

Is Fierce Competition a Reason for Performance Plunge of Mobile Telephony Sector in India

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Abstract

The number of mobile telephony service providers which was fifteen at its peak (in 2009-2012) has come down to just four creating the services a virtual oligopoly. The annual subscriber growth rate has declined considerably. Similarly, the service price, the average revenue per user (ARPU) as well as the adjusted gross revenue has been exhibiting a consistent decline. Three out of four wireless telecom companies are running in net losses and their operational margins have declined to unsustainable levels. A few companies like Aircel, Sistema, RComm, Quadrant, TTSL, TTML, Uninor, Videocon etc. have shut down because of non-feasibility. Idea & Vodaphone have merged their business to face stiff competition in the sector but their profitability does not show any remarkable change. Very often, the blame for this situation is pinned on the new entrant in mobile telephony space. By comparing various performance metrics pertaining to India to that of the Globe. This paper examines whether this performance plunge of Indian operators is a global phenomenon, purely due to saturation of telephone density or it is due to high intensity of competition and/or anti-competitive practises being adopted by any player in the sector. This examination concludes that not only the present service pricing has become lower than the marginal costs but the ratio of ARPU and GDP in comparable countries has also become lower than the trend in comparable markets because of the intensity of competition in the sector.

Keywords

Competition, Mobile telephony, ARPU, Sustainability, Profitability and Subscriber growth.

1. Introduction

Analysis of Competition in wireless telecommunications arena in general becomes typical in view of continual and dynamic technological changes (2G to 3G to 4G to 5G etc.), regulated competition and pricing, impossibility of storage of service, network effects and interconnection between competing service providers.

Effective competition in an oligopolistic environment typically means non-continuance of a price giving excess profits thereby gradually reducing the product or service prices to marginal costs. Paradoxically, the essence of effective competition is lost even when competitive pressures lead to the prices going below the marginal costs as the same leads to elimination of the competitor who blinks first and increasing market concentration. RJIO in India changed the price dynamics of mobile telephony by charging only data and not the voice as a strategic pricing decision to garner increased customer share. This led to reduction in tariffs by other operators also leading to reduction in ARPU and losses by the competitors Vodafone Idea, Bharti Airtel and BSNL. In fact, BSNL has been a typical bureaucratic organization showing little dynamism in responding to market and is expected to remain a fringe player. Hence, closure of one of the other two or even merger of the two will lead to a duopoly which may not be in the long-term interests of the consumers. Unfortunately, in absence of any floor price of services, the closure of one or more players cannot be ruled out. Till just two to three years back, growth of mobile Telephony in India was considered a show-case success story. However, in view of the aforesaid ARPU reduction and a few related developments like closure of a number of mobile telephony service providers and an unusually disproportionate debt burden on the major mobile operators, serious questions are being raised about the health and sustainability of this business in India. Merger of Vodafone & Idea Cellular does not appear to have improved their performance. The subscriber market share of different operators is shown in (Annexure B, Fig.11). Which shows the increasing dominance of the new entrant Reliance Jio.

The basic objective of all business entities is to create value for its stakeholders. For mobile telephony service operators, such value accretion may happen due to increase of subscriber base, increase in per minute service usage charges and overall revenue; and/or increase in operational profits. Incidentally, in Indian mobile telephony sector,

operational revenue and profitability of three out of four surviving operators has been declining (Fig.1) due to declining revenue per minute of usage and declining average revenue per user (ARPU) (Appendix-A, Fig.9). The subscriber growth rate has declined (Appendix-A, Fig.10) considerably. A clear mismatch is visible in the growth rates of AGR and that of subscriber numbers (Fig. 2). On top of it, a recent Supreme Court judgement related to AGR has further adverse implications on this sector which already has an existing total debt in excess of INR 4050 billion.

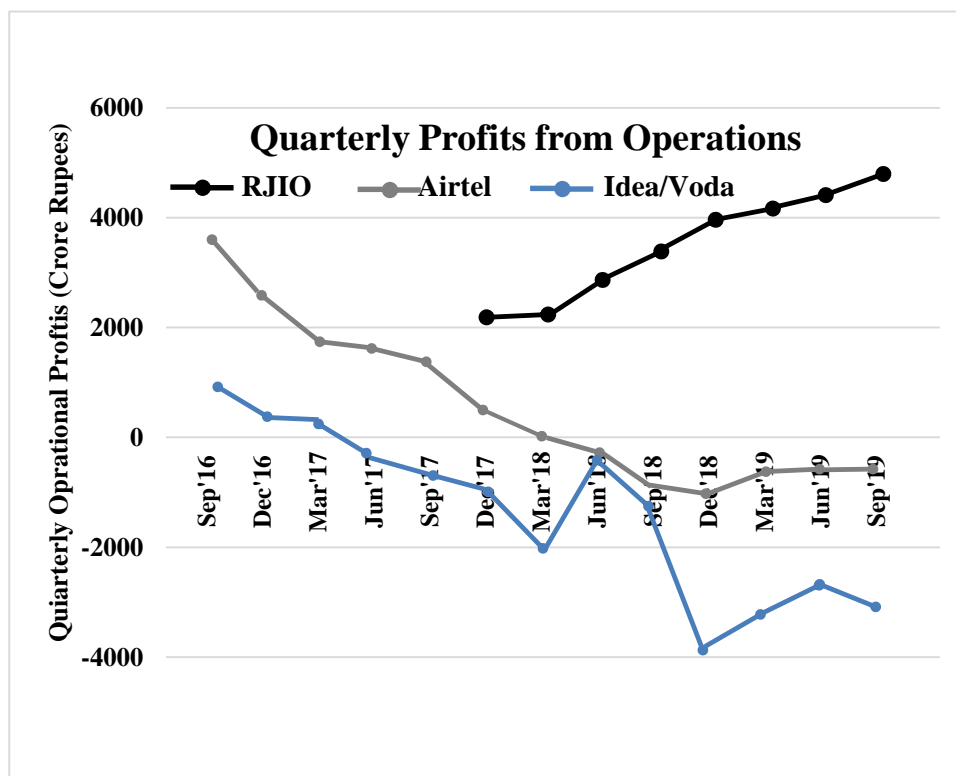


Figure 1: Operational Profit of Various Indian Wireless Companies. BSNL's operational margin from wireless services has not been plotted as it is difficult to reliably calculate as a lot of resources are shared with wireline business.

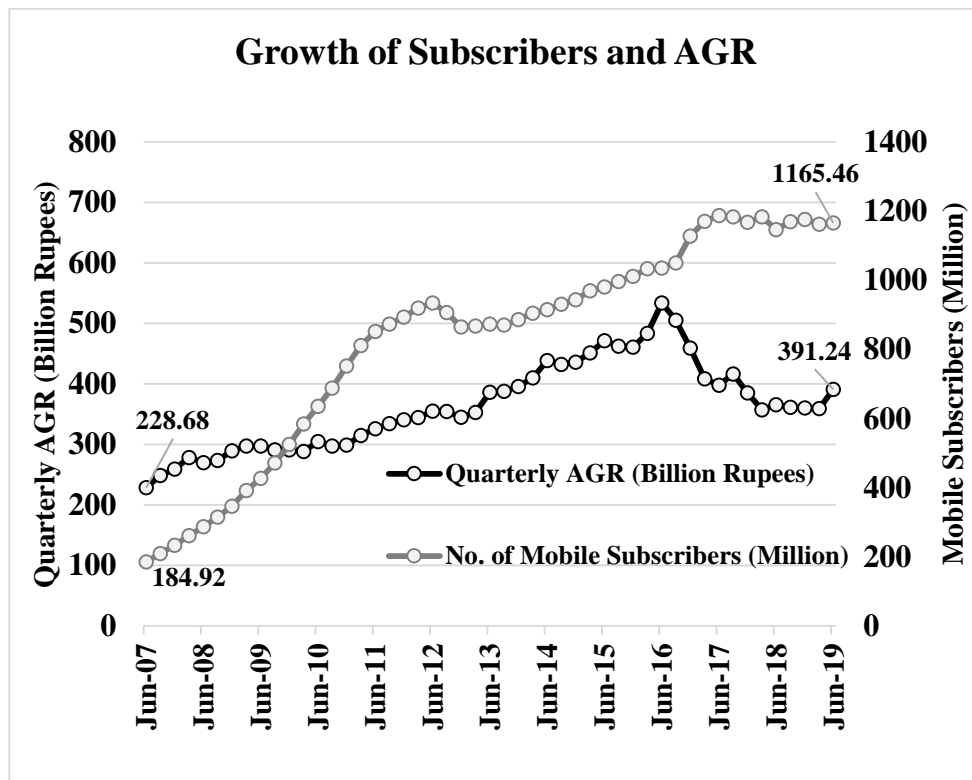


Figure 2: Growth of Subscribers & AGR, in a decade from June 2009. The subscriber number has grown 2.73 times while the AGR has grown 1.32 times only.

Hence, there has been a continuous erosion in value of almost all operators leading to write off of the investments made by them. This erosion in value is what has been termed as “performance plunge”. Besides others, the performance plunge can also be viewed through a comparison with some parameters globally.

It is noted that mobile telephony service products of different competitors are quite homogeneous. Additionally, there is near absence of price difference between operators in view of quick imitation of price reductions by rivals. The measurement of cross price elasticity for use in measuring intensity of competition, accordingly, becomes quite difficult. This paper tries to assess the competitive intensity and its contributions, if any to the troubles of the industry by analysing certain symptoms depicting the health of companies and the sector.

2. Review of Literature

D'Aveni (1998) has enlisted four driving forces causing hypercompetition in various sectors including telecommunications. These driving forces are consumers expecting higher value for money, technology causing rapid changes, falling entry barriers and use of deep pockets. He makes a clear distinction between perfect competition and hypercompetition. Perfect competition makes the competitors similar to each other by eroding all competitive advantages and gradually wiping out everyone's profitability. Hypercompetition is a constant struggle for gaining temporary advantage in aforesaid four arenas of competition. In India, the new competitor Reliance Jio has clearly worked on all these four arenas viz: by changing price structure for creating perception of better value for money amongst consumers, using latest technology for reducing operational costs while maintaining quality, using various strategies including M&A to gain entry in market and using its deep pockets to acquire customers for long term value creation while sacrificing on temporary gains. However, D'Aveni has warned that no advantage is sustainable and hence, new advantages must be continuously created to maintain or achieve leadership position.

Kim, Lee and Ahn (2006) have studied competition in the Korean mobile phone market using Lotka-Volterra competitive diffusion model for estimating demand function and examined the existence and stability of an equilibrium point with respect to the estimated demand function. This study revolves around impact of Personal Communication Service (PCS)-a second generation mobile service working on 1800 MHz band on the first-generation Cellular telecom services working on 800 MHz band and vice versa. This study, in a way highlights the competition for similar services driven by two different technologies.

Nashiruddin (2019) has studied mobile telephony in Indonesia- an analogous telecom market which is also facing severe turbulence with negative growth rate and market leaders reporting negative YoY growth for the first time in recent past. He recommends using cooperative business strategy to overcome the turbulence through reduction of risks and uncertainties, reduction of competition intensity; and design & production of more efficient products.

Grzybowski & Karamti (2010) have studied competition in mobile telephony in France and Germany- both oligopolies and having regulated entry similar to India. Conseil de la Concurrence (CdC)- the competition authority in France had found in Dec 2005 that Orange, SFR and Bouygues were sharing sales data and termed it as collusive and anti-competitive behaviour despite the fact that the service prices did not increase substantially in the period (1998-2002) under study and in fact, were comparable to Germany, a similar market. Grzybowski & Karamti have come up with explanations like difference in the elasticity of demand for mobile services as well as difference in customer behaviour about mobile phones being substitute or complement of fixed line telephones- the fact remains that the end consumer continued to get good quality service in France during the period of supposed collusive behaviour by service providers. What is important to understand is that all co-operation between competitors is not necessarily anti-competition or harmful for the customers, On the contrary, at times such collaboration helps in bringing down costs. In high capex mobile telephony industry, Airtel, Idea & Vodafone – three arch-competitors forming Indus Towers- a tower company to provide shareable towers is an ideal example in this regard. In fact, spectrum, because of its scarcity, is also quite costly besides the infrastructure. Gruber and Verboven (2001) and Valletti (2003) have opined that this makes the mobile telephony market resemble a natural oligopoly. Even Competition Commission of UK, in 2003, had conceded that mobile telecommunications sector has an inherently oligopolistic industry configuration and effective competition is difficult to achieve.

3. Analysis of a Few Parameters by Comparison with other Economies

To select the sample for comparison with India (except for the analysis of subscriber growth where global data has been considered). We took 30 most populous countries of the world as they are closer to India in terms of the size of target population for mobile telephony subscriptions. Out of these countries twenty countries closest to India in terms of per capita GDP were selected and, in the process, 10 countries viz: USA, Germany, France, United Kingdom, Japan, South Korea, Spain, Italy,

Russia and Turkey were eliminated from our sample. Subsequently, we are left with twenty countries including India which we intend to use in relation to our hypotheses. The resultant sample consists of countries with population higher than 36.84 percent of India's population and per capita GDP in between $1/n$ times to n times that of India, n being equal to 1.377. This process is expected to ensure markets most analogous with Indian market for mobile telephony.

(a) India's Participation in Global Subscriber Growth:

India's contribution to the global mobile subscriber growth is shown in (Fig. 3). It is noted that while in years like 2010 & 2015, India has contributed more than one third of global subscriber growth the overall contribution has not been consistent. For clarity, we look at the annual growth rate of subscribers. (Fig. 4) shows the annual growth rate of mobile telephony subscribers in India and the rest of the world. It is noted that for the period 2002-2016, barring the exceptions in year 2012 & 2013, annual growth rate of India's mobile subscriber has been consistently better than that of the rest of the world. However, subsequent to 2016, India's growth rate has been lower than the rest of the world. In the Cumulative average growth rate (CAGR) plot with 2001 as a base year, the difference between CAGR of India and rest of the globe is also reducing (Fig. 5). This phenomenon is worrisome because of India's late start in mobile telephony field because of which overall tele density is still substantially lower than the global average (Fig. 6).



Figure 3: India's contribution in Global Mobile Subscriber growth, source of subscriber data: International Telecommunication Union statistics.
Source: (<http://www.itu.int/ict/statistics>)

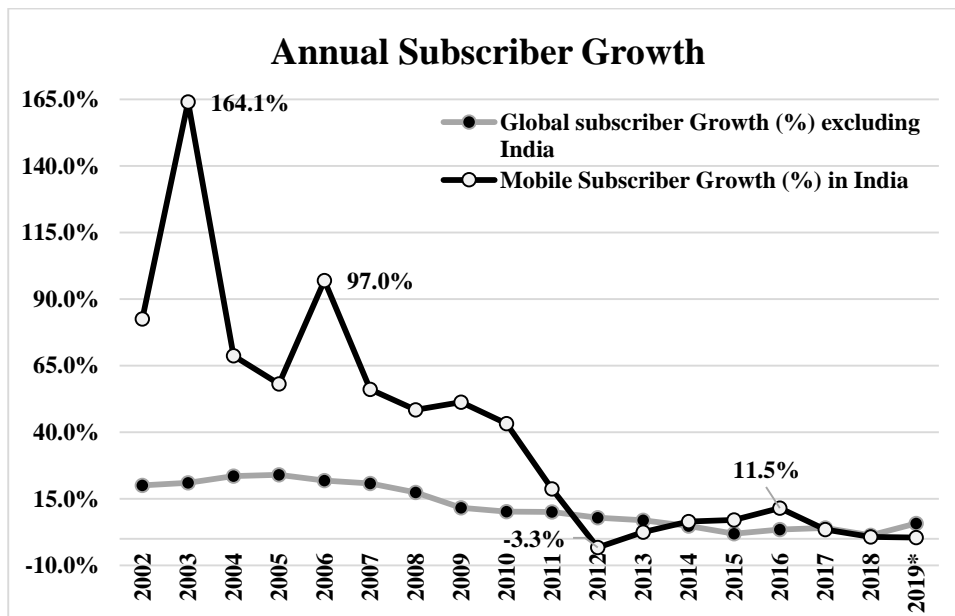


Figure 4: Annual Subscriber growth rate expressed as a percentage of number of subscribers in the previous year.
Source: <http://www.itu.int/ict/statistics> & www.trai.gov.in

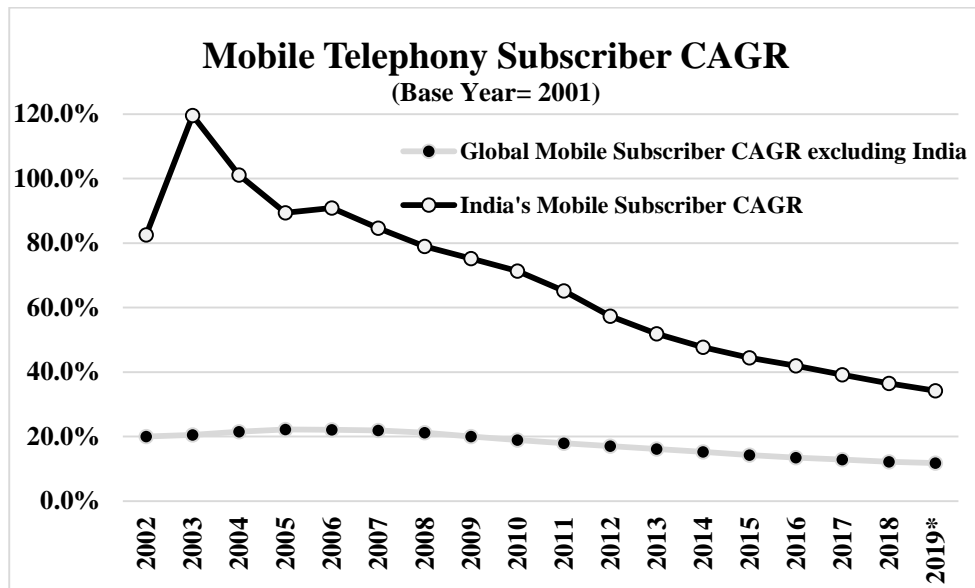


Figure 5: Compounded Annual Subscriber growth rate, calculated the number of subscribers in 2001 as base.

Source: <http://www.itu.int/ict/statistics> & www.trai.gov.in

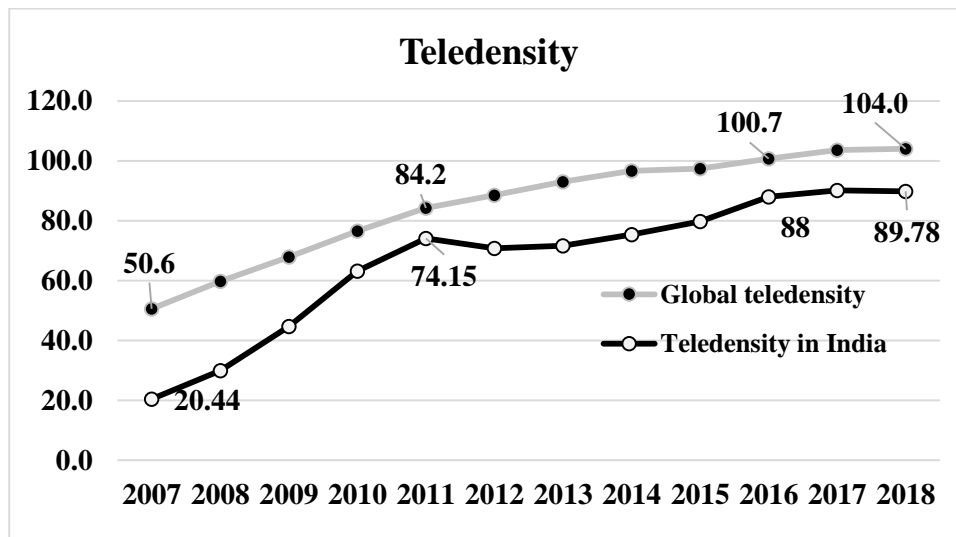


Figure 6: In Dec. 2018, the Global Teledensity (number of wireless phones per 100 people) is at 104-while India's teledensity is hovering around 88-89 for last three years.

(b) Number of Operators

The number of competitors is an important metric in the determination of degree of competition. Hence, we compared the number of operators in India with those countries which appear in our list of countries having comparable market. Subsequent to the closure of various mobile telecom operators and a few mergers happening, India effectively has only four mobile operators Vodafone-Idea, Reliance JIO, Airtel and BSNL+MTNL. BSNL and MTNL together have been considered as one entity as they function in mutually exclusive territories and are government controlled. Moreover, Cabinet of Government of India has already approved the merger proposal of these two companies. Reaching to just four from almost 15 operators at a point of time may raise fears of a collusion

Table 1: Number of Functional Mobile Telephony Service Providers in a Country (out of 20 Countries in our Data Set)

Number of Functional Mobile Operators in a Country		
Number of Operators	Number of Countries out of our sample of 20 countries	Name of the Country
3	5	China, Mexico, Philippines, Iran, Colombia
4	7	India, Brazil, Bangladesh, Egypt, South Africa, Myanmar, Kenya
5	2	Pakistan, Thailand
6	2	Indonesia, Congo D R
7	1	Nigeria
8	3	Ethiopia, Vietnam, Tanzania

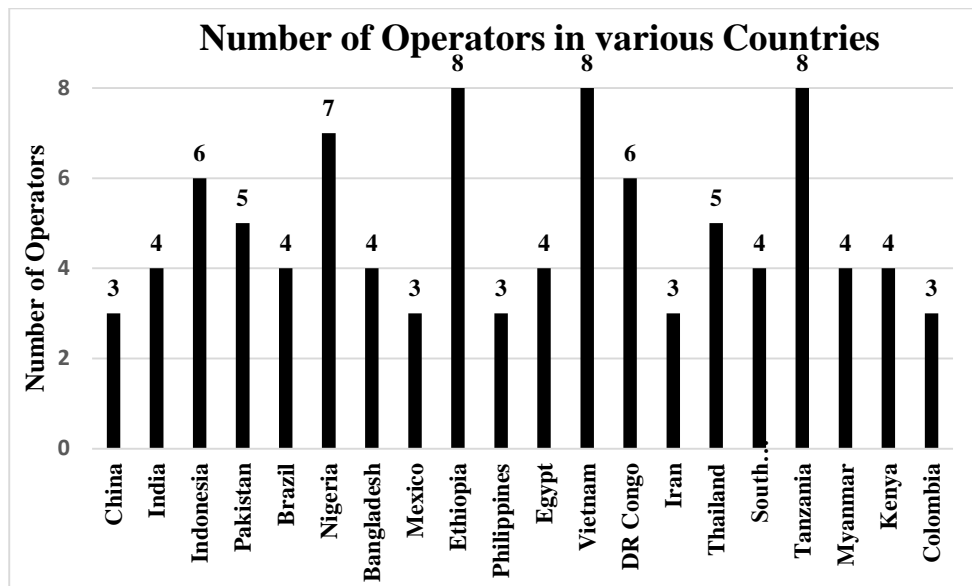


Figure 7: Number of Mobile Telephony Service Operators across different Countries.

amongst remaining service providers and hence, through a comparison with similar markets- the hypothesis tested is whether the number of operators in India which are operational today is significantly different from that in the set of comparable countries (mean number of operators = 4.8421, standard deviation = 1.8032).

H₀: India with number of operators as 4 is not different from comparable mobile telephony markets.

H₁: India with number of operators as 4 is different from comparable mobile telephony markets.

We performed one sample Z_{test} at 5 percent significance level. We have,

$N = 1$, $X_{\text{average}} = 4$, standard error = 1.8032, $Z_{\text{calculated}} = -0.4670$

Two tail p-value = 0.640549, Lower $Z_{\text{critical}} = -1.95996$, Upper $Z_{\text{critical}} = 1.95996$

Since $Z_{\text{calculated}} = -0.4670$ is between Lower $Z_{\text{critical}} = -1.95996$ and Upper $Z_{\text{critical}} = 1.95996$, the null hypothesis of India belonging to the set of countries with mean number of operators as 4.8421 cannot be rejected at a significance level of 5 percent. This is also proved by the fact that the p-value of 0.6405 is more than α -value of 0.05. Thus, India is behaving similar to analogous markets. From the number of functional operators in comparable

countries, it is also noted that the median for the number of companies providing mobile telephony services in a country is four which is exactly the number functional in India.

(c) Significantly Lower ARPUs than the Expected Trend:

India being at absolute bottom of ARPUs clearly distinguishes itself as a hyper-competitive market probably with unsustainable rates presently. In fact, based on the ratio of GDP and ARPU, if we remove four countries each with highest and lowest ratios considering them as outliers and plot GDP & ARPU of balance twelve countries, we find a reasonably high correlation (Figure 8(a)) and a simple regression shows the following relationship:

$$P = 0.004Q + 0.6172; R^2 \text{ (Coefficient of determination)} = 0.7997$$

Where P = Average Revenue Per User (expressed in US\$ per month)

Q = Per capita GDP (expressed in US\$ per month)

Hypothesis test of the significance of the correlation coefficient was also done to decide whether the linear relationship between per capita GDP and ARPU is strong enough to let us extrapolate a stable ARPU for analogous countries.

Null Hypothesis: $H_0: \rho = 0$ (The correlation coefficient is not significantly different from zero) i.e. There is no significant linear relationship (correlation) between per capita GDP and ARPU.

Alternate Hypothesis: $H_a: \rho \neq 0$ (The correlation coefficient is significantly different from zero).

Using a significance level of 5 percent for two-tailed test, at $df = 10$ we have $t_{critical} = 2.228$

Under H_0 , with $R = 0.8943$, the test statistic $t = 14.1183 > t_{critical}$

Accordingly, null hypothesis $\rho = 0$ is rejected at 5 percent level. i.e there exists a significant linear relationship (correlation) between per capita GDP and ARPU in the population.

Assuming the input costs as similar in all the countries. This implies that due to country specific reasons particularly degree of competition amongst service providers or regulatory costs viz: licence fees, spectrum costs, taxation etc. It will be reasonable to assume that the service rates and consequently ARPU in India, Indonesia, Egypt and Iran shall go up and in Ethiopia, Kenya, Myanmar & Thailand shall come down. In case, the per capita GDP & ARPU relationship as shown in Fig. 8(a) holds good, the ARPU is expected to stabilise as tabulated in Table 2.

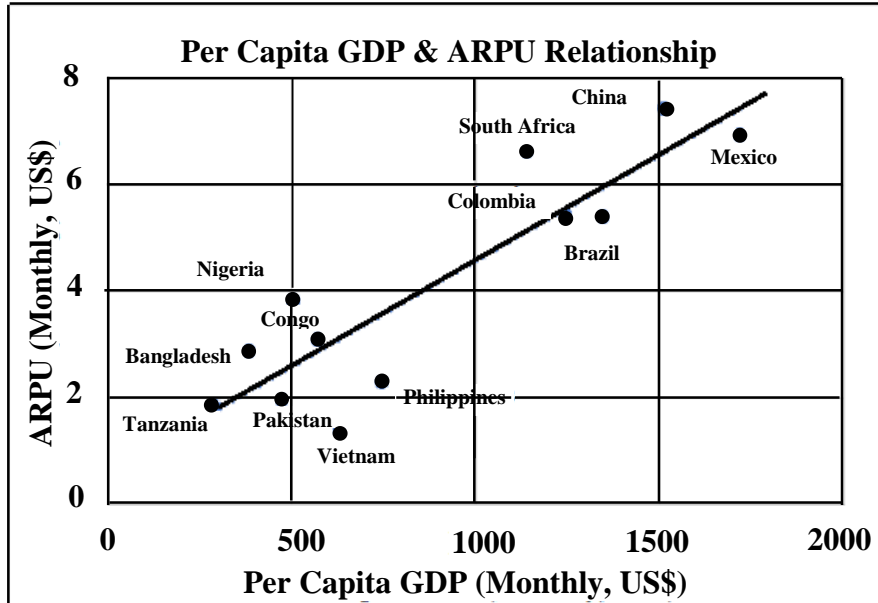


Figure 8 (a): Scatter Diagram of Per capita GDP and ARPU of different Countries.

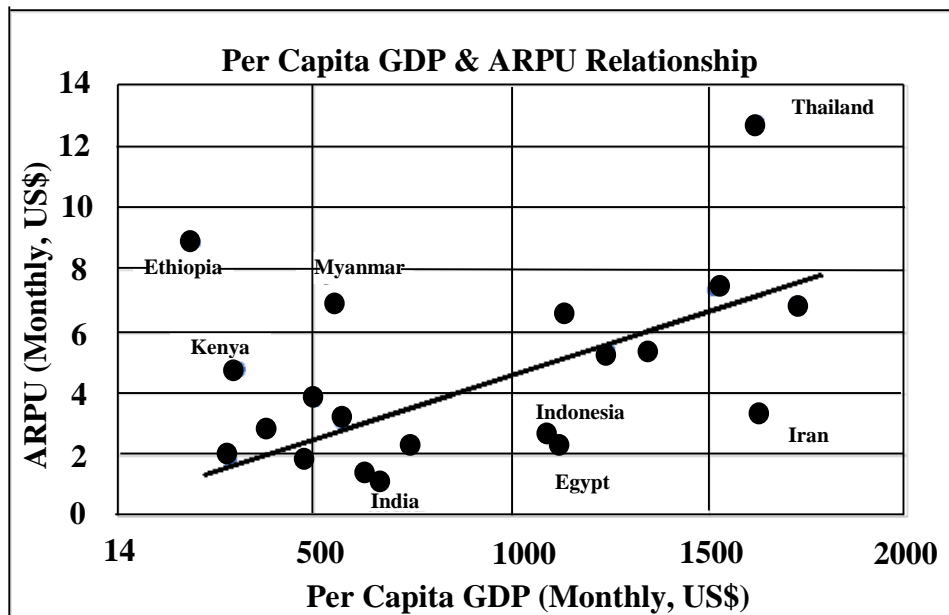


Figure 8 (b): Scatter Diagram of per Capita GDP and ARPU of different Countries. Countries having significant deviation from trend are mentioned.

Table 2: Likely Changes in ARPU Predicted based on a Regression on Analogous Countries.

Countries where ARPU is expected to decrease			Countries where ARPU is expected to increase		
Country	Present ARPU (US\$ per month)	Predicted Stable ARPU (US\$ per month)	Country	Present ARPU (US\$ per month)	Predicted Stable ARPU (US\$ per month)
Ethiopia	8.88	~ 1.39	India	1.2	~ 3.24
Kenya	4.82	~ 1.85	Egypt	2.31	~ 5.07
Myanmar	6.9	~ 2.79	Iran	3.39	~ 7.14
Thailand	12.8	~ 7.11	Indonesia	2.48	~ 5.03

(d) Profit Margins of Competitors:

Fig.1 shows the profits of various mobile telephony service operators. It is clear that the sustainability of business of Vodafone-Idea, Bharti Airtel and BSNL is highly doubtful unless there are significant intrinsic changes in the operations and financing of these organizations or the revenue per minute of mobile telephony service use is revised upwards. On the contrary, while the profitability of global telecom leaders have reduced-they are still making reasonably good profits. As per a Forbes report, the top five telecom companies-AT&T, Verizon, China Mobile, Softbank & NTT together earned a revenue of \$584 billion and made a net profit of \$ 96 billion and thus making a net profit of 16.44 percent & their combined operational margins may be in excess of 35 percent. This implies that the profitability pressure is not a global issue and is more a characteristic of Indian market. Clearly, the degree of rivalry between competitors has pushed the service prices down thereby disrupting the whole Indian wireless telecommunication industry.

4. Conclusion

The Indian phenomenon of consolidation amongst various telecom operators and elimination of a few might be a part of the on-going consolidation of telecom companies around the world. Hence, the number of present service providers left in Indian Market is not unusual and is in line with the number of operators in similarly placed countries. However, the present price of usage of mobile services appear to have gone even below the marginal costs of production of service. Hence, the average revenue per user in India is abysmally low, even after considering the per capita GDP. This is evident from the fact that the operational margins have been consistently declining and all except one operator are showing negative net profits. Since the competition in the sector, in any case, is regulated. It becomes important for the regulator to put a floor price for services for long term health of competition in the sector. Increase of unit price of product and services due to collusive behaviour between competitors is not the only anti-competitive behaviour to be watched by the regulator, a price which does not pass the test of economic sense is an equally threatening symptom. It is, indeed, a serious dilemma faced by the regulator when one of the competitors of an oligopoly indulges in strategic reduction of prices because the regulator intervention on this issue leading to increase in prices, even if it is temporary may be unpopular amongst the customers but non-intervention may cripple the competitors in the long run leading to monopoly or duopoly which may not be in the best interests of the customers whom the regulators are expected to protect. And yes, while the closure of different firms till now may have happened due to intrinsic issues of such companies. The performance plunge of existing three out of four operators appears to be due to the unusual intensity of competition which has dropped the prices to non-sustainable level. At the same time, the three competitors should strive for creation of their own temporary advantages amongst D'Aveni's four arenas of competition.

5. Appendices

Appendix-A: Indicators of the Performance Plunge

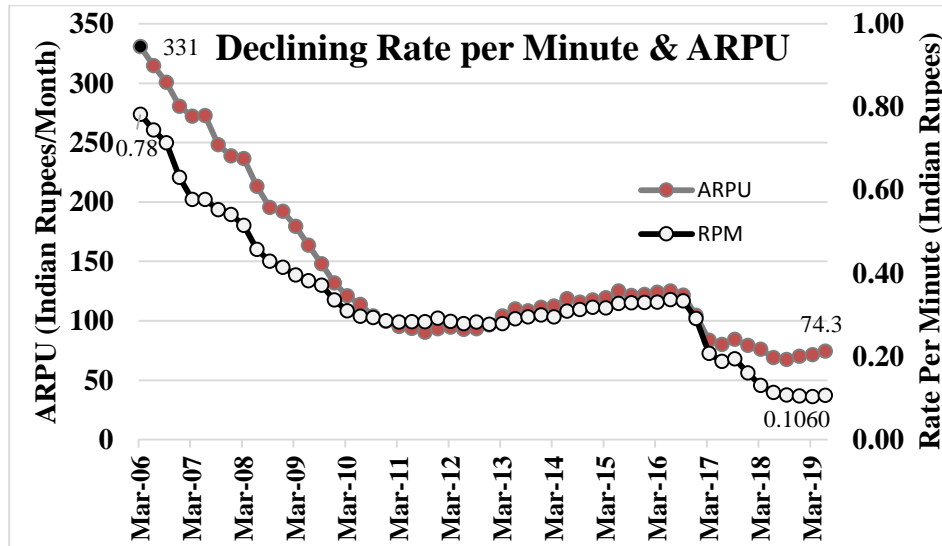


Figure 9: ARPU & Service Rate Per Minute.

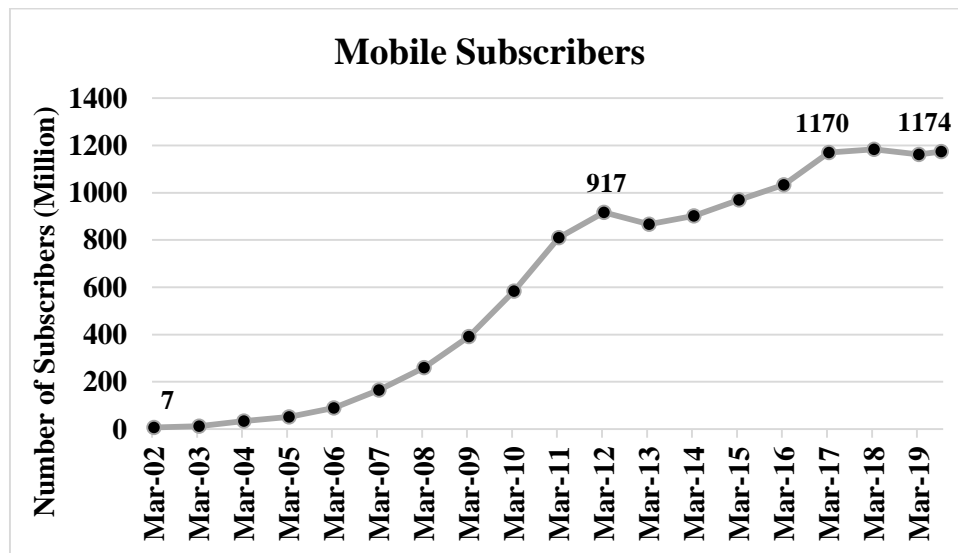


Figure 10: Growth of Mobile Telephony Subscribers. Subscriber Numbers are Virtually Stagnating with Total Subscribers Being 1170 million in March 17 and 1174 million in September 2019.

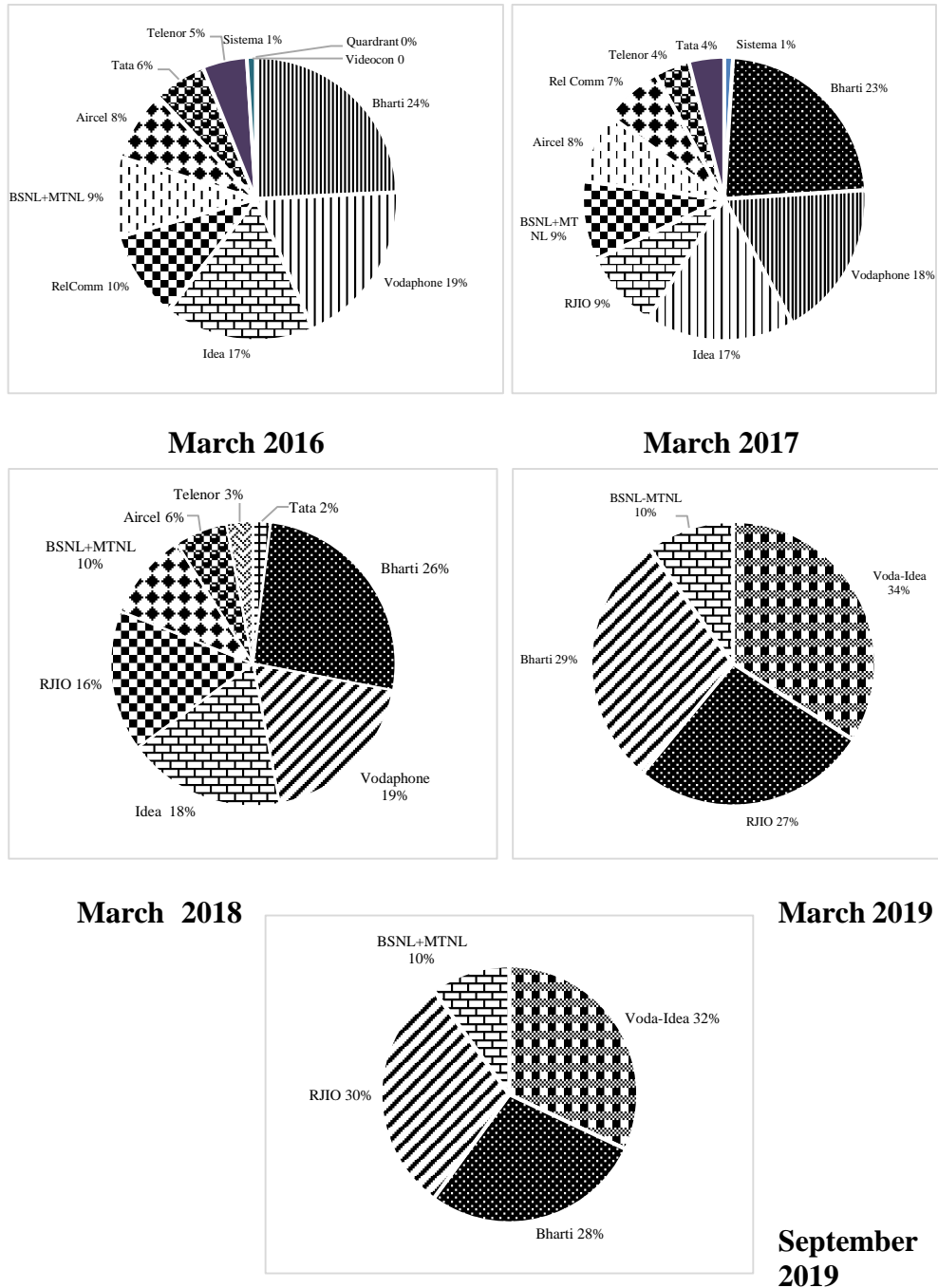


Figure 11: Market Share of different Operators from March 2016 to September 2019.

Note: RCom subscribers have been added in RJIO in March 2018 & March 2019. Tata Subscribers are added in Bharti Airtel in March 2019. BSNL MVNO subscribers are shown under BSNL.

Appendix-C: Thirty Most Populous Countries of the World (2019)

S. No.	Country	Population (2019)	S. No.	Country	Population (2019)
1	China	1,43,37,83,686	16	DR Congo	8,67,90,567
2	India	1,36,64,17,754	17	Germany	8,35,17,045
3	United States	32,90,64,917	18	Turkey	8,34,29,615
4	Indonesia	27,06,25,568	19	Iran	8,29,13,906
5	Pakistan	21,65,65,318	20	Thailand	6,96,25,582
6	Brazil	21,10,49,527	21	United Kingdom	6,75,30,172
7	Nigeria	20,09,63,599	22	France	6,51,29,728
8	Bangladesh	16,30,46,161	23	Italy	6,05,50,075
9	Russia	14,58,72,256	24	South Africa	5,85,58,270
10	Mexico	12,75,75,529	25	Tanzania	5,80,05,463
11	Japan	12,68,60,301	26	Myanmar	5,40,45,420
12	Ethiopia	11,20,78,730	27	Kenya	5,25,73,973
13	Philippines	10,81,16,615	28	South Korea	5,12,25,308
14	Egypt	10,03,88,073	29	Colombia	5,03,39,443
15	Vietnam	9,64,62,106	30	Spain	4,67,36,776

Source: CIA factbook, IMF's World Economic Outlook Database, April 2019

Appendix - D: Basic Data with respect of 20 Countries Comparable to India (used in this paper)

S. No.	Country	Per Capita GDP (monthly, US\$)	Tele-density (Mobile phones/100 people)	ARPU (US\$ per month)	Number of Mobile Telephony Operators
1	China	1509	115.53	7.434	3
2	India	656	86.94	1.2	4
3	Indonesia	1103	119.34	2.48	6
4	Pakistan	473	72.56	1.96	5
5	Brazil	1346	98.84	5.39	4
6	Nigeria	502	88.18	3.85	7
7	Bangladesh	385	100.24	2.9	4
8	Mexico	1717	95.23	6.93	3

S. No.	Country	Per Capita GDP (monthly, US\$)	Tele-density (Mobile phones/100 people)	ARPU (US\$ per month)	Number of Mobile Telephony Operators
9	Ethiopia	194	37.11	8.88	8
10	Philippines	745	126.20	2.33	3
11	Egypt	1114	95.29	2.31	4
12	Vietnam	626	147.20	1.42	8
13	DR Congo	567	95.34	3.11	6
14	Iran	1630	108.46	3.39	3
15	Thailand	1623	180.18	12.8	5
16	South Africa	1140	159.93	6.6	4
17	Tanzania	287	77.24	1.87	8
18	Myanmar	543	113.84	6.9	4
19	Kenya	308	96.32	4.82	4
20	Colombia	1245	129.91	5.43	3

Notes:

- (i) The periods considered for teledensity & ARPU figures may not exactly be coincidental as the results for different countries are published at different time intervals and in a few countries there are reporting issues. However, this study is a study of patterns and trends rather than a study for deterministic predictions of various parameters and hence, the difference or error due to the same is not expected to alter the conclusions.
- (ii) Multiple sources have been used for collection of ARPU for different countries- notably, websites like
 - www.itu.int
 - www.statista.com
 - www.pressreader.com
 - www.gsmaintelligence.com
 - www.bnamericas.com
 - www.mobileworldlive.com
 - www.oxfordbusinessgroup.com
 - www.itweb.co.za
 - www.ovum.informa.com
 - www.ceicdata.com
 - <https://data.worldbank.org> and is thankfully acknowledged.

- (iii) The per capita GDP has been taken from IMF's World Economic Outlook Database, April 2019. IMF.

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