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RESEARCH ARTICLE – 6

ECONOMIC EFFECT OF OLIGOPOLISATION AND CONCENTRATION IN THE TELECOM SECTOR IN INDIA

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ABSTRACT

India's telecom sector underwent a paradigm shift after the reforms in 1991. The sector very much represents what the reform was all about, with the private sector coming into play a big role and the public sector shrinking away and recently, there has been a tendency for concentration with the exit of some firms from the market and with the mergers or acquisition. An oligopolistic market structure has come to prevail in the sector. The study analyses the level of concentration in the telecom sector and the extent to which the sector is oligopolised and its impact on the revenue realization.We calculated the Herfindahl-Hirschman Index of market shares and found that there is a significant concentration in the telecom sector. Further, regressed the Average Revenue per User on the HHI by keeping the total number of subscribers as a controlling variable and found that there is a statistically significant positive relationship between the two. It is concluded that the increased concentration has resulted in monopoly pricing tendencies and increased revenue realization. The major policy implication is that the Competition Commissioner of India and Telecom Regulatory Authority of India has to act in tandem to prevent further monopolization of the sector.

Keywords: *Economic Effects; Oligopolisation; Concentration; Telecom Sector; India*

INTRODUCTION

Telecommunications play a crucial role in a country's social and economic development. The digital revolution has enabled the sector to influence every aspect of human individual and social life. The productivity gain in economies happened through the telecommunications revolution has well been matched by the social development leaps through the application of ICT in critical areas like health and education (Telecom Regulatory Authority of India, 2025). Access to internet and data is fundamental for a society to ensure good governance and for the deepening of democracy, as it empowers citizens to demand transparency and hold institutions accountable (Shikha, 2025). India's

telecom sector underwent a paradigm shift after the reforms in 1991. The sector very much represents what the reform was all about, with the private sector coming into play a big role and the public sector shrinking away (Karunakaran, N, 2025). India witnessed 2G, 3G, 4G and 5G revolutions and managed to cope up with the global level advancements with active participation from the private sector (Navaneeth, 2023). The competition helped the sector to achieve efficiency to some extent and state of the art technology is being installed for improving the quality of service (Sridhar, 2012).

When examining the market structure over time, a marked shift from government monopoly to competition among private players in the beginning is very visible. But, recently there has been a tendency for concentration with the exit of some firms from the market and with the mergers or acquisition (Nafees, 2024). An oligopolistic market structure has come to prevail in the telecom sector of India, making the social and economic implications of such a transition more visible and analyzable. As economic theories have it to say, an oligopoly market is highly competitive and represents competition among a few, promoting economic efficiency. At the same time there is scope for mutually binding agreements between the firms for realizing monopoly profits, to the utter neglect of objectives like consumer welfare and social wellbeing (Symeonidis, 2018). It is an imperative in Indian context to analyse the level of concentration in the telecom sector and theextent to which the sector is oligopolised and its impact on the revenue realization.

REVIEW OF LITERATURE

There are many studies which found increased competition in the telecom sector of India in 2000s. Singh (2023) examined the various initiatives taken by the government intensified the competition among the various telecom players. There were many positive effectives associated with the increased competition. Mangla and Singh (2021) mentioned that the most significant development has been the progressive reduction in tariffs which has been facilitated by competition through multi operator environment. Nickell (1996) argues that apart from lowering prices, increased efficiency, greater innovation, and better-quality services were also realized through the increased competition.Meena and Geng (2022)emphasized that intensification of competition has led the companies to adopt new initiatives to attract customers. Mitra and Shankar (2008) concluded that telecommunication has entered a new age of development with advanced technology and increased competition with established players. Borah (2014) analyzes the major process of transformation in telecom sector through policy reforms and regulation which has led to severe competition in the industry. Deregulation, declining tariff, openingup of the sector to foreign investment, changing customer demands and technological development has led to increased competition among the telecom service providers.Many of the recent studies surveyed by the authors indicate the prevalent tendency for ologopolisation and circumvention of competition through tacit agreements and predatory pricing strategies (Mishra & Rao, 2015; Tang, Chen, & Li, 2020). Roller and Waverman (2001) pointed out that the policy-driven liberalization spearheaded by policy instruments of tariff has

enhanced competition, while expanding network and services. Policy regime and spectrum harmonization that has spurred competition and efficiency and policy tool of net neutrality would be central in establishing a competitive in the sector.

Statement of the Problem

There is a positive relationship between increased concentration and monopoly power in any market. Indian telecom sector has witnessed significant concentration and oligopolisation. It is very critical to analyse whether the increased concentration results in increased revenue realization through an increase in Average Revenue per User (ARPU). If such a positive relationship exists between the index of concentration and ARPU, then the same could be treated as evidence for approximating monopoly pricing by the remaining forms. The present study is an attempt to examine whether the concentration of market shares affects revenue realization. The study has policy implications as the agencies like Telecom Regulatory Authority of India (TRAI) and Competition Commission of India (CCI) can act to regulate the excessive concentration and tacit price agreements.

Objectives

- To examine the trends in the level of competition in telecom industry in India, and
- To examine the relationship competition and Average Revenue per User

Hypothesis

The increased concentration provides added monopoly power to the remaining firms and the prices go above the perfectly competitive market price, resulting in higher average revenue per user. Thus, we hypothesise that the increased concentration has a positive effect on the average revenue per user.

MATERIALS AND METHODS

This is an analytical research using secondary data collected from the annual reports of TRAI from 2010 to 2024.TRAI Yearly Performance Indicator was also referred. To analyse the market concentration and competition, time series data on the market share of various service providers, for the period from 2010 to 2024was taken from the TRAI Annual Reports. Mathematical tools like Herfindhal-Hirschman Index (HHI) were applied to find out the market concentration and competition. The relation between ARPU and HHI values is estimated by regressing ARPU on HHI by using ordinary least square method. Total number of subscribers was included as a control variable in the regression as ARPU is affected by the number of subscribers. For the regression modelling, we used only the wireless service-related data as the share of wired service in total access services is insignificant in terms of number of subscribers. Also, recently, TRAI does not provide separate data of ARPU for wired services due to its insignificant share in total access services. The statistical tools like ratios, annual average growth rate, overall growth rate, compound annual growth rate, line diagrams, pie diagrams, charts etc. are used.

RESULTS, ANALYSIS AND DISCUSSION

Growth of Subscribers in Indian Telecom Sector

The period after 2010 succeeded a period of rapid expansion of telecom sectorin 2000s and the period still maintained a relatively lower but reasonable annual average growth rate up to 2014-15 and the growth rate was low for the period thereafter. The slowing down was obviously due to the nearing of market saturation (table 1).

Table 1: Growth of Subscribers in Indian Telecom Sector

Year	Subscribers (in millions)	Growth
2010-11	846.32	36.22%
2011-12	951.34	12.41%
2012-13	898.02	-5.60%
2013-14	933	3.90%
2014-15	996.49	6.80%
Average Annual Growth Rate (AGGR)= 10.75%		
2015-16	1058.86	6.26%
2016-17	1194.58	12.82%
2017-18	1206.22	0.97%
2018-19	1183.51	-1.88%
2019-20	1177.97	-0.47%
Average Annual Growth Rate (AGGR)=3.54%		
2020-21	1201.2	1.97%
2021-22	1166.93	-0.03%
2022-23	1172.34	0.005%
2023-24	1199.28	0.02%
Average Annual Growth Rate (AGGR)=0.49%		

Source: TRAI Annual Reports, https://www.trai.gov.in/about-us/annual-reports

Distribution of Market Share for Telecom Services

A comparison of the market shares in two selected years 2013 and 2024 is presented. Table 2 shows the market shares in 2013 and Table 3 shows the market shares in 2024. The data for 2013 show a highly diversified telecom sector in terms of market shares (figure 1). There were 13 service providers with market shares ranging from 21.35% to 0.18%.

Table 2: Market share for Telecom services in 2013

Sl. No.	Operator's Name	Market Share, 2013 (in %)
1	Bharthi Airtel	21.35
2	Vodafone India	17.2
3	Idea Cellular	13.49
4	Reliance Communication	13.71
5	BSNL India	11.62
6	Tata Docomo	7.85
7	Aircel	7.14
8	Sistema	1.66
9	Videocon	0.26
10	MTNL India	0.60
11	Loop Mobile	0.35
12	Unitech	4.65
13	HFCL	0.18

Source: TRAI Annual Report 2013

From Table 3, it is clear that the years between 2013 and 2024 witnessed significant concentration in the telecom sector with a substantial increase in the market shares of a few service providers, mergers and acquisitions and fielding out of many other service providers. The number of service providers decreased to 9 and the major service providers now are Reliance Jio, Bharthi Airtel and Vodafone-Idea (figure 2). They together accounted for almost 92% of the market share. The analysis shows that there is significant oligopolisation in the telecom sector of India.

Table 3: Market share of Telecom Services in 2024

Sl. No.	Service provider	Market share, 2024(in %)
1	Reliance Jio	40.19
2	Bharti Airtel	32.92
3	Vodafone Idea	18.41
5	BSNL	7.91
6	MTNL	0.34
7	Tata Tele	0.19
8	Quadrant	0.03

9	Reliance Com	0.01

Source: TRAI Annual Report 2024

Figure 1: Market Share of Telecom Service Providers in 2013

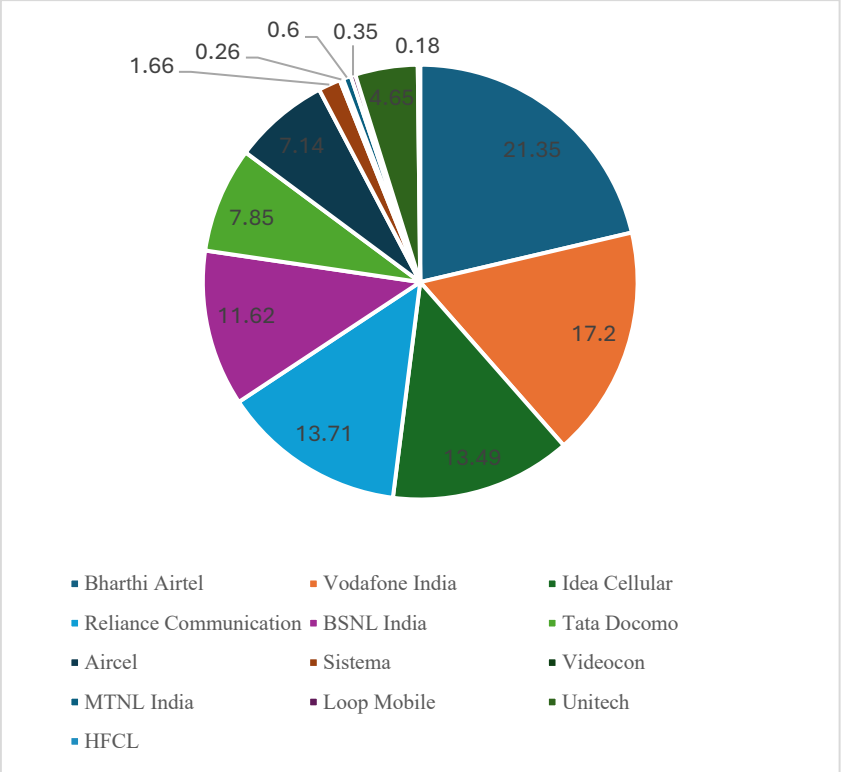
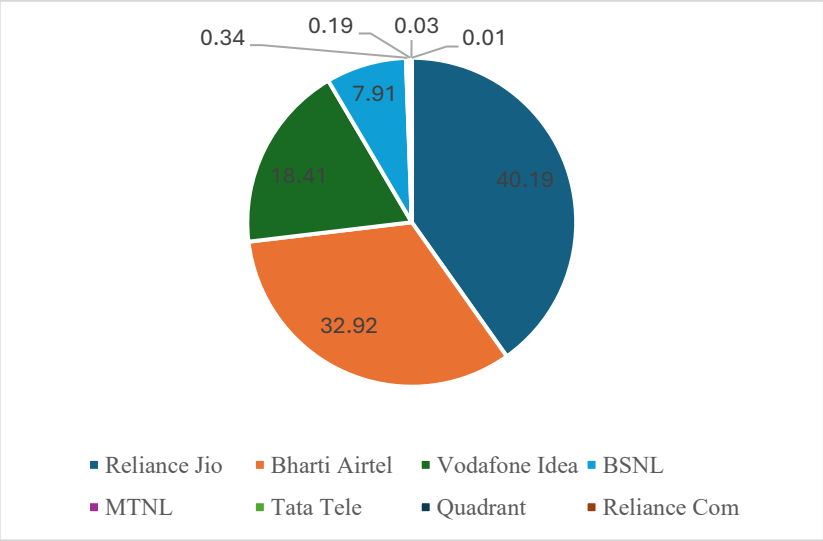


Figure 2: Market share of Telecom Service Providers in 2024



Measuring the Extent of Concentration Using HHI

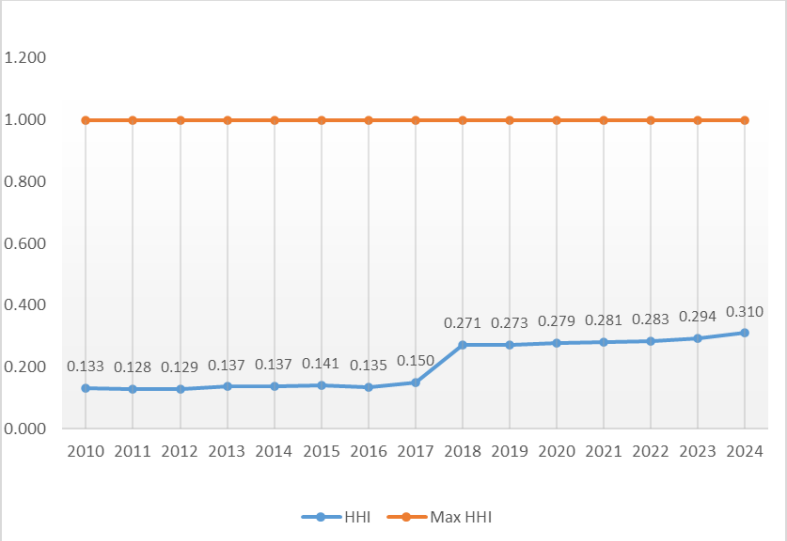
TheHerfindahl-Hirschman Index is applied to analyse the extent of concentration in Indian telecom sector during the period from 2010 to 2024 (table 4). The market share data collected from each year's TRAI annual report were used to calculate the index value. Figure 3 shows that the HHI increased secularly throughout the entire period of study, showing that there occurred a high level of concentration.

Table 4: Herfindahl–Hirschman Index of the Indian Telecom Market

Year	HHI (Wireless + Wired)
2010	0.133
2011	0.1278
2012	0.1286
2013	0.1368
2014	0.1369
2015	0.1414
2016	0.135
2017	0.1503
2018	0.2709
2019	0.2726
2020	0.2787
2021	0.2812
2022	0.2830
2023	0.2944
2024	0.3101

Source: Estimated from TRAI Annual reports, https://www.trai.gov.in/about-us/annual-reports

Figure 3: HHI of Market Shares in the Telecom Sector



3.4. The Effect of Concentration on ARPU: An analysis of the effect of concentration on the Average Revenue per User is attempted andapplied a basic OLS regression by using the model specified below. For analysis used the data pertaining to the wireless connections only as the 98% of total subscribers are belonging to wireless segment and also used the total number of subscribers as a controlling variable for making the results more reliable.

$$ARPU = \beta_0 + \beta_1 HHI + \beta_2 TS$$

Where,

ARPU is the Average Revenue per User

β_0 is the constant used as the intercept term

HHI is the Herfindahl-Hirschman Index of concentration

β_1 is the regression co-efficient of HHI

TS is the number of total subscribers in million

The data used for the regression analysis is provided in table 5.

Table 5: Data used for Regression Analysis

Year	HHI for Wireless	ARPU Wireless	Total Subscribers
2010	0.1511	132	584.32
2011	0.137	97	811.59
2012	0.1324	94	919.17
2013	0.1418	101	867.8
2014	0.1448	112.495	904.51
2015	0.1474	119.3546	969.89
2016	0.1517	124.1042	1033.63
2017	0.1384	83.51	1170.18
2018	0.1717	76.01	1183.41
2019	0.2736	71.39	1161.81
2020	0.2789	91.49	1157.75
2021	0.2851	103.58	1180.96
2022	0.2867	127.17	1142.09
2023	0.2976	142.32	1143.93
2024	0.3133	153.54	1165.49

Source: TRAI Annual reports, https://www.trai.gov.in/about-us/annual-reports

Table 6: The Results of Regression Analysis

	Coefficient	Std. Error	t-ratio	p-value
Constant	148.293	18.6114	7.968	<0.0001

HHI for Wireless	230.202	101.110	2.277	0.0419
Total Subscribers	−0.0842989	0.0190842	−4.417	0.0008

Mean dependent var	108.5976	S.D. dependent var	24.23087
Sum squared resid	5625.739	S.E. of regression	21.65206
R-squared	0.315595	Adjusted R-squared	0.201527
F(2, 12)	9.976936	P-value(F)	0.002805
Log-likelihood	−65.73701	Akaike criterion	137.4740
Schwarz criterion	139.5982	Hannan-Quinn	137.4514
Rho	0.723639	Durbin-Watson	0.630397

Table 6 shows the regression results which indicate a highly significant positive relationship between the concentration and ARPU. A 0.01 rise in HHI leads to an increase in ARPU by Rs.2.3. The co-efficient is significant at five percent level of significance. The results are robust as applied HAC standard error. The variable total subscribers, which used for controlling purpose, have a significant negative relationship with ARPU.

FINDINGS

The study arrived at following major findings

1. A significant oligopolisation in the telecom market of India is evident from the decrease in the number of operating firms from 13 in 2013 to just 9 in 2024 and three major firms, Reliance Jio, Bharthi Airtel and Vodafone-Idea, together accounted for almost 92% of the market share.
2. The level of concentration as measured by the Herfindahl-Hirschman Index increased significantly during the study period.
3. The increased concentration has led to an increased average revenue realisation per user, indicating the wielding of monopoly power by the remaining firms.

CONCLUSION

From the consumer point of view which is also the general welfare point of view, increasing concentration, weakening of competition and wielding of monopoly power have detrimental effect. This unveiled that the oligopolist and increased concentration in the telecom sector resulted in increased revenue per user, indicating the possible excess profiteering. The Competition Commission of India may find the time was ripe enough to intervene with suitable checks for protecting consumer interests. TRAI also has to be vigilant to prevent further monopolization of the market.

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