A STUDY ON THE IMPACT OF ECONOMIC REFORMS ON THE PERFORMANCE OF MTNL

A thesis submitted to

TILAK MAHARASHTRA VIDYAPEETH, PUNE

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Submitted by

Dnyanesh Patalu Bandgar

Under the Guidance of

Dr. Ram Sable

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Declaration

I hereby declare that the thesis entitled **"A Study on the impact of economic reforms on the performance of MTNL"** completed and written by me has not previously formed the basis for the award of any Degree or other similar title upon me of this or any other Vidyapeeth or examining body.

Dnyanesh Patalu Bandgar
Research Student

Place: Mumbai
Date: 05-11-2015

Certificate

This is to certify that the thesis entitled, **"A study on the impact of economic reforms on the performance of MTNL",** which is beingsubmitted herewith for the award of the degree of **Vidyavachaspati (Ph.D.)** in Department of Management of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Shri Dnyanesh Patalu Bandgar under my guidance and supervision. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for the award of any Degree or similar title of this or any other University or examining body upon him.

Dr. Ram Sable
Research Guide

Place: Mumbai
Date: 23-09-2014

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Date : 05-11-2015 **Dnyanesh Bandgar**

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Abbreviations

Sr. No.	Abbreviation	Meaning
1	3G	3rd Generation mobile services
2	ACSI	American Customer Satisfaction Index
3	ADSL	Asymmetric digital subscriber line
4	ARPM	Average Revenue Per Minute
5	ARPU	Average Revenue Per User
6	ATR	Asset Turnover Ratio
7	BALCO	Bharat Aluminum Company Ltd.
8	BSNL	Bharat Sanchar Nigam Limited
9	BTS	Base Transceiver Station
10	BWA	Broadband Wireless Access
11	CAGR	Compound Annual Growth Rate
12	CDMA	Code Division Multiple Access
13	C-DOT	Centre for Development of Telematics
14	CMC	Computer Maintenance Corporation
15	CPP	Calling Party Pays
16	CRM	Customer Relationship Management
17	CSI	Customer Satisfaction Index
18	CUG	Close user group
19	CV	Coefficient of Variation
20	DEL	Direct Exchange Line
21	DGTD	Directorate General of Trade and Development
22	DIPP	Department Of Industrial Policy & Promotion
23	DSL	Digital Subscriber Line
24	DTH	Direct To Home
25	EU	European Union
26	EVDO	Enhanced Voice-Data Only
27	FDI	Foreign Direct Investment
28	FERA	Foreign Exchange Regulation Act
29	FWT	Fixed Wireless Telephones
30	GDP	Gross Domestic Product
31	GOI	Government of India
32	GSM	Global System for Mobile Communication

33	ILD	International Long Distance
34	IMF	International Monetary Fund
35	IPCL	Indian Petrochemicals Corporation Limited
36	IPR	Intellectual Property (IP) rights
37	IPS	Industrial Policy Statement
38	IPTV	Internet protocol Television
39	ISD	International Subscriber Dialing
40	ISDN	Integrated Services for Digital Network
41	IT	Internet Technology
42	ITeS	IT enabled Services
43	ITI Ltd	Indian Telephone Industries Limited
44	MoU	Memorandum of Understanding
45	MPEG	Moving Picture Experts Group
46	MPLS	Multiprotocol Label Switching
47	MRTPA	Monopolies and Restrictive Trade Practices Act
48	MSC	Mobile Switching Center
49	MSITS	MTNL-STPI IT Services Ltd
50	MTL	Millennium Telecom Ltd
51	MTML	Mahanagar Telephone Mauritius Limited
52	MTNL	Mahanagar Telephone Nigam Limited
53	N/w	Network
54	NLD	National Long Distance
55	NTP	National Telecom Policy
56	NVPL	Nepal Ventures (P) Limited
57	OECD	Organization for Economic Co-operation and Development
58	PAT	Profit After Tax
59	PC	Personal Computers
60	PCO	Public Call Office
61	PSU	Public Sector Undertaking
62	PTT	Posts, Telephone and Telegraph
63	ROA	Return on Asset
64	ROCE	Return on Capital Employed
65	RONW	Return on Net worth
66	RPP	Receiving Party Pays

67	SD	Standard Deviation
68	SFA	Stochastic Frontier Analysis
69	STD	Subscriber Trunk Dialing
70	STPI	Software Technology Parks of India
71	TAT	Turnaround time
72	TCIL	Telecommunications Consultants India Ltd
73	TFP	Total Factor Productivity
74	TRAI	Telecom Regulatory Authority of India
75	TV	Television
76	UASL	Unified Access Service License
77	UK	United Kingdom
78	US	United States
79	USOF	Universal Service Obligation Fund
80	UTL	United Telecom Limited
81	VAS	Value Added Services
82	VDSL	Very-high-bit-rate digital subscriber line
83	VOIP	Voice over Internet Protocol
84	VPN	Virtual Private Network
85	VSAT	Very Small Aperture Terminal
86	VSNL	Videsh Sanchar Nigam Limited
87	WLL	Wireless Local Loop

Chapter 1:

A study on the impact of economic reforms on the performance of MTNL

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Chapter 1:
A study on the impact of economic reforms on the performance of MTNL

1.1. Introduction:

The term economic reforms as commonly understood currently refers to the stabilization and structural adjustment policies which have come in vogue in varying measures in almost all the countries since mid/late seventies (Sandesara,1996). Stabilization policies are the macro-level policies affecting government budgets and balance of payments, and structural adjustment policies are the micro level policies affecting the individual sectors agriculture, industry, infrastructure, finance, insurance and so on. These policies seek to reduce the role of the government, thereby correspondingly increasing the role of the private sector and the market in economic activities. This reduction relates to deregulation and decontrol, and to ownership and management of public sector. The purpose of these changes is to promote faster economic growth and eventually a better distribution of income and wealth in the society than would have been achieved under the previously followed policies which focus around strict regulation and control and ownership and management by the government.

1.2. Economic reforms: Theoretical Background

Batley and Larbi (2004) provide an eloquent review of the different aspects of new institutional economics that have shaped public sector reform: Neo-liberalism, public choice theory, principal agent theory, transaction cost economics and property rights theory all supporting the economic reforms and proved the failure of public sector model.

The classical economic theory, on which neo-liberal thinking is based, stresses the superiority of the free market in the efficient distribution of goods and services. In this view government intervention is only necessary in preventing certain market failures (monopoly, information asymmetries, etc.). Classical economic theory therefore supposes limited government action, and strongly opposes large scale regulation by the government. Instead, neo-liberals have argued for wide scale fiscal deregulation, and decreasing the role of the government (Jooste, 2008).

Government intervention, according to the traditional view should be by public ownership managed through hierarchical bureaucratic administration. Public choice theorists have criticized the traditional view, arguing that public sector reward systems do not promote effective performance, because politicians and bureaucrats are not incentivized to control costs (Mueller, 1979). This leads to bureaucracy being self-serving, promoting an overexpansion of the government, and

various forms of opportunistic behavior. This in turn leads to complicated extensions of bureaucracy aimed at curbing opportunistic behavior, which eventually chokes public sector initiate (Batley and Larbi,2004).

Related to the above, is the principal-agent theory or agency dilemma which examines the problems that arise under incomplete information and conflicting self-interests when a principal hires an agent. In the context of public management, the principal can be seen as the citizens (or the general public) while the bureaucrats are their agents. The asymmetry of information and a self-serving interest in the bureaucracy has led to opportunistic behavior in public administration. In this way, principal-agent theory has motivated public sector reform with an emphasis on performance measurement (in response to information asymmetries) and incentive structure (in response to conflicts of interest) (Jooste, 2008).

Transactions cost economics provides a further basis for determining the most efficient structure of service delivery, by identifying that transaction costs are higher when delivered by the market as opposed to a hierarchy (delivering the service in-house). The decision to deliver services via the hierarchy is then be determined by aggregating transaction costs with production costs (Williamson, 1996).

A final theoretical area is property right theory, which explores the incentives for performance in private ownership, and therefore is helpful in determining how this can be brought to bear in public sector service delivery. Specifically it identifies that managers and employees can be incentivized to perform by sharing in residual firm revenues (e.g. though bonus schemes, pay increases, etc.). This has led to proposals for governance reforms seeking to align public sector managers' incentives with the performance of the organization (Batley and Larbi, 2004).

Thus, economic reforms have emphasized markets and competition as a way of giving users a say in public sector activities, as well as increasing efficiency of service delivery. It has therefore led to reforms built on competitiveness, customer quality, transparency and incentives.

1.3. International scenario:

Post Economic crisis in the late 1970s and early 1980s, developed countries have been at the center stage of the reforms movement, largely driven by two broad factors: public sector inefficiencies, and liberal economic ideology (Salamon, 2002). These changes have broadly involved a reduction in the role of government, towards greater private sector involvement. This economic reform has however not been limited to the first world nations in which they evolved. These changes have also been suggested, and implemented, in many developing countries throughout Africa, Asia and Latin America (Jooste, 2008).

The debate between public and private sector has raged for over a century in first world politics. The twentieth century saw a full swing of this pendulum, from overwhelming public sector confidence, to a renewed belief in the free market economy. The two drivers of this shift were the Great Depression of the 1930s, and the economic crisis of the late 1970s and early 1980s (Megginson and Netter, 2001). While the Depression was largely seen as a failure of the private sector, the economic crisis was widely perceived as a public sector failure (Rodrik, 2006). These perceptions were the guiding forces that shaped role of government in economic development, firstly the growth of the public sector, and then the dispersion of liberal reforms.

The public sector of most developing nations has reflected a similar pattern. The formation of post-colonial nations following the Second World War had at its core a belief in the merit of an “extensive government”. The 1950s and 1960s therefore saw a strong consolidation of government power, and an emphasis on internal service delivery, in both capitalist and socialist oriented economy. However, a later dispersion of the liberal economic view in the West, coupled with a widespread disillusionment of role of the government in development, eventually led to policy transfer to developing nations. This transfer happened either directly though aid conditionality (most prominently as

part of “structural adjustment loans”), or indirectly through development initiatives(Gupta,1999).

Although the economic crisis of the early 80’s can be viewed as the central driver for neo-liberal reform, criticism had long been building against public sector delivery, even before the economic crisis. This pessimism of the government, and the need for reform, was also held by two central players in the economic crisis of the 80’s: the World Bank and the IMF. Both institutions propagated the principles of the “Washington consensus” which called for economic liberalization and a reduction of the role of the government for increased efficiency. The wave of reform was soon advocated to developing countries in deep financial problems, and enforced through structural adjustment loans (Rodrik, 2006).

1.4. Difficulties in implementing economic reforms:

The economic reforms implementation was difficult mainly in developing and underdeveloped countries (Mittal and Ashraf, 2006). The economic reforms highly resisted by the governments in developing countries. Also the pressure to reform was external to developing countries as opposed to internally driven reforms in developed countries. Thus, it was difficult to determine who should drive the reforms in developing countries. The reform initiatives in weak democracies were not always successful causing unbalanced

implementations with fiscal changes taking place much faster than lagging economic reforms.

Another difficulty in implementing reforms in developing countries in because of the public sector model was more deeply ingrained in their power structure which affects the level of inclusiveness of benefits for developing countries. In the poorer countries with weak market systems, power and privilege existed in function of government action, and the relief of poverty depended on access to government redistributed wealth. To challenge the public sector model therefore risked challenging the foundations of the government and its legitimacy (Jooste, 2008).

1.5. Indian scenario:

In India, the need for a policy shift had become evident much earlier, as many countries in East Asia achieved high growth and poverty reduction through policies which emphasized greater export orientation and encouragement of the private sector (Reddy,2002). India took some steps in this direction in the 1980s, but it was not until 1991 that the government signaled a systemic shift to a more open economy with greater reliance upon market forces, a larger role for the private sector including foreign investment, and a restructuring of the role of government.

1.5.1. Rational for economic reforms in India:

After Independence, to fulfill economic and social objectives India adopted the path of planned economic development with a distinct predominance of socialist ideology. Economic objective was specified as growth, and the social objectives were self-reliance, self-sufficiency in food grains, balanced regional development, prevention of concentration of economic power in private hands, promotion of employment, egalitarian distribution of income and wealth and so on(Jalan,2002). And to accomplish these objectives, a number of legislative and other measures to regulate and control various economic activities in the fields of industrial relations, licensing, prices, trade, monopolies and restrictive practices, foreign exchange, etc. were adopted.

Similarly, expansion of the area of public sector by starting new enterprises and by nationalization/take-over of a number of private enterprises in the fields of banking, Insurance, trade and industry are also the other measures in this framework (Kaur,1983). The period of the first three decades or so since 1947 is marked by a large number of a variety of policies and measures in these directions. To name some of the more significant policies and measures in this context are the 1948 and the 1956 Industrial Policy resolutions. The 1951 Industries (Development and Regulation) act; the industry-oriented planning with

special emphasis on basic and key industries to be developed in the public sector since 1956; the nationalizations of the Imperial Bank of India and the life insurance business in 1955 and 1956; the establishment of the Industrial Development Bank of India and the Unit Trust of India in the public sector in 1948, 1964 and 1964; MRTP Act, 1969; directives to financial institutions/banks to orient their lending to social sectors and backward areas in 569; nationalization of non-life business in 1971; and so on.

However, as these policies unfolded in practice, it was noticed that these policies were found to be out of line with reality. Firstly, those who controlled the government power and those who has influence on the government to regulate private enterprise and to run public enterprise were widely believed to fulfill largely the narrow, partisan, parochial interests and only subsidiary the larger, general public good (Jalan,1993).

Secondly, public sector has yielded poorer rate of return on capital employed and a large number of public sector enterprises yielded losses persistently more or less throughout and, thus, came to be perceived as anti-growth enterprises (Ahuja and Majumdar,1998).

Thirdly, while industrial growth during the early period of planning was quite good it had begun slowing down since mid-sixties. The trend rate of growth of industrial production (1980-81 base) was 7.3 per cent

during 1951-65 but was only 4.3 per cent during 1966-74. A similar decline was noticed for each of the subsectors of mining and quarrying (5.9 and 2.6 per cent), Manufacturing (7.2 and 4 per cent), and Electricity (13.6 and 9.1 per cent) (Dholakia,1978).

Finally, one must also consider the influence and the impact of world-wide changes towards the new set of policies on the Indian policy makers. Mrs. Thatcher's and Mr. Regan's practices of liberalization policies in their countries seem to have given a special boost to reforms in a large number of other countries as well. Added to this was the influence of the multi-lateral agencies which insisted upon the adoption of reforms while giving assistance. India could not have remained immune from this global current.

1.5.2. Early Reforms: 1980s

From the mid/late seventies began the process of learning the lessons from the experience of the working of the past policies. There are various committees to review the working of the previous policies and to suggest remedial measures, abandonment of and modifications in the old policies and measures, and adoption of new policies and measures following the recommendations of these committees.

Reports of the Committees on (1) Import-Export Policies and Procedures (Chairman: P.C. Alexander, 1978), (2) Controls and Subsidies (Chairman: Vadilal Dagli, 1979), (3) Export Strategy

(Chairman, Prakash Tandon, 1980), (4) Trade Policies (Chairman: Abid Hussain, 1984), (5) Public Enterprises Policy (Chairman: Arjun Sengupta), (6) Principles of a Possible Shift from Physical to Financial Controls (Chairman: M. Narasimhan, 1985), and (7) Working of the Monetary System (Chairman: S. Chakravarty, 1985) have significant role in shaping the reform policies in India(Jalan,1993).

As a step to reforms in policies and measures government began by calling a halt to increased government intervention and then by initiating reduction in the areas of controls / regulations in licensing, trade, prices, etc. and opening up of the areas earlier reserved for the public sector for the private sector. The list of reforms initiated in specific areas namely Raising the income-tax limit, raising successively the limit of investment for licensing, delicensing a number of industries, broad-banding, stream-lining of licensing procedures, raising investment limits of MRTP companies and exemption to such companies from some provisions of the MRTP Act and so on. Also, the relative importance of the public sector in total investment in the plans has been successively reduced from 61 per cent in the Fourth Five Year Plan to 58 percent, 53 percent, 48 percent, and 45 percent in the successive Plans.

1.5.3. Post 1991 reforms: Major steps

The nineties witnessed not merely the continuation, but the acceleration of reforms, especially during 1991-92 and 1992-93, that liberalization in India is widely believed to have begun in 1991(Ahluwalia, 2002).

Some of the major reforms in policies during the nineties were: Depreciation of the rupee, partial and later full convertibility of rupee on trade account, and other liberalizations in regard to trade policies, industrial policies having a bearing on licensing, foreign investment/technology, MRTP, company investments, opening up of a number of areas for private sector, lending rates by financial institutions and banks and reduction in statutory liquidity ratios. Mention must also be made of the freeing of capital market from government control, abolition of the office of the Controller of Capital issues, operationalisation of the National Renewal Fund, and a removal or reduction of excise and import duties from a large number of items. Also substantial liberalization in financial and insurance sectors and in the area of industrial relations is take place post 1991 (Tendulkar and Bhavani, 2007).

The Central Government's initiatives begin with the new industrial policy for large industry in July 1991, followed by the new small enterprise policy in August 1991 and the follow-up changes. Later, state governments followed with changes in their own policies to bring them

in line with the reforms of the Central Government. The following section highlights specifically the reforms in industry and related areas. The principal reforms in that order are present below.

Licensing: Industrial licensing was abolished except for a limited number of 15 items related to security and strategic concerns, social reasons, hazardous chemicals, environmental reasons and luxury consumption goods.

Public Sector: The number of industries reserved for the public sector is reduced to 6. These include: defense products, atomic energy, coal and lignite, mineral oils, railway transport, and minerals specified in the schedule to the Atomic Energy Order, 1953. This reservation principle, it may be noted, is followed by the qualification that even there private participation in some of these sectors is permitted on a case by case basis. Also, more and more private initiative is encouraged in the development of infrastructure like power, roadways, telecommunications, shipping and ports, airports, civil aviation, etc. Further 3 industries opened for private sector and remaining 3 industries specifically defense aircrafts and warships, atomic energy generation, and railway transport are solely reserved for public sector.

The MRTP Act: The MRTP Act has been amended to remove the threshold limits of assets in respect of MRTP Companies and dominant undertakings. This eliminates the requirement of the prior approval by

the Central Government for expansion, establishment of new undertakings, mergers etc and for appointment of certain directors by the large companies/houses.

Foreign Investment and Technology: There is now automatic approval of foreign investment up to 51 per cent and permission for foreign technology agreements for 35 priority industries. These industries account for about 50 per cent value added of manufacturing sector.

Small-Scale Enterprises: Small-scale industries are presently defined as small-scale industrial units with capital investment in plant and machinery not exceeding Rs. 60 lakh (original value) and when ancillaries not exceeding Rs. 75 lakh (original value). The definition has a further subcategory of tiny units in industry and some related services, bounded by the limit of Rs. 5 lakh (original value). A new policy for this sector announced in 1991 articulate that the primary objective of the reforms is to impart "more vitality and growth impetus" to this sector. With this view, some of the old schemes/measures for this sector have been modified.

State government Reforms: Following the initiatives of the Central Government, almost all of the State Governments appointed task forces to review their existing policies and measures, and bring them in line with those of the Central Government.

It would be noticed from the above that the thrust of reforms has been to remove entry barriers, to open out the economy to foreign goods, investment and technology and to facilitate the growth of the small-scale sector.

The study is concerned specially with industrial reforms. Therefore the policy changes related to micro level industries is studied in detail.

1.6. Reforms in Industrial Policy:

Reforms in industrial policy were a central focus of much of India's reform effort in the early stages. Industrial policy prior to the reforms was characterized by multiple controls over private investment which limited the areas in which private investors were allowed to operate, and often also determined the scale of operations, the location of new investment, and even the technology to be used. The industrial structure that evolved under this regime was highly inefficient and needed to be supported by a highly protective trade policy, often providing tailor-made protection to each sector of industry.

1.6.1. Industrial Policy Statement:

Industrial policy has seen the greatest change, with most central government industrial controls being dismantled. The process of deregulation was initiated in the mid-seventies as a follow up of the recommendations of a series of committees which examined India's trade and industrialization policies in the context of the country's poor

export performance. Further, the Industrial Policy Statement of 1980 allowed automatic enhancement in licensed capacities and regularization of the excess capacities established in contravention of the then existing laws. The eighties witnessed another series of Committees which provided a justification for further deregulation of the industrial sector. In 1985 and 1986 major relaxations were allowed through broad banding, partial delicensing, re-endorsement of capacities, enlargement of the list of industries open for MRTPA/FERA companies, exempting MRTPA companies from the obligation of seeking approval under the MRTP Act in case of 27 high technology and heavy investment industries. Exemption limits under the Capital Issues Control Act, 1947 were also enhanced to free a large number of companies from seeking approval under the Act.

The Statement on Industrial Policy, 1991 (IPS 1991) and other measures announced during the year marked acceleration of the trends towards deregulation and an enlarged scope for large private Indian and foreign capital. Industrial licensing by the central government has been almost abolished except for a few hazardous and environmentally sensitive industries. The requirement that investments by large industrial houses needed a separate clearance under the Monopolies and Restrictive Trade Practices Act to discourage the concentration of economic power was abolished and the act itself is to be replaced by a new competition law

which will attempt to regulate anticompetitive behavior in other ways. IPS 1991 virtually abandoned the industrial licensing system under the IDRA, removed restrictions on large industrial houses under the MRTP Act and dispensed with the general ceiling of 40 per cent on foreign equity under FERA. The policy mix included increasing external competition through lowering of customs duties and relaxations in the quantitative restrictions.

This was followed by dismantling of the Directorate General of Trade and Development (DGTD) and the repeal of Capital Issues Control Act, 1947. Thus, the process of freeing the private sector from regulations and enabling it to respond to market forces was nearly complete. Government's response to the shortcomings of the regulatory system was in winding it up. The alternative policy choice could be in affecting administrative reforms and system's genuine restructuring. This remains unattended.

The list of industries reserved solely for the public sector, which used to cover 18 industries, including iron and steel, heavy plant and machinery, telecommunications and telecom equipment, minerals, oil, mining, air transport services and electricity generation and distribution has been drastically reduced to three: defense aircrafts and warships, atomic energy generation, and railway transport.

The main area where action has been inadequate relates to the long standing policy of reserving production of certain items for the small-scale sector. About 800 items were covered by this policy since the late 1970s, which meant that investment in plant and machinery in any individual unit producing these items could not exceed $ 250,000. Many of the reserved items such as garments, shoes, and toys had high export potential and the failure to permit development of production units with more modern equipment and a larger scale of production severely restricted India's export competitiveness. The Report of the Committee on Small Scale Enterprises (1997) and the Report of the Prime Minister's Economic Advisory Council (2001) had both pointed to the remarkable success of China in penetrating world markets in these areas and stimulating rapid growth of employment in manufacturing (Ahluwalia, 2002). Both reports recommended that the policy of reservation should be abolished and other measures adopted to help small-scale industry. While such a radical change in policy was unacceptable, some policy changes have been made by removing fourteen items from the reserved list in 2001 and another 50 in 2002. The items include garments, shoes, toys and auto components, all of which are potentially important for exports. In addition, the investment ceiling for certain items was increased to $1 million.

Industrial liberalization by the central government needs to be accompanied by supporting action by state governments. Private investors require much permission from state governments to start operations like connections to electricity and water supply and environmental clearances. They must also interact with the state bureaucracy in the course of day-to-day operations because of laws governing pollution, sanitation, workers' welfare and safety, and such. Complaints of delays, corruption and harassment arising from these interactions are common. Some states have taken initiatives to ease these interactions, but much more needs to be done (Ahluwalia, 2002).

A joint study by the World Bank and the Confederation of Indian Industry found that the investment climate varies widely across states and these differences are reflected in a disproportional share of investment, especially foreign investment, being concentrated in what are seen as the more investor-friendly states (Maharashtra, Gujarat, Karnataka, Andhra Pradesh and Tamil Nadu) to the disadvantage of other states (like Uttar Pradesh, Bihar and West Bengal). Investors perceived a 30 percent cost advantage in some states over others, on account of the availability of infrastructure and the quality of governance. These differences across states have led to an increase in the variation in state growth rates, with some of the less favored states actually decelerating compared to the 1980s. Because liberalization has

created a more competitive environment, the pay off from pursuing good policies has increased, thereby increasing the importance of state level action(CII-World Bank, 2002).

1.6.2. Foreign Direct Investment:

The most significant reforms taken place in India is foreign direct investment. The logic of allowing foreign direct investment was to create a free and fair market for the various public private, domestic/foreign companies. This has also increased the inflow of foreign direct investment which helps in reducing balance of payment crisis post 1991(Singh, 2005). The other advantage of FDI in various sectors is that it improves the production technology. This allows the domestic as well as foreign companies to produce the goods and services at a very competitive price and make the Indian products globally competitive. The required procedure for FDI is also simplified and the automatic approval is allowed in certain cases. In other cases the, the Foreign Investment Promotion Board established for speeding process of FDI.

The efforts of the economic reforms are showing the fruits in last decades. The GDP is growing at a faster rate, than in 1991. The inward flow of FDI is not only increased but the outer FDI also increased and domestic companies are going global(Chakraborty and Nunnenkamp, 2006). The reforms have created a very competitive environment for

various industries and Indian Products are now globally competitive. The technology upgradation in various industries has increased the number of efficient companies than in 1991. The Indian companies are partnering with foreign companies for strategic reasons and meager and acquisition has been seen in almost every industry. The FDI in India is increased tremendously but it is still very low compared to other emerging countries. Therefore other measures are also needed to increase the FDI in India (Singh, 2005).

1.6.3. Infrastructure Development policy:

The reforms also impacted the infrastructure development in the country. The development in electric power, road and rail connectivity, telecommunications, air transport, and efficient ports is tremendous in last decade. The infrastructure development in India is at par with some of the Southeast Asian countries. The more and more private investment in telecommunications, electricity, ports and air transport has made these sectors competitive.

1.6.4. Privatization policy:

Initially, the development of Indian economy is solely depends on the public sector which accounts for about 35 percent of industrial value added in India (Gupta,1999). But the inefficiency associated with public sector has caused the privatization in some of the sectors. Privatization

is also one of the significant reforms in last two decades. The process of privatization in India is different from the other countries around the world. The privatization process of selling a minority stake in public sector enterprises while retaining management control with the government, a policy described as “partial privatization” or “disinvestment” (Gupta, 2008). The sole objective of privatization process was to mobilize revenue for the budget. The partial privatization or disinvestment policy had very limited success because of revenue from disinvestment were consistently below budget expectations.

In 1998, the policy makers allow transfer of management control to private stakeholders when 74 percent of the equity of Modern Foods India Ltd. was sold to Hindustan Lever. Then the other public sector enterprises like BALCO, Hindustan Zinc; (CMC) Computer Maintenance Corporation; Lagan Jute Machinery Manufacturing Company, several hotels, VSNL, IPCL, and Maruti Udyog Ltd were privatized reducing the government share below 50% (Mathur, 2004).

The privatization of these companies has some problems associated with them. But the problem is not with the privatization process but on the transparency and pricing issue. The transparency in the bidding process was the real concern for some stakeholders because of the ambiguity and also on the price realized by the privatization (Arun &Nixson, 2000).

The privatization of public sector enterprises mainly focusing on the loss making PSEs but government also insist on the selling of profit making companies. However, the opposition for selling public sector enterprises making large profits such as those in the petroleum and domestic telecommunications sectors.

Nowaday, a focus of policy makers to earmark the proceeds of privatization is to finance additional expenditure on social sector development and for retirement of public debt. This will help in reducing the government spending on social sectors like education and healthcare (Naib, 2004).

The state government also started privatization of state public sector enterprises. The majority of State PSEs are loss making and thus it is seen that the proceeds received from them is not significant. But privatization has reduced the burden on government by shelling of loss making and inefficient enterprises which are turnaround by private sector companies. The efficient management and dynamic decision making has caused the turnaround in the privatized public sector enterprises.

1.7. Telecommunication sector in India:

Telecommunication serves in India was introduced in 1851 when the first operational land lines were laid by the government near Kolkata (then Calcutta) but the telephone services were formally introduced in

India 1881. Post independence the nationalization of all the foreign telecommunication companies created a Posts, Telephone and Telegraph (PTT), a body that was governed by the Ministry of Communication. The monopoly of government was broke in 1984 when Indian Telecommunication Institute (ITI) was established to manufacturing telecommunication equipment (Subramanian, 2004).

In 1984, the government established Centre for Development of Telematics (C-DOT), A R&D unit, to develop state-of-the-art telecommunication technology.

The entire development of the telecom industry can be classified into three distinct phases.

- Phase I- Pre-Liberalization Era (1980-89)
- Phase II- Post Liberalization Era (1990-99)
- Phase III- Post 2000

The role of government is significant in development of the telecommunication industry. As a result of economic reforms since 1980s, the Indian telecom market is one of the most developed markets in the world with private participation in almost all of its segments (PricewaterhouseCoopers, 2011). The reforms in regulatory policies and structural changes in the functioning of the industry has successfully transformed the monopolized market into a most competitive and developed market in the world. The growth in the services sectors

especially IT and ITeS sector has increased the importance of the telecom industry in India. A telecom service has emerged as a key infrastructure for economic and social development of the economy. The telecom industry is also facilitating the development of other industries like transport and logistics, Information technology, entertainment and media.

Reforms in the regulatory policies relating to telecommunication industry mainly focus on National Telecom Policy. The first National Telecom Policy was designed in 1994 to accelerate the growth of the telecom sector (TRAI, 2012). The NTP-94 was emphasis on protecting and promoting consumer interests and ensuring fair competition. The policy reflected an ambitious approach in setting the targets, but adopted a cautious approach in dealing with the issues of liberalization in the telecom sector.

Then the NTP-99 was introduced in 1999. It brought changes such as migration from fixed license fee to revenue sharing rule and cost-oriented telecom tariffs. The NTP-99 was amended in 2003 and initiatives such as unified access licensing regime, reduced access deficit and calling party pays (CPP) that has provided further momentum to the sector(TRAI, 2012).

Today, the Indian telecom industry is characterized with intense competition, and continuous price wars. Currently, there are around a

dozen telecom service providers who operate in the wired and wireless segment. The call rates are lowest in the world and growth rate is highest in the world. The government has been periodically implementing suitable fiscal and promotional policies to boost domestic demand and to create volumes for the industry.

1.8. Mahanagar Telephone Nigam limited:

Mahanagar Telephone Nigam Limited (MTNL) is a Navratna public sector enterprise providing the telecommunications service in the two metro cities, Mumbai and New Delhi. MTNL was formed in 1986 with the sole objective to provide world class telecommunication services in these metro cities. Till 1992, the telecommunication service in Mumbai and New Delhi is monopolized by MTNL thereafter the telecom sector was opened to other service providers. MTNL provides fixed telephones, cellular services, Broadband and other telecommunication service in Mumbai and Delhi. MTNL provides mobile services on GSM and CDMA platforms.

The telecommunications market in the cities of Delhi and Mumbai are most competitive markets. MTNL faces intense competition from the other mobile operators and the basic service providers. This has led to an increased pressure on margins due to reducing tariffs and also on the customer retention and acquisition. The average revenue per user is also reduced.

Economic reforms and liberalization have converted MTNL from state owned monopolies to player in a highly competitive market with no social or other non commercial objectives. They will have to be run like other private sector telecom companies if they want to survive and prosper. However, MTNL have shown poor performance in recent years in the face of private sector competition. This has been criticized by the various segments about the role of government in the highly competitive sector. Also the efficiency of management of MTNL is also under question. Therefore it is necessary to understand the impact of reforms on the performance of MTNL in last 10 years when the results of reforms actually seen.

Chapter 2:

Review of literature

2.1.Introduction

2.2.Studies on Economic reforms and impact of economic reforms

2.3.Studies on customer satisfaction with service quality

2.4.Research gap in earlier study

Chapter 2:
Review of literature

2.1. Introduction:

The knowledge of research work carried out by earlier researchers in the past relating to the problem under study is useful and provides guidance to any researcher in conducting the research in the right direction. The review of literature also helps to adopt appropriate methodology besides, proper understanding of the concepts and analytical issues relating to the problem under study.

An attempt has been made by the researcher in this chapter to review some of the relevant studies relating to the topic of the present study. Therefore the aim of this chapter is to review the available literature briefly and identifies certain gaps in the earlier literature.

2.2. Studies on Economic reforms and impact of economic reforms:

Ahluwalia (1) while rejecting the arguments of the critics of economic reforms considered India's efforts of liberalising its economy since 1991 as an 'economic revolution'. He however, suggested a cautious approach towards opening up of route to foreign capital since it brings in the elements of volatility.

Ahluwalia (2) in his study on "Economic Reforms in India since 1991: Has Gradualism Worked?" state that gradualism strategy implies

a clear definition of the goal and a deliberate choice of extending the time taken to reach it, to ease the pain of transition.

Ahuja and Majumdar (3) in their study point out that the performance of firms in the Indian state-owned sector is characterized by both, low performance, as well as significant and systematic variations in the performance parameters. They claim that Indian public enterprises are inefficient by design. Not only companies saddle by their political overseers with non-economic objectives, they are also forced to operate on an uneconomically large scale. In return, public enterprises managers are favored with access to credit from state banks at subsidized borrowing rates, so they face soft budget constraints as well.

Angelucci, Estrin, Konings and Zolkiewski (4) analyze the effect of ownership and competition on firm performance measured by Total Factor Productivity in three transition economies for the years 1994-1998. They find that competitive pressure is associated with higher productivity in all three countries and competitive pressure has stronger effects in private firms and privatization is associated with higher performance in more competitive sector. They concluded that there are complementarities between competitive pressure and ownership in promoting superior firm performance.

Arun and Nixon (5) assessed the disinvestment of public sector enterprises in India. They examine the disinvestment of shares of public

sector enterprises (PSEs) in India since 1991. The study argues that the main aim of disinvestment has been to reduce the public sector borrowing requirement at the cost of the restructuring and rationalization of PSEs in particular and the public sector in general. Alleged under-pricing of shares sold, lack of transparency, limited public support for disinvestment and the absence of a common set of objectives between the Government of India and the Disinvestment Commission have been major problems. In many respects, India provides a checklist of how not to disinvest.

Babatunde (6) study the impact of the reforms on the performance of the firms in the telecommunications sector in Nigeria. The Study reveals strong and positive relationship between economic reform and firms' revenue and profit. The study recommends the provision of supporting infrastructure including electricity and the building of public data networks. He also stressed on the issue of poor quality of service of the telecommunications service providers.

Bhagwati and Srinivasan (7) in their study argued that the crisis of 1991 was not governed by external factors rather was only an outcome of internal causes of weak policy regimes of 1980's.

Bhattacharyya, Lovell and Sahay (8) examined the impact of liberalization on the productive efficiency of Indian commercial banks. They point out that public owned Indian bank have been the most

efficient, followed by foreign-owned banks and private owned Indian banks. They also find a temporal improvement in the performance of foreign-owned banks, virtually no trend in the performance of privately-owned Indian banks, and a temporal decline in the performance of publicly-owned Indian banks.

Boardman and Vining (9) has compared the performance of the 500 largest non US industrial firms in 1983 including mixed enterprises, public enterprises and private enterprises and find that mixed enterprises and public enterprises perform substantially worse than similar private enterprises. They concluded that partial privatization is worse, especially in terms of profitability, than complete privatization or continued state ownership.

Carilin, Fries, Schaffer and Seabright (10) uses data from 1999 survey of 3305 firms in 25 transition countries to examine the factors that promote restructuring by firms and enhances subsequent performance measured by growth in sales and in sales per employee over a three year period. They find that competition has an important and nonmonotonic effect on the growth of sales and labor productivity with performance improving more for firms facing one to three competitors than for monopolist or firms facing many competitors. Controlling of other factors they find no significant relationship between

privatization and performance. They concluded that competition has more powerful influence on performance than ownership.

Chakraborty and Nunnenkamp (11) assess the growth implications of FDI in India. They find out that the growth effects of FDI vary widely across sectors. They find only temporary effects of FDI on output in the services sector, which attracted the bulk of FDI in the post-reform era. They suggest that FDI is unlikely to work wonders in India if only remaining regulations were relaxed and still more industries opened up to FDI.

Chakravartty (12) in his study argued that the negotiation of telecom policy must be seen as more than a problem of the absence of institutional, technological and economic resources. He also point that the politics of telecom reform in the developing world as a whole needs to be understood beyond the singular issues of access.

Chandrasekhar and Ghosh (13) in their study overview the reform policies in India as well as assess of the impacts of these policies, especially in relation to employment and incomes. They concluded that a sound industrial policy is needed to increase the productivity in the Indian economic reform policy which should be applied in line with trade and investment policies. In order to arrive at a sustainable industrial policy a greater attention towards the social relations and the social policies at enterprise and at national level is needed. They argued

therefore for a gradual process of liberalization and privatization, with the consent of all the stakeholders involved, in order to build up a solid industrial base from which India could build up a framework for better economic and social policy.

Chidambaram (14) has dealt with one chapter specifically on disinvestment in his book titled “A view from the outside-Why good economies works for everyone”. In his opinion” the two words disinvestment and privatization are not synonymous, yet they are frequently used interchangeably. The intent is to confuse. Just as public sector become an article of faith in the 1960s and 1970s, deconstructing the public sector is being currently driven by blind faith. If a public sector enterprise can compete and be successful in an open market economy, we should let it remain in public sector. All other public sector enterprises must be privatized. Privatization alone will unlock the true potential of the economy.

Cook and Kirkpatrick (15) argued that market failures are especially pervasive and damaging in developing countries. The institutional weaknesses of governments in developing countries, coupled with weak capital markets and national reliance on single commodity export, means that privatizing public enterprises will be extremely hazardous. They claim that regulatory capacity in developing

countries is very weak and that the best response to market failures will be state ownership with competition.

Dholakia's (16) study is on "Relative performance of public and private manufacturing enterprises in India: Total factor productivity approach". This study illustrated the performance of public enterprises in the manufacturing sector. The study has observed quite remarkable performance, especially compared to that of comparable private enterprises, if performance uses the criterion of growth of total factor productivity rather than net profitability. In fact, public enterprises in the manufacturing sector, which have been absorbing scarce national resources, have been using these resources with rapidly increasing efficiency.

Fink, Mattoo and Rathindran (17) analyses the impact of policy reform in telecommunication for 86 developing countries over the period from 1985 to 1999. The study concludes that both privatization and competition leads to significant improvements in performance. Due to the reform process, the level of productivity has increased compared to years of partial and no reform.

Ganesh (18) deals with the origin of public sector, its present status and public sector reforms. The researcher also forecast the future investment needs of infrastructure and the policy initiatives for speedy world class infrastructure development. The experiment with

disinvestment of public sector industries and reforms in banking and insurance sector are dealt by researcher very well. The need for proper regulation and empowered regulatory machinery to ensure competition and prevention of consumer exploitation is also briefly dealt with.

Goyal (19) in his study assess the impact of globalization on developing countries from the viewpoint of inward foreign direct investment. He focused on the role of developing countries, particularly from parts of Asia and Latin America, as a initiators of globalization through their own MNCs.

Gupta (20) studied privatization in South Asia and its successes and failures. He concluded that privatization of infrastructure sectors remains the key challenge confronting the economies of South Asia. Infrastructure privatization is likely to differ from that of manufacturing because of the need for regulatory oversight. She also suggests that to increase private participation, the government needs to pursue both privatization and competition policy reforms in these sectors.

Gurumurthy and Srinivasan (21) in their study on “Failure of Indian Telecom Liberalization: A Case Study” argues that private telecom operators made unrealistically aggressive bids for basic services because they overestimated the size of the Indian market. It takes the business case of an operator to show that the firm will not make even a cash profit or repay the principal of its loan for 15 years.

Jain (22) analysed the government policy towards small scale sector along with problems faced by them due to globalisation in the pre- and post-liberalisation periods. The study reveals that the problems of small scale sector are multi-dimensional especially in the liberalised environment which would further be intensified with the arrival of multinational companies and removal of quota restrictions in the textile sector. The study suggests that the government should give priority to the timely and adequate loans to the small scale industries along with time-bound promotional concessions, up-gradation of technology, marketing assistance through vigorous research and development efforts.

Jalan (23) the year 1990-1991 was the cruellest year in Indian history and the export performance of Indian economy since independence was despondent when compared with other developing countries.

Jha and Sahani (24) uses Annual survey of Industries data for the years 1960-61 to 1982-83 for four industries; cement, cotton textile, electricity, and iron and steel. For the latter two industries, their claim is primarily in the public sector while the first two are owned predominantly by private interests. They find no evidence of allocative inefficiency in general and each of them is relatively as efficient as one another.

Joshi's (25) study is on "Overview of Privatization in South Asia". He attempted to emphasize that the rationale for privatization and preparations for the privatization are very important to minimize the social costs and dislocations causing from such initiative. Thereforeit is essential to first carry out the regulatory reform that would clarify the roles of government, workers and employers in the process of privatization. A transparent and accountable reform process would not only instill confidence among the private sector and the general public, it would also assure the workers about the fairness of the system.

Kapur and Ramamurti (26) in their study on "Privatization in India: The Imperatives and Consequences of Gradualism" argues that it was not just "vested interests" alone, but institutional structures, in particular those embedded in the judiciary, parliament and India's financial institutions, that played an important role in the long lag between the onset of economic liberalization and privatization. They also explain causes and consequences of slow progress of privatization in India.

Kaur (27) compared total factor productivity ( ) of 15 public and 15 private enterprises from diverse sectors viz. aluminum, steel, fertilizers, engineering, drugs and chemicals, and consumer goods. The results shows that there was not much difference in the average annual growth rate of TFP between the public sector and private sector, both

being around 1.5 percent per annum. In order to estimate the impact of competition on the efficiency of the firm, average annual growth rates of PSEs operating under monopoly and competitive market environment was compared and find that PSEs operating in competitive market environment were performing far better than PSEs operating in monopoly environment. In fact monopoly experienced a negative growth rate of 3.79 percent over the period 1988-89 to 1994-95 while competitive PSEs on an average experienced a positive growth rate of 1.5 percent during the same period.

Kochhar, Kumar, Rajan, Subramanian and Tokatlidis, (28) in their study shows that India has followed an idiosyncratic pattern of development compared to other fast-growing Asian economies. They find that some of these distinctive patterns existed even prior to the beginning of economic reforms in the 1980s, and argue they stem from the idiosyncratic policies adopted soon after India's independence. They concluded that despite recent reforms that have removed some of the policy impediments that might have sent India down its distinctive path, it appears unlikely that India will revert to the pattern followed by other countries.

Kotwal, Ramaswami and Wadhwa (29) in their study surveys the literature on economic reforms and offers its own assessment of the drivers of change. The fast and stable growth accompanied by a decline

in poverty in India has raised many questions about growth drivers, Indian model; sustainability and so on. They have compared the Indian reforms experience with other developing countries in Asia and world.

Kumar and James (30) conducted a study entitled “Public sector enterprises in India”. The study is based on profitability measure of performance. They have accepted that the profitability is the key test for analyzing the performance of state owned enterprises in Kerala.

Li (31) studies the effectiveness of China’s incremental process using a data of 272 Chinese public enterprises with data from 1980 to 1989. These reform processes emphasized giving public enterprises managers greater operating discretion and additional incentives but did not involve privatization. He observed a marked improvement in the marginal productivity of input factors and total factor productivity and also finds that over 87 percent of total factor productivity growth is attributable to improved incentives, intensified product market competition and improved factor allocation.

Mahambare and Balasubramanyam (32) analysed the impact of trade liberalisation on Indian manufacturing sector. The study revealed the mixed impact of 1991 reforms on the selected manufacturing sector. Technology acquisition, efficient utilisation of resources and infrastructure development were considered some of the factors which possibly contributed to the increase in total factor productivity growth.

Mackenzie (33) studied the macroeconomic impact of privatization and argued that the proceeds of privatization should be treated as financing and not as revenue. Also the receipt of proceeds from privatization does not deserve a relaxation of the stance of fiscal policy to maintain aggregate demand.

Mathur (34) in her book titled" Disinvestment of PSEs in India" traces the philosophy and growth of private sector enterprises in India and describes recent moves towards their privatization. It is devoted to the objectives, expansion and problems of public sector enterprises in India. It also explains the disinvestment policy of government and its implementation, besides describing the procedures and modalities of the disinvestment process. In the end it summarizes the discussion and present future outlook for PSEs in India. Further she states that in dismantling the public sector, India has adopted a gradualist approach.

Mattoo and Rathindran (35) explains how the impact of liberalization of service sectors on output growth differs from that of liberalization of trade in goods. They also suggest a policy-based rather than outcome-based measure of the openness of a country's services regime. Such openness measures are constructed for two key service sectors, basic telecommunications and financial services. They suggest that countries with fully open telecom and financial services sectors grow up to 1.5 percentage points faster than other countries.

Mayer and Strasser (36) in their study compare the policies relating to telecom reforms. They found that the liberalization of the US and EU telecom sectors has similar historical setting and the goals of reregulation. Yet, the implementation of these goals was quite different.

Megginson and Netter (37) has surveys the rapidly growing literature on privatization and made an attempt to frame and answer the key questions on the privatization theory and then describes some of its lessons on the promise and perils of selling state-owned assets. The focus of study was on to know and understand the process of “state to market”.

Mittal and Ashraf (38) analyze the competition, privatization and reforms in Indian telecom industry. They review the industrial policy and important aspects of the performance of Indian industry and point out that economic reform, the process of privatization and the need for a competitive environment seems to be necessary for the growth of the industry.

Mohan (39) studied relationship between Politics and Economic Liberalization and has argues that politics drive economics in India, especially as elections approach. He shows how two important economic policy initiatives of the coalitional government, involving tax reform and privatization, have stalled because of the political need to satisfy powerful interest groups.

Nagaraj (40) has studied the disinvestment and privatization in India and he point out that the effect of reforms in public sector has not reflected in the financial performance of the public sector enterprises. He suggest that alternative institutional arrangement for improving PSEs' financial performance; mutual stock holding among complementary enterprises tied around a public sector bank to minimize problems of soft budget constraint, dysfunctional legislative and bureaucratic interference, and to encourage close interaction between banks and firms to promote long term economic development.

Naib (41) has analyzed disinvestment policies, procedures and practices in India from a theoretically perspective. He says that disinvestment in India was part of broader process of economic liberalization. To get inside into the impact that new economic policies had on disinvested enterprises and the way in which these enterprises responded to them, researcher provides a firm level analysis through case studies of seven partly disinvested enterprises. Impact of post reform policies on enterprises is analyzed in terms of changes in market share, cost structure, profitability and work culture. The strategic response of these enterprises is examined in terms of cost reduction measures, changes in product portfolio, restructuring innovations and institutional arrangement for diagnosing environmental changes.

Neogi and Ghosh (42) assessed to see the impact of liberalisation on the performance of four-selected industry groups, namely, (1) chemical, (2) textile, (3) non-metallic mineral products and (4) electric machinery, by using firm level data for period 1989-94. The results indicated that productivity growth and efficiency levels have not improved as per expectation during the post-reform period and the distribution of efficiency is skewed. The relationship between labour productivity and capital intensity indicated a general downfall of efficiency of the firms during the study period. The level of technical efficiency for all the industries was found to be very low and no significant improvement was observed in this level during the post reform period.

Patnaik and Chandrasekhar (43) in their study considered the crisis of 1991 purely speculative in nature caused by speculative outflows from Indian economy that continued the pressure on balance of payments despite reduction in trade deficit. A very vital, daring and worrisome feature of India's economic reform according to them was that, there was no urgent need of bringing about structural changes in 1991 since the condition could have come under control by low conditionality of IMF loans. It was the liberalization lobby that consisted of Fund, Bank, government elements and Indian business class that made use of this unprecedented economic crisis by introducing liberalization.

Parmeswarn (44) explored the impact of economic reforms on technical efficiency using firm level data from selected industries in India. Using the technique of SFA, the study revealed that all the industries considered have registered a higher rate of technical progress in the post reform period. The effect of change in the policy environment on technical efficiency was found to be varying among industries. The study also found that firms' involved in the international trade through export and import of raw materials and technology had a positive effect on technical efficiency.

Prasad (45) examined the impact of economic reforms on exports of India and concluded that during 1990-1991 to 1994-1995, India experienced a high growth compared to growth rates of world exports. The study also revealed that the growth in the values of exports from India was mainly due to growth in quantity of exports and not due to real increase in unit values. This showed that Indian exports were becoming more competitive in terms of prices.

Rajesh and Swamy (46) analyzed the effect of economic reforms on the manufacturing sector. They identified that a wide gap is noticed in productivity growth and efficiency aspects across the Indian states. They suggests that technological up gradation needs to be prioritized if the output of the manufacturing sector has to be improved.

The scope and coverage of Ram Mohan and Ray's study was wide (47). To study public and private sector bank's performance, maximization efficiency approach was used by researcher. They attempt a comparison of performance among three categories of banks - public, private and foreign and find that the public sector banks performed significantly better than private sector banks but no differently from foreign banks. The conclusion points to a convergence in performance between public and private sector banks in the post-reform era, using financial measures of performance.

Ray (48) examined whether India's Economic Reforms have improved efficiency and productivity for the period 1986-87 to 1995-96. They found that the states with higher capital-labour ratio and higher percentage of the urban population experienced a greater acceleration in the productivity growth rate after the reforms. They also revealed that on the average the annual rate of productivity growth has been higher in the post-reform period than in pre-reform period. However, some states have actually experienced a slowdown in the productivity growth or even productivity decline after the reforms.

Reddy (49) addressed the Liberalization and privatization of public enterprise in India. He shows that Indian policy is poised towards a structured change in the balance between state and market, openness and national self-reliance, public and private enterprise. It has elements

of privatization, in terms of wider scope for the private sector, but only marginally in terms of share transfers.

Rodrik (50) in his study demonstrate the extent to which the thinking of the development policy community has been transformed over the years. One puts faith on extensive institutional reform, and another puts faith on foreign aid. He concluded that from the diverse perspectives and an explicitly diagnostic approach it is recognized that the binding constraints on growth differ from economy to economy.

Ros (51) study the state versus private ownership using International Telecommunications Union data to examine the effects of competition and privatization on network expansion and efficiency in 110 countries over the period 1986-1995. He finds that countries with at least 50 percent private ownership of the main telecom firms have significantly higher teledensity levels and growth rates. Both privatization and competition has increased efficiency, but only privatization is positively associated with network expansion. He concluded that competition is more important than ownership in improving telecom performance.

Seetharaman (52) in his research study titled “Financial performance of public sector enterprises in India -A study of select heavy and medium engineering enterprises” has evaluated the financial

performance of selected public sector enterprises for the duration of 1975-76 to 1995-96.

Singh (53) in his study explores the uneven beginnings of FDI, in India and examines the economic and political developments relating to the trends in Industry and Telecommunication sector in India.

Sharma (54) in his study on, “Customer's Perception on MTNL Services: An Indian Viewpoint” highlighted the customer's expectation and their perceived value from the MTNL services.

Siggel and Agrawal (55) in their study report the findings of a small sample survey of manufacturing enterprises in the Delhi region regarding perceptions of the impact of economic reforms of 1990s. They find that most firms felt that the reforms were helpful by increasing access to foreign technology and making imports of capital and intermediate goods cheaper. They also felt that improvement in infrastructure and more flexible labour laws will facilitate further growth of India’s manufacturing sector.

Subramanian (56) in his study on impact of deregulation on a public sector firm explores the manner in which state-owned telecommunications equipment manufacturer Indian Telephone Industries (ITI) was affected by the radically altered market conditions brought about by the opening up of the economy and the loss of its monopoly status. ITI's experience shows that the government's market-

oriented reform programme ended up creating anything but a level-playing field for public enterprises. Deregulation had an extremely destabilizing effect on the operations of ITI. The government has eliminated its monopoly privileges and imposing new market-related constraints but has not given the autonomy to compete in the free market.

Thakur, Sharma and Raj (57) examine the trends in industrial production for the period 1950-51 to 1989-90 and 1990-91 to 2011-12. They show that industrial efficiency was relatively higher in the decade of 1950's whereas, in the 1960's and 1970's there was severe retrogression in industrial growth. The period of 1980's was marked by industrial recovery. However, the pattern began reversing themselves in 1990's. But particularly after 2002-03, the Indian industry have started showing some signs of improvement in its performance, thus providing some evidence that these reforms seems to be working.

Trivedi (58) attempts to piece together various policy pronouncements and publicly available documents on India's privatization to outline what appears to be the prevalent approach to privatization. He also point that Privatization is only one of the many options to improving the performance of public sector enterprises and the preference continues to be to treat it as a policy of last resort.

Vickers and Yarrow (59) shows the advantages for liberal government in owning commercial enterprises. They observed that if

political market works efficiently, competition between politicians will ensure that correct set of policies will be implemented, and politicians will seek to maximize social welfare- defined as the sum of producers and consumer surplus.

Virmani (60) viewed external sector reforms in India since 1991 as the most successful reforms. It had disclaimed the fear of ballooning of imports in post reform period, while the performance of current account and capital account, had improved significantly.

Wallsten (61) examines the impact of state ownership, control and regulation on telephone penetration rates by going back in time and examining how ownership influenced the speed with which telephone service was provided to citizens of different countries during the industries infancy. He uses the data compiled from early twentieth-century sources to test the effect of government monopoly, service, competition, and regulation on the development of the telecommunications industry in Europe during the early 1990s. He examines the effect of very stringent licensing arrangements that allowed private firms to operate but with highly insecure property rights. He finds that, countries with competition between telephone providers and whose government did not threaten to expropriate firms' assets saw higher telephone penetration and lower prices even in rural areas. Telephone penetration is much lower in countries where service

was provided by state owned monopolies than in countries that allowed private sector. However countries that licensed firms under stringent concessions saw worse penetration rates than countries with state owned monopolies.

Wood and Kodwani (62) in their study on “Privatization Policy and Power Sector Reforms: Lessons from British Experience for India” examines the lessons of the British privatization programme for India. The discussion focuses on privatization of electricity supply industry a key sector in economic development in India. Privatization of British Electricity Supply Industry was preceded by radical changes in the industry structure and restructuring of the firms in the industry and was accompanied by a tight regulatory framework intended to promote efficiency and competition.

2.3. Studies on customer satisfaction with service quality:

With the liberalization and internationalization in telecommunication, service quality has become an important means of differentiation and path to achieve business success. Such differentiation based on service quality can be a key source of competitiveness for many Indian firms and hence have implications for leadership in such organizations. For the past few years, telephone service sector in India has been experiencing the biggest growth rate in terms of subscribers and revenues. With the increasing demands of the customer, cellular sector

has become competitive. Is this implicating on customers' service quality satisfaction? Studying this aspect is one of the objectives of this study. Therefore review of studies on customer satisfaction with service quality is needed. Hence aim of this section is to review studies related to customer' satisfaction with service quality in general and telecommunication in particular.

Accenture (63) carried out survey of 4189 consumers in Australia, Brazil, Canada, China, France, Germany, India, United States, and United Kingdom. More than 67% respondents confirmed poor customer services as the core reason for leaving the operators. The survey also found the rising expectations of customers in mature and growing markets.

ACSI (American Customer Satisfaction Index) (64) has detailed the purpose, history and methodological aspect of American customer satisfaction Index. The report shows that ACSI is predictive of corporate performance, growth in the Gross Domestic Product (GDP), and changes in consumer spending.

Anderson, Fornell, and Rust (65), study the relationship between customer satisfaction and productivity. They argued that trade-off between customer satisfaction and productivity is more prevalent in services than goods. They point out that linkage between

changes in customer satisfaction and changes in productivity is positive for goods but negative for services.

Berry, Parasuraman, Zeithaml, and Adsit (66) argued that SERVQUAL is an effective tool to steer organization in its pursuits of quality improvement by focusing on those areas that significantly contributes toward improvement.

Brady and Cronin (67) developed a hierarchical multidimensional model, in which they identified the fundamental attributes of mobile service quality which are composed of three main dimensions: interaction (service delivery), outcome (service product), and physical environment (service environment). Interaction quality comprises the sub-dimensions of expertise, problem solving, information, security/privacy, and customization/personalization. Environment quality can be achieved though the sub-dimensions of equipment, design, and context. Finally, outcome quality consists of the sub-dimensions of reliability, tangibles, and valence.

Brown and Swartz (68) tested the SERVQUAL model and did not support the five factor structure of the instrument. He criticized the instrument because of the generalizability of its dimensions.

Churchil and Surprenant (69) in their study on determinants of customer satisfaction find that service quality (SQ) seems to be a key driver of business success especially in the market saturation stage in

Thailand. They suggested that a firm cannot gain the competitive advantage in today's business environment without delivering high quality service.

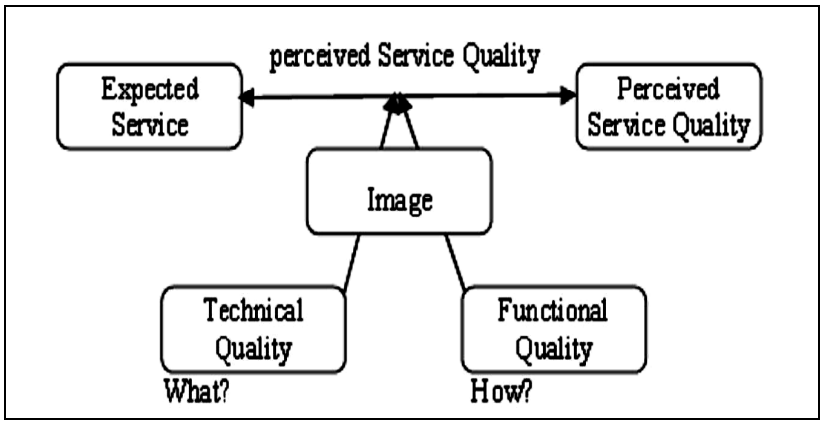
Cronin and Taylor (70) in their study on service quality measurement criticized the conceptualization and measurement of service quality. They illustrated that SERVQUAL confounds customer satisfaction with service quality, and proposed a performance-based measure of service quality called SERVPERF by explaining that service quality is a form of customer attitude.

Dabholkar, Thorpe, and Rentz (71) compare the SERVQUAL dimensions to their own qualitative research and propose five dimensions central to service quality (physical aspects, reliability, personal interaction, problem solving, and policy) suggesting that SERVQUAL dimensions need modification and require a hierarchical factor structure to better capture overall evaluations of service quality. They further suggest that a measure of service quality across industries is not feasible.

Gronroos (72) has developed a Nordic model for measuring service quality and divides the customers' perception of any particular service into two dimensions, namely technical and functional quality. The model conceptualizes perceived service quality by differentiating

between what and how components of the buyer- seller interact. This is presented in chart 2.1.

Chart 2.1: Nordic Model of service quality



Hassan, Malik and Faiz (73) in their study on service quality and its relationship with customer loyalty in telecom sector of Pakistan has concluded that gaps exist between customer perceptions and their expectations. Major gap exist in network dimension followed by responsiveness and reliability. A correlation analysis shows positive significant relationships between service quality attributes and customer loyalty.

Lai, Hutchinson, Li and Bai (74) in their study to assess the SERVQUAL instrument reliability and validity and apply the SERVQUAL instrument in China's mobile communication setting. They find that the adapted SERVQUAL instrument is a valid and valuable tool to measure service quality. Service convenience is an important

additional dimension of service quality in China's mobile communications setting.

OECD (Organisation for Economic Co-operation and Development) (75) has undertaken a study in 2007 on Consumer Satisfaction in Telecommunication markets in the OECD countries. The study found imperfect information on quality and price, lack of transparency in roaming charges for international in service and contractual binding in changing the operators affect consumer behavior. The study found that quality of service and price were two major factors for switching over to new operators. The study further highlighted that major factors affecting mobile phone users' dissatisfaction included lack of differentiation in United Kingdom, prices and quality of services in Portugal, early termination fee and unsolicited calls and inaccurate billing in United States, and lack of meeting and exceeding customer's satisfaction in Australia.

Ozer and Aydin (76) in their study undertaken to determine the National Customer Satisfaction Index of mobile phone users based on a sample of 1950 mobile phone subscribers. The dimensions that emerged in customer satisfaction included meeting customers' pre-purchase expectations, perceived quality (coverage, responsiveness to customers complaints, value-added services, promotional activities and their fulfillment), and complaint handling found that network quality based

on data services and voice services strongly influence customer satisfaction and loyalty with regard to the use of mobile phone.

Parasuraman, Zeithaml and Berry (77) proposed the gap model of service quality that operationalised service quality as the gap between expectations and performance perceptions of the customer.

Parsuraman, Zeithaml, and Berry, (78) developed a list of characteristics through formal surveys of customers in different industries and focus group that define service quality in general. They combined these attributes into five major dimensions of service quality, namely; tangible, assurance, responsiveness, empathy, and responsiveness. They subsequently tested these dimensions through SERVQUAL; a 22-items scale measuring customers' expectations and perception on five dimensions to evaluate service quality.

Prahalad and Ramaswamy (79) stated that the role of customer is changing in dynamic business environment. The changing paradigm of business has made the provision of quality of services as top priority for organizations. They argued that customer-focused strategy has become a means of competitive advantage and survival for organizations.

Rudie and Wansley (80) pointed out that intense competition and rapid deregulation have led many service and retail businesses to seek profitable ways to differentiate themselves. Thus the strategy that

has been related to success in these businesses is the delivery of high service quality.

Seth, Momaya and Gupta (81) studied managing the customer perceived service quality for cellular mobile telephones based on primary data, which was collected through questionnaire by using convenience sampling method. The sample size of the study was 225. The factor analysis was used as statistical tool. This highlighted the relative importance of service quality attributes and showed that "responsiveness" is the most important dimension, followed by reliability, customer perceived network quality, assurance, convenience, empathy and tangibles. This research work contributed theoretically by proposing a tool for managers that can be used for monitoring and improvement of service quality from customers' perceptions.

Sharma and Singh (82) in their study analyse the customers' perception about the value added services (VAS), service quality, customer satisfaction and loyalty in telecom service providers in northern India. Further, a comparative analysis of the leading service providers has been undertaken from customers' perspective to understand the variations in satisfaction and loyalty levels of their customers. They suggest that value added services are perceived to be a strategic tool to differentiate service of one provider from the other.

Sureschander, Rajendran, and Anantharaman (83) concluded that SERVQUAL has been widely used in telecommunication industries in different cultural context with high reliability and validity.

Sutherland (84) identified a list of indicators for mobile phone quality of services. These indicators included network access, service access, service integrity, and service retainability.

Taylor and Baker (85) empirically assess the nature of the relationship between service quality and consumer satisfaction in the formation of consumers' purchase intentions across four unique service industries. The results suggest that consumer satisfaction is best described as moderating the service quality/purchase intention relationship.

Thompson (86) in his study examined the relationship between profitability and service quality and observed that delivering superior service quality appears to be a prerequisite for success, if not survival, of such businesses in the 1980s and beyond.

Van der Wal, Pampallis and Bond (87) in their study on mobile telecommunication in South Africa used SERVQUAL with some modifications. The modified instrument resulted scale reliability of 0.95.

Ward and Mullee (88) in their study on service quality in telecommunication services have used reliability, availability, security, assurance, simplicity, and flexibility as criteria of service quality. They

argued that, from customers' perspective, it is not appropriate to separate network quality from the other dimensions of quality.

2.4. Research gap in earlier study:

It is clear from the above review of literature that:

- The total of 88 studies on economic reforms and allied subject are reviewed and most of the previous studies laid emphasis on the implementation of economic reform, impact of economic reforms, comparative performance analysis of public sector and private sector companies.
- Majority studied the economic reforms in terms of liberalisation, privatisation and globalisation.
- There have been studies on impact of economic reforms on macro level and micro level. But the studies are not recent and the economic reforms process in India has shown significant changes in recent decade.
- The periods of studies were short 3 to 5 years.
- Impact of economic reforms on MTNL was studied by very few experts and researchers.
- Not a single research study at micro and macro level had been done taking into account multi-performance indicators on MTNL.
- The need for the study in the present day context is very urgent for the very reason that so far no one has tried to study impact of

economic reforms on MTNL taking into primary data from customers. There must be a study on impact of economic reforms on public sector enterprises, taken into account fair long period and more than 3 parameters or measures, especially MTNL- a public sector enterprise which is now marching from state to market.

To sum up all the reviews, in the back drop of gradual policy change there is need to understand the impact of economic reforms on public sector enterprises which are facing a stiff competition from the private sector companies. Therefore, in the present study efforts are made to understand the impact of economic reforms on the performance of Mahanagar Telephone Nigam Limited (MTNL).

Chapter 3:
Research Methodology

3.1. Defining the Problem

3.2. Objectives of the study

3.3. Hypotheses of the study

3.4. Research Methodology

- 3.4.1. Research Method
- 3.4.2. Data Collection
- 3.4.3. Sampling
- 3.4.4. Data Analysis

3.5. Significance of the study

3.6. Limitation of the study

3.7. Chapter plan of the study

Chapter 3:
Research Methodology

3.1. Defining the Problem:

Over the last few decades, an economic reform has cause the transformation of various economies. This reforms trend started by UK Prime Minister Margaret Thatcher in the early 1980s and in India by Manmohan Singh in 1990's has proved the usefulness of policy reforms in the development of the economy (Vickers and Yarrow, 1991).

Since then many countries have embarked on the course of reforms which has changed the economic landscape around world. Economic reforms have spread in many industries, including those that had exclusively public sector. An economic reform has transformed command economies in post-communist countries into decentralized ones. It has changed the political balance of power in many societies and revolutionized global financial markets.

The reforms like liberalization and privatization of public sector enterprises has characterized economic policy worldwide for more than 30 years (Vining and Boardman, 1992). Based on the free market economic theories, the removal of the economy from government influence and the opening up of former monopoly markets is the main agenda of the economic policy of many governments. Free market theory advocate that the government should roll back and occupy the

minimum possible space and allow the market forces instead of the arbitrary decisions undertaken by bureaucrats and politicians to decide all economic decisions (Megginson and Netter, 2001). In India, after pursuance of planned development for nearly half a century, a stage was reached when questions were raised about the relevance and the need to continue the planned development strategy. Also the economic crises in early nineties also forced the Indian government to adopt the free market theories.

This has changing perception of public sector enterprises performance and impact of economic reforms on public sector enterprises. The extent of impact of economic reforms is totally depends upon how quality service or products exploited by public sector enterprises after economic reforms adopted. The public sector enterprises, that is able to offer superior quality or products to customers quickly may enhance speed and determine the degree/level of performance and positive impact. The tempo and extent of impact and quality service varies from public sector enterprises and even within enterprises, form state to state also. In this scenario, it is interesting to study and assess the impact of economic reforms on public sector enterprises and customer satisfaction delivered by them. Therefore, the approach of the study is used to assess the impact of economic reforms in the telecommunications industry on the public sector enterprise i.e. on Mahanagar Telephone Nigam Limited.

The study of impact of economic reforms and customer satisfaction towards service quality of MTNL is of contrasts. On the one hand, there are pockets of highly positive impact and on the other, highly negative. Similar situation may available on customer satisfaction from high to low level. Therefore statement of problems is stated as under.

"A study on the impact of economic reforms on the performance of MTNL"

3.2. Objectives of the study:

The objectives of the study are as follows:-

1. To study the economic reforms with reference to telecommunication industry in India.
2. To assess the impact of economic reforms on the growth of telecommunication industry in India.
3. To assess the impact of economic reforms on performance of MTNL during the period 2003-2012 period.
4. To measure the impact of economic reforms on customer service quality of MTNL.
5. To study the problems faced by MTNL due to economic reforms.
6. To suggest measures to improve the performance of MTNL in future.

3.3.Hypotheses of the study:

The present research deals with analysis and evaluation of impact of economic reforms on the performance of one of the Central public sector enterprise, MTNL. Post 1991, the microeconomic reforms allowed increased participation of private sector in various industries. Telecommunication industry is the forefront in this respect. Today the telecommunications market in India is one of the fastest growing markets in the world. This growth attracts large number of foreign and private sector companies in this industry. The metro cities of Delhi and Mumbai are among the most competitive markets in India. MTNL, a public sector enterprise, is providing telecommunication services in these cities since establishment in 1986. But MTNL faces intense competition from the other telecommunications operators post economic reforms. Therefore it is interesting to study the performance of MTNL to assess the impact of economic reforms. Therefore, the null hypothesis and alternate hypothesis for the study are as follows:

H_0: There is a negative impact on the performance of the MTNL due to the economic reforms.

H_1 – Economic reforms have led to an increased pressure on margins due to reducing tariffs and also on the customer retention and acquisition.

Following additional hypotheses were formulated for the purpose of the study.

Hy_1: Customers are satisfied with landline service quality of MTNL.

Hy_2: Customer satisfaction with landline service quality dimensions of MTNL is equal to or better than expectation.

Hy_3: Customers are satisfied with broadband service quality of MTNL.

Hy_4: Customer satisfaction with broadband service quality dimensions of MTNL is equal to or better than expectation.

Hy_5: Customers are satisfied with mobile service quality of MTNL.

Hy_6: Customer satisfaction with mobile service quality dimensions of MTNL is equal to or better than expectation.

Hy_7: Customers are satisfied with overall service quality of MTNL.

Hy_8: Customer satisfaction with overall service quality dimensions of MTNL is equal to or better than expectation.

3.4.Research methodology:

The study is descriptive to the extent that it explains the impact of operating, financial and overall performance of MTNL after economic reforms. It is also analytical to the extent that it evaluates and analyzes the customer satisfaction levels of MTNL and also evaluates the satisfaction with various service quality dimensions of MTNL services. Research is a scientific endeavor. The present study explores and

analyses the various problems faced by the MTNL due to economic reforms. In the present study an attempt is made to follow systematically the logical process of reasoning.

3.4.1. Research Method: There are various methods of conducting research. The present study is an exploratory in nature to provide a clear understanding of the impact of economic reforms on PSEs particularly the MTNL. It is also a descriptive research where focus is on fact finding investigation with adequate interpretation. The method of conducting the research is analytical and descriptive; therefore survey method is followed in this study.

3.4.2. Data collection: The study is based on primary as well as secondary data. Extensive literature survey connected with the topic has been carried out. Secondary data were collected from books, journals, annual reports, web sites and government reports. Primary data were collected from the customers of MTNL with the help of a structured questionnaire using close ended questions.

3.4.3. Sampling: As the primary data was collected from the customers of MTNL, the universe of the sample was the customers of MTNL in Mumbai. Thus, the area of study was the city of Mumbai. The size of the sample was 1000 MTNL customers. Considering the time available and cost involved the sample size of 1000 customers has been justified. The samples were selected

on random basis. However, stratified random sampling method was followed for selecting the samples. The samples covered male and female, employed and businessmen/professionals and from the city as well as suburban areas.

3.4.4. Data Analysis: The data collected was tabulated and analyzed with the help of computer software. Various statistical methods were used for analysis of data, such as mean, percentages, correlation standard deviation etc. The data were interpreted for drawing conclusions. Apart from these, one sample t-test is used to test the hypotheses. To measure the customer satisfaction and service quality of the MTNL, Customer Satisfaction Index (ACSI model) and SERVQUAL model were used respectively. A few suggestions were made at the end in order to improve the performance of the MTNL in future.

3.5. Significance of the study:

1. The study would be significant for government-state and central, private and public entrepreneurs. It would also help the telecommunication service providing companies to understand the perception towards service quality of telecom services and enhance the satisfaction level of customers, resulting in improvement of performance.

2. The study helps to find out the level of satisfaction for different services of MTNL.
3. The study also helps to know the level of satisfaction towards different dimensions/aspect of service delivery of MTNL.
4. The study will help the management of MTNL to understand the characteristic of customer satisfaction and various dimensions of service quality delivered by MTNL.
5. Development of any service organization, especially telecommunication services, is totally depends on the satisfaction with the service quality. In today's competitive market, success mantra is to provide quality service at affordable cost. Because low satisfied customers will not loyal to the organization and switch to other organization to fulfill their need. It does not matter how perfect is the management and infrastructure to provide service if service is not delivered satisfactorily then company will not earn profit and thus result in poor performance. Therefore it is essential to measure the service quality of various services provided and from this point this study is more significant to understand the overall performance of telecom service providers.
6. This study would be significant for telecom industry; IT enabled service industries and other technology driven service industries.

7. This study is helpful for government –state and central to decide on the various policies of state or central public sector enterprises.
8. This study is also helpful for the regulation body like TRAI to understand the quality of service provided by the telecom service organization in India.
9. There is general tendency in the organization to lay emphasis on operations and financial management. The quality aspect is not considered as parameter for performance evaluation. Therefore this study is significant to each and every individual or organization especially government organization to understand the performance of public sector enterprises.

3.6.Limitations of the study:

The present study has certain limitations. They are as under.

1. The survey method is conducted only in Mumbai city so results may not applicable to other cities.
2. The survey was based on stratified random sampling.
3. The secondary data is analyzed for 10 years duration from 2003-2012.
4. The impact of economic reforms on MTNL is evaluated so results may not be applicable to other central public sector enterprises in India.
5. Random error is inevitable while sampling techniques.

6. The conclusions have drawn on the basis of data available or collected from different sources. The secondary data were available and the data collected were not adequate or accurate for drawing conclusions.
7. The researcher has tried in the pilot survey to collect data from the employees of MTNL in Mumbai. However, the employees were refused to give the information because of government service and confidentiality.

3.7. Chapter plan of the study:

This study is presented in seven chapters as under.

1. Introduction
2. Review of literature
3. Research methodology
4. Indian Telecom Sector
5. Data Analysis: Part-I
6. Data analysis: Part-II
7. Conclusions and Suggestions

Chapter 4:

Indian Telecommunication Sector

4.1. Introduction

4.2. Economic reforms in Telecommunications sector in India:

4.2.1. NTP -1994

4.2.2. NEW Telecom Policy-1999

4.2.3. Other Policy Initiatives:

4.2.3.1. Foreign Direct Investment (FDI) policy:

4.2.3.2. Telecom Regulatory Authority of India (TRAI):

4.2.3.3. Calling Party Pays (CPP) policy:

4.2.3.4. Broadband Policy 2004:

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4.3. Impact of economic reforms on Telecommunication Sector in India:

4.4. Market share of wireline connections:

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4.6. Trend in Teledensity:

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4.9. Private vs. Public share in Indian telecom sector

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4.14.1. Network Infrastructure of MTNL

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Chapter 4:
Indian Telecommunication Sector

4.1.Introduction:

Telecommunications infrastructure is an important tool for socio-economic development. It is one of the prime infrastructure services needed for rapid growth and development of various sectors of the economy (OECD, 2008). The growth in Information technology over the last decade has played an important role in the development of the telecommunication services in the economy. Thus it contributes to the growth in GDP.

Since 1991, a Telecommunications service sector has witnessed the most fundamental, structural and institutional reforms. Today, India is emerged as one of the fastest growing telecom markets in the world. From 2001 to 2012, the total number of telephone subscribers has grown at a Compound Annual Growth Rate (CAGR) of 35 percent. The comparable rates in the 1980s and 1990s were 9 percent and 22 percent, respectively (TRAI, 2012). However, the composition of the subscribers shows that mobile services subscribers have outplayed the other telecom services. The increase in teledensity has mainly been driven by the increase in mobile phones. This high growth rate has been achieved due to sharp fall in tariffs. The rapid growth in Indian

telecom services has encouraged major global manufacturers of telecom equipment like Nokia, Motorola, Ericsson, and Siemens to invest in India. The potential for growth in broadband and wireless internet services will be the next segment for the telecom service operators for investment and earning higher growth.

4.2. Economic reforms in Telecommunications sector in India:

Prior to liberalization, the telecom scene in India was far from enticing. Abysmally low tele-density, poor state of tele-infrastructure, restrictive portfolio of services and a highly bureaucratized structure characterized the government monopoly (Mittal and Ashraf, 2006). The GOI's policy of economic liberalization in 1991 provided the real impetus for reform. This policy reflected a change in the mindset of policy makers, which led to a structural shift in the Indian economy. The policy makers were acutely conscious of the need to strengthen the infrastructure sector as it formed the backbone of the economy. The choice of the telecom sector for "show-casing" the policy shift reflected the importance the government attached to telecommunications as a common man's tool for capacity building, as an important driver of economic and social change, and as a factor in building the international competitiveness of the country. The policy initiatives and the decisions of regulatory

institutions, which were set up in the wake of earlier reforms, had a wholesome impact on a telecom sector that subsequently witnessed exponential growth.

Historically, the reform process began in the 1980s with the entry in 1984 of private players in the manufacturing of customer premise equipment and corporatization of domestic telecom operations (i.e. MTNL) in two metros: Delhi and Mumbai; and the establishment of a corporation (i.e. VSNL) for international services in 1986 and of the Telecom Commission with full government powers in 1989.

The policy initiatives taken during the 1990s constituted the second, but the most important, stage of the reform process as the transition from monopoly to competition was accomplished during this period. This was done through three major policy initiatives beginning with the deregulation of the sub-sector of value added services in July, 1992, followed by the issuance of two major policy instruments: the National Telecom Policy, 1994 (NTP94) and the New Telecom Policy 1999 (NTP99).

4.2.1. NTP -1994

National Telecom Policy 1994 document represented the first attempt to codify policy objectives and provide a roadmap for telecom development in India. The policy document laid down specific

targets, such as making telephone service available on demand by 1997, coverage of all villages by 1997, provision of PCOs in urban areas for every 500 persons by 1997 and introducing all value added services available internationally, preferably by 1996. The resource gap estimated for realization of these targets was well over Rs. 230 billion and therefore the policy emphasized the involvement of the private sector and the need for private investment to bridge the resource gap. Hence, the policy for the first time allowed private companies registered in India to participate in the provision of basic telephone services subject to stipulated conditions.

Another important dimension of this policy document was its emphasis on protecting and promoting consumer interests and ensuring fair competition. The policy reflected an ambitious approach in setting the targets, but adopted a cautious approach in dealing with the issues of liberalization in the telecom sector.

The new paradigm in the telecom sector created interest worldwide and investors, both Indian and foreign, shown keen interest in being partners in telecom development. However, the implementation of the policy did not match the excitement it created and delivered mixed results. Physical targets were not achieved, particularly for rural telephony. Only about half of over 600,000 villages stood covered by

March 1999. And many of these telephones in rural areas failed to work properly for technology reasons (GOI,2009).

However, with regard to provision of PCOs, the progress was comparatively better and the number rose from 80,000 in March 1994 to 277,000 in March 1999. There was significant growth in the number of STD/ISD PCOs, which went up from 57,119 in March 1994 to 272,989 in March 1999. The STD/ISD PCOs were franchised, and provided opportunity for self-employment to unemployed youth, ex-servicemen and economically disadvantaged segments of the society.

In the introduction of private players in the mobile and the basic segments of the service, the rollout of private operators suffered considerable delay, particularly so in the case of basic service, largely due to controversies surrounding the bidding and selection processes for award of a license. As a result, by 1999 the private operators could introduce service in only two of the six circles for which basic service licenses were awarded. The picture was somewhat better for mobile services, as private mobile operators started operations in 1997. From a policy perspective, the noticeable delays and hiccups pointed to the need for greater transparency and clarity in the

licensing process and the terms of licenses, as well as for an independent regulator.

4.2.2. NEW Telecom Policy-1999

The New Telecom Policy 1999 responded to the far-reaching changes taking place in the telecom sector worldwide as well as to the inadequacies of NTP94. The NTP99 further liberalized the scope of cellular mobile service, fixed service, and cable service, including the terms and conditions of licenses and operational aspects. Interconnection had been a key concern among service providers and had given rise to many disputes.

Recognizing the importance of the issue, in NTP99 the GOI brought it within the ambit of policy. The NTP99 policy unequivocally asserts that interconnection shall be permitted between service providers in the mobile and basic service segments This policy also covered issues in such other areas as the resolution of problems facing the existing operators, the restructuring of the Department of Telecommunications (i.e. creation of BSNL), spectrum management, universal service obligations and the role of the regulator. Free entry into basic telecommunications replaced duopoly.

The NTP-99 was amended in 2003 to permit a licensee to provide wireline and wireless services using any technology in a

predetermined license area after conversion to a Universal Access Service License (UASL).

4.2.3. Other Policy Initiatives:

4.2.3.1. Foreign Direct Investment (FDI) policy:

Another important policy initiative endeavored to promote FDI in the telecom sector, a measure considered necessary to augment the resources available to the sector. The new Policy permitted foreign ownership of up to 49% of a telecom venture, automatically, and up to 74% subject to certain conditionality. This was further relaxed and foreign ownership up to 100% is permitted in the telecommunications services. In the manufacture of telecom equipment, however, sole foreign ownership has been permitted, subject to sectoral requirements.

4.2.3.2. Telecom Regulatory Authority of India (TRAI):

In 1997, Government of India enact a law, the Telecom Regulatory Authority of India Act 1997 (TRAI Act 1997)leading to the establishment of an independent statutory Regulatory Authority for the telecom sector, with clearly defined functions, powers and responsibilities to encourage competition, ensure a level playing field, and promote and protect consumer interests. The Telecom Regulatory Authority

of India (TRAI) enjoyed wide-ranging functions and powers in the areas of its responsibility. These relate to and include ensuring technical compatibility and effective interconnection between operators and service providers; regulating revenue-sharing agreements among service providers; monitoring quality-of-service standards; ensuring compliance with license conditions; approving tariffs for telecom services; and protecting consumer interests. The TRAI is not entrusted with functions relating to licensing, standard setting and allocating spectrum, which are in the domain of the GOI. This Act initially had vested dispute settlement functions with the TRAI, but an amendment to the TRAI Act in 2000 divested TRAI of these functions.

4.2.3.3. Calling Party Pays (CPP) policy:

The Calling Party Pays policy was introduced in India in 2003.In this policy, the calling party was to bear the entire cost of the call. This policy is applicable to mobile to mobile calls as well as fixed line to mobile calls. Prior to this, the Receiving Party Pays (RPP) system was used where the subscriber used to pay for incoming calls from both mobile as well as fixed line networks. Thus introduction of Calling Party Pays policy has

greatly driven the growth in subscriber base in the mobile services in India.

4.2.3.4. Broadband Policy 2004:

The potential of broadband services in various applications like tele-education, tele-medicine, e-governance and entertainment has involuntary made the government to accelerate the growth of Broadband services. Therefore the Broadband policy has been introduced in 2004.

The internet and broadband penetration is lowest in India compared to other Asian countries. Therefore the policy makers foresee an accelerated growth in Internet penetration and PC through the technology options like Optical Fiber Technologies, Digital Subscriber Lines (DSL) on copper loop, Cable TV network, Satellite Media, Terrestrial Wireless and Other Future Technologies. The Policy highlighted on the use of copper loop for implementation of broadband services. The Broadband Policy also cited that Mahanagar Telecom Nigam Limited (MTNL) and Bharat Sanchar Nigam Limited (BSNL) would aggressively use their already existing broadband infrastructure to provide broadband services.

The Policy foresaw that the cable networks can be utilized to provide broadband connections because of their network. The

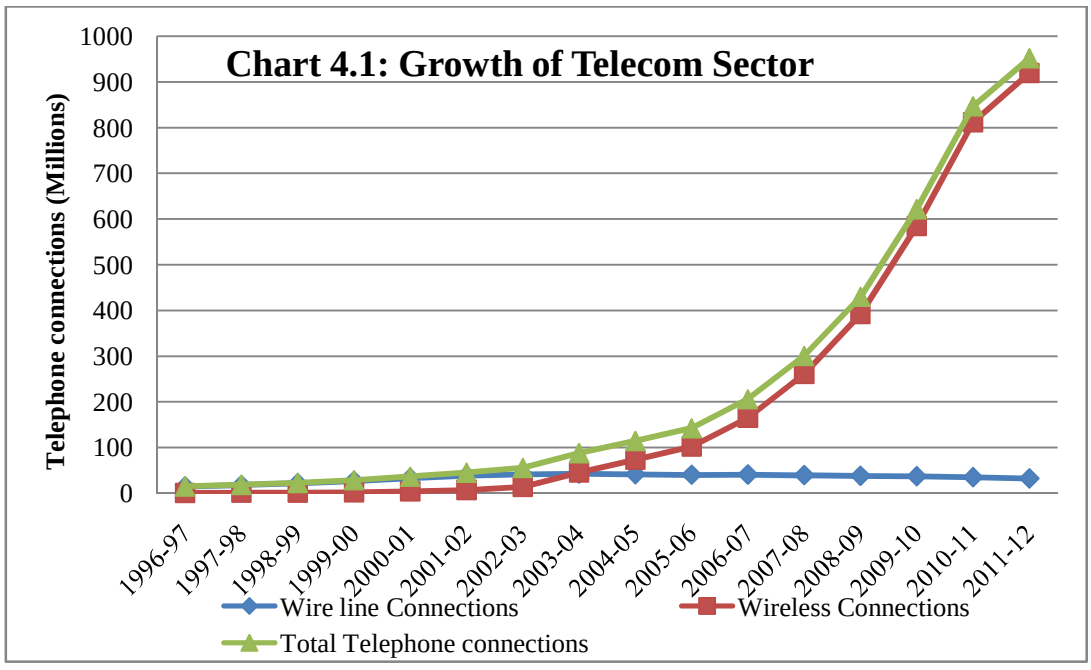
Policy also stated that to increase the broadband penetration in remote areas, technologies such as very small aperture terminals (VSAT) and direct-to-home (DTH) will be implemented aggressively.

4.2.3.5. Infrastructure sharing policy:

A recent development has witnessed active infrastructure sharing. Earlier only passive infrastructure sharing was allowed, permitting a new telecom operator to rent space on the tower belonging to another for deployment of its own equipment to support its rollout. With the new ruling on active infrastructure sharing, a new entrant can now rent all active electronics, switching, and circuits from another telecom operator that owns the passive and active infrastructure. The active sharing of infrastructure, however, excludes the sharing of spectrum. This ruling will help new operators to launch their services with lower upfront capital investment, resulting in improved viability and lower tariffs. The lower cost of providing service will encourage service providers to expand telecom services in rural areas without encountering the high costs that usually accompany the provision of telecom coverage in such areas.

4.3.Impact of economic reforms on Telecommunication Sector in India:

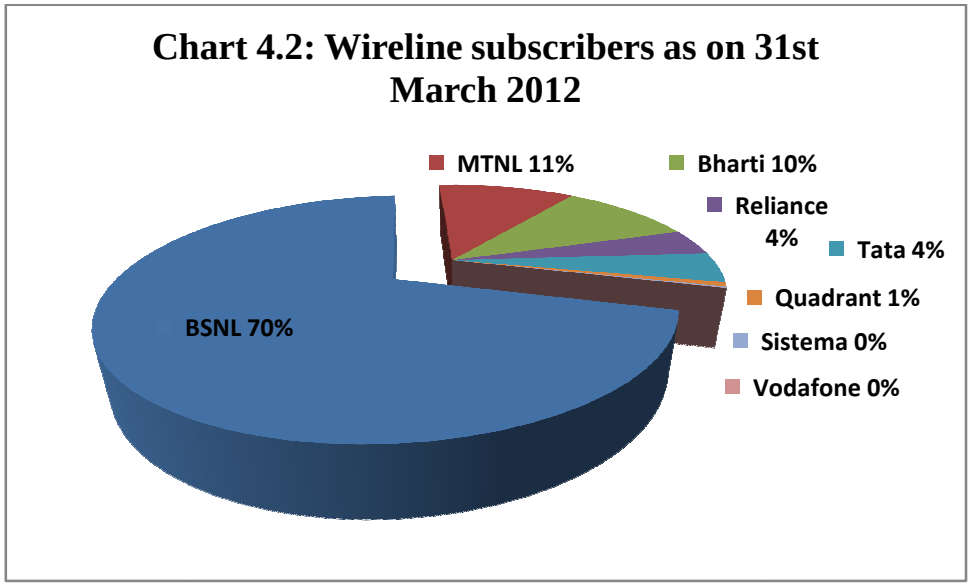
The reform in the sector has not only led to rapid growth but also facilitate variety of consumer benefits like lower tariffs as a result of unrestricted competition. A Telecom reform has witnessed a tremendous growth in the total number of telephone subscribers. From a meager 22.8 million telephone subscribers in 1999, it has grown to 951.34 million at the end of March, 2012. Indian telecom network has million connections as on 31st March 2012 having a dominant share of 96.62% wireless connections. Wireless connections rose from 35.61 million in 2004 to 919.17million in March, 2012. The wireline connections started to decline from 40.92 million in 2003-04 to 32.17 million in March 2012.



Source: TRAI quarterly report

4.4.Market share of wireline connections:

Wireline subscriptions increased from 2.3 million in 1981 to 32.71 million in 2000-01 to reach its peak at 42.84 million in 2003-04. Thereafter, it started registering negative growth as shown in the chart 4.1. By the end of March 2012, wireline subscriptions came down to 32.17 million. The competition has forced the landline services to become more efficient in terms of quality of services but still the mobile phone became a substitute to fixed line phone. The landline network quality has improved thanks to fiber optics network and landline connections are now usually available on demand.



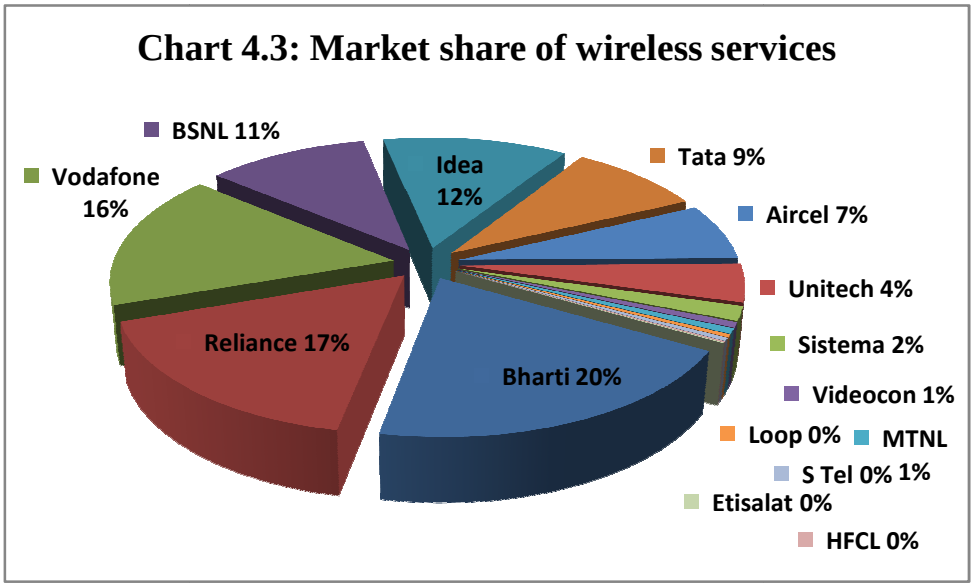
Source: TRAI Quarterly report

The market share of wireline connections as on 31st March 2012 is shown in the chart 4.2. There is dominance of public sector enterprises in the wireline services. BSNL (70%) and MTNL (11%)

together has 81 % market share of 32.2million telephone connections. The share of private sector giant Bharti Airtel has 10% market share followed by Reliance Communications and Tata Teleservices having 4 % market share. The share of wireline is significantly reduced in last 8 years in account of substitute wireless services. The low cost of mobile phones and reduced call rates influence the subscribers to use wireless services.

4.5.Market share of wireless connections

The market share of various wireless telecom operators as on 31st March 2012 are shown in the chart 4.3. Bharti Airtel is the market leader with 20% share followed by Reliance and Vodafone having market share of 17 % and 16 % respectively. The public sector companies BSNL and MTNL having market share of 11% and 1% respectively. The low market share of MTNL was due to limited operations in Delhi and Mumbai circle only.

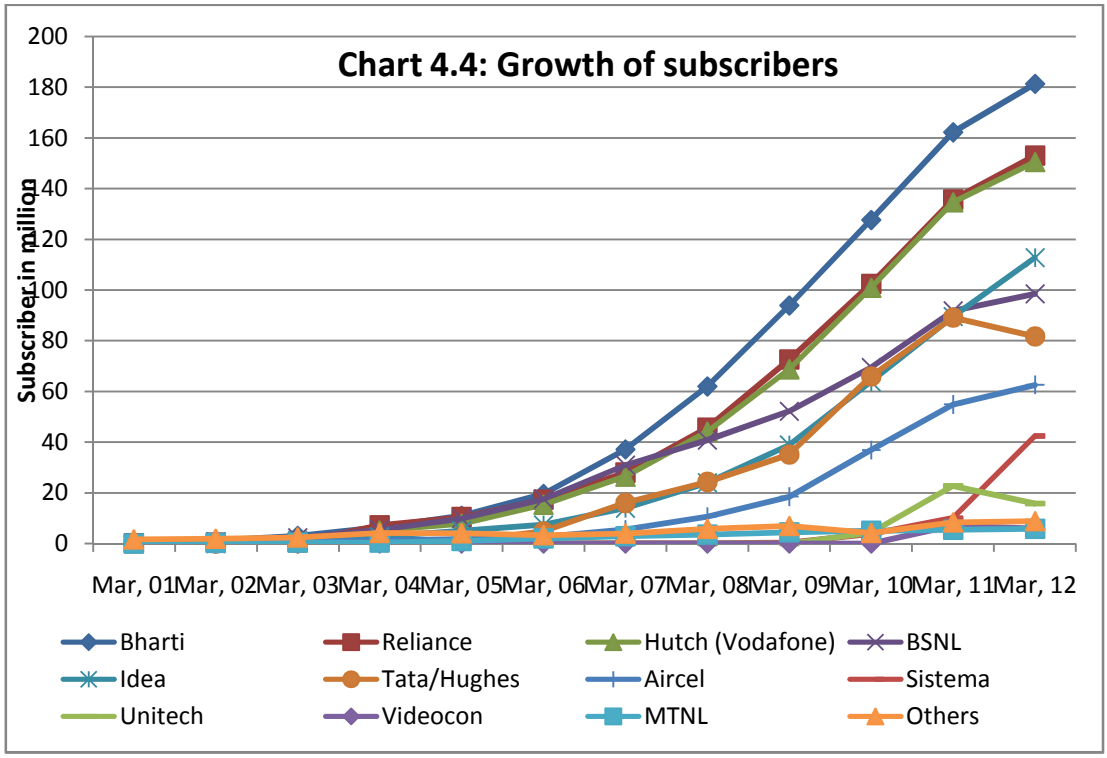


Source: TRAI Quarterly Report 2012

The total subscriber base is 919.17 million subscribers as on 31st march 2012.The market leader Bharti Airtel (20%) has 181.28 million subscribers where as Reliance (17%) and Vodafone (16%) has 153.05 million and 150.47 million subscriber base. The public sector companies BSNL (11%) and MTNL (1%) have 98.51 million and 5.83 million subscribers. The new operators Videocon and Unitech, who got license in the year 2009-10, had captured a significant market share of 1 % and 3 % respectively having 7.11 million and 22.79 million subscribers as on March 2012.

The share of mobile phones in total telecom connections is 96.62%. In India, more than 95 per cent of wireless connections are prepaid. There is a clear distinction between the Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA) technologies. At the end of March 2012, GSM accounted

for 88.56% of the wireless subscriptions and was growing at a faster rate.



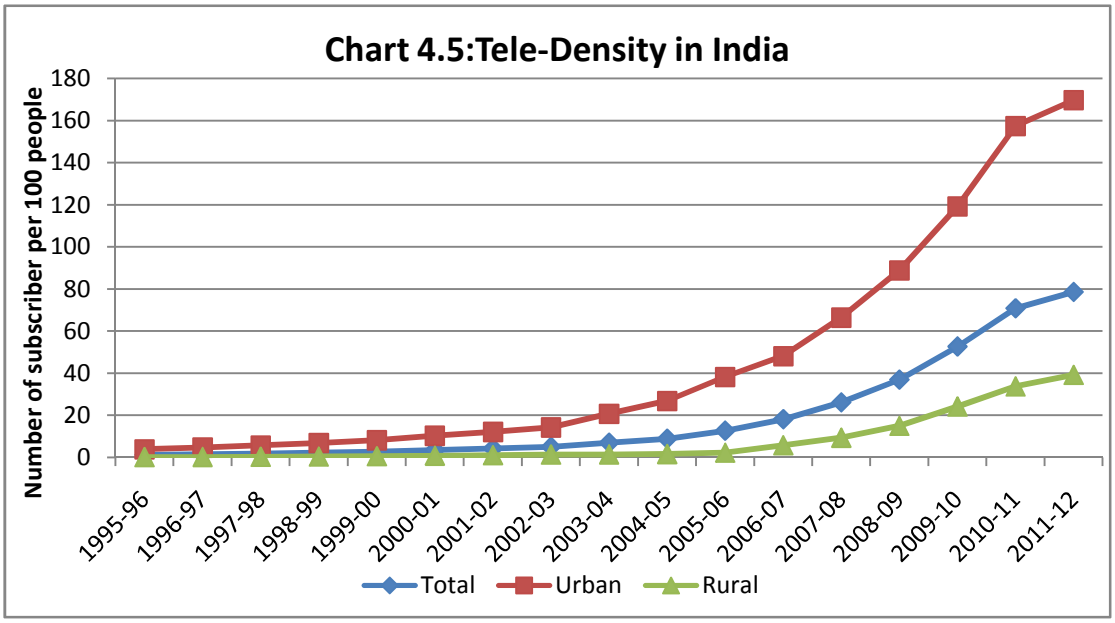
Source: Indiastat database

The chart 4.5 shows the growth of subscribers of wireless operators in India. The market leader Bharti has subscriber base of 3.07 million subscribers in March 2003 which has increased to 181.28 million in March 2012 at an average growth rate of 58 %. Similarly in the case for Reliance and Vodafone the subscriber base increased from 0.54 million and 2.16millons in March 2003 to 153.05 million and 150.47 million in March 2012 with an average growth rate on 46.69% and 45%. The subscriber base of public sector companies BSNL and MTNL are increased from 2.29 million and 0.35 million March 2003

to 98.51 million and 5.83 million in March 2012 with an average growth rate of 35.62 % and 2.82 % respectively.

4.6.Trend in Teledensity:

Teledensity is an indicator used for measuring the telecom penetration in the country. The introduction of new wireless technology such as GSM, WLL and CDMA cause the phenomenal growth in the total teledensity in the country. The teledensity has increased from 1.28 in 1995-96 to 78.66 on 31st March 2012, showing a CAGR of 29.77%. This is mainly driven by subscribers in urban area rather than rural area (Chart 4.5).



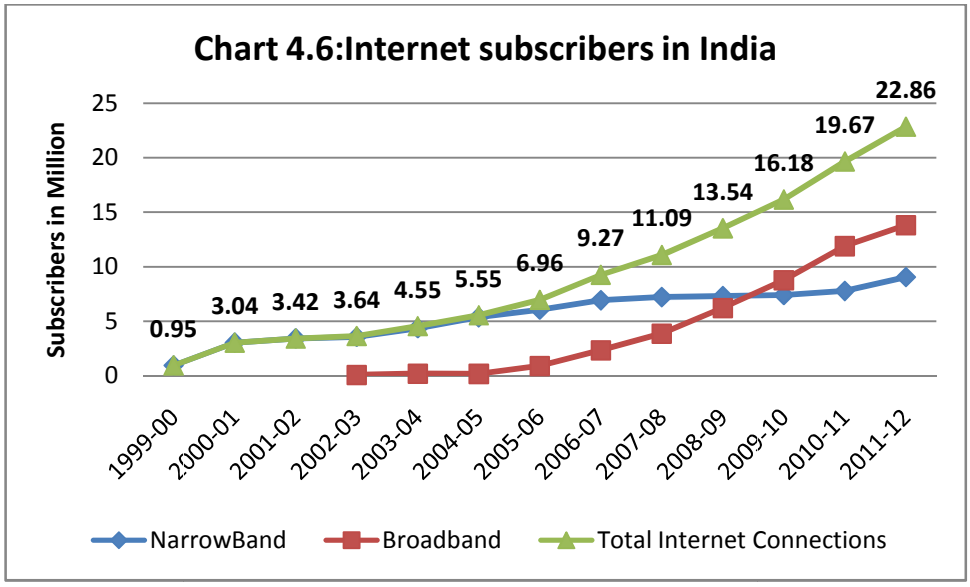
Source: Indiastat database

Initially, the urban teledensity has shown a tremendous growth. With the introduction of wireless services in rural areas the rural teledensity also help in rural teledensity. The rural teledensity which was 0.29 in

1995-96 has increased to 39.22 in March, 2012. The urban teledensity has increased from 3.95 in 1995-96 to 169.55 in March, 2012. Urban density was higher than rural density. During the period 1995-96 to March 2012, urban density increased at the CAGR of 26.21% while rural teledensity was grow at a rate of 36.59%. The policy makes efforts for expansion of mobile network in remote rural areas strengthen using various measures under Universal service obligation fund (USOF). Also the saturation in urban teledensity caused the private service providers to tap the opportunities in rural areas. All these factors have caused the increase in rural teledensity.

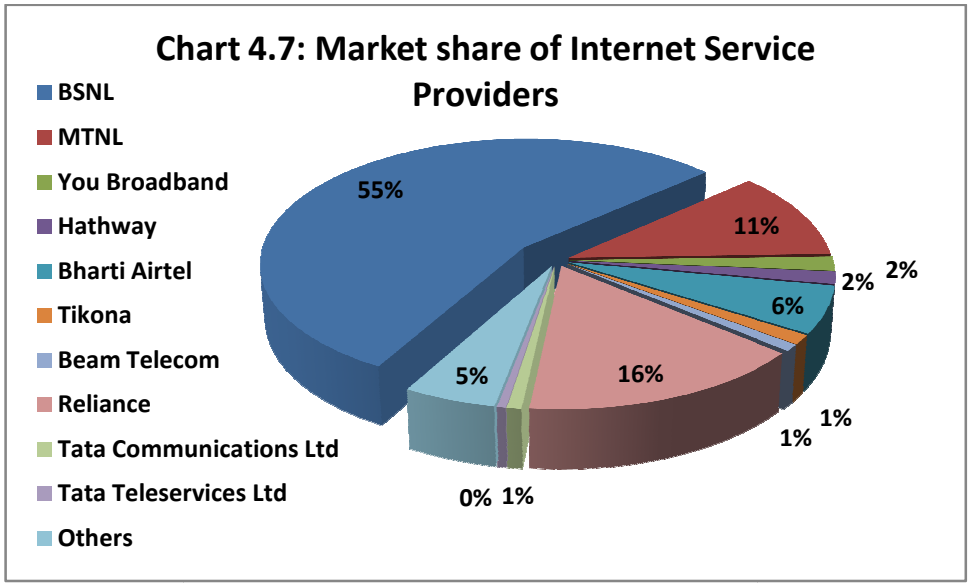
4.7. Internet services in India

The number of Internet subscribers increased from 0.95 million in March 2000 to 22.86 million in March 2012, grown at a CAGR of 27.7%. As of March 2012 this comprises of 13.81 million broadband (>=256 kbps) connections and 9.05 million narrowband (<256 kbps) connections.



Source: TRAI Quarterly report

Despite such impressive growth, the share of Internet users remains a negligible fraction of India's total population. Lack of accessibility, lack of information, lack of literacy, inconsistent power supply, and high maintenance cost of personal computers (PCs) are some of the major reasons for this phenomenon.



Source: TRAI quarterly report

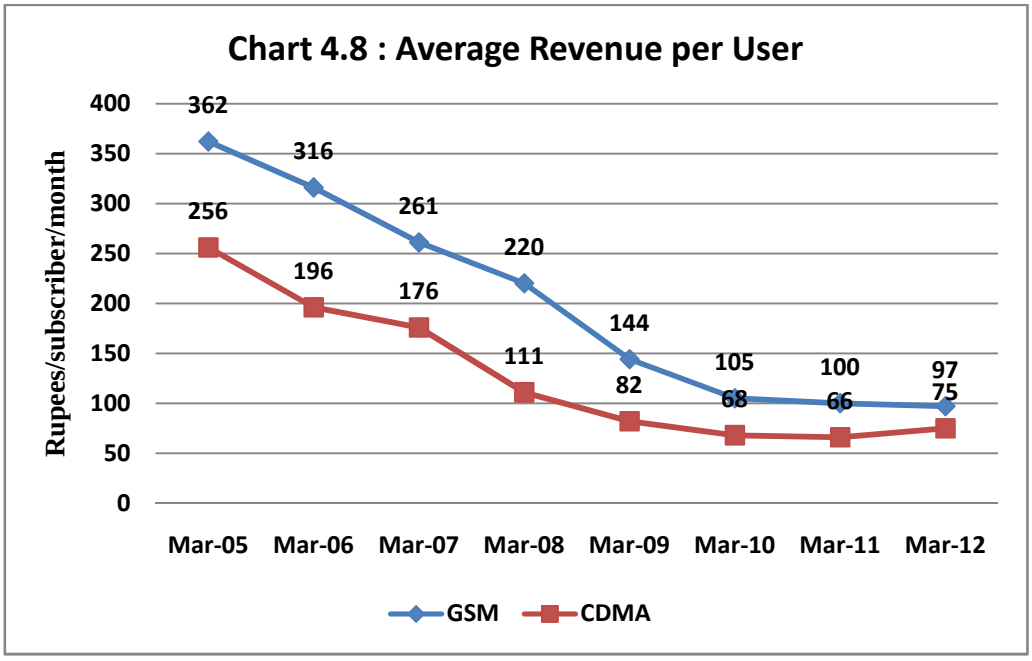
The market share of internet service providers is shown in chart 4.7. BSNL holds 55.32% market share having 12.65 Million internet subscribers. It was followed by Reliance communications Infrastructure Ltd, MTNL and Bharti Airtel having share of 15.65%, 11.13% and 6.05% respectively. Top 10 internet services providers are having almost 95% market share.

Mobile broadband is getting increasingly popular in India especially for accessing broadband over the mobile phone. There were 448.89 million wireless subscribers in India who had subscribed to data services as of March 2012. This implies that 48.87 % of total wireless subscribers were capable of accessing data services/Internet at the end of March 2012. This implies that mobile Internet access may have a substantial impact on Internet users in the country.

4.8. ARPU, ARPM and MoU of Indian telecom industry

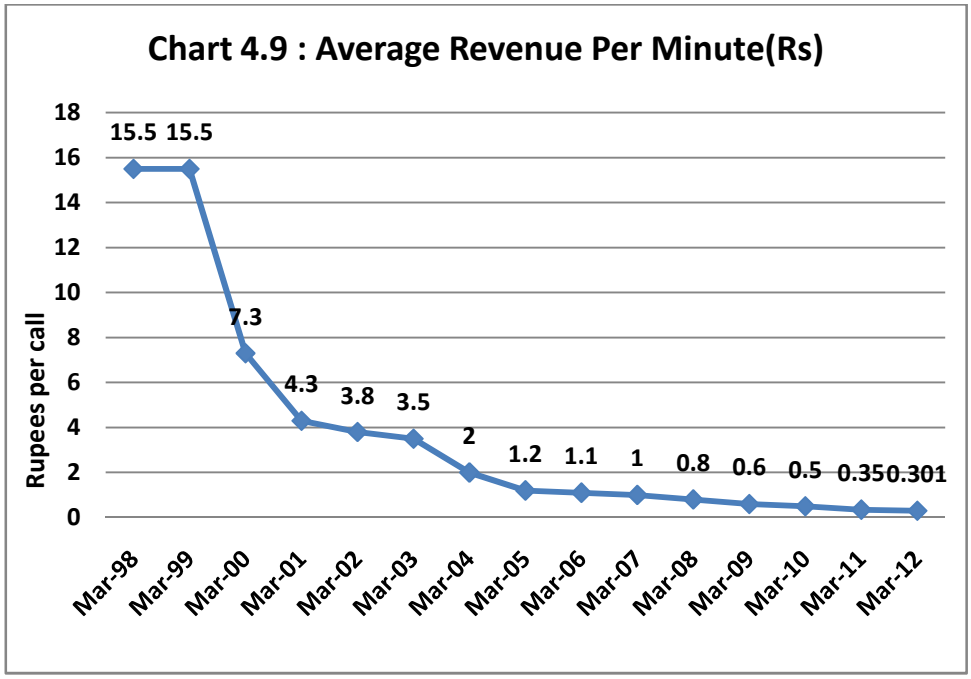
Average Revenue per user (ARPU) indicates the average revenue that is generated per person or per subscriber. It shows the profitability of a firm. It is a powerful and extremely useful indicator of just how well a telecom company is accessing its customers' revenue potential. In Indian telecom sector, the over the last few years increasing competition in the industry has resulted in a downward pressure on tariffs, which has translated into ARPU. The

Chart 4.8 shoes the average revenue per user for last eight years when the new operators are allowed in Indian Telecom market.



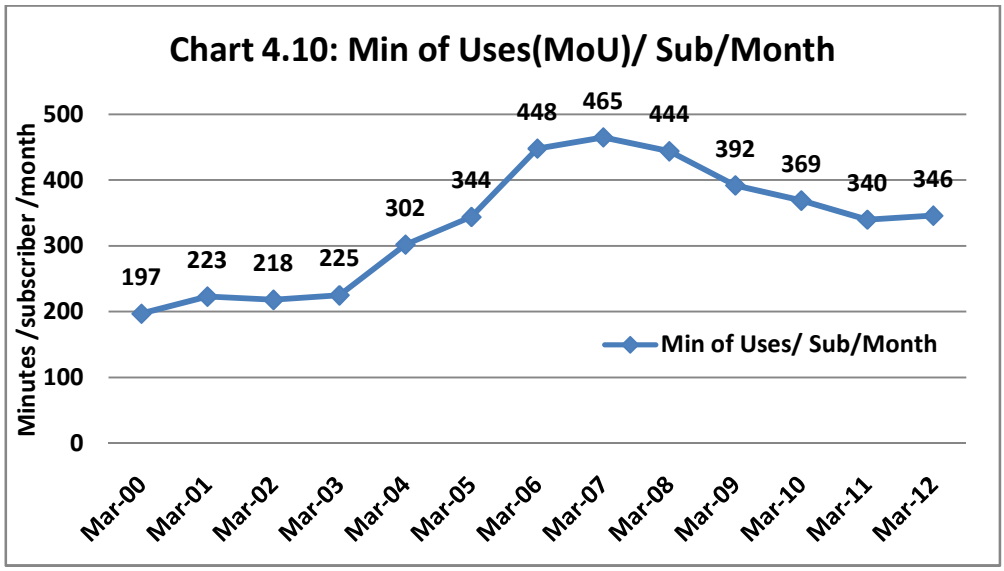
Source: TRAI quarterly report

As shown in the chart 4.8, the ARPU for GSM was Rs.362 while for CDMA operator is Rs.256 in March 2005. The intense competition among Indian telecom operators, results in a price war which reduces the call cost per minute.



Source: Indiastat database

The chart 4.9 shows the average call cost per minute. Average revenue per minute is reduced significantly from Rs.15.5 per call in March 1998 to Rs.0.301 paise per call in March 2012. This reduction in average revenue per minute is compensated by the increased minutes of usage (MoU) and growing subscriber base.

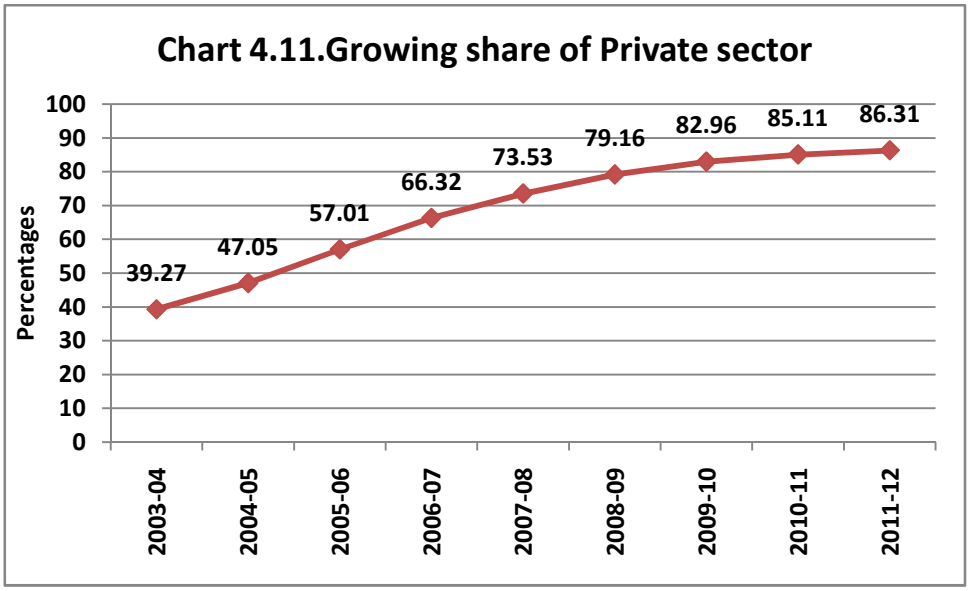


Source: Indiastat database

The chart 4.10 shows the increase in MoU of the Indian telecom industry. It is seen from the chart 4.3 showing the growth in subscribers that the subscriber growth is started to accelerate from 2006-07. The reason to this fast acceleration in subscriber growth is due to tariffs hitting the bottom and operators expanding their subscriber base.

As shown in chart 4.10, the minutes of usage (MoU) is increased from 197 minutes per subscriber per month in 1999-2000 to 346 minutes per subscriber per month in the year 2011-12 before reaching the all time high MoU of 465 minutes per subscriber per month in 2006-07.

4.9.Private vs. Public share in Indian telecom sector



Source: TRAI quarterly report

The impact of economic reforms like liberalization has been evident in the growing share of the private sector. The domination of private sector in the telecom sector has played an important role in the expansion of telecom services. The share of private sector in total telephone connections is reached to 86.31% as on 31st March, 2012 as against a mere 5% in 1999. As shown in chart 4.11, the share of private sector in 2003-04 was about 40%, which is now increased to 86% in 2010-12. This shows how seriously and aggressively private sector has participated in the Indian telecom sector.

4.10. Potential for future Growth

Indian telecom market still has a huge untapped potential. Teledensity still being 78.66% and rural teledensity at 39.22% shows that there is large population yet to have access to telecommunication, especially in rural India.The penetration of internet services is still very low compared to wireless services. With the introduction on broadband policy 2004 the internet penetration it is expected to increase.

4.11. Manufacturing in telecommunication sector:

The booming mobile telecom sector has increased demand for telecom equipment. Service providers need fixed and mobile switches, transmission equipment, fiber and copper cables, test equipment etc to fulfill the demand of the sector. Infrastructure

providers need fiber, duct and tower. There are 15 major players in this segment. Further, application developers need backend and platform systems. Lastly, network equipment and handset manufacturers need equipment for this dynamic sector.

Initially, the import of wireless core equipmentis high, thus provided great opportunity for the manufacturing of telecom equipment in India.Post 1991, the liberalization of telecom equipment manufacturing sector allowed entry of renowned telecom companies in India. Today, India ranked fourth in telecom equipment manufacturing in the Asia Pacific region in 2009 and is expected to move to the third spot by 2014.

The Indian telecom industry manufactures a vast range of telecom equipment using state-of-the-art technology. Table 4.1 shows the status of the Indian telecom manufacturing sector for the period 2002–03 to 2009–10.

The production of telecom equipments in value terms has increased from Rs.488000 million during 2008-09 to Rs.510000 million during 2009-10. Notably, the telecom revenue of the manufacturing sector is much smaller than the services sector and has actually declined in 2009–10 on a year-on-year basis. Exports have shown steady increase between 2002–03 and 2009–10. Also, imports are more than exports

signaling that India is importing a majority of its equipments. The factors such as government policies, large talent pool in R&D and low labor cost are helping the telecom manufacturing industry.

Table 4.1:Telecom Equipment Manufacturing in India

(Rs crore)

	Telecom revenue	Total imports	Equipment production	Total exports	Exports as % of production
2002–03	45,672	NA	14,400	402	2.79
2003–04	14,000	NA	NA	250	1.79
2004–05	71,674	14,269	16,090	400	2.49
2005–06	86,720	27,010	17,833	1,500	10.64
2006–07	1,05,319	34,042	23,656	1,898	8.41
2007–08	1,29,083	41,600	41,270	8,131	19.7
2008–09	1,52,360	44,800	48,800	11,000	22.54
2009–10	1,57,985	60,300	51,000	13,500	23.44

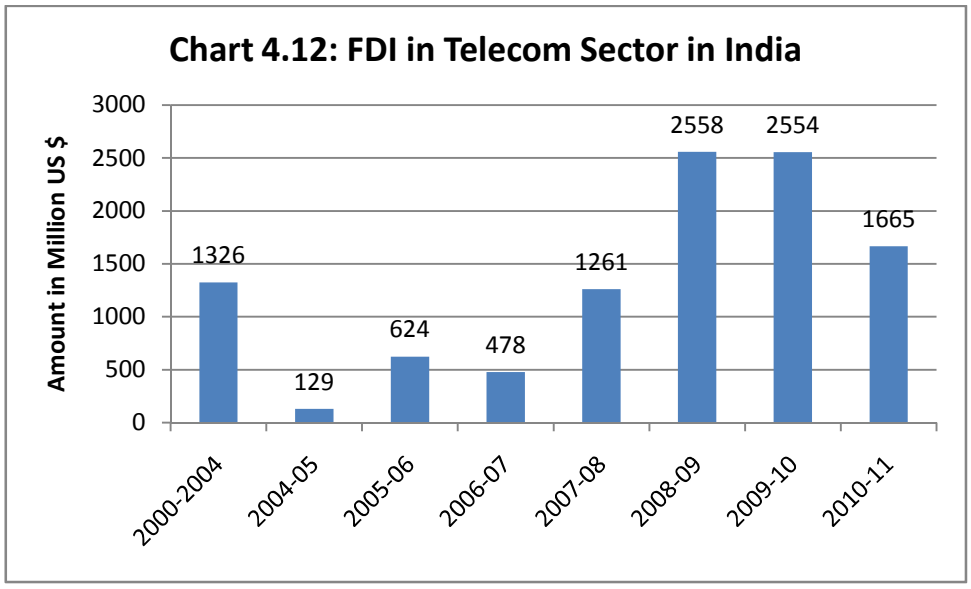
Source: TRAI

In general, however, the manufacturing sector is hampered by poor research and development (R&D) in the area and sourcing of inputs, which are mostly imported. Further, most of the telecom products manufactured in India are basically assembled here with the Intellectual Property Rights (IPR) lying outside.

4.12. Foreign Direct Investment in telecom sector in India:

The economic reforms in one sector can facilitate growth in the other sectors also. This is evident from the reforms in financial

sector which has produced beneficial results in telecom sector. Reforms like allowing entry to the private firms has resulted in unprecedented growth in telecom sector. Today, telecom is the third major sector attracting FDI inflows after services and computer software sector. At present 74% to 100% FDI is permitted for various telecom services. This investment has helped telecom sector to grow. The total foreign investment in telecom sector is around US $10 Billion.



Source: Department of Industrial Policy and Promotion (DIPP)

The chart 4.12 shows the foreign direct investment in telecom sector. In 2008-09 and 2009-10, the flow of FDI is highest as the new technology was introduced and auction of 3G and BWA spectrum was started in these years. The total FDI equity inflows in telecom sector have been US$ 1665 million during 2010-11.

4.13. Public Sector Enterprises in Telecommunications sector:

MTNL and BSNL are the two premier PSE's under the Department of telecommunications that caters to the growing requirements of telecom services. MTNL established in 1986 to provide and expand the telecommunication facilities in India's key metro cities - Delhi and Mumbai. MTNL has achieved a customer base of 11 million at the end of March 2012.

BSNL is the World's 7th largest Telecommunications services providing company having services ranging from Wireline, CDMA wireless, GSM wireless, Internet, Broadband, Carrier service, MPLS-VPN, VSAT, VOIP services and IN Services telecom services in India. After separating from department of telecommunications in 2000 it has become one of the largest public sector service providers in the country serving 130 million subscribers including 98 million wireless customers (including CDMA and GSM) in March, 2012. Rural telephony is one of the focus areas of BSNL. It has provided Village Public Telephones (VPTs) in 5.70 lakh villages and has 396.30 lakh telephones in the rural areas. BSNL has introduced broadband services from January 2005 and has provided around 12 million broadband connections till March 2012.

The Indian Telecom sector is a classic example of fruits of economic reforms. The Telecom sector in India has witnessed anincredible decade and continues to grow from strength to strength in coming years.The tremendous growth observed in mobile services is needed to be replicate in broadband services, where the penetration is still very low. Therefore the Broadband policy 2004 is framed to enhance the wireless broadband penetration across the country and help connect the remotest locations across India. Thus government is also supporting by various policy decisions in achieving their vision to provide telephone connection and broadband facilities on demand across the country and at an affordable price.

4.14. Profile of Mahanagar Telephone Nigam Ltd (MTNL):

On 1st April, 1986, the Government of India's initiative to upgrade the quality of telecom services, expand the telecom network, and to introduce new services and to raise revenue for telecom development needs of India's key metro cities of Delhi & Mumbai established a public sector enterprise naming Mahanagar Telecom Nigam Limited (MTNL). MTNL is the major provider of fixed-line telecommunication service in the two Metropolitan Cities of Delhi and Mumbai. MTNL offers mobile services in the city of Delhi including four peripheral towns Noida, Gurgaon, Faridabad

&Gaziabad and the Mumbai city along with the areas falling under the Mumbai Municipal Corporation, New Mumbai Corporation and Thane Municipal Corporation.

In more than two decades of its operations, there has been all-round development and growth and improved operational efficiency. Presently, MTNL is providing a host of telecom services that include fixed telephone service, GSM (including 3G services) & CDMA based Mobile service, Internet, Broadband, ISDN and Leased Line services., MTNL has been in the forefront of offering state of the art technology based telecommunications services to its customers at most affordable prices. MTNL has been the first to launch some of the latest telecom technologies in the country like ADSL2+ & VDSL2 in broadband, IPTV on MPEG4 technology, VOIP and 3G Mobile service.

MTNL is providing telecommunications beyond boundaries through its Joint Ventures and Subsidiaries. MTNL is present in Nepal through its Joint Venture United Telecom Limited (UTL) and in Mauritius through its 100% subsidiary Mahanagar Telephone Mauritius Limited (MTML).

The authorized capital of the Company is Rs. 800 crores. The Paid up Share Capital is Rs. 630 crores divided into 63 crore share of Rs. 10

each. At present, 56.25% equity shares are held by President of India & his nominees and remaining 43.75% shares are held by FIIs, Financial Institutions, Banks, Mutual Funds and others including individual investors. MTNL has been given Navratna status in 1997 and was listed in New York Stock Exchange in 2001.

The mission of MTNL is "To provide in its area of operation in a leading way world class telecom service which are demanded, keeping always the customer's delight as its aim, so that it continues to be the premier Indian Telecom Company".

The journey of MTNL and technology in Indian telecom sector has been tremendous. The first mover in introduction of technology has sustained MTNL in the most competitive industry in the world. The introduction of 3G in GSM or broadband services are the indications which shows how responsive MTNL to the changing market dynamics.

4.14.1. Network Infrastructure of MTNL

In more than two decades of its operations, MTNL is growing rapidly by modernizing the network, incorporating the State-of-the-art technologies and a customer friendly approach. There has been all-round development and growth and improved operational efficiency. Presently, MTNL is providing a host of

telecom services that include fixed telephone service, GSM (including 3G services) and CDMA based Mobile service, Internet, Broadband, ISDN and Leased Line services.

Table 4.2: Status Of MTNL Network (As on 31.03.2012)			
Name of the items	Delhi	Mumbai	Total
Number of Exchanges			
Wireline Exchanges	358	218	576
GSM MSCs	6	6	12
CDMA MSCs	2	5	7
N/w Switching Capacity			
Fixed Line	2771995	2570947	5342942
GSM (Trump + Dolphin)	3025000	3025000	6050000
CDMA	550000	542230	1092230
Total Switching Capacity	6346995	6138177	12485172
Total DELs	**4448993**	**4841134**	**9290127**
BTS (GSM)	1100 (2G) 762 (3G)	1010 (2G) 724 (3G)	2110 (2G) 1486(3G)
Broadband capacity	786192	845908	1632100

Source: Annual reports of MTNL

4.14.2. Subscriber base of MTNL

MTNL is providing vast number of services to the subscriber base. The major services of MTNL are Landline, mobile (GSM) and broadband service. As on 31st March 2012, the mobile service has largest subscriber base of 5585082 customers. The landline and broadband services has 3457729 and 1040191 subscribers respectively. The other subscriber base is shown in the table below.

Table 4.3: Subscriber base of MTNL as on 31st March 2012			
Name of the items	**Delhi**	**Mumbai**	**Total**
Landlines (Wireline)	**1563034**	**1894695**	**3457729**
FWT	26833	81334	108167
Trump	2457678	2516125	4973803
Dolphin	294084	317195	611279
GSM (Trump + Dolphin)	**2751762**	**2833320**	**5585082**
CDMA	107364	31785	139149
Internet customers (Dial Up)	20421	879044	899465
Broadband customers	**476127**	**564064**	**1040191**
IPTV customers	13308	4149	17457
VOIP customers	2193	1847	4040
Pay Phones	60972	97998	158970
Sanchar Haats/ CSCs	88	89	177

Source: www.mtnl.in

4.14.3. Growth and Achievement of MTNL

MTNL as a company, over the last **twenty six** years, grew rapidly by modernizing the network through induction of State-of-the-art technologies and adopting a customer friendly approach. The state of the art network infrastructure of MTNL started with 114 exchanges capable of providing 8.8 lakh connection in 1986 and expand their exchanges to 595 units capable of providing 1.25 crore connections in 2012. The subscriber base has increased from 7.5 lakh in 1986 to 92.9 lakhs in 2012 providing telephone, cellular and internet services. The old analog exchanges are upgraded to digital exchanges for superior service quality during the 26 years of journey. MTNL also expand ISD services from one country in 1986 to 243 countries in 2012.

Table 4.4: Growth and Achievement of MTNL		
	1986	**2012**
1.No of exchanges	114	595
2.Equipped capacity (Millions)	0.88	12.48
3.Subscriber base (Millions)	0.75	9.29
i) Basic Wireline & CDMA Fixed (Millions)	0.75	3.45
ii) CDMA-Mobile (Millions)	-	0.13
iii) GSM Cellular (Millions)	-	5.5
4.Internet Dial-up(Millions)	-	0.89
5.Broadband (Millions)	-	1.04
6.PCOs (Local and Long Distance) (Millions)	0.01	0.21
7.No of stations on Long Distance Network	264	39,303
8.No of countries connected overseas on ISD	11	243
9.Digitalization of exchange network	Nil	100%

Source: www.mtnl.in

4.14.4. Joint Ventures & Subsidiaries of MTNL

The goal of MTNL is to diversify in to new geography to provide quality services at affordable cost. Thus MTNL has expanded beyond national boundaries through its Joint Ventures and Subsidiaries. MTNL has presence in Nepal through its Joint Venture United Telecom Limited (UTL) and in Mauritius through its 100% subsidiary Mahanagar Telephone Mauritius Limited (MTML). Similarly Millennium Telecom Ltd (MTL) and MTNL-STPI IT Services (MSITS) Ltd were established to provide related business services in India.

1. **Millennium Telecom Ltd. (MTL):**

Millennium Telecom Ltd. (MTL) a wholly owned subsidiary of MTNL with registered office located in Mumbai was incorporated in February 2000. The MTL is in the business of Infrastructure

Sharing, Data Centre Outsourcing Application including Web Hosting, Cloud computing etc. MTL also providing Turn Key Solutions to various central Government /State Government /PSU/Banks/ Private Corporate etc. MTL is also exploring new opportunities in providing Broadband services in Wi-Fi environment, leasing out spare optical fiber capacity, and sharing spare CDMA Switch capacity to other operators.

2. **United Telecom Limited (UTL):**

UTL is a joint venture company of MTNL (26.68%), Tata Communications Limited (26.66%) and TCIL (26.66%) along with partner Nepal Ventures (P) Limited (NVPL) (20%). The company provides basic, Mobile, NLD, ILD and data services in Nepal. The Company is operational since 10th October, 2001 with initial offerings of WLL based basic services in Nepal. The company has set up CDMA 1X EVDO infrastructure to cater to growing data and VAS needs of its customers in Nepal. UTL network has its presence in 36 districts (out of 75 districts in Nepal).

The present paid up equity capital of the company is INR Rs. 1,945 Millions. The Turnover of the company for FY 2009-10 is around INR Rs.1, 058.55 Millions and Profit after Tax (PAT) is

around INR Rs. 0.54 Millions. UTL has achieved the customer base of 611668. UTL has contributed in expansion of the telecom sector and towards GDP of the country. During the period ending 31st March 2011 (2010-2011), the company has reported a net profit of INR 73,456,410.

3. **MTNL-STPI IT Services (MSITS):**

   MTNL-STPI IT Services Ltd. is a 50:50 Joint Venture between Software Technology Parks of India (STPI) and Mahanagar Telephone Nigam Limited, (MTNL). The JV formed in 2006 combines the STPI's rich experience as an ISP and MTNL's track record of being India's leading telecom operating company to offer niche portal services to the Indian community. The JV aims to provide exclusive data center services, messaging services, business application services to the identified sectors of economic activity and thereby also popularizing the .in domain in the networked community across the world.

4. **Mahanagar Telephone Mauritius Limited (MTML):**

   MTML a 100% subsidiary company of MTNL was incorporated as a private domestic company in November 2003 at Mauritius. Registered with Authorized capital of 600Millon MUR and paid up capital of 300M at the time of inception. The Authorized

capital was enhanced to MUR 1500Million in 2009. The paid-up capital of the company is enhanced from INR 854.12 Million to INR 1052 Million. Company got license from the ICTA (Telecom regulatory at Mauritius) to operate Fixed Wireless Services, Mobile Services, International Long Distance Services and Internet Services.

Company is Providing Fixed, Mobile, International Long Distance and Internet services to the people of Mauritius at most competitive rates. Around $ 20 million have been invested by MTNL in MTML. MTML is also expanding the capacity of core network upto 310K lines along with implementation of GSM network in Mauritius for 200K lines capacity and replacing 110K core capacity of CDMA 1XEVDO network. Steps are being taken for implementing international roaming for MTML Mauritius GSM network.

4.14.5. Employment generation by MTNL

The employee strength of MTNL for last seven years is shown in the table 4.5.

Table 4.5: Employee strength of MTNL	
Year	**Employees**
2005-06	51133
2006-07	48529
2007-08	47422
2008-09	46155
2009-10	44910
2010-11	43311
2011-12	41611

Source: Annual reports of MTNL

It is known that public sector enterprises are overstaffed and it is proved by the MTNL. The employee strength of MTNL is 51133 in 2005-06 was reduced to 41611 in 2011-12 registering a decline of average 3% per year.

Chapter 5:

Data analysis: Part-I

5.1. Introduction

5.2. Impact of economic reforms on Net sales of MTNL

5.3. Impact of economic reforms on operating profit of MTNL

5.4. Impact of economic reforms on net profit of MTNL

5.5. Impact of economic reforms on operating profit margin of MTNL

5.6. Impact of economic reforms on net profit margin of MTNL

5.7. Impact of economic reforms on capital employed of MTNL

5.8. Impact of economic reforms on ROCE of MTNL

5.9. Impact of economic reforms on Return on networth of MTNL

5.10. Impact of economic reforms on employment generation in MTNL

5.11. Impact of economic reforms on miscellaneous variables of MTNL

5.11.1. Impact of economic reforms on Return on Assets of MTNL

5.11.2. Impact of economic reforms on asset turnover of MTNL

5.11.3. Impact of economic reforms on liquidity of MTNL

5.11.4. Impact of economic reforms on employee cost of MTNL

5.12. Assessing overall impact of economic reforms on performance of MTNL

5.13. Testing of hypothesis

Chapter 5:
Data analysis: Part-I

5.1. Introduction:

In the previous chapter the various economic reforms done by government of India is analyzed and also the impact of economic reforms on telecommunication sector is analyzed. MTNL, a Navratna public sector enterprise, is one of the major telecommunication service providers in India. Indian Telecommunication industry is regarded as one of the fasted growing industry not only in India but also in the world. Post 1991 reforms there is deregulation by way of allowing entry to private sector which was previously a monopoly of government. MTNL which has monopoly in the metro cities like Mumbai and Delhi before economic reforms now has to compete with private sector companies. Therefore an attempt has been made in the present chapter to assess the impact of economic reforms on the performance of MTNL for the period of 2003-2012 (i.e. ten years) based on the secondary data.

To assess the impact of economic reforms on MTNL, thirteen financial, operating and profitability indicators are used. The thirteen indicators considered for assessing the impact of economic reforms on performance of MTNL are as under:

1. Net sales
2. Operating profit
3. Net profit
4. Operating profit margin
5. Net profit margin
6. Capital employed
7. Return on Capital employed
8. Return on networth
9. Employment generation
10. Return on Assets
11. Asset turnover
12. Liquidity (current ratio) and
13. Employee cost as percentage of sales

5.2. Impact of economic reforms on Net sales of MTNL

The sale is one of the indicators which show the performance of company. The sales growth is significant indicator to find the impact of economic reforms on MTNL. The net sales means net revenue from business operations and includes other income of MTNL. The table 5.1 shows the net sales of MTNL.

Table 5.1: Impact of economic reforms on Net sales of MTNL (in Crores)		
Year	Net Sales	Index Number
2002-03	5,990	100
2003-04	6,542	109.22
2004-05	5,838	97.46
2005-06	5,949	99.32
2006-07	5,421	90.50
2007-08	5,128	85.61
2008-09	5,010	83.64
2009-10	4,892	81.67
2010-11	3,908	65.24
2011-12	3,624	60.50
Average	5,230	
SD	926	
CV	17.71	
CAGR	-5.64	
Estimated t-value	-7.12	

Source: Compiled from Annual reports of MTNL

It can be seen from the table 5.1 that:

1. An average net sales of MTNL during 2002-03 to 2011-12 was Rs.5230 crores.
2. MTNL net sales has decreased from Rs.5990 crores in 2002-03 to Rs.3624 crores in 2011-12, showing a negative growth of 39.50 percent as index decreased from 100 in 2002-03 to 60.50 in 2011-12.
3. The year on year net sales of MTNL is deviating from Rs.926 crores from the mean net sale of Rs.5230 crores.
4. The net sales of MTNL has increased at CAGR of -5.64 percent. The growth in net sales of MTNL is negative and significant at 1 percent level of significance for the estimated t-value of -7.12.

Thus it can be concluded from the Table 5.1 that, the impact of economic reforms on net sales of MTNL is negative and significant as net sales has decreased form Rs.5990 crores in 2002-03 to Rs.3624 crores in 2011-12 respectively.

5.3. Impact of economic reforms on operating profit of MTNL:

The operating profit is the business performance of the company. Higher operating profit shows that company is efficient and effective in using the resources. The operating profit of MTNL is shown in the table 5.2.

Table 5.2: Impact of economic reforms on operating profit of MTNL

Year	Operating Profit	Index Number
2002-03	1,965	100
2003-04	1,997	101.63
2004-05	1,431	72.82
2005-06	893	45.45
2006-07	892	45.39
2007-08	925	47.07
2008-09	372	18.93
2009-10	-2,936	-149.42
2010-11	-1,150	-58.52
2011-12	-1,851	-94.20
Average	254	
SD	1674	
CV	659	
CAGR	-22.13	
Estimated t-value	-5.47	

Sources: Compiled from Annual reports of MTNL

Table 5.2 shows that:

1. The operating profit of MTNL has decreased from Rs.1965 crores in 2002-03 to Rs.-1851 crores in 2011-12 showing a negative growth of -194.2 percent from base year 2002-03.
2. The average operating profit of MTNL is Rs.254 crores which is considerably lower than the base year due to losses in the last three years during 2002-03 to 2011-12 period.
3. The yearly deviation in operating profit of MTNL is significantly higher than the average operating profit. The variability of operating profit is significantly volatile and inconsistent during last 10 years; it is to the extent of Rs.1676 and 659.
4. The compound average growth rate was -22.13 percent for operating profit of MTNL. The growth in operating profit is negative and significant at 1 percent level of significance for the estimated t-value of -5.47 during 2002-03 to 2011-12 period.

Thus it is concluded from the above analysis that impact of economic reforms on operating profit of MTNL is negative and significant for 1 percent level of significance.

5.4. Impact of economic reforms on net profit of MTNL:

Net profit is the profit available to the shareholders of the company for ultimate purpose of any business. The impact of economic reforms on

performance of MTNL is measured using the net profit, which shows CAGR of -24.55. This is shown in Table 5.3.

Table 5.3: Impact of Economic reforms on net profit of MTNL (in Rs.Crores)

Year	Net Profit	Index Number
2002-03	877	100.00
2003-04	1,235	140.82
2004-05	948	108.10
2005-06	580	66.13
2006-07	466	53.14
2007-08	407	46.41
2008-09	168	19.16
2009-10	-3,064	-349.37
2010-11	-2,802	-319.50
2011-12	-4,110	-468.64
Average	-530	
SD	1980	
CV	-373.86	
CAGR	-24.55	
Estimated t-value	-4.88	

Source: Compiled from Annual reports of MTNL

Table 5.3 shows that:

1. The net profit of MTNL has decreased significantly from Rs.877 crores in 2002-03 to Rs.-4110 crores in 2011-12 showing a negative growth of -368.64 percent from base year 2002-03.
2. The average net profit of MTNL is negative at Rs.-530 crores during 2002-03 to 2011-12 period, showing a contrasting situation from the base year.
3. The yearly deviation in net profit of MTNL is significantly higher and negative than the average net profit. The variability in operating

profit of MTNL is significantly negative and volatile during last 2002-03 to 2011-12 period.

4. The net profit of MTNL has increased at CAGR of -24.55 percent. The growth in net profit of MTNL is negative and significant at 1 percent level of significance for estimated t-value of -4.88.
5. The standard deviation comes to 1980, CV shows -373.86 and estimated t-value is -4.88. These all indicators shows profitability of MTNL affected negatively during 2002-03 to 2011-12 period.

Thus it is concluded from the above analysis that there is negative and significant impact of economic reforms on net profit of MTNL during 2002-03 to 2011-12 period.

5.5. Impact of economic reforms on operating profit margin of MTNL:

Operating profit margin is the ratio showing the percentage of profit generated for given sales. The operating profit margin expresses the operating profit in percentages. Thus the impact of economic reforms on MTNL is assessed using operating profit margin. The operating profit margin of MTNL is shown in table 5.4.

Table 5.4: Impact of Economic reforms on operating profit margin of MTNL		
Year	OPM	Index Number
2002-03	33.78	100.00
2003-04	31.27	92.57
2004-05	25.25	74.75
2005-06	15.79	46.74
2006-07	18.16	53.76
2007-08	19.31	57.16
2008-09	8.29	24.54
2009-10	-80.36	-237.89
2010-11	-31.44	-93.07
2011-12	-54.85	-162.37
Average	-1.48	
SD	39.74	
CV	-2684.81	
CAGR	-17.86	
Estimated t-value	-4.35	

Source: Compiled from Annual reports of MTNL

Table 5.1, 5.2, 5.3 shows that net sales, operating profit and net profit of MTNL has decreased during 2002-03 to 2011-12 period resulted negative impact of economic reforms on performance of MTNL. Corresponding to this operating profit margin of MTNL also declined during 2002-03 to 2011-12 period. The result of operating profit margin shows that:

1. The operating profit margin of MTNL has decreased from 33.78 percent in 2002-03 to -54.85 percent in 2011-12 showing a negative growth of -262.37 percent from base year 2002-03.
2. The average operating profit margin of MTNL has increased at -1.48 percent largely due to negative figures in last three year.

3. The CV of -2684.81 shows that operating profit margin of MTNL is highly volatile and inconsistent during 2002-03 to 2011-12.
4. The operating profit margin of MTNL has shown CAGR of -17.86 percent which is negative and significant at 1 percent level of significance for estimated t-value of -4.35. This negative growth in operating profit margin point towards MTNL facing stiff competition from the private sector companies.

Thus it is concluded from the Table 5.4 that operating profit margin has increased at -17.86 percent CAGR, with average operating profit margin of -1.48 percent. The standard deviation and CV was to the extent of 39.24 and -2684.81 and estimated t-value was -4.35 respectively. These all indicators show that the impact of economic reforms on operating profit margin of MTNL is negative and significant during 2002-03 to 2011-12 period.

5.6. Impact of economic reforms on net profit margin of MTNL

Net profit margin is important measure to understand the profitability of the company. The net profit margin indicates the profitability of the MTNL and is used to measure the performance of the MTNL. The table 5.5 below shows the Net profit margin of MTNL for 2002-03 to 2011-12 period.

Table 5.5: Impact of Economic reforms on net profit margin of MTNL		
Year	**NPM**	**Index Number**
2002-03	14.61	100.00
2003-04	18.79	128.61
2004-05	16.1	110.20
2005-06	9.66	66.12
2006-07	8.49	58.11
2007-08	7.69	52.64
2008-09	3.23	22.11
2009-10	-61.4	-420.26
2010-11	-71.2	-487.34
2011-12	-113.39	-776.11
Average	-16.742	
SD	47.09	
CV	-281.25	
CAGR	-21.99	
Estimated t-value	-4.57	

Source: Compiled from Annual reports of MTNL

Table 5.5 reveals that:

1. The Net profit margin of MTNL has decreased from 14.61 percent in 2002-03 to-113.39 percent in 2011-12 and peaked to a high of 18.79 percent in 2003-04 from 14.61 percent in the base year to settle at -113.39 percent in 2011-12. The growth in net profit margin is negative at -876.11 percent from base year 2002-03.
2. The net profit margin of MTNL was deviating by 47.09 percent from the average net profit margin of -16.74 percent.
3. The CV of -281.25 in net profit margin of MTNL was highly volatile and inconsistent.

4. The annual average growth rate for net profit margin of MTNL was highly negative and non significant at -21.99 percent at 1 percent level of significance for the t-value of -4.57.

Thus it is inferred from the table 5.5 that the net profit margin has increased on an average -16.74 percent and -21.99 percent CAGR, showing coefficient of variation of -281.25 and standard deviation of 47.09 percent. The trend analysis shows that net profit margin has decreased from 14.61 percent in 2002-03 to -113.39 percent in 2011-12 showing -776 percent decrease. The estimated t-value of -4.57 for net profit margin for the 2002-03 to 2011-12 period pointed out that there is negative impact of economic reforms on net profit margin of MTNL.

5.7. Impact of economic reforms on capital employed of MTNL:

Capital employed in MTNL has increased from Rs.9497 crores in 2002-03 to 12184 crores in 2011-12 indicates positive impact of economic reforms on capital employed. This is presented in Table 5.6.

Table 5.6: Impact of Economic reforms on capital employed of MTNL (in Rs.crores)		
Year	Capital Employed	Index Number
2002-03	9,497	100.00
2003-04	10,328	108.75
2004-05	10,944	115.23
2005-06	11,237	118.32
2006-07	11,629	122.45
2007-08	11,921	125.53
2008-09	12,059	126.98
2009-10	9,448	99.49
2010-11	14,102	148.49
2011-12	12,184	128.30
Average	11,335	
SD	1,392	
CV	12.28	
CAGR	2.41	
Estimated t-value	2.07	

Source: Annual report of MTNL

Table 5.6 shows that:

1. The capital employed in MTNL is increased from Rs.9497 crores in 2002-03 to Rs.12184crores in 2011-12 showing a positive growth of 28.30 percent from base year 2002-03.
2. The average capital employed in MTNL is Rs.11335 crores during 2002-03 to 2011-12 period (i.e. 10 years).
3. The CV and standard deviation of capital employed in MTNL was Rs.1352 crores and 12.28 indicates the variation in capital employed is stable and consistent at 12.28 percent for the last 10 year.
4. The capital employed in MTNL has increased by 2.41 percent CGAR indicates that impact of economic reforms on capital

employed in MTNL is positive and significant at 10 percent level of significance for estimated t-value of 2.07.

Thus it is concluded from the above analysis that impact of economic reforms on capital employed in MTNL is positive as CAGR is 2.41 for estimated t-value 2.07 as well as trend in capital employed shows that it is increased by 28.20 percent in 2011-12 over 2002-03 respectively.

5.8. Impact of economic reforms on ROCE of MTNL:

Return on capital employed (ROCE) is the most important indicator showing the returns generated on capital employed, which is measuring the impact of economic reforms on MTNL. Table 5.7 shows the Return on capital Employees (ROCE) for the public sector enterprises.

Table 5.7: Impact of Economic reforms on ROCE of MTNL

Year	ROCE	Index Number
2002-03	13.57	100.00
2003-04	15.95	117.54
2004-05	10.16	74.87
2005-06	5.95	43.85
2006-07	6.77	49.89
2007-08	6.48	47.75
2008-09	3.43	25.28
2009-10	-35.63	-262.56
2010-11	-16.35	-120.49
2011-12	-25.4	-187.18
Average	-1.507	
SD	17.75	
CV	-1178	
CAGR	-20.24	
Estimated t-value	-5.28	

Source: Compiled from Annual reports of MTNL

The following observations have been made from the Table 5.7.

1. The Return on capital employed in MTNL has declined from 13.57 in 2002-03 to -25.40 in 2011-12 and reached a high of 15.95 percent in 2003-04 from the 13.57 percent in base year before settling at -25.4 in 2011-12. ROCE has shown a negative growth of -87.18 percent from base year 2002-03.
2. The return on capital employed in MTNL is achieved on an average -1.51 percent having standard deviation of 17.75 percent from the average.
3. The coefficient of variation in Return on capital employed of MTNL is comes -1178 and is highly volatile and inconsistent during the last 10 year (i.e. 2002-03 to 2011-12 period).
4. The Return on capital employed in MTNL has shown a CAGR of -20.24 percent which is negative and significant for the 1 percent level of significance. The estimated t-value is -5.28 for ROCE during 2002-03 to 2011-12 period.

Thus it is inferred from the above analysis that impact of economic reforms on Return on capital employed in MTNL is negative and significant during privatised era (i.e. 2002-03 to 2011-12) as the return on capital employed has declined from 13.57 percent in 2002-03 to -25.40 percent in 2011-12 and CAGR was -20.24 for the estimated t-value of -5.28.

5.9. Impact of economic reforms on Return on networth of MTNL:

Another measure used to identify the impact of economic reforms is Return on networth (RONW) of MTNL. This is shown in Table 5.8.

Table 5.8: Impact of Economic reforms on RONW of MTNL

Year	RONW	Index Number
2002-03	9.24	100.00
2003-04	11.95	129.33
2004-05	8.67	93.83
2005-06	5.16	55.84
2006-07	4.01	43.40
2007-08	3.45	37.34
2008-09	1.4	15.15
2009-10	-32.42	-350.87
2010-11	-42.15	-456.17
2011-12	-162.01	-1753.35
Average	-19.27	
SD	53.46	
CV	-277.42	
CAGR	-27.27	
Estimated t-value	-5.95	

Source: Compiled from Annual reports of MTNL

Table 5.8 reveals that:

1. The Return on networth of MTNL peaked to a high of 11.95 percent in 2003-04 from 9.24 percent in the base year before dipping to -162.01 percent in 2011-12. The growth in RONW is negative at -1853 percent from base year 2002-03.
2. The RONW has declined from 9.24 percent in 2002-03 to -162.01 percent in 2011-12.
3. The RONW of MTNL was deviated by 53.46 percent from the average RONW of -19.27 percent.

4. The CV of -277.42 in RONW of the MTNL is consistent.
5. The RONW of MTNL was -27.27 and is highly negative and significant at 1 percent level of significance for the estimated t-value of -5.95 during 2002-03 to 2011-12.

Thus it can be concluded from the Table 5.8 that average RONW of MTNL was -19.27, standard deviation was 53.46 and CV was -277.42. The CAGR was -27.27 percent for the estimated t-value was -5.95. These all indicators show that the impact of economic reforms on Return on Networth of MTNL is highly negative and significant.

5.10. Impact of economic reforms on employment generation in MTNL:

To determine the impact of economic reforms on MTNL, a trend in employment of MTNL is a crucial indicator as MTNL is into labour intensive industry providing the service to its customers. The employment scenario in MTNL is depicted in Table 5.9.

Table 5.9: Impact of Economic reforms on Employee generation of MTNL		
Year	No. of Employees	Index Number
2002-03	57984	100.00
2003-04	55760	96.16
2004-05	54399	93.82
2005-06	51133	88.18
2006-07	48529	83.69
2007-08	47422	81.78
2008-09	46155	79.60
2009-10	44910	77.45
2010-11	43311	74.69
2011-12	41611	71.76
Average	49121	
SD	5522	
CV	11.24	
CAGR	-3.6	
Estimated t-value	-26.17	

Source: Compiled from Annual reports of MTNL

Table 5.9 shows that:

1. The number of employees in MTNL was 57984 in 2002-03, which was gradually decreased to 41611 in 2011-12 showing a negative growth of 28.24 percent from base year 2002-03.
2. The average number of employees in MTNL are 49121.
3. The variation in number of employees is 11.24 which is marginal and consistent for the 2002-03 to 2011-12 period.
4. The number of employees in MTNL has shows a CAGR of -3.6 percent which is negative and significant at 5 percent level of significance.

5. Standard deviation and CV in number of employees generated in MTNL was 5522 and 11.24 and CAGR was -3.6 percent at 1 percent level of significance for the estimated t-value of -26.17 respectively.

Thus it is concluded from the Table 5.9 that impact of economic reforms on employment in MTNL is negative and significant during last 10 years as economic reforms not able to generate employment in MTNL in fact it reduces employment.

5.11. Impact of economic reforms on miscellaneous variables of MTNL:

Till now, the indicators common for both public sector enterprises and MTNL are analysed. Now the various company specific variables are also necessary to understand the impact of economic reforms on MTNL. The variables those are covered in above analysis are considered here and called miscellaneous variables. The following variables are covered in order to understand the impact of economic reforms. In other words the impact of economic reforms is assessed in terms of following variables.

1. Return on asset (ROA) of MTNL
2. Asset turnover ratio (ATR)
3. Current assets and current liability i.e. current ratio and
4. Employee cost as percentage of sales of MTNL

5.11.1. Impact of economic reforms on Return on Assets of MTNL:

The Return on Assets (ROA) shows that how efficiently and effectively the assets are utilised by the company. Hence, ROA is also used to assess the impact of economic reforms on the performance of MTNL. The Return on Assets of MTNL for 2002-03 to 2011-12 years is shown in the table 5.10.

Table 5.10: Impact of Economic reforms on ROA of MTNL

Year	ROA	Index Number
2002-03	4.48	100.00
2003-04	5.77	128.79
2004-05	4.17	93.08
2005-06	2.68	59.82
2006-07	2.05	45.76
2007-08	1.77	39.51
2008-09	0.69	15.40
2009-10	-8.8	-196.43
2010-11	-9.88	-220.54
2011-12	-15.27	-340.85
Average	-1.23	
SD	7.29	
CV	-591.04	
CAGR	-26.67	
Estimated t-value	-5.64	

Source: Compiled from Annual reports of MTNL

Table 5.10 shows that:

1. The ROA of MTNL peaked to a high of 5.77 percent in 2003-04 from 4.48 percent in the base year to settle at -15.27 percent in 2011-12. The growth in RONW is negative at -440.85 percent from base year 2002-03. It has decreases from 4.48 percent in 2002-03 to -15.27 percent in 2011-12.

2. The return on assets of MTNL was deviated by 7.29 percent from the average RONW of -1.23 percent.
3. The coefficient of variation (CV) of -591.04 in ROA of MTNL is highly inconsistent and negative.
4. The return on assets of MTNL has shown a CAGR of -26.67 percent which is negative and significant at 1 percent level of significance for the estimated t-value of -5.64 during last 2002-03 to 2011-12.

Thus it is concluded from the Table 5.10 that during 2002-03 to 2011-12 the average ROA was -1.23 percent. The standard deviation and CV was 7.29 percent and -591.04 respectively. CAGR was -21.27 percent and estimated t-value was -5.64. These all indicates that the impact of economic reforms on Return on Assets of MTNL is negative and significant.

5.11.2.Impact of economic reforms on asset turnover of MTNL:

To know this impact asset turnover ratio is considered. The asset turnover ratio indicates the operating efficiency of the company. It shows how good company in generating revenues from the available asset. The Asset turnover ratio of MTNL is shown in the table 5.11.

Table 5.11: Impact of Economic reforms on ATR of MTNL		
Year	Asset turnover ratio	Index Number
2002-03	0.61	100.00
2003-04	0.62	101.64
2004-05	0.51	83.61
2005-06	0.5	81.97
2006-07	0.42	68.85
2007-08	0.4	65.57
2008-09	0.37	60.66
2009-10	0.39	63.93
2010-11	0.26	42.62
2011-12	0.28	45.90
Average	0.44	
SD	0.12	
CV	28.30	
CAGR	-8.9	
Estimated t-value	-9.77	

Source: Compiled from Annual reports of MTNL

It can be seen from the Table 5.11 that:

1. The ATR of MTNL peaked to a high of 0.62 in 2003-04 from 0.61 in the base year to settle at 0.28 in 2011-12. The growth in ATR is negative at -54.1 percent from base year 2002-03.
2. The ATR of MTNL was deviated by 0.12 from the average ATR of 0.44.
3. The variation in ATR of MTNL is stable and consistent as shown by CV of 28.30.
4. The annual average growth rate for ATR of MTNL is -8.9 percent. The growth in asset turnover ratio is negative and

significant at 1 percent level of significance for the estimated t-value of -9.77 during last 10 years.

Thus it is concluded from the table 5.11 that during 2002-03 to 2011-12 period, MTNL achieved on an average asset turnover ratio of 0.44 and CAGR of -8.9 percent; whereas standard deviation and CV is to the extent of 0.12 and 28.30 for the same period. These all indicators show that the impact of economic reforms on Assets turnover ratio of MTNL is negative and significant.

5.11.3.Impact of economic reforms on liquidity of MTNL:

The short term liquidity of company is measured by current ratio. The table 5.12 shows the current ratio of MTNL for last 10 years.

Table 5.12: Impact of Economic reforms on current ratio of MTNL

Year	Current Ratio	Index Number
2002-03	1.27	100
2003-04	1.29	101.57
2004-05	1.29	101.57
2005-06	1.34	105.51
2006-07	1.34	105.51
2007-08	1.35	106.30
2008-09	1.34	105.51
2009-10	0.65	51.18
2010-11	0.73	57.48
2011-12	0.66	51.97
Average	1.13	
SD	0.31	
CV	27.50	
CAGR	-7.74	
Estimated t-value	-3.29	

Source: Compiled from Annual reports of MTNL

Table 5.12 reveals that:

1. The current ratio of MTNL peaked to a high of 1.35 in 2007-08 from 1.27 in the base year to settle at 0.66 in 2011-12. The growth in current ratio is negative at -48.03 percent from base year 2002-03.
2. The current ratio of MTNL was deviating by 0.31 from the average ratio of 1.13.
3. The variability of 27.50 in current ratio of MTNL was stable and consistent.
4. The current ratio of MTNL has shown a CAGR of -7.74 percent which is highly negative and significant at 1 % level of significance for the estimated t-value of -3.29 during 2002-03 to 2011-12 period.
5. The current ratio of MTNL has declined from 1.27 in 2002-03 to 0.66 in 2011-12. CAGR, standard deviation and CV of current ratio of MTNL were -7.74 percent, 0.31 and 27.50 respectively. The CAGR is significant at 1 percent level of significance.

Thus it is concluded from the above analysis that there is highly negative and significant impact of economic reforms on current ratio of MTNL i.e. liquidity is not improved during 2002-03 to 2011-12 period.

5.11.4.Impact of economic reforms on employee cost of MTNL:

The analysis of employee cost as percentage of sales ratio reveals the cost incurred by companies on their employees. The employee cost as percentage of sale for MTNL is shown in the following table 5.13.

Table 5.13: Impact of Economic reforms on Employee cost of MTNL

Year	Employee cost as % of sales	Index Number
2002-03	26.7	100.00
2003-04	26.7	100.00
2004-05	34.5	129.21
2005-06	34.9	130.71
2006-07	35.7	133.71
2007-08	33.5	125.47
2008-09	46.3	173.41
2009-10	133.1	498.50
2010-11	88.7	332.21
2011-12	110	411.99
Average	57.01	
SD	38.81	
CV	68.08	
CAGR	18.99	
Estimated t-value	5.23	

Source: Compiled from Annual reports of MTNL

Table 5.13 shows that:

1. The employee cost as percentage of sales of MTNL has increased significantly from 26.7 percent in 2002-03 to 110 percent in 2011-12.
2. The average employee cost of MTNL is negative at 57.01 percent for 2002-03 to 2011-12 period.

3. The CV of 68.08 shows that variation in employee cost of MTNL is high and inconsistent for the 2002-03 to 2011-12 period.
4. The compound average growth rate of 18.99 percent for employee cost of MTNL was positive and significant at 1 percent level of significance for the estimated t-value of 5.23.

Thus it is concluded from the above analysis that impact of economic reforms on employee cost as percentage of sales of MTNL is positive and significant at 1 percent level of significance during 2002-03 to 2011-12 period.

5.12. Assessing overall impact of economic reforms on performance of MTNL:

In order to assess the impact of economic reforms on performance of MTNL, 13 variables are considered. With the help of CAGR and estimated t-value of these 13 variables, impact of economic reforms on performance of MTNL is assessed; assuming that positive value of variables and estimated t-value is considered positive impact and negative value is treated negative impact of economic reforms on the performance of MTNL. Table 5.14 presents CAGR and estimated t-value for 13 variables for 2002-03 to 2011-12 period of MTNL.

Table 5.14: Impact of economic reforms on performance of MTNL				
Sr. No	Variable	CAGR	Estimated t-value	Positive /Negative impact
1	Net sales	-5.64	-7.12	-
2	Operating profit	-22.13	-5.47	-
3	Net profit	-24.55	-4.88	-
4	Operating profit margin	-17.86	-4.35	-
5	Net profit margin	-21.99	-4.57	-
6	Capital Employed	2.41	2.07	+
7	Return on Capital employed	-20.24	-5.28	-
8	Return on Networth	-27.27	-5.95	-
9	Employment generation	-3.6	-26.17	-
10	Return on Asset	-26.67	-5.64	-
11	Asset turnover	-8.9	-9.77	-
12	Liquidity (current Ratio)	-7.74	-3.29	-
13	Employee cost	18.99	5.23	-

Source: Compiled from various tables given earlier

Table 5.18 shows that:

1. Out of 13 variables, 12 variables shows negative impact and 1 variable shows positive impact of economic reforms on performance of MTNL. As majority variables (92.30 percent) show negative impact, this study shows economic reforms has negative impact on the performance of MTNL.
2. CAGR of 11 variables is negative and CAGR of 2 variables is positive. Negative CAGR is seen in net sales (-5.64 percent), operating profit (-22.13 percent), net profit (-24.55 percent), operating profit margin (-17.86 percent), net profit margin (-21.99 percent),

Return on capital employed (-20.24 percent), Return on Networth (-27.27 percent), Employment generation (-3.6 percent), Return on Assets (-26.67 percent), asset turnover ratio (-8.9 percent)and current ratio (-7.74 percent).

3. CAGR of 11 variables varies maximum and minimum to the extent of -27.27percent in return on networth and -3.6 percent in employment generation respectively. It indicates highest and lowest negative impact of economic reforms in on return on networth and employment generation.
4. The positive CAGR is found in capital employed (2.41 percent), and employee cost as percentage of sales (18.99 percent). Here the positive value of CAGR signifies negative impact as growth in employee cost is not good for the organization.
5. ‘t-test’ of 11 variables shows negative value and 2 variables shows positive value. ‘t-test’ clearly shows impact of economic reforms on net sales, operating profit, net profit, operating profit margin, net profit margin, Return on capital employed, Return on Networth, Employment generation, Return on Assets, asset turnover ratio and current ratio of MTNL is negative.
6. Highest estimated t-value is observed in employee cost to the extent of 5.23 shows the significant impact of economic reforms on employee cost of MTNL.

Thus it can be inferred that impact of economic reforms on performance of MTNL during 2002-03 to 2011-12 is negative. In other words, an economic reform of MTNL is not resulted in improved performance. It also indicates that MTNL is not able to perform and compete successfully with the private sector. Hence performance is not improved in MTNL.

5.13. Testing of hypothesis:

Following hypotheses were formulated at the beginning of the study.

H_0: There is a negative impact on the performance of the MTNL due to the economic reforms.

H_1: Economic reforms have led to an increased pressure on margins due to reducing tariffs and also on the customer retention and acquisition.

In order to test the above hypotheses t-test was used. Table 5.14 (Impact of economic reforms on performance of MTNL) shows that out of 13 variables, 12 variables/indicators shows 'negative' performance and only 1 (one) variable shows positive performance. It means that impact of economic reforms on performance of MTNL is negative as majority (92.30 percent) shows negative performance. This is confirmed by CAGR and estimated t-value also. CAGR of 11 variables/indicators is

negative and CAGR of 2 variables is positive. It means impact of economic reforms on performance of MTNL is negative. Therefore, the null hypothesis is accepted.

‘t’-test of 11 variables/indicators also shows that negative value whereas 2 variables/ indicators shows positive value. ‘t’-test clearly shows impact of economic reforms on net sales, operating profit, net profit, operating profit margin, net profit margin, return on capital employed, return on networth, employment generation, return on assets, asset turnover ratio, and current ratio of MTNL is negative during 2003-2012 period.

Thus it can be inferred that impact of economic reforms on performance of MTNL during 2003-2012 is negative. It indicates that this hypothesis is accepted. Therefore the alternative hypothesis has been rejected.

Chapter 6:

Data analysis: Part-II

6.1. Introduction

6.2. Profile of the sample respondents taken for the study

- 6.2.1. Respondent's Gender
- 6.2.2. Respondent's Age
- 6.2.3. Respondent's Occupation
- 6.2.4. Respondent's income
- 6.2.5. Respondent's Qualification

6.3. Use and switching pattern of MTNL services among respondents and their satisfaction

- 6.3.1. Use pattern of MTNL services among respondents
- 6.3.2. Switching pattern of respondents
- 6.3.3. Desire, expected and overall customer satisfaction on service quality of MTNL

6.4. Dimension wise customer satisfaction on service quality of MTNL

- 6.4.1. Customer satisfaction on Tangible service quality dimensions
- 6.4.2. Customer satisfaction on reliability service quality dimension
- 6.4.3. Customer satisfaction on responsiveness service quality dimension
- 6.4.4. Customer satisfaction on empathy service quality dimension

Chapter 6:
Data analysis: Part-II

6.1.Introduction:

In today's competitive environment delivering high quality service is the key for a sustainable competitive advantage. Customer satisfaction does have a positive effect on an organization's profitability. Satisfied customers form the foundation of any successful business, because customer satisfaction leads to repeat purchases, brand loyalty and positive word of mouth, which ultimately leads overall performance.

Customer satisfaction impacts the behavior of customers in a number of ways. First, customer satisfaction is found to be a key determinant of customer retention. Again, customer satisfaction is regarded as a necessary antecedent of customer loyalty, which in turns drives profitability and performance. Also increasing customer satisfaction and customer retention leads to improved profits, positive word-of-mouth, and lower marketing expenditure. Therefore an attempt has been made by researcher to assess the impact of economic reforms on customer satisfaction related to overall performance of service quality delivered by MTNL.

Therefore the objective of this chapter is to find out that whether the customers are satisfied or not towards service quality provided by MTNL

in the post reforms era and if they are not satisfied, then which service quality dimension have low satisfaction and hence needs to be improved.

The chapter is based on primary data, which was collected through questionnaire. The sample respondents are selected and collected from Mumbai city. Total sample size of the present study is 1000 customers, who are using MTNL service.

To assess the extent of customer satisfaction on service quality provided by MTNL in Mumbai, SERVQUAL model and customer satisfaction index (CSI) is adopted. 36 quality indicators distributed among eight dimensions namely tangible, reliability, responsiveness, empathy, assurance, technical, image and economy are selected.

6.2.Profile of the sample respondents taken for the study:

This section of the study deals with the profile of the respondents. The questionnaire included a section on respondent's profile. It includes customer's gender, age, occupation, income, education level. There were 1000 respondents surveyed for the study. The profile of the samples is as follows.

6.2.1. Respondent's Gender:

The table 6.1 and chart 6.1 shows gender wise distribution of respondents.

Table 6.1: Respondent's Gender		
Gender	Frequency	Percent
Male	615	61
Female	385	39
Total	1000	100

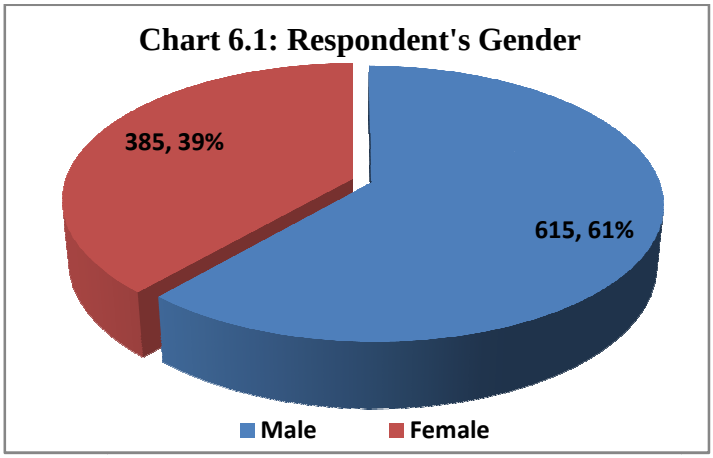
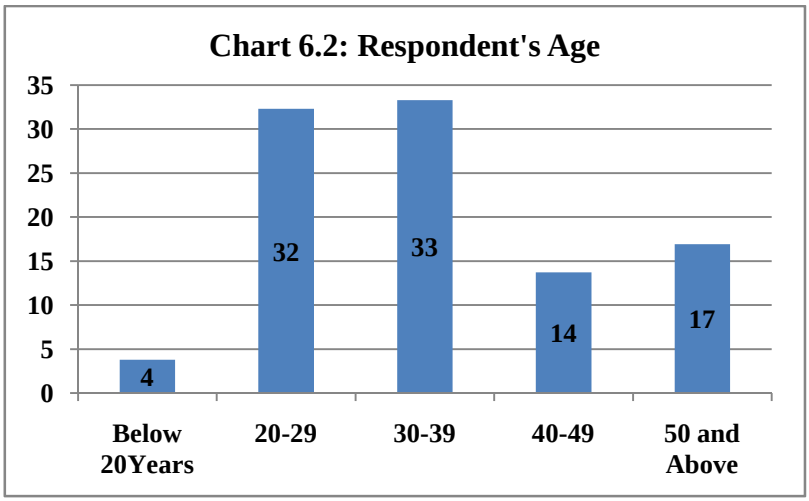


Table 6.1 and chart 6.1 shows that out of 1000 respondents, 615 (61 percent) are male respondents and 385 (39 percent) are female respondents respectively.

6.2.2. Respondent's Age:

The age wise profile of the respondents is given in table 6.2 and chart 6.2.

Table 6.2: Respondent's Age		
Age	Frequency	Percent
Below 20Years	38	4
20-29	323	32
30-39	333	33
40-49	137	14
50 and Above	169	17
Total	1000	100



It is evident from the table 6.2 and chart 6.2 that out of 1000, 656 respondents (65 percent) of samples are in the age group of 20 to 39.Whereas the sample below age of 20 year is just 38(4 percent) and above 40 year sample size is 306 (31 percent) respectively. This indicates that majority respondents are of 20-39 age group (65 percent).

6.2.3. Respondent's Occupation:

The occupation of respondents is shown in the table 6.3 and chart 6.3.

Table 6.3: Respondent's Occupation		
Occupation	Frequency	Percent
Service	407	41
Student	169	17
Self Employed	185	19
Professional	191	19
Other	48	5
Total	1000	100

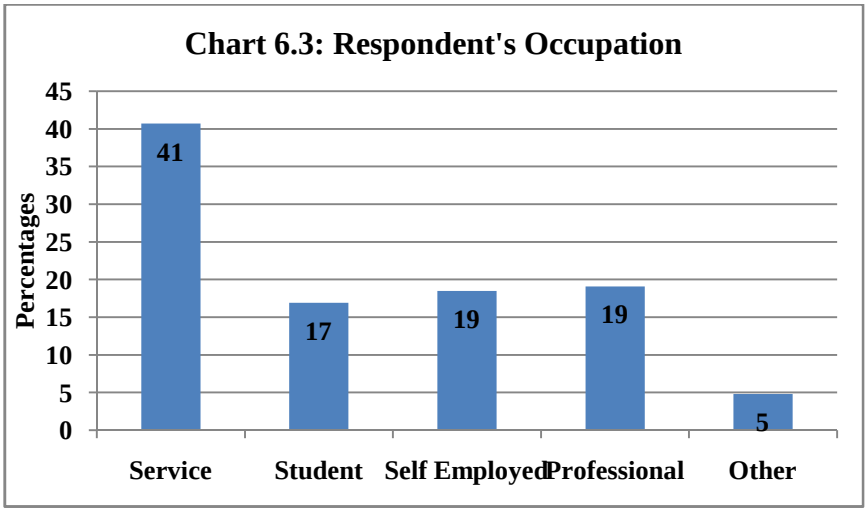
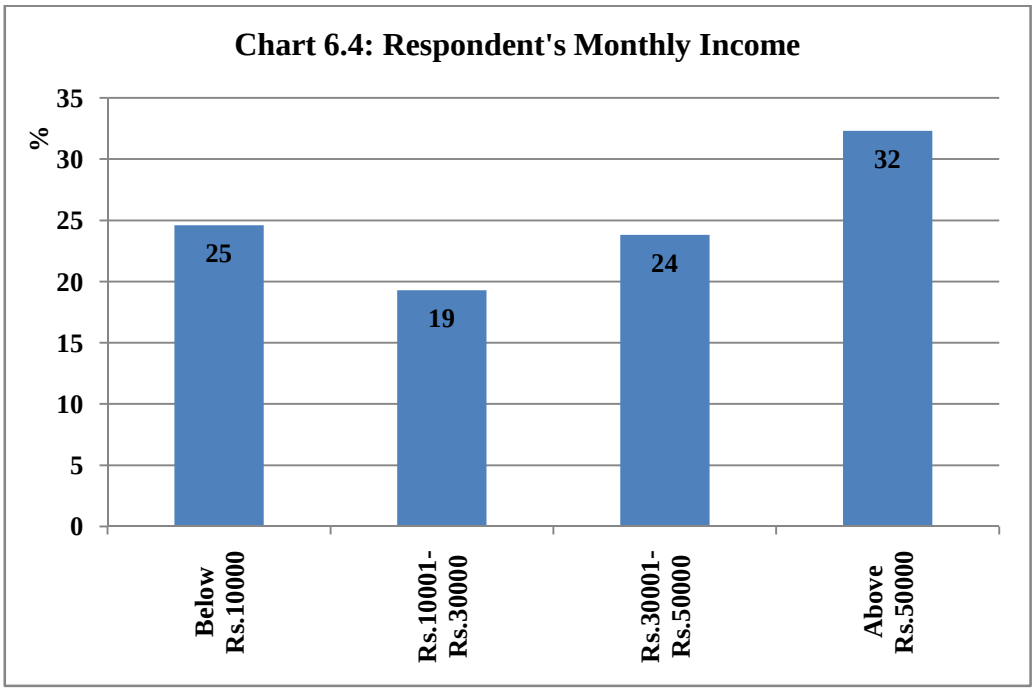


Table 6.3 and chart 6.3 shows that most of the respondents were service professional (41%) whereas least respondents were comprises others (5%) who are housewives, retired servicemen and likewise. It is interesting to note that the respondents from students, self-employed and professional are having almost equal proportion in the sample size. From the table 5.4 and chart 5.6 it is inferred that majority (41 percent) respondent's occupation is service.

6.2.4. Respondent's income:

The income level of respondent's is shown in the table 6.4 and chart 6.4.

Table 6.4: Respondent's Income		
Monthly Income	Frequency	Percent
Below Rs.10000	246	25
Rs.10001-Rs.30000	193	19
Rs.30001-Rs.50000	238	24
Above Rs.50000	323	32
Total	1000	100



The table 6.4and chart 6.4 shows that most of the respondents are from high (i.e. Rs. 50,000 and above) income group (32%), whereas 25 % of samples are having monthly income below Rs. 10001. The respondent's earning between Rs.10001 to 50000 was 43% of total sample size. Thus it can be inferred from table 5.5 and chart 5.7 that

majority respondents (32 percent) belong from above Rs.50000 income group.

6.2.5. Respondent's Qualification:

The qualification of sample is shown in the table 6.5 and chart 6.5.

Table 6.5: Respondent's Qualification

Qualification	Frequency	Percent
SSC	66	7
HSC/Diploma	121	12
Graduate	339	34
Professional	88	9
Post Graduate/Masters	365	37
PhD	21	2
Total	1000	100

Chart 6.5: Respondent's Qualification

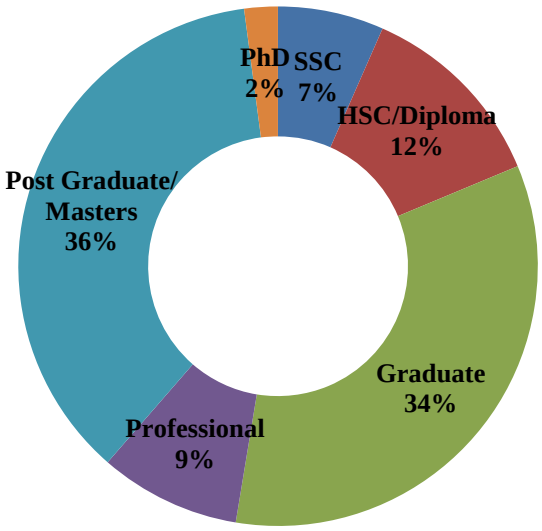


Table 6.5 and chart 6.5 shows that out of 1000, 48 percent (474) of the respondents are highly educated having qualifications ranging from post graduate to professional to Ph.D. A small 7 percent (66) of respondents are having educational qualifications less than or equal to

SSC. 34 percent (339) of respondents are graduate and only 12 percent (121) of respondents are having HSC qualification.

Thus table 6.5 and table 6.5 shows that majority (37 percent) respondents are having post graduate level qualification followed by graduate (34 percent).

6.3. Use and switching pattern of MTNL services among respondents and their satisfaction:

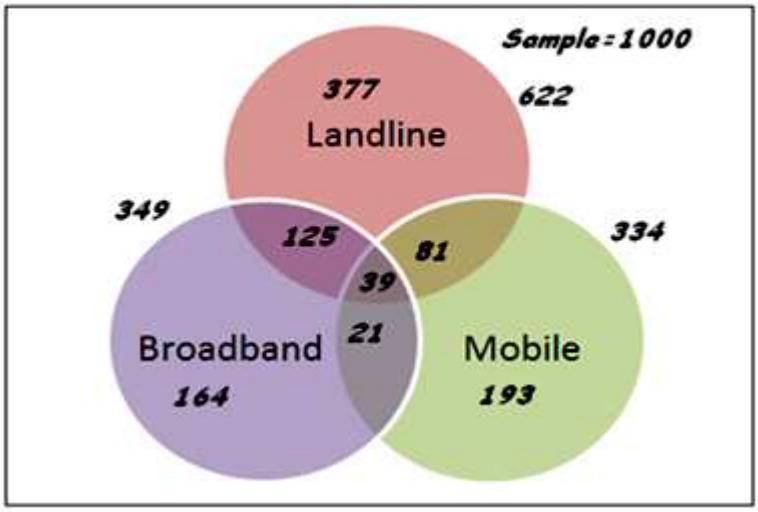
6.3.1. Use pattern of MTNL services among respondents:

The use of MTNL service is shown in the table 6.6 and chart 6.6.

Table 6.6: Use of MTNL services

Service	Respondents
Landline	377
Mobile	193
Broadband	164
Landline + Mobile	81
Landline + Broadband	125
Mobile + Broadband	21
Landline +Mobile + Broadband	39
Other services	0

Chart 6.6 : Use of MTNL Services



It can be reveals from table 6.6 and chart 6.6 that,

1. The landline service is used by 622 respondents, Mobile service is used by 334 respondents and broadband service is used by 349 respondents.
2. Of the 622 landline users 377 are using only landline service while other 245 uses landline along with mobile and/or broadband service.
3. Out of the 334 mobile users' only 193 uses only mobile service while 143 uses mobile along with landline and/or broadband.
4. Of the 349 broadband users only 164 uses broadband service while other 185 uses broadband service along with mobile and/or landline. None of the users of use other services such as IPTV, leased line.

It can be inferred from table 6.6 and 6.6 that majority (37 percent) respondents are using landline followed by mobile (19.3 percent) and broadband (16.4 percent) respectively.

6.3.2. Switching pattern of respondents:

The actual satisfaction of the customers is seen from loyalty of the customers to the company and customer retention of the company. In this study the attempt is made to understand how many customers are switched the services from MTNL and how will be their future switching intention. The table 6.7 shows the switching pattern/dimension of the customers of MTNL.

Table 6.7: Switching dimension of respondents

Switched in past			Switching Intention in future		
	N	%		N	%
Yes	327	32.7	Definitely Yes	284	28.4
No	673	67.3	A bit yes	173	17.3
Total	1,000	100.0	Neutral	183	18.3
			A bit No	176	17.6
			Definitely No	184	18.4
			Total	1,000	100.0

It is seen from the table 6.7 that, 67.3 percent of respondents have not switched their services whereas only 32.7 percent of respondents have switched to other service operators for better service. The 45.7 percent respondent intention is to switch in future. Of it, 28.4 percent respondents will definitely switched to other service operator for better services whereas 17.3 percent respondents will slightly favouring a other service operator. Only 36 percent of respondents (17.6 + 18.4) say they will not switched the service operator whereas 18.3 percent respondents are neutral about their future switching intension.

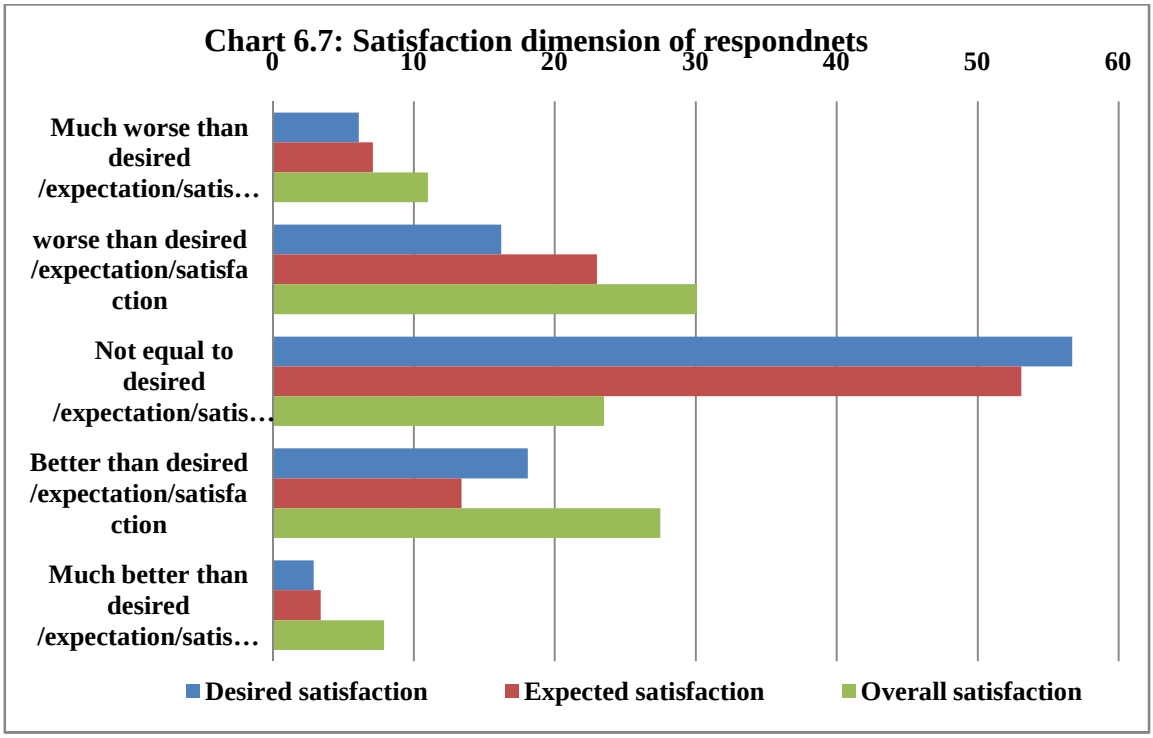
Thus it can be inferred from table 6.7 that as 45.7 percent respondents are ready to switch from MTNL to elsewhere, it means there is significant negative impact of privatisation on MTNL and 32.7 percent already shifted or switch over from MTNL in addition to this 45.7 percent respondents shows switching intention in future. Net result is that MTNL get influenced due to privatisation of telecommunication industry.

6.3.3. Desire, expected and overall customer satisfaction on service quality of MTNL:

The customer satisfaction in terms of desire, expected and overall service quality delivered by MTNL are shown in the table 6.8 and chart 6.7.

Table 6.8: Satisfaction Dimensions of respondents

	Desired satisfaction		Expected satisfaction		Overall satisfaction	
	N	%	N	%	N	%
Much worse than desired /expectation/satisfaction	61	6.1	71	7.1	110	11.0
worse than desired /expectation/satisfaction	162	16.2	230	23.0	301	30.10
Not equal to desired /expectation/satisfaction	567	56.7	531	53.1	235	23.5
Better than desired /expectation/satisfaction	181	18.1	134	13.4	275	27.5
Much better than desired /expectation/satisfaction	29	2.9	34	3.4	79	7.9
Total	1000	100.0	1000	100.0	1000	100.0



From table 6.8 and chart 6.7, it is revealed that,

1. Using desire satisfaction dimension, the 56.7% respondents rated their satisfaction not equal to desired, followed by 22.3% respondents rated their satisfaction as worse (16.2%) or much worse (6.1%) than desired. Only 22% respondents say their satisfaction is better than (18.1%) and much better than (2.9%) desired.
2. Regarding expected satisfaction it was observed that, 83.2 % respondents rated their satisfaction below expectation. 30.1% respondents rated their satisfaction as worse (23%) and much worse (7.1) that expected. Only 16.8% respondents rated their satisfaction better (13.4%) and much better (3.4%) than expected. This clearly indicates higher respondent's shows unexpected satisfaction than expected.

3. The overall satisfaction of the respondents shows that only 35.4% respondents (i.e. 27.5 percent better and 7.9 percent better than expected satisfaction) are satisfied about the services of MTNL whereas 64.6 % respondents (i.e. 11.0 percent much worse, 30.10 percent worse and 23.5 percent not equal to expected satisfaction) are not satisfied with the services of MTNL.

Thus it can be concluded from table 6.8 and chart 6.7, that unsatisfied respondents (64.6 percent) are higher than that of satisfied customers (35.4 percent) on service quality provided by MTNL to their customers. As higher the dissatisfaction, lower the performance and vice versa. Accordingly as unsatisfied customers are higher towards service quality provided by MTNL resulted in low performance of MTNL.

6.4. Dimension wise analysis of customer satisfaction on service quality of MTNL:

Eight dimensions are considered to know whether customers are satisfied or not on quality service provided by MTNL. The eight dimension, those are considered for identifying customer satisfaction towards service quality of MTNL, are 1) tangible, 2) reliability, 3) responsiveness, 4) empathy, 5) assurance, 6) economy, 7) technical and 8) image respectively. In all 36 attributes or service quality indicators are employed to measure and identify the extent of customer satisfaction

towards service quality of MTNL. 36 attributes or quality indicators divided into 8 dimensions like tangible (4), reliability (5), responsiveness (5), empathy (7), assurance(4) economy(2), technical (5) and image(4) respectively.

Extent of customer satisfaction is measured using 5 point likert scale varying from 1) much worse than expectation, 2) worse than expectation, 3) n ot equal to expectation, 4) better than expectation and 5) much better than expectation respectively. Service quality dimensions are tested using one sample t-test using a cutoff value of 3because of rating of 4 and 5 indicates satisfaction and 1, 2, and 3 indicates non-satisfaction.

6.4.1. Customer satisfaction on Tangible service quality dimensions:

TANGIBLE service quality dimension includes the appearance of physical facilities, equipment, personnel, and communication material of an organization. As shown in the table, the tangible dimensions TA1 to TA4 represent communication materials, physical facilities, equipment and presentation of employees respectively. The specific questions/ attributes are as follows.

TA1: MTNL's ability to give you access to information, about new plans and services (Website, hoardings)

TA2: Provision of visually attractive offices, equipment and materials like pamphlet, posters etc

TA3: MTNL's ability to providing variety of facilities etc.

TA4: How appealing are the appearance and behaviour of employees of MTNL.

Table 6.9 and chart 6.8 shows the customer satisfaction on service quality dimensions for tangibility of MTNL.

Table 6.9:Tangible service quality dimensions

		Much worse	Worse than	Not equal to expectation	Better than	Much Better	Total
TA1	N	135	210	486	135	34	1,000
	%	13.5	21.0	48.6	13.5	3.4	100
TA2	N	118	273	430	162	17	1,000
	%	11.8	27.3	43.0	16.2	1.7	100
TA3	N	133	235	347	253	32	1,000
	%	13.3	23.5	34.7	25.3	3.2	100
TA4	N	113	261	369	228	29	1,000
	%	11.3	26.1	36.9	22.8	2.9	100

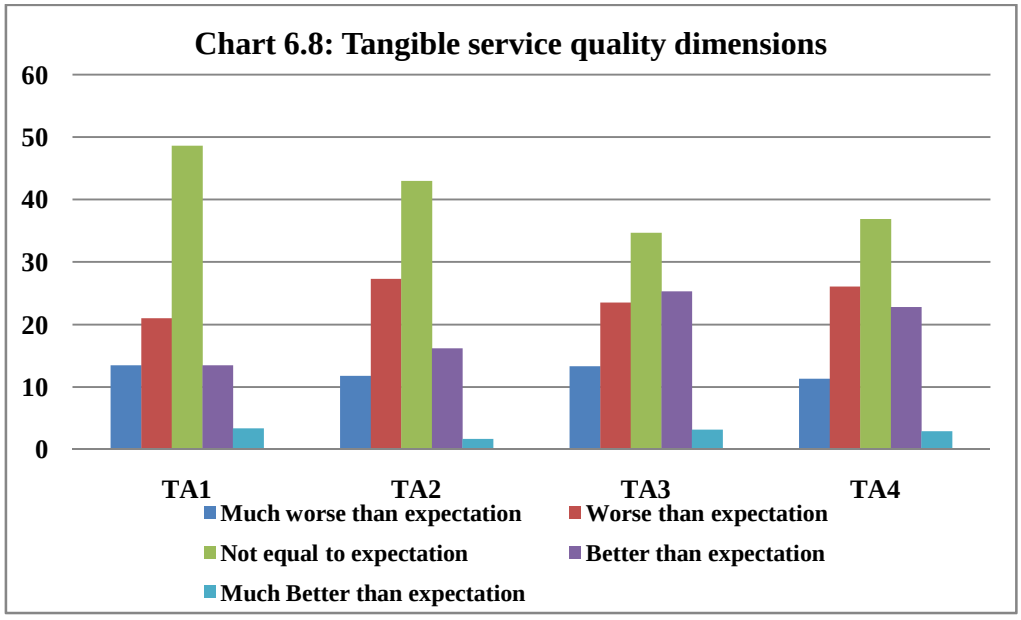


Table 6.9 and chart 6.8 shows that,

1. The majority of the respondents think that tangible dimensions are not as per their expectation.
2. The communication materials like hoardings, websites and posters are worse and worse than expectation for 34.5% of respondents and

better and much better than expectation for 16.9% respondents. 48.6 % respondents feel communication materials is not as per their expectation.

3. 43 % respondents think that offices and equipments are not as per their expectation whereas 39.1% respondents think that offices and equipments are worse and much worse than their expectations. Only 17.9 % thin that offices and equipments are better and much better than their expectation.
4. The variety of facilities provided by MTNL is not equal to expectation for 34.7% respondents. 36.8% respondents think that physical facilities provided by MTNL are worse (13.3%) and much worse (23.5%) than their expectation.
5. The appearance of employees of MTNL is not as per expectation for 36.9% of respondents while 37.4 % respondents think that the appearance and behaviour of employees of MTNL is worse (11.3%) and much worse (26.1%) than expected.
6. 22.8% respondents think appearance and behaviour of employees is better than expectation while only 2.9% respondents think that employee appearance is much better than expected.

Thus from Table 6.9 and chart 6.8 it is seen that most of the respondents think that the tangible dimensions of service quality are not equal or less than their expectation.

6.4.2. Customer satisfaction on reliability service quality dimension:

Reliability service quality dimension focus on the ability to provide the promised service dependably and accurately. Reliability is the customer expectation that the service is accomplished on time every time, in the same manner, and without errors. As shown in the table, the reliability dimensions RL1 to RL5 represent timely delivery, truthfulness, consistent, first time service performance and error free service by MTNL respectively. The respective questions from questionnaire are as follows:

RL1: How timely is the delivery of services of MTNL?

RL2: How truthful (keeping to promises) is MTNL to you?

RL3: How dependable and consistent is MTNL in solving customers' complaints?

RL4: How able is MTNL to perform services right the first time?

RL5: How able is MTNL to insist on error-free records.

Table 6.10 and chart 6.9 shows the customer satisfaction on service quality dimensions for reliability of MTNL.

Table 6.10: Reliability service quality dimensions							
		Much worse	Worse	Not equal to expectation	Better	Much Better	Total
RL1	N	105	279	402	168	46	1,000
	%	10.5	27.9	40.2	16.8	4.6	100
RL2	N	94	220	459	204	23	1,000
	%	9.4	22.0	45.9	20.4	2.3	100
RL3	N	120	280	355	220	25	1,000
	%	12.0	28.0	35.5	22.0	2.5	100
RL4	N	107	242	369	233	49	1,000
	%	10.7	24.2	36.9	23.3	4.9	100
RL5	N	113	316	434	126	11	1,000
	%	11.3	31.6	43.4	12.6	1.1	100

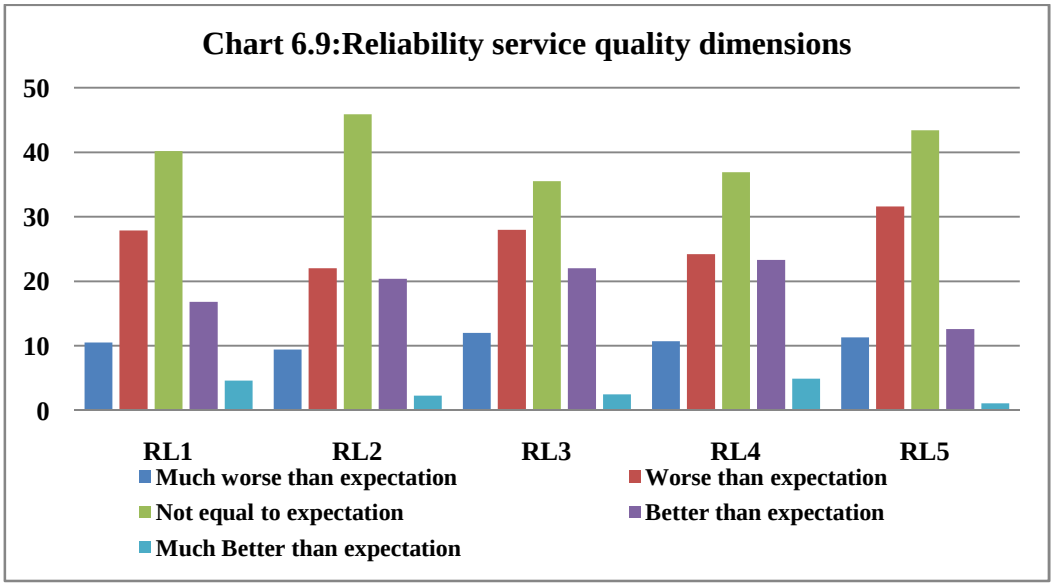


Table 6.10 and chart 6.9 shows that,

1. Majority of respondents think that the reliability dimensions RL1 to RL5 are not as per their expectations.
2. 38.4% respondents think that MTNL is worse (27.9%) and much worse (10.5%) in timely delivery of services than their expectations whereas 21.4% respondents think that MTNL is better (16.8%) and much better (4.6%) in timely delivery of services. 40.2 percent

respondents indicates that satisfaction towards RL1 reliability dimension is not as per their expected satisfaction.

3. 31.4% respondents think that MTNL is worse (22%) and much worse (9.4%) in keeping promises and reliability. Whereas 22.7% respondents think that MTNL is better and much better than expectation in keeping promises and reliability.45.9 percent respondents indicated that satisfaction on RL2 reliability dimension is not equal to their expectation.
4. Around 35.5% respondents think that MTNL is worse than expectation and further 40 percent respondents' states that MTNL is not equal to their expectation in solving customers' complaints, consistency and dependability. Only 24.5% respondents think that MTNL is consistent and dependable in solving customers' problems.
5. Majority (36.9 percent) of MTNL customers think that MTNL services are not performing as per their expectation at first time. 34.9 % respondents think that MTNL services are worse (24.2%) or much worse (10.7%) at first time. 28.2% respondents (i.e. 23.3 better and 4.9 much better) think that MTNL services are better or much better while first time use.
6. 42.9 percent respondents think that MTNL is worse (31.6 percent) or much worse (11.3 percent) in maintaining error free records

while 43.4percent respondents think that MTNL is not maintaining error free records as expected by them. Only 13.7% respondents think that MTNL is better (12.6 percent) and much better (1.1 percent) than their expectation in maintaining error free records.

Overall it is seen from the table 6.10 and chart 6.9 that majority of respondents think that all reliability dimensions of service quality in terms of RL1 TO RL5 are not equal to or worse than their expectation. Very few respondents rate reliability dimensions above their expectation.

6.4.3. Customer satisfaction on responsiveness service quality dimension:

Responsiveness service quality dimension focus on the willingness to help customers and provide prompt service. Responsiveness is also focus on reducing customers waiting time or helping customers in emergency situations. As shown in the table, the responsiveness dimensions RS1 to RS5 represent Turnaround time, prompt services, and help in emergency situations, employee approachable and employee's communication respectively. The respective question from questionnaire is as follows:

RS1: MTNL's ability to tell customers exactly when services will be performed?

RS2: How able is MTNL to give prompt customer services and attend to customers' needs/problems?

RS3: How are employees' willing to help customers in emergency situations?

RS4: How are the employees approachable and easy to contact?

RS5: Employees' ability to communicate clearly with you.

The service quality dimensions for responsiveness aspect are shown in the table 6.11 and chart 6.10.

Table 6.11: Responsiveness service quality dimensions

		Much worse	Worse	Not equal to expectation	Better	Much Better	Total
RS1	N	81	262	445	202	10	1,000
	%	8.1	26.2	44.5	20.2	1.0	100
RS2	N	72	318	388	210	12	1,000
	%	7.2	31.8	38.8	21.0	1.2	100
RS3	N	78	305	360	227	30	1,000
	%	7.8	30.5	36.0	22.7	3.0	100
RS4	N	125	221	501	132	21	1,000
	%	12.5	22.1	50.1	13.2	2.1	100
RS5	N	78	262	455	173	32	1,000
	%	7.8	26.2	45.5	17.3	3.2	100

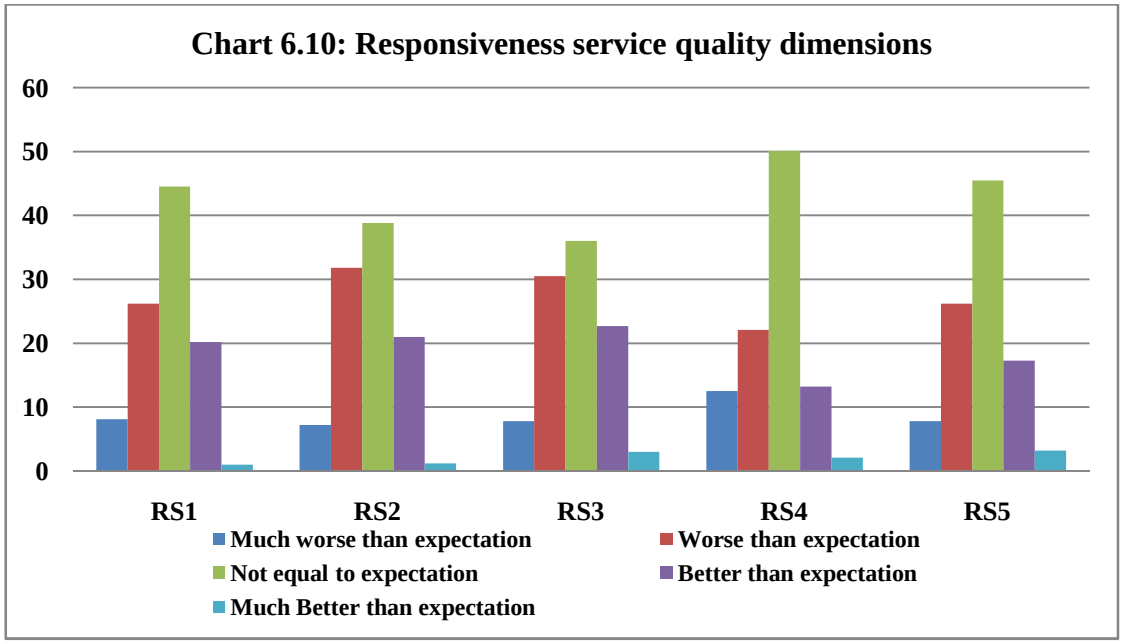


Table 6.11 and chart 6.10 shows that,

1. Majority of respondent's rate all RS1 to RS5 responsiveness dimensions of service quality is not as per their expectations.
2. 34.3% respondents think that MTNL is worse (26.2%) or much worse (8.1%) in maintaining turnaround time, whereas 21.2% respondents think that MTNL is better or much better in maintaining turnaround time. Majority respondents (44.5 percent) indicated that satisfaction towards RS1 of responsiveness service quality dimension is not equal to expectation.
3. 44.5% respondents think that turnaround time maintained by MTNL is not as per their expectation.
4. 22.2% respondents (21.0 percent and 1.2 percent) think that MTNL is prompt in providing services and attending customer's problems whereas 39% respondents (7.2 percent much worse and 31.8 percent worse) think that MTNL is worse or much worse in providing services and attending customers problems. 38.8% respondents think that MTNL is not prompt in providing service and solving customers' problem as per their expectation.
5. 38.3% respondents (7.8 percent and 30.5 percent much worse and worse) think that MTNL is worse and much worse in helping customers in emergency situations. 25.7 % respondents think that MTNL is better (22.7 percent) or much better (3 percent) in helping customers in emergency situations. 36% respondents agreed that

employee's willingness to help in emergency situations is not as per their expectations.

6. 15.3 % respondents (13.2 percent better and 2.1 percent much better) think that MTNL employees are approachable and easy to contact while 34.6% respondents (much worse 12.5 percent and worse 22.1 percent) think that MTNL employees are unfriendly and difficult to connect with. 50.1% respondents think that approachability and accessibility of MTNL employees is not as per their expectation. 34% respondents think that MTNL employees are worse (26.2 percent) or much worse (7.8 percent) in communication with customers, whereas 20.5% respondents (17.3 percent better and 3.2 percent much better) think that they are better or much better in communication with customers.

It is inferred from the table 6.11 and chart 6.10 that majority of respondents rate all five responsiveness dimensions of service quality is not equal to or below their expectation. Very few respondents rate responsiveness dimensions of service quality above their expectations.

6.4.4. Customer satisfaction on empathy service quality dimension:

The service quality dimensions for empathy aspect are shown in the table 6.12 and chart 6.11.Empathy includes approachability, sense of security, and the effort to understand the customer's needs. The provision of caring, providing individualized attention to its customers helps

customers and provides prompt service. As shown in the table, the empathy dimensions EM1 to EM7 represent customer's needs, convenient operating hours, loyalty programs, customers' best interest at heart, individual attention, understanding specific need of customers and apologising for inconvenience caused respectively. The respective question from questionnaire is as follows:

EM1: Having convenient periods & terms for activation, recharge, and accounts suspension, free call times

EM2: Having operating hours convenient to all customers

EM3: Having sound loyalty program to recognize you as a frequent customer

EM4: Having the customer's best interest at heart

EM5: Giving individual customer attention by employees

EM6: Efforts to understand specific customer needs.

EM7: Apologizing for inconvenience caused to customers

Table: 6.12:Empathy service quality dimensions							
		Much worse	Worse	Not equal to expectation	Better	Much Better	Total
EM1	N	119	253	456	161	11	1,000
	%	11.9	25.3	45.6	16.1	1.1	100
EM2	N	101	262	401	207	29	1,000
	%	10.1	26.2	40.1	20.7	2.9	100
EM3	N	139	245	351	227	38	1,000
	%	13.9	24.5	35.1	22.7	3.8	100
EM4	N	130	272	381	167	50	1,000
	%	13.0	27.2	38.1	16.7	5.0	100
EM5	N	137	299	362	173	29	1,000
	%	13.7	29.9	36.2	17.3	2.9	100
EM6	N	110	323	337	202	28	1,000
	%	11.0	32.3	33.7	20.2	2.8	100
EM7	N	176	300	384	122	18	1,000
	%	17.6	30.0	38.4	12.2	1.8	100

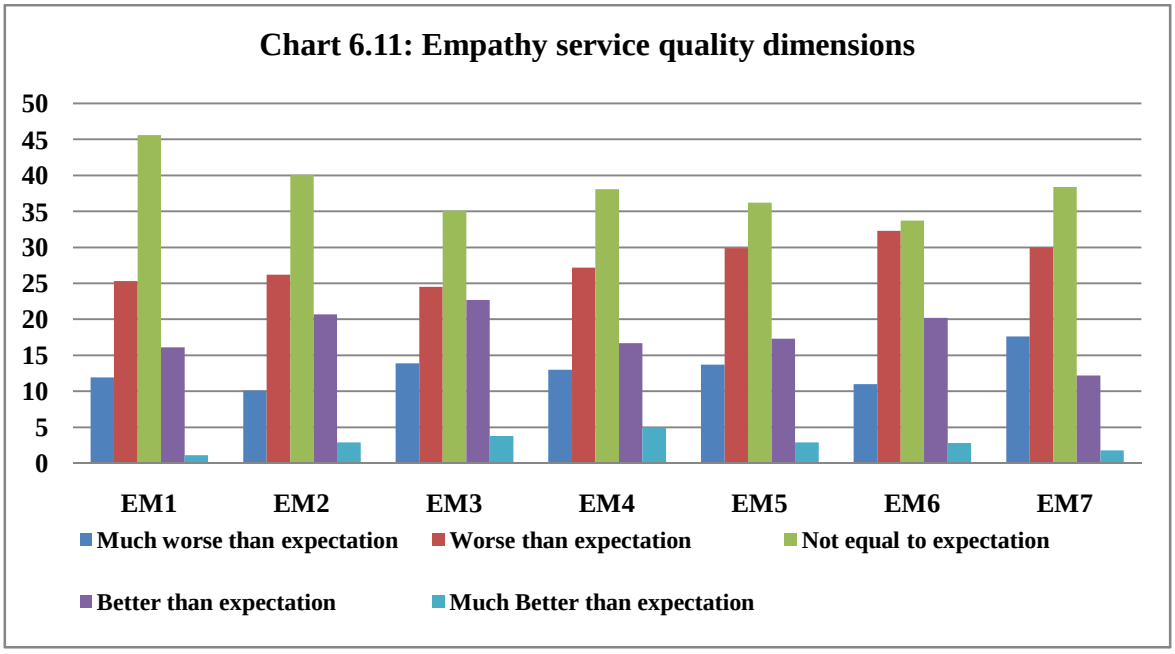


Table 6.12 and chart 6.11 reveals that,

1. 37.2% respondents think that MTNL is worse (25.3 percent) and much worse (11.97 percent) in providing convenient periods, recharge options and other customer specific needs, while 17.2% think that MTNL is better (16.1 Percent) and much better (1.1

percent) in fulfilling customer specific needs. 45.6% respondents think that MTNL is not fulfilling their specific needs as per their expectation.

2. 36.3% respondents think that MTNL is having worse (26.2 percent) or much worse (10.1 percent) operating hours, whereas 23.6% respondents think that MTNL is having better (20.7 percent) and much better (2.9 percent) operating hours. Majority respondents (40.1percent) agreed that operating hours of MTNL are not convenient.
3. 73.5% respondents (i.e. 13.9 percent much worse, 24.5 percent worse and 35.1percent not equal to expectation) think that MTNL's efforts to recognise a frequent customer through loyalty program is not equal to or below their expectation, while only 26.5% respondents (22.7 percent better and 3.8 percent much better than expectation) think that MTNL is recognise their regular customers with sound loyalty program.
4. 78.3% respondents (i.e. 13.0 percent much worse, 27.2 percent worse and 38.1percent not equal to expectation) think that MTNL is not having customers' best interest at heart, while only 21.7% respondents (16.7 percent better and 5.0 percent much better than expectation) think that MTNL is having customers' best interest at heart.

5. 43.6% respondents (13.7 percent much worse and 29.9 percent worse than expectation) think that MTNL is not providing individual attention whereas only 20.2% respondents (17.3 percent better and 2.9 percent much better than expectation) think that MTNL is providing individual attention to their customers. 36.2% respondents think they are not getting individual attention as per their expectation.
6. 43.3% respondents (11.0 percent much worse and 32.3 percent worse than expectation) think that MTNL is inactive in understanding the specific needs of the customers while only 23% respondents (20.2 percent better and 2.8 percent much better than expectation) think MTNL is active and make efforts to understand the customer's needs.
7. Almost 86% respondents (i.e. 17.6 percent much worse, 30.0 worse and 38.4 percent not equal to expectation) think that MTNL is not apologising for the inconvenience caused to the customers while only 14% respondents(12.2 percent better and 1.8 percent much better than expectation) think that MTNL is apologise for the inconvenience caused to customers.

It is inferred from the table 6.12 and chart 6.11 that majority of respondents rate all seven empathy dimensions of service quality is not equal to or below their expectation. Very few respondents rate empathy

dimensions of service quality above their expectations. Overall the empathy dimension of service quality is rated not equal to or below the expectation of respondents.

6.4.5. Customer satisfaction on Assurance service quality dimension:

The service quality dimensions for assurance aspect are shown in the table 6.13 and chart 6.12.The assurance dimension includes competence to perform the service, politeness and respect for the customer, and effective communication with the customer.Assurance focus on the knowledge and courtesy of employees and their ability to inspire trust and confidence. As shown in the table, the assurance dimensions AS1 to AS4 represent ability to provide Value Added Services (VAS) services, Sincerity and patience in solving customer complaints, behaviour of employees and employees' skill and knowledge respectively. The respective question from questionnaire is as follows:

AS1: Ability to provide variety of value added services- Music, access to internet, SMS, MMS, etc.

AS2: Sincerity and patience in resolving customers' complaints/problems

AS3: The behaviour of employees in instilling confidence in customers.

AS4: Employees' use of required skills and knowledge to answer customers' questions.

Table 6.13:Assurance service quality dimensions							
		Much worse	Worse	Not equal to Expectation	Better	Much Better	Total
AS1	N	118	242	386	220	34	1,000
	%	11.8	24.2	38.6	22.0	3.4	100
AS2	N	76	321	376	205	22	1,000
	%	7.6	32.1	37.6	20.5	2.2	100
AS3	N	79	298	415	191	17	1,000
	%	7.9	29.8	41.5	19.1	1.7	100
AS4	N	61	238	543	129	29	1,000
	%	6.1	23.8	54.3	12.9	2.9	100

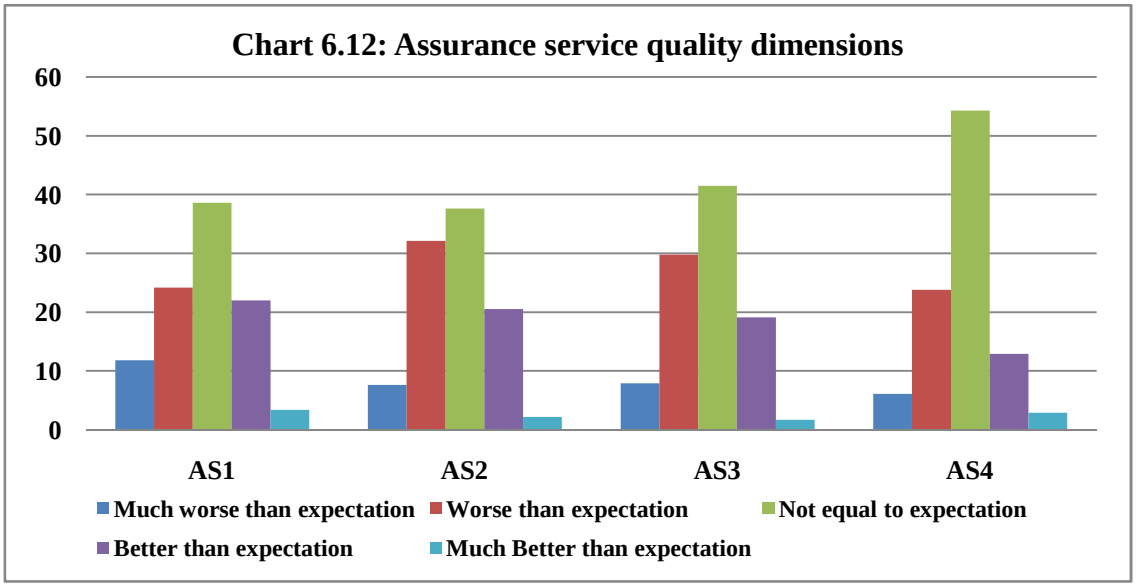


Table 6.13 and chart 6.12 shows that,

1. 38.6% respondents think that MTNL's ability to provide variety of Value Added Services is not as per their expectation.
2. 36% respondents (11.8 percent much worse and 24.2 percent worse than expectation) think that MTNL's ability is worse and much worse in providing variety of Value Added Services, whereas 25.4% respondents (22.0 percent better and 3.4 percent much better than expectation) think that MTNL's ability to provide Value added service is better and much better than their expectation.

3. 39.7% respondents (7.6 percent much worse and 32.1 percent worse than expectation) think that MTNL's sincerity and patience is worse and much worse in resolving customers' complaints. The 22.7% respondents (20.5 percent better and 2.2 percent much better than expectation) think that MTNL's sincere and patience efforts in resolving customers problems is better than their expectation. 37.6 percent respondents think that MTNL's sincere and patience efforts in solving their problems are not as per their expectation.
4. 37.7% respondents (7.9 percent much worse and 29.8 percent worse than expectation) think that MTNL employees' are worse and much worse in instilling confidence in customers', whereas only 20.8% respondents (19.1percent better and 1.7 percent much better than expectation) think that MTNL employees are able to inspire trust among customers. 41.5% respondents think that the ability to inspire confidence and trust among customers is not as per their expectation.
5. 54.3% respondents think that MTNL employee skill and knowledge is not adequate as per their expectation while 29.9% respondents (6.1 percent much worse and 23.8 percent worse than expectation) think that skills and knowledge of MTNL employees is worse and much worse than their expectation. Only 15.8% respondents (12.9 percent better and 2.9 percent much better than expectation) think that Skills and knowledge of MTNL employees is better that their expectation.

It is seen from the table 6.13 and chart 6.12 that majority of respondents rate all assurance dimensions of service quality is not equal to or below their expectation. Very few respondents rate assurance dimensions of service quality above their expectations.

6.4.6. Customer satisfaction on economy service quality dimension:

The service quality dimensions for economy aspect are shown in the table 6.14 and chart 6.13.The economy dimensions focuses on the pricing aspect of the services of MTNL. As shown in the table, the economy dimensions EC1 to EC2 represent variety of billing and recharge options call per minute/ second or per MB charges respectively. The respective question from questionnaire is as follows:

EC1: Prepaid and post-paid plans recharge cards and their denominations?

EC2: The call charges per minute/second?

Table 6.14: Economy service quality dimensions

	Much worse	Worse	Not equal to Expectation	Better	Much Better	Total
EC1	88	191	394	297	30	1000
	8.8	19.1	39.4	29.7	3.0	100
EC2	62	160	430	300	48	1000
	6.2	16.0	43.0	30.0	4.8	100

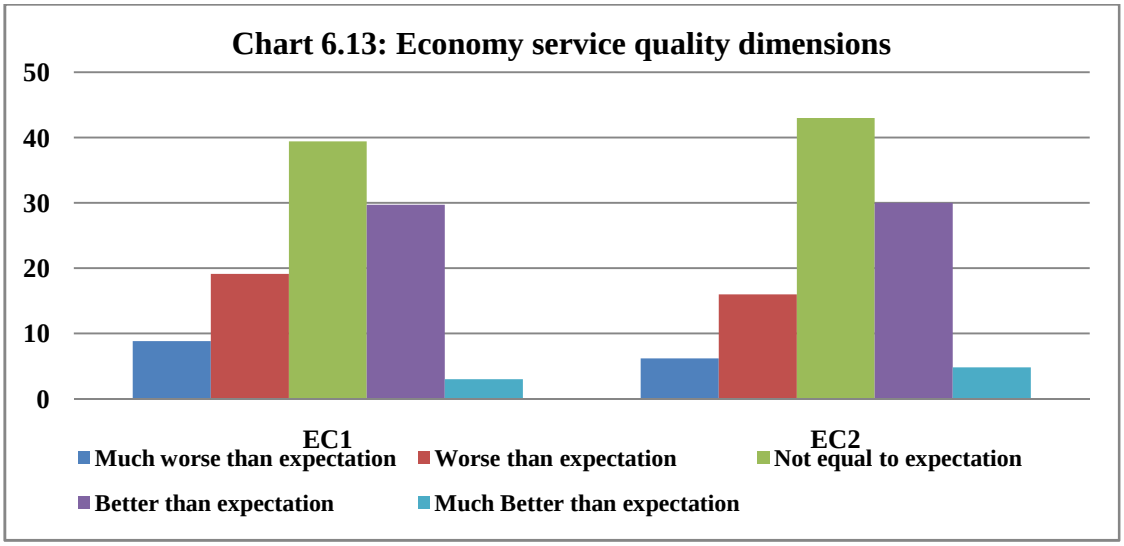


Table 6.14 and chart 6.13 shows that,

1. 39.4% respondent rate prepaid and post-paid plans and recharge options and denominations are not as per their expectation while 32.7% respondent's rate plans and recharge options better (29.7%) and much better (3%) than their expectations. Only 27.9% respondent rates plans and recharge options worse (19.1%) and much worse (8.8%) than their expectations.
2. 43 % respondents think that MTNL's call charges and data charges are not matching their expectations while 34.8% respondents think that MTNL's call charges and data charges are better (30%) and much better (4.8%) than their expectations. Only 22.2% respondents think that MTNL's call charges and data charges are worse (16%) and much worse (6.2%) than their expectations.

It is inferred from the table 6.14 and chart 6.13 that majority of respondents rate both the economy dimensions of service quality below

their expectation. Very few respondents rate both economy dimensions of service quality above their expectations. Overall the economy dimension of service quality is rated below the expectation of respondents.

6.4.7. Customer satisfaction on technical service quality dimension:

The service quality dimensions for technical quality aspect are shown in the table 6.15 and chart 6.14.The technical quality dimensions focuses on network clarity, adequate network coverage, technical knowledge and skill of employees, the successful completion of call, data, SMS, MMS etcAs shown in the table, the technical quality dimensions TQ1 to TQ5 represent the successful completion of call, data, SMS, MMS etc, technical knowledge and skill of employees, network clarity, network innovativeness, adequate network coverage respectively. The respective question from questionnaire is as follows:

TQ1: Successful in completion of calls, SMS, MMS, line activation, downloads, etc

TQ2: Employees have technical knowledge and skills in solving customer problems

TQ3: Network clarity and speed for call and other services

TQ4: Network innovativeness ability to use current technology to improve services

TQ5: Providing adequate network coverage

Table 6.15:Technical service quality dimensions							
		Much worse	Worse	Not equal to Expectation	Better	Much Better	Total
TQ1	N	74	231	404	239	52	1,000
	%	7.4	23.1	40.4	23.9	5.2	100
TQ2	N	95	164	447	253	41	1,000
	%	9.5	16.4	44.7	25.3	4.1	100
TQ3	N	97	250	320	310	23	1,000
	%	9.7	25.0	32.0	31.0	2.3	100
TQ4	N	85	250	422	204	39	1,000
	%	8.5	25.0	42.2	20.4	3.9	100
TQ5	N	108	226	317	292	57	1,000
	%	10.8	22.6	31.7	29.2	5.7	100

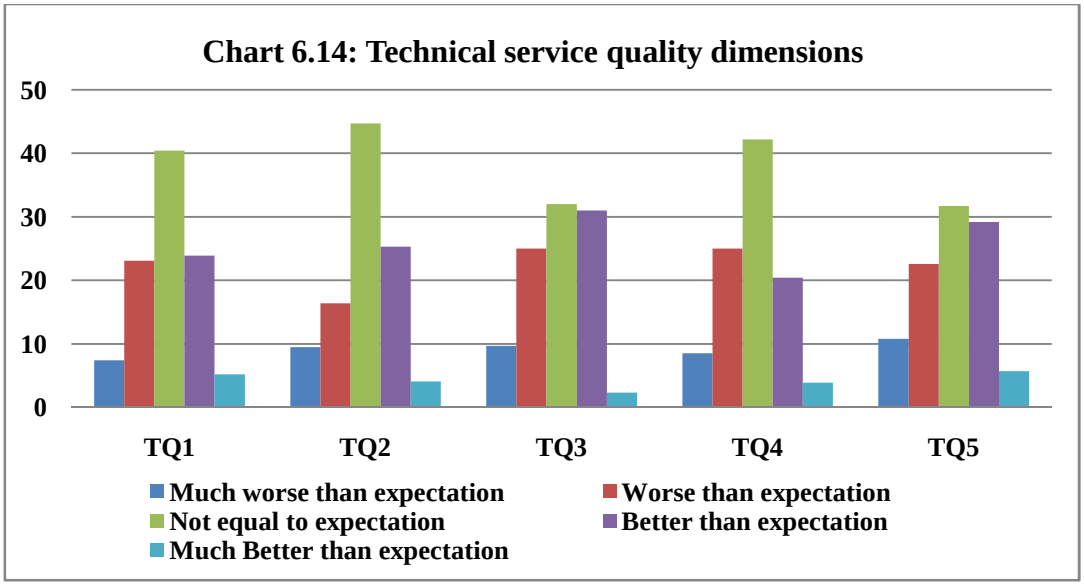


Table 6.15 and chart 6.14 shows that,

1. Majority of respondents find technical quality dimensions not matching their expectations. 30.5% respondents (7.4 percent much worse and 23.1 percent worse than expectation) think that MTNL's call processing is worse and much worse than their expectation, whereas 29.1% respondents (23.9 percent better and 5.2 percent much better than expectation) think that MTNL's call processing is better and much better than their expectation.

2. 70.6% respondents (i.e. 9.5 percent much worse, 16.4 percent worse and 44.7 percent not equal to expectation) think that skill and technical knowledge of MTNL employees is below their expectations, while only 29.4% respondents think that skills and technical knowledge of employees of MTNL is better (25.3%) and much better (4.1%) than their expectation.
3. 34.7% respondents think that network clarity of MTNL is worse (25%) and much worse (9.7%) than their expectation while 33.3% respondents think that network clarity of MTNL is better (31%) and much better (2.3%) than their expectation. Only 32 % respondents think that network clarity of MTNL is not matching their expectations.
4. 33.5% respondents think that MTNL is worse (25%) and much worse (8.5%) in network innovativeness and implementing new technologies while 24.3% respondents think that MTNL is better (20.4%) and much better (3.9%) in network innovativeness and implementing new technologies. 42.2% respondents think that MTNLs network innovativeness is not as per their expectations.
5. 65.1 percent respondents (i.e. 10.8 percent much worse, 22.6 percent worse and 31.7 percent not equal to expectation) think that MTNL network coverage is below their expectation whereas 34.9 %

respondents think that MTNL network coverage is better (29.2%) and much better (5.7%) than their expectation.

It is inferred from the table 6.15 and chart 6.14 that majority of respondents rate all five technical quality dimensions of service quality is below their expectation. Very few respondents rate technical quality above their expectations. Overall, it is observed that MTNL is not only able to implement the new technologies well but also not able to provide adequate coverage for successful completion of the call and other services of the MTNL.

6.4.8. Customer satisfaction on image service quality dimension:

The image dimensions focuses on business success, reputation of MTNL, brand name in market and social responsibility taken by MTNL. As shown in the table, the image dimensions IM1 to IM4 represent the business success, reputation, brand image and social responsibility respectively. The respective question from questionnaire is as follows:

IM1: How successful is MTNL?

IM2: What is the reputation of MTNL?

IM3: What is the brand image of MTNL?

IM4: How socially responsible is MTNL?

The service quality dimensions for image aspect are shown in the table 6.16 and chart 6.15.

Table 6.16:Image service quality dimensions							
		Much worse	Worse	Not equal to Expectation	Better	Much Better	Total
IM1	N	54	200	386	308	52	1,000
	%	5.4	20.0	38.6	30.8	5.2	100
IM2	N	75	209	379	274	63	1,000
	%	7.5	20.9	37.9	27.4	6.3	100
IM3	N	75	219	401	236	69	1,000
	%	7.5	21.9	40.1	23.6	6.9	100
IM4	N	84	201	413	250	52	1,000
	%	8.4	20.1	41.3	25.0	5.2	100

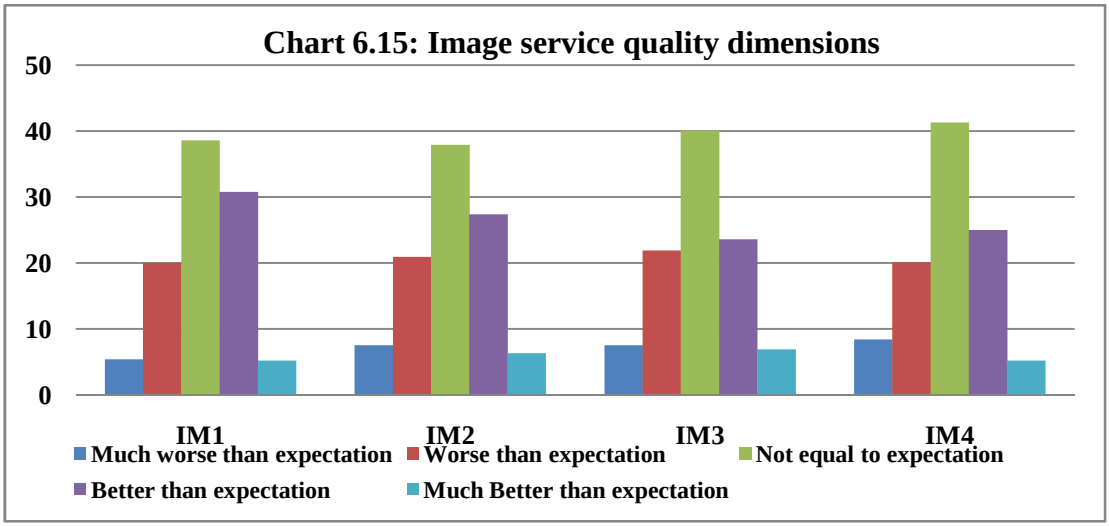


Table 6.16 and chart 6.15 shows that,

1. The majority of respondents rated all IM1 to IM4 image dimension below their expectation.
2. 64 % respondent's (5.4 percent much worse and 20.0 percent worse than and 38.6 percent not equal to expectation) think that MTNL is not successful in business and achieving their mission while 36% respondents (30.8 percent better and 5.2 percent much better than expectation) think that MTNL is successful in achieving their objective.

3. 28.4% respondents (7.5 percent much worse and 20.9 percent worse than expectation) think that MTNL's reputation is worse and much worse than their expectation while 33.7% respondents (27.4 percent better and 6.3 percent much better than expectation) think that MTNL's reputation is better and much better than their expectations. 37.9% respondents think that MTNL is unable to build the reputation they expected.
4. 69.5% respondents (i.e. 7.5 percent much worse, 21.9 percent worse and 40.1percent not equal to expectation) think that brand image of MTNL is below their expectation or worse or much worse than their expectation while 30.5% respondents (23.6 percent better and 6.9 percent much better than expectation) think that MTNL's brand image is better and much better than their expectation.
5. 69.8 % respondents (i.e. 8.4 percent much worse, 20.1 percent worse and 41.3 percent not equal to expectation) think that MTNL is worse than their expectation in social responsibility while 30.2% respondents (25.0 percent better and 5.2 percent much better than expectation) think that MTNL is better than their expectation in social responsibility.

It is seen from the table 6.16 and chart 6.5 that majority of respondents rate all four image dimensions of service quality below their expectation. Very few respondents rate image dimensions of service quality above

their expectations. Overall the image dimensions of service quality are rated below their expectation by majority of respondents while few respondents rated the image dimension of the service quality above their expectation.

6.5. Assessing customer satisfaction based on Customer Satisfaction Index(CSI):

CSI is based on the American Customer Satisfaction Index (ACSI) model used in U.S.A.The heart of the American Customer Satisfaction Index is a set of three questions that assess satisfaction, each on a different 10-point scale. But for convenience researcher use 5 point scale to measure the satisfaction level among MTNL's customers. The three questions are as follows:

1. Overall, what is satisfaction level with the service quality of MTNL?

Much worse than expected	worse than expected	Not equal to expectation	Better than expected	Much better than expected
1	2	3	4	5

2. How well the service provided compare with ideal/Desired one?

Much worse than desired	worse than desired	Not equal to my desire	Better than desired	Much better than desired
1	2	3	4	5

3. To what extent has the service met your expectations?

Much worse than expected	worse than expected	Not equal to my expectation	Better than expected	Much better than expected
1	2	3	4	5

Respondents will rate their opinion for the above questions on a five-point scale; the value for each response will have a value from one (1) to five (5) respectively:

Then CSI is calculated using following formula. This formula is modified since 5 point scale is used to record five (5) responses to the three questions.

$$CSI = \frac{Q1 - 1}{4} \times 33.3 + \frac{Q2 - 1}{4} \times 33.3 + \frac{Q3 - 1}{4} \times 33.3$$

Then the average of all the responses is calculated to form the index on a scale of 0-100. The “fair Satisfaction” is assigned a value of 50. This is because if a customer rates satisfaction as equal to expectation or desire, or neutral for all the three questions in the formulae (CSI), it would sum up to an index of 49.99 i.e. 50. The Very much High Satisfaction is assigned a value above 81 whereas “very much low satisfaction” is assigned value below 10. The “Low satisfaction” assigned a value in the range of 30 to 49, whereas “High satisfaction” is assigned value ranging from 61 to 70.

As explained above, the formula and methodology is used to calculate the satisfaction index for overall service delivery of MTNL and also for landline, broadband and mobile service of MTNL. The result was shown in the table 6.17.

Table 6.17: Customer satisfaction Index for MTNL		
Service	CSI	Interpretation
Overall	47.42	Low
Landline	53.48	Fair
Mobile	44.94	Low
Broadband	45.30	Low

Table 6.17 shows that,

1. The customer satisfaction index for Landline service is 53.48 which indicate fair satisfaction for the landline service of MTNL.
2. The customer satisfaction index for Mobile service of MTNL is 44.94 which show that customers' satisfaction level is low for mobile service of MTNL.
3. The customer satisfaction index for Broadband service is 45.30 shows MTNL customers are having low satisfaction level compared to landline service but more than mobile service of MTNL.
4. The customer satisfaction index for overall service including landline, broadband and mobile service is 47.42 which show that MTNL customers are having low satisfaction level from services provided by MTNL.

Thus it is inferred from table 6.17 that MTNL customers are having low satisfaction level with overall service of MTNL. For the landline service the satisfaction level is fair compared to broadband service and mobile service of MTNL.

6.6. Testing of hypothesis:

Following additional hypotheses were formulated for the purpose of the study.

Hy_1: Customers are satisfied with landline service quality of MTNL.

Hy_2: Customer satisfaction with landline service quality dimensions of MTNL is equal to or better than expectation.

Hy_3: Customers are satisfied with broadband service quality of MTNL.

Hy_4: Customer satisfaction with broadband service quality dimensions of MTNL is equal to or better than expectation.

Hy_5: Customers are satisfied with mobile service quality of MTNL.

Hy_6: Customer satisfaction with mobile service quality dimensions of MTNL is equal to or better than expectation.

Hy_7: Customers are satisfied with overall service quality of MTNL.

Hy_8: Customer satisfaction with overall service quality dimensions of MTNL is equal to or better than expectation.

6.6.1. Hypothesis on landline services of MTNL:

Hypothesis 1:

Customers are satisfied with landline service quality of MTNL.

The hypothesis is tested using the significance of the mean difference at significance value of 0.05 and estimated t-value. Table 6.18, shows the result of t-test for satisfaction with landline service of MTNL.

Table 6.18: T-test results for satisfaction with landline service						
Test Value = 3						
Measure	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Satisfaction	6.695	621	0.000	0.29	0.21	0.38

It can be seen from the table 6.18 that, the mean difference for satisfaction with landline service of MTNL is 0.29 with significance value of 0.00 and estimated t-value of 6.695. This estimated t-value is much more than the $t_{(0.05,\ 621)}$ is ± 1.96. This indicates that the mean is significantly less than the cutoff value (3) providing strong evidence to reject the hypothesis that customers of MTNL are satisfied with landline service of MTNL. Therefore, it can be safely concluded with 95% confidence that, customers are not satisfied or they are dissatisfied with service quality of landline services of MTNL.

Hypothesis 2:

Further to measure thesatisfaction with landline service quality dimension of MTNL, following hypothesis is formulated:

Customer Satisfaction with landline service quality dimensions of MTNL is equal to or better than expectation.

In Table 6.19, t-test result for landline service quality dimensions of MTNL is presented.

Table 6.19: T-test result for landline service quality dimensions							
Test Value = 3							
	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Assessment of Hypothesis
					Lower	Upper	
TA1	-6.44	621	0.00	-0.24	-0.31	-0.17	Rejected
TA2	-7.80	621	0.00	-0.31	-0.38	-0.23	Rejected
TA3	-4.86	621	0.00	-0.20	-0.29	-0.12	Rejected
TA4	-6.20	621	0.00	-0.26	-0.34	-0.17	Rejected
RL1	-5.45	621	0.00	-0.22	-0.30	-0.14	Rejected
RL2	-6.20	621	0.00	-0.24	-0.32	-0.16	Rejected
RL3	-6.76	621	0.00	-0.28	-0.36	-0.20	Rejected
RL4	-4.46	621	0.00	-0.18	-0.27	-0.10	Rejected
RL5	-11.72	621	0.00	-0.42	-0.49	-0.35	Rejected
RS1	-5.74	621	0.00	-0.20	-0.27	-0.13	Rejected
RS2	-5.84	621	0.00	-0.21	-0.29	-0.14	Rejected
RS3	-5.43	621	0.00	-0.21	-0.29	-0.14	Rejected
RS4	-8.46	621	0.00	-0.31	-0.38	-0.24	Rejected
RS5	-4.32	621	0.00	-0.15	-0.22	-0.08	Rejected
EM1	-8.18	621	0.00	-0.30	-0.38	-0.23	Rejected
EM2	-5.20	621	0.00	-0.21	-0.29	-0.13	Rejected
EM3	-5.41	621	0.00	-0.22	-0.30	-0.14	Rejected
EM4	-5.56	621	0.00	-0.24	-0.32	-0.15	Rejected
EM5	-9.19	621	0.00	-0.36	-0.44	-0.29	Rejected
EM6	-7.10	621	0.00	-0.28	-0.36	-0.20	Rejected
EM7	-11.50	621	0.00	-0.47	-0.55	-0.39	Rejected
AS1	-5.38	621	0.00	-0.23	-0.31	-0.14	Rejected
AS2	-5.18	621	0.00	-0.21	-0.29	-0.13	Rejected
AS3	-6.42	621	0.00	-0.24	-0.31	-0.17	Rejected
AS4	-4.71	621	0.00	-0.16	-0.22	-0.09	Rejected
EC1	-0.34	621	0.73	**-0.01**	**-0.10**	**0.07**	**Accepted**
EC2	2.57	621	0.01	**0.10**	**0.02**	**0.18**	Rejected
TQ1	0.04	621	0.97	**0.00**	**-0.08**	**0.08**	**Accepted**
TQ2	-1.89	621	0.06	**-0.08**	**-0.16**	**0.00**	**Accepted**
TQ3	-2.89	621	0.00	-0.12	-0.21	-0.04	Rejected
TQ4	-3.09	621	0.00	-0.13	-0.21	-0.05	Rejected
TQ5	-0.78	621	0.44	**-0.03**	**-0.12**	**0.05**	**Accepted**
IM1	2.30	621	0.02	**0.09**	**0.01**	**0.17**	Rejected
IM2	1.00	621	0.32	**0.04**	**-0.04**	**0.13**	**Accepted**
IM3	2.14	621	0.03	**0.09**	**0.01**	**0.18**	**Accepted**
IM4	0.79	621	0.43	**0.03**	**-0.05**	**0.12**	Rejected

The results in the table 6.19 shows that,

1. Thirty (30) attributes has the significance value of 0.00 ($p < 0.05$) and estimated t value above the $t_{(0.05, 621)}$ ($\pm$ 1.96). This indicates that customer satisfaction is below or worse than expected for the tangibility (TA1 to TA4), reliability (RL1 to RL5), responsiveness(RS1 to RS5), empathy (EM1 to EM7), assurance(AS1 to AS4), EC2 attribute of economy dimension, TQ3 and TQ4 attributes of technical quality dimension and IM1 and IM3 attribute of image dimension.
2. 6 attributes (EC1, TQ1, TQ2, TQ5, IM2 and IM4) has significance value more than ($p > 0.05$) and estimated t value in the range of $\pm$ 1.96 a $t_{(0.05, 621)}$ value. This indicates that customer satisfaction with EC1 attribute of economy dimension, TQ1, TQ2 andTQ5 attributes of technical quality and IM2 and IM4 attribute of image dimension is below or worse than expected for customers of MTNL.

Thus, of the 36 dimensions of service quality, customer satisfaction with landline service quality dimensions is below or worse than expectation for 30 attributes of 8 dimensions and customer satisfaction with landline service quality dimensions is equal to or better than expectation for 6 service quality dimensions. Hence hypothesis that customer satisfaction with landline service quality dimensions of MTNL is equal to or better than expectation is stand rejected.

Thus, it is concluded from the able 6.18 and 6.19 that the customers are not satisfied with service quality of landline service of MTNL and hypothesis that customers are satisfied with landline service quality of MTNL is stand “Rejected”.

6.6.2. Hypothesis on broadband services of MTNL:

Hypothesis 3:

Customers are satisfied with broadband service quality of MTNL.

The stated hypothesis is tested using the significance of the mean difference at significance value of 0.05 or 95 percent confidence interval and estimated t-value. Table 6.20, shows the result of t-test for satisfaction with broadband service of MTNL.

Table 6.20 : T-test results for satisfaction with broadband service of MTNL

Test Value = 3						
Measure	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Satisfaction	-5.41	348	0.000	-0.32	-0.42	-0.21

Table 6.20 shows that, the mean difference for satisfaction with broadband service of MTNL is -0.32 with significance value of 0.00 and estimated t-value of -5.41. This estimated t-value is much more than the $t_{(0.05, 348)}$ is ± 1.967. This indicates that the mean is significantly less than the cutoff value (3) providing strong evidence to reject the hypothesis that customers of MTNL are satisfied with broadband service quality of

MTNL. Therefore, it can be safely concluded with 95% confidence that, customers are not satisfied or they are dissatisfied with service quality of broadband service of MTNL. It reveals that this hypothesis stands rejected.

Hypothesis 4:

Further to measure the customer satisfaction with broadband service quality dimension of MTNL following hypothesis is formulated:

Customer Satisfaction with broadband service quality dimensions of MTNL is equal to or better than expectation.

The stated hypothesis is tested using the significance of the mean difference and the estimated t-value. In Table 6.21, t-test result for broadband service quality dimensions of MTNL is presented to really know which dimensions of broadband service quality customers are satisfied with or not.

Table 6.21: T-test result for broadband service quality dimensions							
Test Value = 3							
	Estimated t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Assessment of Hypothesis
					Lower	Upper	
TA1	-1.99	348.00	0.05	-0.10	-0.21	0.00	Rejected
TA2	-6.40	348.00	0.00	-0.28	-0.37	-0.20	Rejected
TA3	-1.99	348.00	0.05	-0.11	-0.22	0.00	Rejected
TA4	-3.07	348.00	0.00	-0.17	-0.28	-0.06	Rejected
RL1	-5.30	348.00	0.00	-0.30	-0.41	-0.19	Rejected
RL2	-3.05	348.00	0.00	-0.14	-0.24	-0.05	Rejected
RL3	-5.40	348.00	0.00	-0.30	-0.40	-0.19	Rejected
RL4	-0.95	348.00	0.34	-0.05	-0.16	0.06	**Accepted**
RL5	-9.01	348.00	0.00	-0.40	-0.49	-0.32	Rejected
RS1	-4.47	348.00	0.00	-0.20	-0.28	-0.11	Rejected
RS2	-5.57	348.00	0.00	-0.29	-0.39	-0.19	Rejected
RS3	-5.09	348.00	0.00	-0.25	-0.35	-0.15	Rejected
RS4	-8.41	348.00	0.00	-0.43	-0.53	-0.33	Rejected
RS5	-4.50	348.00	0.00	-0.23	-0.33	-0.13	Rejected
EM1	-8.65	348.00	0.00	-0.40	-0.49	-0.31	Rejected
EM2	-5.37	348.00	0.00	-0.26	-0.35	-0.16	Rejected
EM3	-2.54	348.00	0.01	-0.15	-0.27	-0.03	Rejected
EM4	-5.41	348.00	0.00	-0.29	-0.39	-0.18	Rejected
EM5	-4.70	348.00	0.00	-0.26	-0.36	-0.15	Rejected
EM6	-6.74	348.00	0.00	-0.37	-0.48	-0.26	Rejected
EM7	-9.36	348.00	0.00	-0.54	-0.66	-0.43	Rejected
AS1	-2.11	348.00	0.04	-0.11	-0.22	-0.01	Rejected
AS2	-4.74	348.00	0.00	-0.25	-0.35	-0.14	Rejected
AS3	-3.69	348.00	0.00	-0.19	-0.30	-0.09	Rejected
AS4	-3.22	348.00	0.00	-0.16	-0.25	-0.06	Rejected
EC1	2.17	348.00	0.03	0.12	0.01	0.22	Rejected
EC2	4.71	348.00	0.00	0.24	0.14	0.35	Rejected
TQ1	-0.27	348.00	0.79	**-0.01**	**-0.12**	**0.09**	**Accepted**
TQ2	2.16	348.00	0.03	0.11	0.01	0.21	Rejected
TQ3	0.00	348.00	1.00	**0.00**	**-0.10**	**0.10**	**Accepted**
TQ4	-1.12	348.00	0.26	**-0.06**	**-0.17**	**0.05**	**Accepted**
TQ5	2.21	348.00	0.03	0.14	0.02	0.26	Rejected
IM1	3.49	348.00	0.00	0.17	0.07	0.26	Rejected
IM2	2.17	348.00	0.03	0.11	0.01	0.21	Rejected
IM3	0.54	348.00	0.59	**0.03**	**-0.08**	**0.13**	**Accepted**
IM4	0.12	348.00	0.91	**0.01**	**-0.09**	**0.10**	**Accepted**

The results in the table 6.21 shows that,

1. Thirty (30) attributes has the significance value less than 0.05 ($p < 0.05$) and estimated t value above the $t_{(0.05,\ 348)}$ ($\pm$ 1.967). This indicates that customer satisfaction is below or worse than expected for the tangibility (TA1 to TA4), reliability (RL1 to RL3 and RL5), responsiveness(RS1 to RS5), empathy (EM1 to EM7), assurance(AS1 to AS4), economy (EC1 and EC2), TQ2 and TQ5 attributes of technical quality dimension and IM1 and IM2 attribute of image dimension of broadband service of MTNL.
2. 6 attributes (RL4, TQ1, TQ3, TQ4, IM3 and IM4) has significance value more than 0.05 ($p > 0.05$) and estimated t value in the range of $\pm$ 1.967 a $t_{(0.05,\ 348)}$ value. This indicates that customer satisfaction with RL4 attribute of reliability dimension, TQ1, TQ3 andTQ4 attributes of technical quality and IM3 and IM4 attribute of image dimension is equal to or better than expectation for customers of MTNL.

Thus, of the 36 dimensions of service quality, customer satisfaction with broadband service quality dimensions is below or worse than expectation for 30 attributes of 8 dimensions and customer satisfaction with broadband service quality dimensions is equal to or better than expectation for 6 service quality dimensions. Hence hypothesis that customer satisfaction with broadband service quality dimensions of MTNL is equal to or better than expectation is stand rejected.

Thus, it is concluded from the able 6.20 and 6.21 that less number of service quality dimensions satisfying the broadband users of MTNL causes lower customer satisfaction for broadband services of the MTNL and that is why customers are satisfied with broadband service quality of MTNL is stand “Rejected”.

6.6.3. Hypothesis on mobile services of MTNL:

Hypothesis 5:

Customers are satisfied with mobile service quality of MTNL.

This hypothesis is tested using the significance of the mean difference at significance value of 0.05 and estimated t-value. Table 6.22, shows the result of t-test for satisfaction with mobile service of MTNL.

Table 6.22: T-test results for satisfaction with mobile service

Test Value = 3						
Measure	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Satisfaction	-4.64	333	0.00	-0.28	-0.38	-0.18

As shown in the table 6.22, the mean difference for satisfaction with mobile service of MTNL is -0.28 with significance value of 0.00 and estimated t-value of -4.64. This estimated t-value is much more than the $t_{(0.05, 333)}$ is ± 1.967. This indicates that the mean is significantly less than the cutoff value (3) providing strong evidence to reject the hypothesis that customers of MTNL are satisfied with mobile service of MTNL. Therefore, it can be safely concluded with 95% confidence that,

customers are not satisfied or they are dissatisfied with service quality of mobile service of MTNL. The hypothesis thus stands rejected.

Hypothesis 6:

Hypothesis for testing satisfaction with landline service quality dimension of MTNL is as follows:

Customer Satisfaction with mobile service quality dimensions of MTNL is equal to or better than expectation.

Table 6.23 presents the t-test result to know which dimensions of mobile service quality customers are satisfied with or not.

Table 6.23: T-test result for mobile service quality dimensions							
Test Value = 3							
	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Assessment of Hypothesis
					Lower	Upper	
TA1	-5.25	333	0.00	-0.28	-0.39	-0.18	Rejected
TA2	-7.15	333	0.00	-0.36	-0.46	-0.26	Rejected
TA3	-2.08	333	0.04	-0.13	-0.25	-0.01	Rejected
TA4	-4.58	333	0.00	-0.21	-0.30	-0.12	Rejected
RL1	-3.45	333	0.00	-0.19	-0.29	-0.08	Rejected
RL2	-2.34	333	0.02	-0.11	-0.21	-0.02	Rejected
RL3	-4.88	333	0.00	-0.26	-0.37	-0.16	Rejected
RL4	-3.35	333	0.00	-0.19	-0.30	-0.08	Rejected
RL5	-7.87	333	0.00	-0.35	-0.44	-0.27	Rejected
RS1	-6.70	333	0.00	-0.30	-0.39	-0.21	Rejected
RS2	-4.89	333	0.00	-0.23	-0.32	-0.14	Rejected
RS3	-4.84	333	0.00	-0.25	-0.35	-0.15	Rejected
RS4	-3.89	333	0.00	-0.19	-0.29	-0.10	Rejected
RS5	-1.97	333	0.05	-0.09	-0.19	0.00	**Accepted**
EM1	-5.95	333	0.00	-0.27	-0.35	-0.18	Rejected
EM2	-3.72	333	0.00	-0.19	-0.28	-0.09	Rejected
EM3	-3.50	333	0.00	-0.20	-0.31	-0.09	Rejected
EM4	-5.24	333	0.00	-0.27	-0.37	-0.17	Rejected
EM5	-9.57	333	0.00	-0.48	-0.57	-0.38	Rejected
EM6	-6.65	333	0.00	-0.34	-0.43	-0.24	Rejected
EM7	-11.0	333	0.00	-0.54	-0.64	-0.45	Rejected
AS1	-4.24	333	0.00	-0.22	-0.32	-0.12	Rejected
AS2	-5.19	333	0.00	-0.22	-0.30	-0.14	Rejected
AS3	-6.74	333	0.00	-0.29	-0.38	-0.21	Rejected
AS4	-7.09	333	0.00	-0.27	-0.34	-0.19	Rejected
EC1	0.18	333	0.86	0.01	-0.09	0.11	**Accepted**
EC2	4.79	333	0.00	0.23	0.14	0.33	Rejected
TQ1	0.06	333	0.95	0.00	-0.10	0.10	**Accepted**
TQ2	0.67	333	0.50	0.03	-0.06	0.12	**Accepted**
TQ3	-2.98	333	0.00	-0.15	-0.25	-0.05	Rejected
TQ4	-2.17	333	0.03	-0.11	-0.21	-0.01	Rejected
TQ5	-0.68	333	0.49	-0.04	-0.16	0.08	**Accepted**
IM1	-0.77	333	0.44	-0.04	-0.13	0.06	**Accepted**
IM2	-3.42	333	0.00	-0.17	-0.27	-0.07	Rejected
IM3	-6.77	333	0.00	-0.29	-0.38	-0.21	Rejected
IM4	-3.40	333	0.00	-0.16	-0.25	-0.07	Rejected

The results in the table 6.23 shows that,

1. Out of 36, thirty (30) attributes has the significance value less than 0.05 ($p < 0.05$) and estimated t value above the $t_{(0.05, 333)}$ ($\pm$ 1.967). This indicates that customer satisfaction is below or worse than expected for the tangibility (TA1 to TA4), reliability (RL1 to RL5), responsiveness(RS1 to RS4), empathy (EM1 to EM7), assurance(AS1 to AS4), EC2 attribute of economy dimension, TQ3 and TQ4 attributes of technical quality dimension and IM2,IM3 and IM4 attribute of image dimension.
2. Remaining 6 attributes (RS5, EC1, TQ1, TQ2, TQ5, and IM1) has significance value more than ($p > 0.05$) and estimated t value in the range of $\pm$ 1.967 a $t_{(0.05, 333)}$ value. This indicates that customer satisfaction with RS5 attribute of responsiveness, EC1 attribute of economy dimension, TQ1, TQ2 and TQ5 attributes of technical quality and IM1 attribute of image dimension is below or worse than expected for customers of MTNL.

Thus of the 36 dimensions of mobile service quality of MTNL, customer satisfaction with service equality dimensions is below expectation or worse than expectation for 30 attributes and customer satisfaction with service quality dimensions is equal to or better than expectation for 6 attributes of 8 dimensions. This indicates that customer satisfaction with mobile service quality of MTNL is not equal to or better than expectation but is worse. Hence hypothesis that customer satisfaction with mobile

service quality dimensions of MTNL is equal to or better than expectation is stand “Rejected”.

It can be inferred from Table 6.22 and 6.23 that the customers are not satisfied with the service quality of mobile service provided by MTNL and hence hypothesis that customers are satisfied with mobile service quality of MTNL is stands rejected.

6.6.4. Hypothesis on overall service of MTNL:

In this respect, the following hypothesis is set.

Hypothesis 7:

Customers are satisfied with overall service quality of MTNL.

The hypothesis is tested using the significance of the mean difference and significance value of 0.05 and estimated t-value. Table 6.24, shows the result of t-test for satisfaction with overall service including landline, mobile and broadband services of MTNL.

Table 6.24: T-test results for satisfaction with overall service

Test Value = 3						
Measure	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Satisfaction	-2.47	999	0.014	-0.09	-0.14	-0.03

Table 6.24 shows that, the mean difference for satisfaction with overall service of MTNL is -0.09 with significance value of 0.014 and estimated t-value of -2.47. This estimated t-value is much more than the $t_{(0.05, 999)}$ is ± 1.962. This indicates that the mean is significantly less than the cutoff

value (3) providing strong evidence to reject the stated hypothesis that customers of MTNL are satisfied with overall service of MTNL. Therefore, it can be safely concluded with 95% confidence that, customers are not satisfied or they are dissatisfied with the overall service quality of MTNL. Hence the hypothesis that customers are satisfied with overall service quality of MTNL is rejected.

Hypothesis 8:

Hypothesis for testing satisfaction with overall service quality dimension of MTNL is as follows:

Customer Satisfaction with overall service quality dimensions of MTNL is equal to or better than expectation.

In Table 6.25, t-test result for overall service quality dimensions of MTNL is presented.

Table 6.25: T-test result for overall service quality dimensions							
Test Value = 3							
	Estimated t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Assessment of Hypothesis
					Lower	Upper	
TA1	-9.01	999	0	-0.28	-0.34	-0.22	Rejected
TA2	-10.56	999	0	-0.31	-0.37	-0.26	Rejected
TA3	-5.51	999	0	-0.18	-0.25	-0.12	Rejected
TA4	-6.3	999	0	-0.2	-0.26	-0.14	Rejected
RL1	-7.24	999	0	-0.23	-0.29	-0.17	Rejected
RL2	-5.36	999	0	-0.16	-0.22	-0.1	Rejected
RL3	-7.83	999	0	-0.25	-0.31	-0.19	Rejected
RL4	-3.8	999	0	-0.13	-0.19	-0.06	Rejected
RL5	-14.08	999	0	-0.39	-0.45	-0.34	Rejected
RS1	-7.2	999	0	-0.2	-0.26	-0.15	Rejected
RS2	-8	999	0	-0.23	-0.28	-0.17	Rejected
RS3	-5.69	999	0	-0.17	-0.23	-0.11	Rejected
RS4	-10.19	999	0	-0.3	-0.35	-0.24	Rejected
RS5	-6.23	999	0	-0.18	-0.24	-0.12	Rejected
EM1	-10.63	999	0	-0.31	-0.37	-0.25	Rejected
EM2	-6.46	999	0	-0.2	-0.26	-0.14	Rejected
EM3	-6.54	999	0	-0.22	-0.29	-0.15	Rejected
EM4	-8.03	999	0	-0.27	-0.33	-0.2	Rejected
EM5	-10.71	999	0	-0.34	-0.41	-0.28	Rejected
EM6	-9.03	999	0	-0.29	-0.35	-0.22	Rejected
EM7	-15.99	999	0	-0.49	-0.56	-0.43	Rejected
AS1	-5.91	999	0	-0.19	-0.25	-0.13	Rejected
AS2	-7.6	999	0	-0.22	-0.28	-0.17	Rejected
AS3	-8.07	999	0	-0.23	-0.29	-0.18	Rejected
AS4	-6.55	999	0	-0.17	-0.23	-0.12	Rejected
EC1	-0.32	999	0.75	-0.01	-0.07	0.05	**Accepted**
EC2	3.76	999	0	0.11	0.05	0.17	Rejected
TQ1	-1.15	999	0.25	-0.04	-0.1	0.03	**Accepted**
TQ2	-0.61	999	0.54	-0.02	-0.08	0.04	**Accepted**
TQ3	-2.74	999	0.01	-0.09	-0.15	-0.03	Rejected
TQ4	-4.52	999	0	-0.14	-0.2	-0.08	Rejected
TQ5	-1.05	999	0.29	-0.04	-0.1	0.03	**Accepted**
IM1	3.43	999	0	0.1	0.04	0.16	Rejected
IM2	1.28	999	0.2	0.04	-0.02	0.1	**Accepted**
IM3	0.16	999	0.88	0.01	-0.06	0.07	**Accepted**
IM4	-0.48	999	0.64	-0.02	-0.08	0.05	**Accepted**

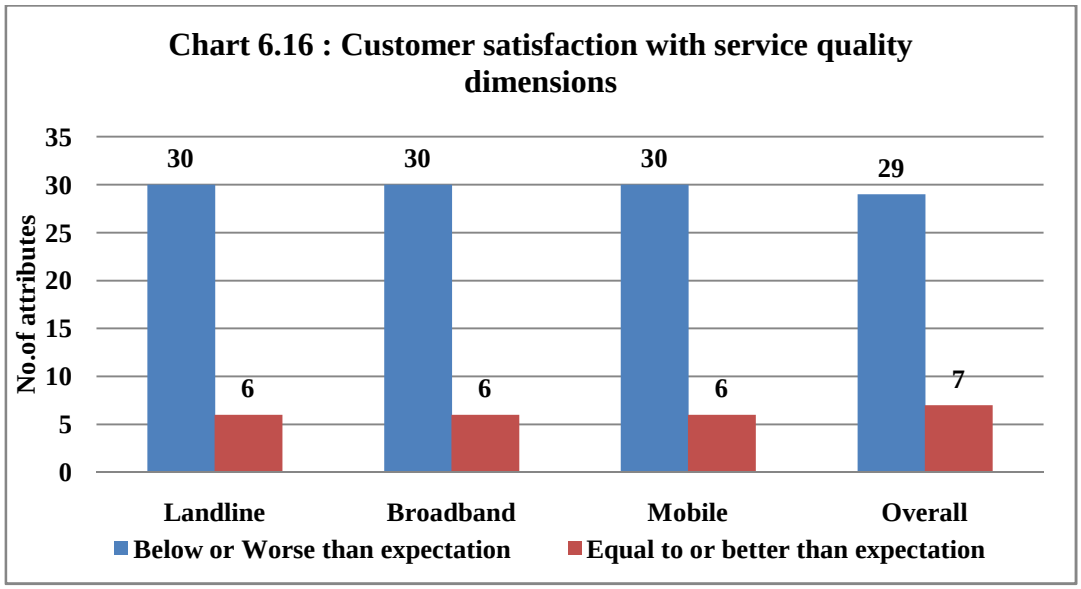
The results in the table 6.25 show that,

1. Of the 36 attributes, twenty nine (29) attributes has the significance value less than 0.05 ($p< 0.05$) and estimated t value above the $t_{(0.05, 999)}$ (± 1.962). This indicates that customer satisfaction is below or worse than expected for the tangibility (TA1 to TA4), reliability (RL1 to RL5), responsiveness(RS1 to RS5), empathy (EM1 to EM7), assurance(AS1 to AS4), EC2 attribute of economy dimension, TQ3 and TQ4 attributes of technical quality dimension and IM1 attribute of image dimension.
2. 7 attributes (EC1, TQ1, TQ2, TQ5, IM2, IM3 and IM4) has significance value more than ($p>0.05$) and estimated t value in the range of ± 1.962 a $t_{(0.05, 999)}$ value. This indicate that customer satisfaction with EC1 attribute of economy dimension, TQ1, TQ2 andTQ5 attributes of technical quality and IM2, IM3 and IM4 attribute of image dimension is equal to or better than expected for overall service of MTNL.

Thus, of the 36 dimensions of service quality, customer satisfaction with overall service quality dimensions is below or worse than expectation for 29 attributes of 8 dimensions and customer satisfaction with overall service quality dimensions is equal to or better than expectation for 7 service quality dimensions. Hence hypothesis that customer satisfaction with overall service quality dimension of MTNL is equal to or better than expectation is stand rejected.

Therefore, it is concluded from the table 6.24 and table 6.25 that the customers are not satisfied with overall service quality of MTNL and hypothesis that customers are satisfied with overall service quality of MTNL is stand “Rejected”.

The summery of all service quality dimensions for landline, mobile, broadband and overall service of MTNL is shown in chart 6.16.



From chart 6.16 it is seen that service quality of MTNL is low and satisfaction level is low for almost all eight dimensions of service quality for landline, broadband, mobile and overall service of MTNL. Therefore it is concluded that customer satisfaction is low or worse for MTNL. Also from the hypothesis testing it is proved that hypothesis of “customers are satisfied with service quality of MTNL” is rejected and alternate hypothesis of “customers are not satisfied with service quality of MTNL” is accepted.

Chapter 7:

Conclusions and Suggestions

7.1. Conclusions

7.2. Conclusions based on secondary data

7.3. Conclusions based on primary data analysis

7.3.1. Use and switching pattern of MTNL services

7.3.2. Customer satisfaction on service quality of MTNL

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7.4. Suggestions

7.5. Scope for future research

Chapter 7:
Conclusions and Suggestions

7.1. Conclusions:

Data analysis was carried out in two parts. Part-I was based on secondary data and part-II was based on primary data analysis.

7.2. Conclusions based on secondary data:

Following are the conclusions based on secondary data analysis.

1. A mobile service of MTNL is used by majority (59%) of customers followed by landline and broadband services.
2. Net revenue from operations of MTNL has been showing decreasing trend. Hence, there is a negative impact on the sales/ revenue of MTNL during the study period.
3. Operating profit of MTNL has been showing a negative growth in the study period. Hence, there is negative impact of reforms on the operating profit of MTNL.
4. The net profit of MTNL has shown a negative growth and even incurred losses in the recent years. This shows the negative impact of economic reforms on the net profit of MTNL.
5. MTNL has shown a negative compound annual growth rate for the operating profit margin. This indicates that the impact of

economic reforms on operating profit margin of MTNL is negative and significant during study period.

6. Net profit margin of MTNL has shown a negative growth and decreased from the base year period. Thus it is inferred that MTNL has faced stiffed competition from the private companies.
7. The capital employed in MTNL has shown a positive growth during the study period. But still MTNL is not able to generate sufficient profits shows that performance of MTNL is deteriorated after the entry of private sector companies.
8. The return on capital employed in MTNL has shown a negative trend in last 10 years. This shows that MTNL has shown a negative performance post economic reforms.
9. The return on networth of MTNL has shown a decreasing trend in last 10 years. Hence, there is negative impact of economic reforms on return on networth of MTNL.
10. The employee strength of MTNL has shown a negative trend. Hence, there is negative impact on the employee strength of MTNL.
11. Return on Asset of MTNL has shown a negative growth in last 10 years. Hence, there is negative impact on the Return on asset of MTNL.

12. The compound growth rate in asset turnover ratio of MTNL is negative. This shows that MTNL has fail to utilize the asset in last 10 years.
13. The liquidity ratio of MTNL has shown a decreasing trend in last 10 years. Hence, there is negative impact on the liquidity ratio of MTNL.
14. The employee cost as percentage of sales of MTNL has shown a significant growth in last 10 years. Hence, there is negative impact of economic reforms on the employee cost of MTNL.
15. CAGR of 11 variables is negative and CAGR of 2 variables is positive. Negative CAGR is seen in net sales (-5.64 percent), operating profit (-22.13 percent), net profit (-24.55 percent), operating profit margin (-17.86 percent), net profit margin (-21.99 percent), Return on capital employed (-20.24 percent), Return on Networth (-27.27 percent), Employment generation (-3.6 percent), Return on Assets (-26.67 percent), asset turnover ratio (-8.9 percent)and current ratio (-7.74 percent). It indicates highest and lowest negative impact of economic reforms is on the return on networth and employment generation.
16. The positive CAGR is found in capital employed (2.41 percent), and employee cost as percentage of sales (18.99 percent). Here

the positive value of CAGR signifies negative impact as growth in employee cost is not good for the organization.

17. Out of 13 variables, 12 variables shows negative impact and 1 variable shows positive impact of economic reforms on performance of MTNL. As majority variables (92.30 percent) show negative impact, this study shows economic reforms has negative impact on the performance of MTNL.
18. There is a negative impact of economic reforms on the performance of MTNL.

7.3. Conclusions based on primary data analysis:

The primary data is collected through questionnaire method. The conclusions based on primary data are as follows.

7.3.1. Use and switching pattern of MTNL services:

1. The majority (62 %) of the respondents have been using landline service followed by Mobile and broadband.
2. Only 33 percent respondents have switched from MTNL in the past and around 46 percent have intension to switch in future. Hence, there is significant negative impact of economic reforms on MTNL.
3. The majority (65 percent) respondents are not satisfied with the services provided by MTNL. Hence, there is negative impact on the satisfaction towards MTNL services.

7.3.2. Customer satisfaction on service quality of MTNL:

Following conclusions were drawn after analyzing the 8 dimensions of service quality of MTNL services:

1. Majority (83 percent) of customer's feel that the communication materials like hoardings, websites and posters of MTNL are not as per their expectation. Therefore communication materials of MTNL are failing to make an impact on the customer buying behaviour.
2. Majority (82 percent) respondents think that offices and equipment are not matching their expectations.
3. Majority (72 percent) of respondents feel that physical facilities provided by MTNL are below their expectation and the appearance. Also the behaviour of employees of MTNL is much worse than their expectation.
4. Only few (21percent) respondents think that MTNL is providing quick service but majority (78 percent) of respondents think that MTNL services are unreliable.
5. Majority (76 percent) respondents think that MTNL is worse in solving customers' complaints.
6. Majority (72 percent) of MTNL customers think that MTNL services are not performing as per their expectation at first time.

7. Majority (86 percent) of respondents think that MTNL is not maintaining records as expected by them.
8. Majority (88 percent) respondents think that MTNL is much worse in maintaining turnaround time.
9. Only few (22 percent) respondents think that MTNL is prompt in providing services and attending customer's problems.
10. Majority (74 percent) respondents agreed that MTNL employee's willingness to help in emergency situations is below their expectations.
11. Majority (50 percent) respondents think that approachability, accessibility and communication with customers of MTNL employees is worse that their expectation.
12. Majority (83 percent) respondents think that MTNL is worse in providing specific needs of the customers and not providing individual attention to their customers.
13. Majority (77 percent) respondents think that MTNL is having worse operating hours and most of the respondents think that MTNL fall short to recognise a frequent customer through loyalty program.
14. Almost 86% respondents think that MTNL is not apologising for the inconvenience caused to the customers and MTNL employees have no sincerity and patience in resolving customers' complaints.

15. Majority (74 percent) respondents think that MTNL is not able to provide variety of Value Added Services.
16. Majority (78 percent) respondents think that MTNL employees' are much worse in instilling confidence in customers and they are unable to inspire confidence and trust among customers.
17. Majority (84 percent) of respondents think that MTNL employees skill and knowledge is not adequate.
18. Majority (67 percent) respondent are not satisfied with prepaid and post-paid plans and recharge options and denominations of MTNL services whereas majority (65 percent) respondents are not satisfied with MTNL's call charges and data charges.
19. Majority (71 percent) of respondents are not satisfied with technical quality of MTNL and think that network clarity of MTNL is worse.
20. Majority (71 percent) respondents think that skill and technical knowledge of MTNL employees is not adequate.
21. Majority (74 percent) respondent think that MTNL is lack network innovativeness and unable to implement new technologies.
22. Majority (65 percent) respondents are not satisfied with the network coverage of MTNL.
23. Majority (64 percent) respondent's think that MTNL is not successful in business and achieving their mission.

24. Majority (69 percent) respondents think that MTNL has lost its reputation and their brand image is also fallen in last 10 years.
25. Majority (70 percent) respondents think that MTNL has fallen short in social responsibility.
26. Customers are not satisfied or they are dissatisfied with service quality of landline services of MTNL.

7.3.3. Assessing customer satisfaction based on Customer Satisfaction Index(CSI):

Following conclusions were drawn in respect of customer satisfaction index of MTNL services:

1. The customer satisfaction index for Landline service is 53.48 which indicate fair satisfaction for the landline service of MTNL.
2. The customer satisfaction index for Mobile service of MTNL is 44.94 which show that customers' satisfaction level is low for mobile service of MTNL.
3. The customer satisfaction index for Broadband service is 45.30 shows MTNL customers are having low satisfaction level compared to landline service but more than mobile service of MTNL.
4. The customer satisfaction index for overall service including landline, broadband and mobile service is 47.42 which show that MTNL customers are having low satisfaction level compared for overall services of MTNL.

7.4. Suggestions:

After studying and analyzing the impact of economic reforms on performance of MTNL few suggestions are given to improve service quality of MTNL through which the performance and productivity of MTNL will improve.

1. MTNL has state of the art infrastructure to improve the performance. It is suggested that it should focus on service quality so that customer satisfaction with services will increase.
2. MTNL should aggressively market its services so that customers will get awareness of these services and offers.
3. There should be improvement in the communication or advertising material so that proper communication of various plans and offers will be known to customers.
4. There should be improvement in the website of MTNL. Nowadays most of the customers are techno savvy, so to impress these customers, website must be up-to-date and creative.
5. There should be improvement in the offices and furniture to make customer comfortable while their visit to offices and also various facilities like recharging points, water, washrooms and sitting arrangements for the customers.
6. It is suggested that front desk employees in the offices should be given an attractive uniforms. Apart from that formal training should

be provided to customer service employees in respect of customer handling and solving their problems.

7. There should be clear display of names of each sections and accessibility of customers should be improved so that customer should not baffled.
8. Around 79 percent respondents think that waiting time is more in service delivery; so it is suggested that MTNL should increase the customer service employees and have sufficient staff for attending the customers.
9. It is suggested that the customer service employees in MTNL should focus on delivering reliable service to customers. The reliable service will help in adding new customers while retaining the existing customers.
10. There should be focus on solving the customer complaints. A quick response from the customer service employees will improve the satisfaction of the customers.
11. Around 86 percent respondents say that MTNL is poor in record keeping. So it is strongly suggested that MTNL should implement Customer Relationship Management (CRM) and focus on delighting the customers becoming proactive rather than reactive.CRM will also help in identifying the regular customers and rewarding them with sound loyalty schemes.

12. There should be a mechanism to monitor the time taken to resolve the customer's queries. Normally, Turnaround time (TAT) is specified in the service manuals of most of the companies. This system shall be implemented in MTNL so that service is delivered on time to customers.
13. It is suggested that MTNL should focus on providing prompt and quick service so that customer's complaint get resolved quickly. This will help in improving the satisfaction and thus loyalty of the customers.
14. It is observed that telecommunication services are become essential service for the customers. In case of customers having emergency satiation, like internet is not working, a quick response is needed from the company. Therefore, it is suggested that MTNL should train its staff to assess the need of the customers and act accordingly. This will not only increase the satisfaction but also help in increasing the reliability of services which is crucial factor in telecommunication services like broadband.
15. There should be improvement in the recharge options and validity of plans for services of MTNL. There should be schemes for attracting specific customers like students, housewives, tech savvy customers. Students should be provided with low cost plans and CUG plans whereas tech savvy customers should be given plans

fulfilling their technical requirements like gaming, chatting, downloading etc.

16. There should be improvement in operating hours of the customer service center of MTNL. The most of the working customers are visiting the customer service centers in lunch time so the timings of lunch, tea in customer service center should be adjusted accordingly.
17. It is suggested to the customer service employees in MTNL that individual attention should be given to each customer so their specific needs should be understand and fulfilled. This factor will help in attracting customers who are new to use particular service of MTNL.
18. Customers always prefer innovative products especially techno savvy customers so it is always advisable that they should take care of desire and expectation of customers.
19. Value added services are very important for retaining the customers in services especially for mobile services. Thus, MTNL should focus on providing variety of value added services Music, access to internet, SMS, MMS, astrology, ringtones, caller tunes etc.
20. It is suggested to MTNL staff that they should focus on encouraging customers to use variety of services so that revenue is increased for MTNL apart from addition of customers. Employees should change

their mindset as government servant and act as employee of the corporate.

21. MTNL should adopt a franchisee model to outsource a customer service along with sales so that service accessibility will increase and also promotion of various services of MTNL is done through these franchisees. This will also help in reducing the employee cost and increasing the profitability of company.
22. Landline service of MTNL is used by most of the respondents. Hence it is suggested that other services like mobile, broadband, IPTV, leased line should be promoted aggressively so that more customers are aware about the plans and schemes about these services.
23. Most of the respondents (84 percent) think that skill and knowledge of MTNL employees is needed improvements and thus efforts should be made by MTNL to improve the skills and knowledge of the employees of MTNL. Various training programs not only technical but also consumer behavior should be given to employees of the customers.
24. Most of the respondents think that prepaid and postpaid plans of MTNL are not attractive. Hence it is suggested that MTNL should improve the prepaid and postpaid plans and make them attractive along withcall and data charges of various services of MTNL.

25. Most of the respondents are not satisfied with network quality of MTNL. Therefore it is suggested here that MTNL should focus on their network so that call processing and other network related problems should be minimized and quality service is delivered to the customers.
26. Broadband services are seen as the next generation telecommunication service. It has tremendous scope for growth especially in metro cities like Mumbai and Delhi. Hence it is suggested that MTNL should tap this market by providing variety of broadband services.
27. From the service quality dimension, it is suggested that MTNL should focus on responsiveness, reliability, assurance and empathy dimensions to improve the customer satisfaction of customers.
28. The American satisfaction index is a market oriented performance measure used by many corporations to measure the satisfaction of their own customers. Such mechanism is missing in Indian economy which gives referential data for customer satisfaction for various products and services. Hence it is strongly suggested here to implement market oriented performance measure such as ACSI which will give information about customer satisfaction with various products and services. It is helpful for individual customers

while purchasing and also helpful for corporate to assess the service quality of their product and services.

7.5.Scope for future research:

This study is performed with some limitations and assumptions that can be used as opportunity to future researchers for their study. Therefore some scope for future research topic related to current study is as under.

1. The scope of the future research should be on assessing the impact of economic reforms on public sector enterprises having manufacturing facility or services organization.
2. The future scope of the study should be on Understanding the failure of public sector enterprises and suggesting remedy to improve the performance of public sector enterprises.
3. The future scope of the study should be on comparative performance assessment of public and private sector enterprise in telecommunication industry.
4. The future scope of the study should be also on the assessment of customer satisfaction with services of public sector enterprises or comparative assessment of service quality of public and private sector enterprises.

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Annexure:
Questionnaire

A study on the impact of economic reforms on the performance of MTNL

Questionnaire for customers of MTNL

Dear MTNL subscriber, this questionnaire is designed to collect information about how you feel about the service quality of MTNL in Mumbai. Your responses will be treated confidential and used only for academic purpose. Please tick [√] the appropriate box for your answers.

Respondent's Profile

1. What is your gender? [ ] male [ ] female

2. Select your age group.

[ ] below 20 years [ ] 20-29 [ ] 30-39 [ ] 40-49 [ ] 50 and above

3. What is your occupation?

[ ] Service [ ] student [ ] Self Employed [ ] Professional [ ] other

4. What is your monthly income?

[ ] Below Rs.10000 [ ] Rs.10001 to 30000

[ ] Rs.30001 to 50000 [ ] above Rs.50000

5. Select your highest academic or professional qualification? Select only one

[ ] SSC [ ] Graduate [ ] Post- graduate /Masters

[ ] Diploma/HSC [ ] Professional [ ] PhD

Customer Satisfaction with Service Quality

6. Which Service(s) of MTNL do you use? Tick all the services you used.

[ ] Landline [ ] Mobile [ ] Broadband [ ] others

7. How well did the services you received from MTNL compare with the ideal/desired set of services?

Much worse than desired	worse than desired	Not equal to desire	Better than desired	Much better than desired
1	2	3	4	5

8. To what extent have MTNL services met your expectations?

Much worse than expected	worse than expected	Not equal to expectation	Better than expected	Much better than expected
1	2	3	4	5

9. Do you switched to other service operator for better Service?

[ ] Yes [ ] No

10. Do you have intention to switching to other service operator for better Service?

[ ] Definitely yes [ ] a bit Yes [ ] Neutral [ ] a bit No [ ] Definitely No

11. Overall, what is satisfaction level with the service quality of MTNL?

Much worse than expected	worse than expected	Not equal to expectation	Better than expected	Much better than expected
1	2	3	4	5

Customer Satisfaction with Service Quality Dimensions

In your opinion, how does the service quality of MTNL meet your expectations in terms of following dimensions? Use these responses from 1- 5 to answer, where:

1-Much worse than expected
2 -worse than expected
3 -Not equal to expectation
4 -Better than expected
5-Much better than expected

	Dimensions	*circle only one option in 1 -5*				
	Tangibles dimension					
TA1	MTNL's ability to give you access to information, about new plans and services(Website, hoardings)	1	2	3	4	5
TA2	Provision of visually attractive offices, equipment and materials like pamphlet, posters etc	1	2	3	4	5
TA3	MTNL's ability to providing variety of facilities etc.	1	2	3	4	5
TA4	How appealing are the appearance and behavior of employees of MTNL.	1	2	3	4	5

	Reliability dimension					
RL1	How timely is the delivery of services of MTNL?	1	2	3	4	5
RL2	How truthful (keeping to promises) is MTNL to you?	1	2	3	4	5
RL3	How dependable and consistent is MTNL in solving customers' complaints?	1	2	3	4	5
RL4	How able is MTNL to perform services right the first time?	1	2	3	4	5
RL5	How able is MTNL to insist on error-free records.	1	2	3	4	5
	Responsiveness dimension					
RS1	MTNL's ability to tell customers exactly when services will be performed?	1	2	3	4	5
RS2	How able is MTNL to give prompt customer services and attend to customers' needs/problems?	1	2	3	4	5
RS3	How are employees' willing to help customers in emergency situations?	1	2	3	4	5
RS4	How are the employees approachable and easy to contact?	1	2	3	4	5
RS5	Employees' ability to communicate clearly with you.	1	2	3	4	5
	Empathy dimension					
EM1	Having convenient periods & terms for activation, recharge, and accounts suspension, free call times	1	2	3	4	5
EM2	Having operating hours convenient to all customers	1	2	3	4	5
EM3	Having sound loyalty program to recognize you as a frequent customer	1	2	3	4	5
EM4	Having the customer's best interest at heart	1	2	3	4	5
EM5	Giving individual customer attention by employees	1	2	3	4	5
EM6	Efforts to understand specific customer needs.	1	2	3	4	5
EM7	Apologizing for inconvenience caused to customers	1	2	3	4	5
	Assurance dimension					
AS1	Ability to provide variety of value added services- Music, access to internet, SMS, MMS, etc.	1	2	3	4	5

AS2	Sincerity and patience in resolving customers' complaints/problems	1	2	3	4	5
AS3	The behavior of employees in instilling confidence in customers.	1	2	3	4	5
AS4	Employees' use of required skills and knowledge to answer customers' questions.	1	2	3	4	5
	Economy dimension					
EC1	Prepaid and postpaid plans, recharge cards and their denominations?	1	2	3	4	5
EC2	The call charge per minute/second?	1	2	3	4	5
	Technical Quality dimension					
TQ1	Successful in completion of calls, SMS, MMS, line activation, downloads, etc	1	2	3	4	5
TQ2	Employees have technical knowledge and skills in solving customer problems	1	2	3	4	5
TQ3	Network clarity and speed for call and other services	1	2	3	4	5
TQ4	Network innovativeness ability to use current technology to improve services	1	2	3	4	5
TQ5	Providing adequate network coverage	1	2	3	4	5
	IMAGE dimension					
IM1	How successful is MTNL?	1	2	3	4	5
IM2	What is the reputation of MTNL?	1	2	3	4	5
IM3	What is the brand image of MTNL?	1	2	3	4	5
IM4	How socially responsible is MTNL?	1	2	3	4	5

Thank you for taking time to complete this questionnaire!