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Evaluation of Subscriber Base and Service Efficiency in Indian Telecom Industry- A Comparative Study of Select Telecom Enterprises

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Abstract:

The study evaluates the subscriber base and service efficiency of three prominent telecom companies in India: Bharti Airtel, Vodafone Idea, and BSNL. With the telecom industry being a critical driver of digital transformation, understanding the dynamics of market share and performance is essential. This comparative analysis focuses on the market share trends, subscriber base fluctuations, and overall market performance of the selected companies over a specified period. The study also examines the service efficiency of each company, considering factors such as network coverage, customer satisfaction, and service reliability. By providing insights into the strengths and weaknesses of each company, the research aims to contribute to strategic planning and decision-making in the highly competitive telecom sector.

Key words: Call Drop, TRAI, Shareholding, Subscriber

1. Introduction

India, the second-largest telecommunications market globally, had a tele-density of 85.23% as of December 2023. The total number of telephone subscribers was 1,190.33 million by the end of the year. The wireless subscriber base stood at 1,158.49 million, with Reliance Jio leading at 459.81 million, followed by Bharti Airtel at 257.37 million, Vodafone Idea at 127.28 million, and BSNL at 21.28 million.

According to IBEF Report on Indian Telecom Industry Statistics, 2023, Broadband subscriptions in India surged from 149.75 million in FY16 to 904.54 million by FY23 (April-December). Wired broadband subscriptions were 38.35 million, while wireless broadband subscriptions reached 866.19 million during the same period. By December 2023, the top broadband providers included Reliance Jio Infocom Ltd with 470.19 million subscriptions, Bharti Airtel with 264.76 million, Vodafone Idea with 127.29 million, and BSNL with 25.12 million.

In the first half of 2023 (April-September), India's total internet subscribers numbered 918.19 million, comprising 37.11 million wired and 881.08 million wireless subscribers. The Indian Telecom Market is one of the largest industries in the country, boasting over 1.25 billion subscribers to date. Telecom companies in India operate across three primary market segments: Wireless, Data Services, and Wireline Services. Among these, the Wireless segment is the most dominant compared to the other two. The telecom industry has shown substantial progress, with a compound annual growth rate (CAGR) of 19.7 percent from 2012-13 to 2022-23.

The growth of the industry has been bolstered by the stringent regulatory measures enforced by the Telecom Regulatory Authority of India (TRAI) and a supportive policy framework from the Government of India. The increasing presence of international companies in the mobile market has further accelerated the growth of the sector, with many telecom enterprises now eyeing the Indian market for sustainability.

Government policies, such as allowing up to 100 percent Foreign Direct Investment (FDI) in the telecom sector, have greatly benefited the industry. Among the three segments—wireline, wireless, and data services—the demand for data services has surged significantly. Data services have become the most profitable products for many telecom enterprises. The rapid increase in internet users across India has also driven up data traffic, prompting companies to enhance their network infrastructure to provide higher quality services, thereby expanding their market coverage and share.

Key factors underscoring the importance of the Indian Telecom Market include the growing number of internet subscriptions. According to a 2019 report by the India Brand Equity Foundation (IBEF), the number of internet subscribers in India reached 560 million. The affordability of data products and services has made telecom services accessible to a broad spectrum of the population.

2. Review of Literature

An evaluation of studies on performance of Telecom enterprises is evaluated and key observations are presented here.

Anathi and Sriram (2012) analyzed the financial performance of six telecom companies using the Taxonomy approach, ranking Bharti Airtel highest overall, with BSNL leading in liquidity ratios. Venkatram R and Zhu (2012) conducted a comparative study of Indian and Chinese telecom companies, applying Porter's five forces model to assess competitive factors in rural and urban markets.

Kiran Kumar A and Uma H (2013) examined consumer perceptions of telecom services, identifying brand consciousness, rational buying, and reference group influence as key factors in consumer preferences through factor analysis. Sardana M (2013) explored the competitive landscape in the Indian telecom sector, particularly the disruption caused by Reliance Jio's entry and its impact on the market. Saxena V et al. (2013) evaluated the performance of Indian telecom companies using benchmarking, tele-density, and efficiency analyses, highlighting the need for improved efficiency and the role of regulatory bodies.

Dhingra V and Gakhar K (2014) discussed the need for continuous development practices in public sector telecom companies, emphasizing employee training and systematic development programs. Yadav (2014) highlighted customer service and satisfaction as critical areas for BSNL in the competitive telecom landscape, advocating for quality service delivery to enhance performance.

Baruah and Rashmi R (2015) conducted an empirical study on public and private telecom companies in Assam, revealing BSNL's dominance but stressing the need for uninterrupted services. Khan and Safiudding (2016) analyzed the liquidity and profitability of select Indian telecom companies, finding higher returns on assets for Reliance Communications and better return on equity for Vodafone.

Masson et al. (2016) assessed the performance of Indian telecom service providers using Data Envelopment Analysis, finding that companies with higher service delivery effectiveness and operational efficiency achieved better profitability. Gaste M and Hundekar V (2017) compared the financial performance of Bharti Airtel, BSNL, and Vodafone, concluding that Bharti Airtel had better returns on capital employed over the 2013-16 period.

Pravin Kumar et al. (2017) evaluated the operational performance of mobile service providers using a Fuzzy Elimination approach, with Airtel and Vodafone emerging as top performers. Megha G and Hundekar V (2017) analyzed the financial performance of BSNL, Vodafone, and Bharti Airtel, focusing on profit after tax and return on capital employed. Shukla S and Roopa T.N. (2017) examined the financial performance of five Indian telecom companies, emphasizing liquidity, solvency, and profitability, and noting that financial health is crucial for company strength.

Yadagir M and Rajraram B (2018) studied BSNL's operational performance over ten years, observing a decline in revenue, EBITDA, and profit after tax. Mishra et al. (2018) analyzed the operational efficiency and customer satisfaction of major Indian telecom companies, with Bharti Airtel and Vodafone ranked highest in profitability. Rani P (2018) compared the financial performance of telecom companies, finding Bharti Airtel had the most subscribers, with BSNL showing better annual growth rates. Gaonkar D et al. (2018) evaluated customer satisfaction using SERVQUAL, identifying areas for improvement in service quality among mobile operators.

Bhavik and Japee (2021) analyzed the financial performance of Airtel and Vodafone Idea from 2015-20, concluding that Airtel outperformed Vodafone in profitability, liquidity, and solvency. Meena et al. (2022) compared the telecom industries in the U.S., China, and Canada, revealing significant growth in active users and a high number of studies on telecom performance in the U.S. Karthikeyan K (2023) assessed the performance of Reliance Jio, Bharti Airtel, and Vodafone Idea, highlighting Reliance Jio's lower debt-to-equity ratio and the impact of regulatory constraints and competition on sector performance.

3. Objectives

The following are the key objectives of the study.

1. To examine the market share dynamics of Bharti Airtel, Vodafone Idea, and BSNL, identifying patterns, growth trajectories, and factors influencing changes in market share over a specified period.
2. To assess the fluctuations in the subscriber base of the three selected telecom companies, exploring the factors contributing to subscriber growth or decline and their impact on overall market performance.
3. To present a comparative analysis of the market performance of Bharti Airtel, Vodafone Idea, and BSNL, focusing on financial metrics, operational efficiency, and competitive positioning within the Indian telecom industry.
4. To evaluate the service efficiency of each company by analysing network coverage, customer satisfaction levels, and service reliability, identifying areas of strength and opportunities for improvement.

4. Methodology

The study employs an exploratory research design to analyze and compare the market share, subscriber base, market performance, and service efficiency of three select telecom companies in India: Bharti Airtel, Vodafone Idea, and BSNL. The research is predominantly based on secondary data, collected from reliable and authoritative sources such as TRAI reports, Annual reports of three select telecom enterprises, market reports from IBEF and Nielsen survey.

5. Results and Discussion

The results obtained from the study on secondary sources of data are compiled and presented in the following headings.

5.1 Analysis of Market Share of Telecom Enterprises in India

With an objective to analyse the market share occupied by telecom enterprises under wireline subscriber segment, TRAI reports are extracted to examine the service provider wise, i.e., telecom enterprise wise wireline subscribers. Results are shown in the following table and graph.

Table-1: Market Share of Telecom Enterprises (Wireline Subscribers)

Sl.No.	Service Provider	Wireline subscribers
1.	Bharti Airtel	25.16%
2.	Vodafone Idea	2.48%
3.	BSNL	25.01%
4.	Reliance Jio	32.09%
5.	Quadrant	1.19%
6.	Reliance Communications	0.51%
7.	MTNL	8.14%
8.	Tata Tele	5.42%
	Total	100.00%

Source: TRAI Reports, 2022-23

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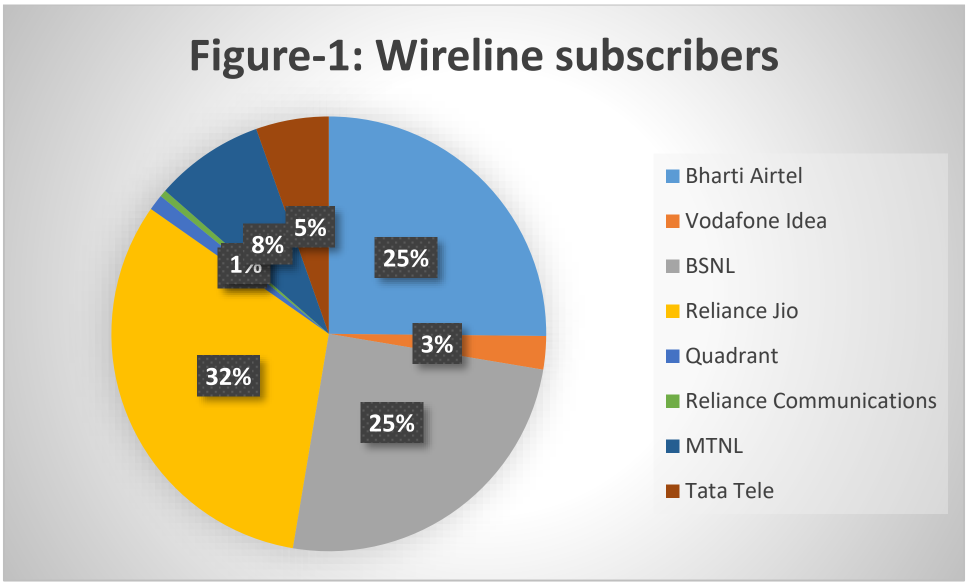

The results presented in Table-1 illustrate the market share distribution of telecom enterprises in both wireline and wireless subscriptions. Based on the 2022-23 financial year annual reports, the market share for each telecom enterprise has been calculated as a percentage. Among the three companies selected for this study—Bharti Airtel, Vodafone Idea, and BSNL—the market shares were 25.16%, 2.48%, and 25.01%, respectively. The industry leader was Reliance Jio, with a 32.09% market share, followed by Bharti Airtel at 25.16% and BSNL at 25.01%. Reliance Communications held the smallest market share at 0.51%, with Quadrant slightly ahead at 1.19%. When comparing public and private sector enterprises, the market share for wireline subscribers was 33.15% for public sector enterprises and 66.85% for private sector enterprises.

5.2 Analysis of Market share of Telecom Enterprises in India (Wireless Subscribers)

The comparison of results on wireless subscribers show that, the win relines subscribers industry is led by Reliance Jio with 37.61% market share followed by Bharti Airtel with 32.42%, Vodafone idea with 20.70%, BSNL with 9.06% market share. The proportion of MTNL and Reliance communications share is very minimal in the wireless subscriber's market. The comparison of public sector and private sector share in wireless subscribers show that, the market was predominantly dominated by private sector. \The Private sector companies occupy 90.73% market share and public sector companies occupy 9.27% market share.

Table-2shows the figures of market share obtained by the telecom enterprises as on 31st March, 2023. The share of market occupied by the service provider under Wireless segment is presented here.

Table-2: Market Share of Telecom Enterprises in India (Wireless Subscribers)

Sl.No.	Service Provider	Wireless subscribers
1.	Bharti Airtel	32.42%
2.	Vodafone Idea	20.70%
3.	BSNL	9.06%
4.	Reliance Jio	37.61%
5.	Quadrant	--
6.	Reliance Communications	0.00002%
7.	MTNL	0.21%
8.	Tata Tele	--

Source: TRAI Reports, 2022-23

With reference to Vodafone Idea, the company owns 8,55,000 lines capable of equipped switching and 7,03,179 working connections. Among the 4 companies, BSNL have highest number of lines capable of switching. The company owns 1,68,71,879 lines capable of equipped switching and 71,05,823 working connections.

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5.3 Proportion of Ownership and Services of select Telecom Enterprises

To assess the ownership status and the types of services offered by the telecom enterprises included in this study, an analysis was conducted on the service categories and ownership percentages of each entity. The results are detailed in Table-3.

According to Table-3, Bharti Airtel offers 2G, 4G, and 5G services. The ownership of Bharti Airtel is distributed among Bharti Airtel itself, Telenor, and Google, with Bharti Airtel holding the largest share at 66.57%. Telenor owns 32.15%, and Google holds a 1.28% stake. Vodafone Idea provides 2G, 3G, and 4G services. The ownership structure of Vodafone Idea is as follows: the Government of India holds a 32.09% stake, Vodafone Idea has 31.27%, Idea Cellular owns 17.49%, Private Equity accounts for 15.97%, and American Tower Corporation has a 3.18% share. BSNL, which currently offers 2G, 3G, and 4G services, plans to introduce 5G services after April 2024. BSNL is fully owned by the Government of India.

Table-3: Type of Services and Percent of Ownership of select Telecom Enterprises

Sl.No.	Operator	Type of Services	Ownership	Percent of ownership
1.	Airtel India	2G, 4G, 5G	Bharti Airtel	66.57%
			Telenor	32.15%
			Google	1.28%
2.	Vodafone Idea	2G,3G,4G	Government of India	32.09%
			Vodafone Idea	31.27%
			Idea Cellular	17.49%
			Private Equity	15.97%
			American Tower Corporation	3.18%
3.	BSNL	2G,3G,4G	Government of India	100%

Source: TRAI reports, 2022-23

5.4 Analysis on Shareholding of select Telecom Enterprises

Company wise shareholding pattern of the select Telecom Enterprises is shown in table-4. The shareholding of Bharti Airtel shows that, majority of the share is owned by its Promoter and Promoter group.

Table-4: Shareholding of select Telecom Enterprises

Sl.No.	Name of the Company	Shareholding Details	Percentage
1.	Bharti Airtel	Promoter and Promoter Group	67.14
		Mutual Funds and UTI	6.61
		Financial Institutions, Banks and Foreign Institutions	18.53
		Insurance Companies	5.69
		Others	2.03%
		Total	**100%**
2.	Vodafone Idea	Promoter & Promoter Group	42.56
		Public	57.44
		Non-Promoter-Non public	0.00
		Shares Underlying DRs	000
		Shares held by Employee Trust	0.00
		Total	**100%**
4.	BSNL	**Total 100% Shareholding lies with Government of India**	**100.00**

Source: Annual Reports of select Telecom Enterprises

The ownership distribution of the selected telecom enterprises reveals varied structures across different companies: For Bharti Airtel, the largest shareholder is the Group itself, holding a substantial 67.14% of the total shares. Other significant shareholders include Mutual Funds and Unit Trust of India (UTI), which collectively own 6.61%. Financial institutions, banks, and foreign entities collectively hold 18.53% of the shares. Insurance companies own 5.69%, while other shareholders account for 2.03% of the total shares. In the case of Vodafone Idea, public shareholding constitutes the majority, with 57.44% of the shares held by the public. Promoters and promoter groups own 42.56% of the shares. There are no shares held by non-promoter, non-public entities or employee trusts, and there are no shares underlying depository receipts.

Reliance Communications exhibits a different ownership structure, where the promoter and promoter group collectively own 58.85% of the shares. Public shareholding stands at 39.91%. A small portion, 0.39%, is held by custodians and in the form of depository receipts.

BSNL, on the other hand, is entirely owned by the Government of India, with 100% of its shares held by the state.

5.5 Analysis on Subscriber Base of Wireless Services

The analysis of the subscriber base for wireless services among the selected telecom companies reveals notable trends:

Table-5: Performance on Subscriber Base of Wireless Services

Name of the Telecom Enterprise	Wireless Subscribers		
	Bharti Airtel	Vodafone Idea	BSNL
2012-13	188.2	121.61	101.21
2013-14	205.39	135.79	94.65
2014-15	226.02	157.81	77.22
2015-16	251.24	175.07	86.35
2016-17	273.65	195.37	100.99
2017-18	304.19	211.21	111.68
2018-19	325.18	394.84	115.74
2019-20	327.81	319.17	119.87
2020-21	352.39	283.71	118.63
2021-22	360.33	260.77	113.74
2022-23	370.91	236.75	103.68
Mean	289.57	226.55	103.98
SD	64.53	83.23	13.75
CV	22.28	36.74	13.22
CAGR	7.02	6.89	0.24

Source: TRAI Reports, 2022-23

Bharti Airtel has demonstrated significant growth in its wireless subscriber base, expanding from 188.20 million to 370.91 million over the study period. This consistent upward trend in subscriber numbers reflects the increasing demand for wireless services driven by population growth and rising customer needs. The average number of wireless subscribers for Bharti Airtel during this period was 289.57 million, with a standard deviation of 64.53 million.

Vodafone Idea also experienced growth in its wireless subscriber base, which rose from 121.61 million to 236.75 million. However, this growth was marked by inconsistency. The average number of wireless subscribers for Vodafone Idea was 226.55 million, with a standard deviation of 83.23 million.

BSNL showed a more uneven performance in its wireless subscriber base. From 2012-13 to 2022-23, BSNL’s subscribers increased from 77.22 million to 103.68 million. The average number of wireless subscribers for BSNL was 103.98 million, with a standard deviation of 13.75 million.

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To assess the consistency of performance, the Coefficient of Variation (CV) was calculated. Bharti Airtel had a CV of 22.28%, indicating moderate variability. Vodafone Idea exhibited a higher CV of 36.74%, suggesting greater variability in subscriber numbers. BSNL demonstrated the highest consistency with a CV of 13.22%. The Compound Annual Growth Rate (CAGR) also highlights the growth trajectories of the companies. Bharti Airtel achieved a notable CAGR of 7.02%, while Vodafone Idea recorded a CAGR of 6.89%. BSNL's CAGR was significantly lower at 0.24%, reflecting its slower growth in subscriber numbers.

5.6 Service Evaluation of Select Telecom Enterprises

The analysis of service quality for the selected telecom enterprises, based on data from TRAI, is categorized into five key indicators. These indicators include:

a. Total accumulated downtime of calls per day in a month (percentage)
b. Successful call accessibility per day in a month (percentage)
c. Call drop rate per month (percentage)
d. Sound clarity percentage in calls per month (percentage)

The comparative results, detailed in Table-6, indicate the following:

i. Bharti Airtel: This company has an exceptionally low accumulated downtime of 0.01% per month, reflecting excellent service reliability. The call accessibility rate is 99.80%, and the call drop rate is minimal at 0.51%. Additionally, 99.84% of calls exhibit good sound quality. Bharti Airtel also achieves a 100% resolution rate for customer complaints, demonstrating a strong commitment to service quality.
ii. Vodafone Idea: Vodafone Idea reports a downtime of 0.10% per month, indicating occasional service disruptions. The call accessibility rate is 99.41%, with a call drop rate of 0.58%. The percentage of calls with good sound quality is 98.80%. The company also has a 100% success rate in addressing customer complaints.
iii. BSNL: BSNL shows a higher downtime of 2.20% per month compared to the other companies, leading to a lower accessibility rate of 98%. The call drop rate is 1.03%, and only 68% of calls have good sound quality. Despite these challenges, BSNL also maintains a 100% success rate in complaint resolution.

Table-6: Service Evaluation of select Telecom Enterprises

Name of the Service Provider	Accumulated Down time per month (%)	Accessibility of Calls	nnection Maintenance (Retain ability)		Resolve of Complaints (%)
			Call Drop Rate %	Calls with Good Voice quality (%)	
Bharti Airtel	0.01	99.80	0.51	99.84	100.00
BSNL	2.20	98.00	1.03	68.33	100.00
Vodafone Idea	0.10	99.41	0.58	98.80	100.00

Source: TRAI performance Report 2022-23

Overall, Bharti Airtel stands out for its superior service quality, with the highest rates of call accessibility and sound clarity, and the lowest call drop and downtime rates among the three companies. Conversely, BSNL lags in call drop rates, service downtime, and sound clarity.

6. Conclusions

The analysis of market share and performance among telecom enterprises in India reveals distinct patterns. In the wireline segment, Reliance Jio leads with 32.09% market share, followed by Bharti Airtel at 25.16% and BSNL at 25.01%. The private sector dominates with a 66.85% market share compared to 33.15% for the public sector. In wireless services, Reliance Jio is the leader with 37.61%, followed by Bharti Airtel at 32.42%

and Vodafone Idea at 20.70%. The private sector holds a substantial 90.73% of the market, highlighting its dominance. Bharti Airtel is primarily owned by itself, Telenor, and Google; Vodafone Idea has a mix of public and private ownership; and BSNL is fully government-owned. Bharti Airtel shows significant and steady growth in its subscriber base with a 7.02% CAGR, while Vodafone Idea's growth is less consistent, and BSNL's growth is slower. Service evaluation results indicate Bharti Airtel excels with minimal downtime, high call accessibility, and excellent sound clarity. Vodafone Idea performs well but with slightly higher downtime and call drop rates. BSNL, despite full complaint resolution success, lags in downtime, call drop rates, and sound clarity. Overall, Bharti Airtel leads in service quality and subscriber growth, while BSNL shows lower performance levels.

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