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## Evolution of the Indian Telecom Industry and its impact on consumer

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### ABSTRACT

*The purpose of this paper is to profile the Indian telecom industry (2015 – 2020) from an economic and game theoretic perspective. The Indian Telecom industry has undergone massive change over the last few years, and the paper investigates the long run impact of these changes on consumer welfare. The paper uses literature and books on different oligopoly models and pricing strategies to explain the workings of the telecom industry. These models are verified using empirical data. The first section of the paper explains the entry of new firms in an oligopoly, and the second section explains how present and future equilibrium models, pricing strategies and collusion in the telecom industry impact consumer welfare. The study uses the models discussed to predict the future of the telecom industry and identifies the role of the government in order to increase long run consumer welfare.*

**Keywords**— Reliance Jio, Indian Telecom Industry, Consumer Welfare, Oligopoly, Collusion

### 1. INTRODUCTION

The telecom industry in India has been an oligopoly – a market structure in which a few firms have majority of the market share – for the past many years. In September of 2016 Reliance Jio entered the telecom industry, and since then has grown to become the most dominant firm in the industry. The entry of Jio was accompanied with drastic price reductions, and low prices are often associated with long run consumer welfare. However, the long run impact of Jio's entry on consumer welfare is unknown. The objective of this study will be to investigate the workings of the telecom industry and identify models and strategies that explain how consumer welfare has and will change for users of telecom. The findings of this paper will help government regulators and users of telecom plan for the future and take any necessary action.

### 2. MARKET MODEL

The extremely high fixed costs (spectrum licencing, technology, etc.) and high economies of scale, make it impractical and unprofitable for more than a few firms to co-exist; These are referred to as Natural Barriers of entry and are the key reasons why there are limited TSPs in a specific market. In addition to this, incumbent firms take preventive measures to deter entry of new firms, as is discussed later.

Before the entry of Jio, the Telecom Market consisted of 7 key players (players with a market share of greater than 5 percent). The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration, and the Telecom industry had a score of 1600, indicating that there was a moderate level of competition between firms.

When making decisions in an oligopoly each firm must weigh its competitors' reactions, knowing that these competitors will also react to their decisions. Furthermore, decisions, reactions, and reactions to reactions are dynamic, evolving over time. When the managers of a firm evaluate the potential consequences of their decisions, they must assume that their competitors are as rational and intelligent as they are. They must put themselves in their competitors' place and consider how they would react. Therefore, the dominant strategy for firms in an oligopoly is to undercut their opponents' price, in an attempt to gain a larger market share. Moreover, each firm knows that its opponents have the same incentive as them to undercut, and by not moving first, they are at a disadvantage. Similar to the prisoner's dilemma [1], it is often the case that firms will engage in price wars, resulting in low prices and profit margins, despite the fact that all firms will do better if they decide to cooperate.

The managers of firms in an oligopoly may grow tired of losing money due to price wars. An implicit understanding may come about by which all firms charge high prices, and no individual firm decide to undercut its opponents. Firms will follow this ideology as the profit gained from undercutting will be short lived. In the long run, this is beneficial to all firms in the market, as they can make monopoly levels of profit by colluding. This was the condition of the Telecom Industry Pre-Jio. Firms were making large chunks of profit, by charging customer high prices for Data, Calling and SMS services. In FY 14-15 Bharti Airtel made Rs. 15,000 Crore of profit.

Despite the low output and economic efficiency, government regulators may not set a price ceiling or interfere in the pricing (Freshman & Pakes). This is because in the long run, aversion to collusion could lead to a monopoly situation, as firms exit the market due to low profits. This situation would clearly be worse for customers.

**2.1 Equilibrium in an Oligopoly**

When analysing any market, it is extremely important to find the equilibrium price and quantity. Unlike for market structures like a monopoly, where price is simply where marginal revenue equals equal to marginal cost, finding the equilibrium in an oligopoly is more complicated. Over the years there have been many seminal models that describe equilibrium in an oligopoly: Cournot, Bertrand, Stackelberg and Sweezy’s kinked demand curve model. The Cournot and Stackelberg equilibriums are based on quantity settings; however, in the telecom industry marginal costs are extremely low and an increase in quantity does not have a substantial impact on costs in the short run, so I will not be discussing them.

**2.2 Bertrand Model**

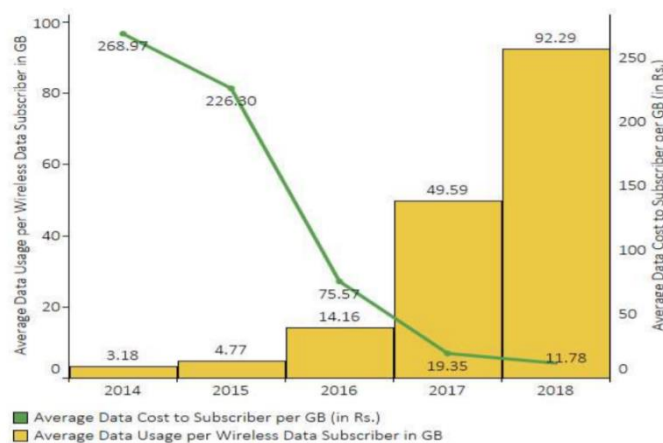
In the Bertrand model of an Oligopoly each firm keeps the other’s price as fixed, and then proceed to choose their own profit maximizing price. Bertrand equilibrium results in firms choosing a price which equals marginal costs. At this price is no firms are in a Nash equilibrium, where no firm is incentivized to change their price. For any firm, increasing price will lead to loss of market share, while decreasing price will lead to negative economic profit. It assumes that goods are homogeneous, and that the customer will decide which good to buy solely based on price. This is the case in the Telecom market, with Airtel, Vodafone and Jio all having similar quality of data, leaving price as the only deciding factor.

**2.3 Price Rigidity and Sweezy’s kinked demand curve model**

Price rigidity is a characteristic of oligopolistic markets where firms are reluctant to change prices even if costs or demands change. The kinked demand curve model explains price rigidity under oligopolistic market situations. The kinked demand curve model is made by assuming the reactions made by rivals following a change in price in an oligopolistic market situation. Given an equilibrium price which all firms in the market operate at, if a firm increases its price, its rivals will not follow the firm’s price increase. On the other hand, if a firm decreases its prices, all other firms will follow this price cut, in order to prevent loss of market share. This pattern of behaviour results in two different sections of a firm’s demand curve. The portion of the curve above prevailing price is extremely elastic, as an increase in price will cause customers to switch to the firm’s rivals, who have not followed a price hike. The portion of the curve below the prevailing price will be inelastic, as a decrease in price will be followed by rival firms, leading to almost no increase in quantity demanded. The kinked demand curve model therefore dictates that the profit maximizing level for a firm will be at the prevailing price, as neither an increase nor a decrease in price would result in greater levels of revenue; there is a kink in the demand curve at the prevailing price. In this model even if marginal costs increase firms will not be able to rise prices as other firms will not follow suite – thus fitting the definition and explaining price rigidity. As stated by Joseph Schumpeter in his book “Schumpeter, Capitalism, Socialism and Democracy”, price rigidity is essentially a short-run phenomenon. There are no major instances of long-run rigidity of prices. In the long run prices adapt themselves to technological progress, often spectacularly falling due to this. Despite prices being rigid in the 2G/3G data market before Jio’s entry, prices decreased sharply after Jio’s entry in the 4G market. Following this decrease in price, however, prices were rigid. Each firm knew that they would be unable to change their price. Although prices were much below profit maximizing levels, with large firms such as Airtel and Vodafone making losses, they were unable to increase prices as this would result in a loss of market share.

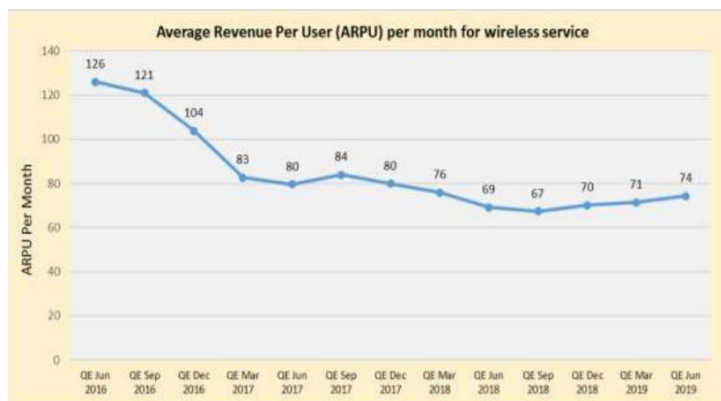
**3. MARKET STRUCTURE AND DATA PRICES**

The market structure of the telecom industry had been completely disrupted by the entry of Jio, leaving only 3 key private players in the market – Jio, Vodafone Idea and Airtel. The Herfindahl-Hirschman Index (HHI) in the market in early 2020 was around 2800, which is considered to be a highly concentrated marketplace. This is compared to a score of 1600 just a few years back. Many small-time players left the telecom industry due to competitive pressure, and Jio has grabbed their market share. In addition to this, 2 large players (Vodafone and Idea) had a merger, leading to a greater degree of market concentration. Jio has the largest market share in the telecom industry and it continues to increase. Jio’s entry caused data prices to decline sharply, causing data consumption to rise. The average price of data per GB fell from around Rs. 270 in 2014 to around Rs.12 in 2018. As a result of these low prices, consumer surplus and social welfare has increased substantially.



**Fig. 1: Data cost vs data usage between 2014 and 2018 (TRAI)**

The Average Revenue Per User (ARPU) obtained by TSPs has declined since the entry of Jio, as data and voice prices have plummeted. ARPU fell from around Rs.130 in June 2016 to around Rs.70 in Jan 2019.



**Fig. 2: ARPU from 2016-2019(TRAJ)**

Despite the low prices, the ARPU is making a steady comeback as more people switch to more data heavy 4G plans and lay off 2G and 3G, both of which tend to have much cheaper plans.

## 4. ENTRY OF JIO

### 4.1 Entry of new firms

Real or potential monopoly power in the short run can make an industry more competitive in the long run: large short-run profits can tempt new firms to enter an industry, thereby reducing monopoly power in the longer run. In addition to making entry easier for the potential entrant, a higher premium also makes entry more attractive. The mere enjoyment of lucrative premium by existing firms, no matter how difficult the entry into the industry may be, will attract firms into the industry. These firms will be willing to undergo initial losses with a view to driving some existent firms out, in the hope of surviving and earning the lucrative premium that is being made in the industry (Bhagwati, 1970).

Further, regarding the survival of a firm, it is quite possible that the entrant may have greater financial reserves than some existing firms and thus a greater chance of survival – an assumption clearly compatible with homogeneous cost curves. Backed by its parent company reliance, Jio was more financially powerful than any of the other firms, and therefore succeeded in securing a foothold in the market despite being a new entrant. Multiple-product firms can always set off losses on a new venture against profits from existing activities. Thus, the prospect of initial losses is relatively less inhibiting than might otherwise be supposed. This was the case with Jio since Reliance is a vast conglomerate; Reliance has several profitable segments, such as its oil and petrochemical business.

Another key factor affecting attractiveness of entry of new firms in an oligopoly is the way incumbents can be expected to react. In general, once the firm enters the market, incumbents cannot be expected to maintain output at their pre-entry levels; in the short run prices may drop due to an increased level of competition. Eventually, the incumbents may back off and reduce output, raising price to a new joint profit maximizing level.

Jio’s entrance into the telecom market was at a time when other TSPs were buried in legacy costs – the money they had to spend for the upkeep of their vast 2G and 3G network – and only spent a fraction of their capital investing in 4G. Reliance Jio could focused all their energy on building up their 4G network. Therefore, they had a more efficient cost-structure and better technological capabilities, both of which led to Jio having a clear cost advantage over other TSP’s. As stated by Joseph Schumpeter in his book “Schumpeter, Capitalism, Socialism and Democracy”, new competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives is the kind of competition that counts in the long run. It is hardly necessary to point out that competition of the kind we now have in mind (Jio) acts not only when in being but also when it is merely an ever-present threat. It disciplines before it attacks. (Schumpeter, 1962)

### 4.2 Deterring Entry

Existing firms often take precautions to deter entry of new firms. When sticking to a strategy or foreboding a threat, firms have to ensure that the threat is credible and not an empty threat that they can back out of at any time. To deter entry, the incumbent firm must convince any potential competitor that entry will be unprofitable. The Harrod strategy explains that firms in an oligopoly can prevent new entrants from entering by lowering price to the point where average cost equals average revenue, and the firm makes no economic profit. As a result of this the firm will no longer be attracted by entry into that industry.(Friedman, 1983). Another common method of entry deterrence is an irrevocable commitment to investment in sunk capacity. By having larger capacity incumbents can threaten that they can sustain a price war by quickly increasing output. This decision must be taken before the entrant has decided to enter the market, or it will have little to no impact (Rubinfeld & Pindyck, 2018).

By fostering an image of irrationality and belligerence, an incumbent firm might convince potential entrants that its entry will be met with devastating price wars and be unprofitable for both firms. Firms can develop this reputation over time if, in the past they have responded to new entrants by engaging in aggressive pricing strategies in hopes to drive them out. This will lead to potential new entrants thinking the same will happen to them and dissuaded from entering the market.

As discussed before, for many years before Jio’s entry the prices in the Telecom industry were extremely high, with TSPs earning large amounts of profit ; this large remunerative premium offered by firms is the key reason why Reliance Jio felt unthreatened by the original incumbents, and thus attracted to the telecom industry.

No TSPs took major steps to deter entry and this played a crucial role in Reliance Jio’s entry and long-term success. However, the incumbents did take certain measures right before Jio’s entrance to make sure they would retain more customers, in hopes of driving Jio out in the short run. For example, Airtel launched a discount offer in which the prices of data were up to 80% lower than previously offered. Other large TSPs behaved in a similar manner, but their long-term impact was negligible.

### 4.3 Price Strategies

Jio and other TSP’s implement several different pricing strategies in order to maximize revenue and profit. Some of the important pricing strategies that grew popular after the entrance of Jio have been discussed below.

### 4.4 Predatory Pricing

The concept of predatory pricing is relatively straightforward. A firm (the predator) temporarily charges a price below its costs. The idea is that its rivals (the prey) will either lose their customers, or be forced to match the price reduction, thereby incurring losses that will drive them out of business. The predator can then charge monopoly prices and make up the losses it suffered while it was engaged in predation.

The tariff plans offered by Reliance Jio were drastically lower priced than what was being offered in the market at that time. In addition to this, Jio had offered its services for free for a few months.

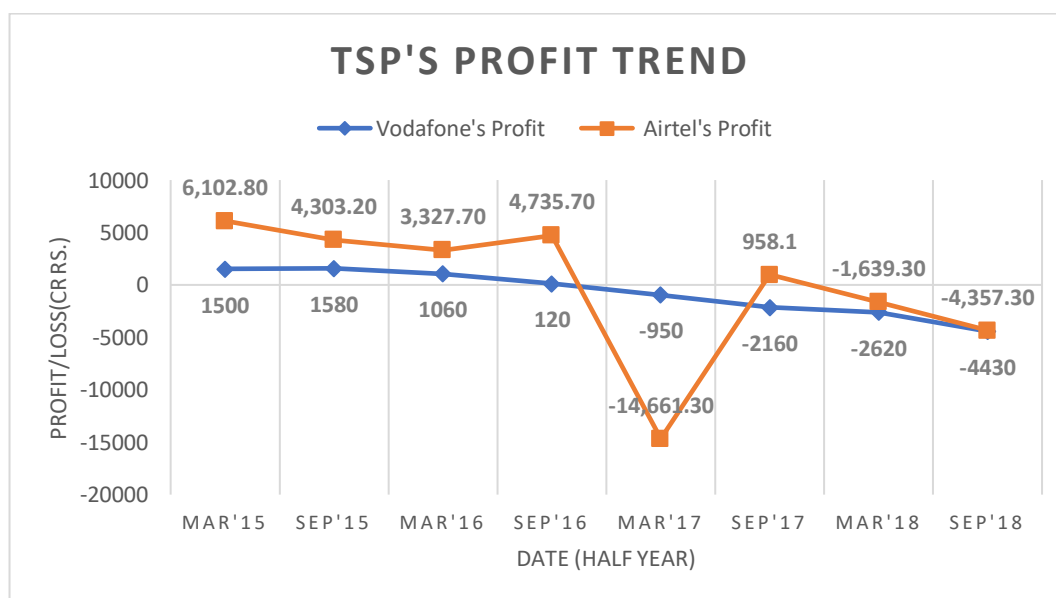
**Table 1: comparing Monthly Voice & Data Pricing in 2016**

	<b>Airtel</b>	<b>Vodafone</b>	<b>Jio</b>
Price of Plan (Rs.)	455	465	499
Data in Plan	2GB	2GB	4GB + Unlimited data at Night
Data Price (per GB)	227.5	232.5	<b>Rs. 125</b>

Predatory pricing of Jio impacted all players in the telecom industry – small and large. Although Jio’s pricing was considered predatory, regulatory authorities deemed the strategies as fair, and not predatory since the firm was a new entrant, and had a low market share compared to Market leaders like Airtel, Vodafone, etc. As a result of these low prices, tens of millions of users shifted to Jio. This impact changed the overall landscape of the market in a big way: It forced private telecom companies like Aircel, Tata Teleservice and Telenor to close their telecom business. Scholars associated with the Law School of Chicago University have noted that a predator with superior financial resources can sustain a period of losses to drive out its rivals (Bhattacharjea A. , 2000)

Jio’s strategy for the first few years was not to maximize profits, but to be a loss leader; backed by its parent company Reliance, they had larger financial backing and could sustain more losses than other TSP’s. As discussed earlier, this worked flawlessly, as it forced several small players out of the market.

As stated in Aditya Bhattacharjea’s paper, “Predatory Pricing in Platform Competition: Economic Theory and Indian Cases”, if banks cannot observe firms’ profits, they guard against bankruptcy by demanding higher interest rates from (or refusing to lend to) these firms. Predation then operates by reducing the value of the prey’s profits, thereby tightening its external financial constraint (Bhattacharjea, 2018). Since the onset of Jio, TSP’s profits have plummeted, and financial constraint has increased, with companies like Vodafone having AGR dues of Rs.58000cr. pending. As a result of poor financial records over the past few years, several private banks have refused to lend money to Vodafone, succinctly showing how Jio’s predation has been successful.



(moneycontrol.com)

**4.5 Price Discrimination**

First degree price discrimination has been banned by the TRAI – they banned TSPs from offering different plans to subscribers in the same category. Arbitrage – when consumers buy a product at a low price and sell it at a high price – makes first degree price discrimination less successful; The telecom industry prevents arbitrage, therefore, banning it was a good move by the TRAI. Moreover, TSPs have a lot of information and data on their customers and would have been able to price discriminate very effectively.

Second Degree (Non-Linear) price discrimination involves charging customers different prices for different quantity of product purchased. This has been a common form of price discrimination used by TSPs over the years.

Price of Data (Rs.)	Amount of Data (GB)	Price per unit data(Rs. per GB)
149	24	<b>6.2</b>
249	56	<b>4.4</b>
599	168	<b>3.6</b>

The table above shows how low quantity data packs can be up to 70% more expensive. The Telecom industry is one with high fixed costs and low variable costs of production. Increasing economies of scale and low marginal costs have given TSPs the ability to charge much low prices for additional units sold. Thus, second degree price discrimination permits firms to increase profits, while also increasing consumer welfare (Rubinfeld & Pindyck, 2018).

Jio engages in some forms of third-degree price discrimination, which involves charging different groups of consumers differently. Jio offers 25% free extra data to all students who can provide an ID. Students are likely to have a lower budget, and higher price elasticity of demand, therefore charging them a lower price increases demand and revenues significantly. Government Regulators prefer these models to conventional models, where firms in an oligopoly charge a single price to its customers, as it results in a more allocatively efficient model.

Customer poaching is a form of price discrimination where firms offer lower discounted prices to first time customers. Airtel offered new 4G users 3 GB of free data every month, for a period of 12 months. Vodafone offered new 4G users 9GB additional free data on for a recharge of only 1 GB. These offers were made in a desperate attempt by these TSPs to poach some of Jio’s and other TSP’s customers, as well as new 4G users. This strategy is effective in the telecom industry as switching between providers involves a cost. Lured in by the discounted first time offers once a user switches TSPs he/she will be stuck there even if prices are slightly higher.

**4.6 Peak Load Pricing**

Reliance Jio’s Opening welcome offer and Happy new year offer included a distinct form of Peak-Load pricing. Peak-load pricing also involves charging different prices at different points in time (Rubinfeld & Pindyck, 2018). Subscribers were offered free unlimited mobile data in the night (2AM to 5AM). This data was not included in the (daily) total limit. Along with capturing consumer surplus, Peak Load pricing also increases economic efficiency by charging consumers prices that are close to marginal cost.

Marginal cost is high during peak periods because of capacity constraints. From 2AM – 5AM there will be a very low data usage, therefore marginal revenue gained from an increase in subscribers due to this strategy is more than the low marginal cost of providing this free data(Although the data is free it may increase revenue by attracting more subscribers). This leads to an increase in profits for the firm. In addition, the free data strategy leads to a lower price and higher average speed for users. Individuals who would originally purchase more expensive data packs, can now maintain the same level or more data consumption with a cheaper data plan. During the day fewer people may use data, to avail of the free data at night. Lower traffic during the day results in higher average data speed. This results in a greater demand for Jio’s data. Other TSPs have also used this strategy after it was introduced by Jio.

**4.7 Positive Network externalities**

A positive network externality exists if the quantity of a good demanded by a typical consumer increases in response to the growth in purchases (Rubinfeld & Pindyck, 2018). Jio to Jio voice calls are free, however Jio to Non-Jio voice calls require users to pay for an IUC top up of 6 paise per minute. This creates a positive externality, if more people use Jio, calls made to non-Jio users will reduce and the IUC top up charge will reduce.

For example, if an individual were the only person who had a Jio sim, that individual would have to pay IUC top up for every call made. However, if half the consumer base had Jio sim card, the average user would only have to pay IUC charge for half the calls. The more people use a particular product or participate in a particular activity, the greater the intrinsic value of that activity or product to each individual.<sup>1</sup> Consumption externalities give rise to demand-side economies of scale (Katz & Shapiro, 1985). Telecom firms are quintessential example of this, as number of users increase, network coverage, customer care, quality of data, etc. may improve. Therefore, with more users using Jio sims, the demand curve for Jio shifts to the right.

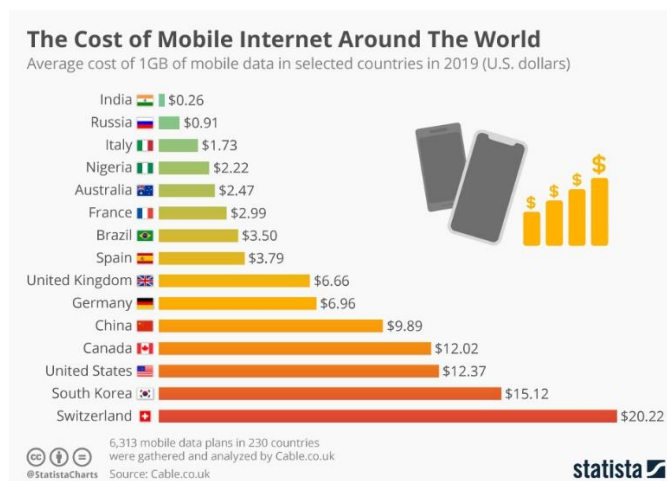
Given that Jio used the strategy to offer free voice and data to their users, this worked in their favour as they accumulated a significant consumer base in the early on.

## 5. COLLUSION IN THE TELECOM INDUSTRY

### 5.1 Future of the Telecom Industry

Data prices in India have been at an all-time low. In a report by the TRAI, it was stated that “all TSPs were of the view that due to competitive pressures, the telecom services are being offered with almost no margin, which is likely to pose serious constraints on generation of adequate funds for future upgradation.”(TRAI) While low prices may seem appealing to the public right now, its long term repercussions are unknown. Joseph Schumpeter, in his book “Schumpeter, Capitalism, Socialism and Democracy” stated that since we are dealing with a process whose every element takes considerable time in revealing its true features and ultimate effects, there is no point in judging the performance of that process at any given point of time; we must judge its performance over time. Moreover, a system that at every given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a system that does so at no given point of time, because the latter’s failure to do so may be a condition for the level or speed of long-run performance (Schumpeter, 1962). In the same way, the low data prices right now may not lead to an efficient long run system. It may instead lead to a monopoly.

When comparing data prices in India to other countries around the world, we can see that the price in India is much lower than anywhere else in the world. This is an indication that data prices in India are lower than they should be and are going to rise in the future.



(Cable.co.uk)

### 5.2 Price Hike

In late 2019, all TSPs, within a time frame 1a week, announced substantial price hikes on their data tariffs. Most tariffs prices increase by around 30%; for example, a data pack costing Rs.460 costed Rs. 600 after the hike. As a result, the ARPU received by firms in the quarter following this price hike was 25-30% higher than the quarter before.

This price hike was the first instance of cooperation or collusion between these firms post-Jio entry. Vodafone was the first firm to announce a price hike. According to the kinked demand curve model, and its characteristic of price rigidity, other firms should not have followed this price increase, but instead should have tried to capture a larger share of the market by maintaining a lower price. This leads us to believe that the firms were under some sort of understanding – either implicit or explicit. Many well-known analysts pointed that this price increase was expected, as firms were under immense financial stress.

### 5.3 Collusion in an Oligopoly

The dominant strategy for a firm in an oligopoly is always to undercut its opponents and try to maximize market share. This statement holds true if firms were to play the game – of deciding their price – only once. However, when the game repeats itself – as it does in reality – the players can establish a cooperative strategy that will benefit all.

By colluding, firms can raise prices and earn the monopoly profit as long as they cooperate. A firm could earn the maximum monopoly profit if it deviates during one period of the game but then it would earn zero in profits subsequently, as the agreement would be broken, and all other firms would lower their price. The resulting strategy is known as tacit collusion. (Sagi, 2007)

In Stigler’s seminal paper, “Theory of Oligopoly” he identifies three major factors necessary in forming successful cooperation among firms: the ability to reach an agreement, the ability to detect cheating, and the ability to swiftly punish deviators. As a market becomes more concentrated, it becomes easier for the firms to reach an agreement, to detect cheating, and to punish non-cooperative firms. As it is human nature for any player to violate any agreement if it is beneficial to him/her, collusion stands on the ability to be able to punish deviators from the agreement in a manner such that sticking to the agreement would indeed be more profitable. Stigler’s theory relies on the assumption that firms, recognizing their mutual interest in price raising and in high price maintaining cooperation, would try to promote such cooperative strategies (Stigler, 1964).

In the telecom industry, Jio has gained a reputation of irrationality and belligerence by setting extremely low prices and offering their services to customers for free. In a game theory setting – such as the telecom industry – such a reputation can be beneficial. When joining an agreement, other firms will be under the impression that if they back out, or deviate from the collusive strategy, Jio will go back to setting low prices, even below marginal cost, and will do so at the expense of its own profits. This gives Jio an advantage as other firms will be afraid to deviate from a mutual agreement.

The price hike of data prices in late 2019 was an example of collusion between firms. All firms are better off than they were before. The downfall of collusion is that it reduces consumer welfare, as they are faced with higher prices (often monopoly level). It can be understood that all TSPs have reached an agreement; therefore, price hikes in the future are expected.

#### **5.4 Price Floors**

In early 2020, all three private TSPs proposed that price floors should be placed in the data market to restore the financial well-being of the industry. Vodafone Idea, Bharti Airtel and Jio proposed that the minimum data price should be fixed at Rs 35 per GB, Rs 30 per GB, and Rs. 20 per GB, respectively. Comparatively, the price of data in the current market is around Rs.5 per GB for popular bundled offers in the current market. These price floors would lead to a substantial decrease in quantity of data demanded. This will severely affect the rural and financially weaker populations of India, many of whom rely on data for their day to day activities, as they will no longer be able to afford data at these high prices. Furthermore, price floors create surpluses in supply, leading to a reduction in allocative efficiency and consumer surplus in the market of the market.

### **6. CONCLUSION**

The entry of Jio has led to an increase in short run consumer welfare, but a decrease in long run consumer welfare. Before Jio's entry into the telecom industry, due to the collusion between firms, prices were extremely high and consumer welfare was low. Jio's entry drastically increased consumer welfare in the short run. Even before Jio's entry, firms started lowering their tariffs and charging lower prices in anticipation of Jio's entry. In the short run, as a result of the predatory pricing strategy, consumer welfare increased, and has remained high as a result of continually low prices. Second degree price discrimination, third degree price discrimination and peak load pricing also give way to more allocatively efficient models, resulting in lower prices and more quantity sold, where both consumer and producer benefit.

According to the equilibrium models discussed, namely the kinked demand curve model, prices should have remained low. However, as a result of collusion between firms, prices are going to rise. In the long run, collusion could lead to monopoly level prices. The rise of Jio's dominance in the market, due to its reputation, pricing strategies, and superior financial backing, has increased. Furthermore, other large players, like Vodafone Idea are on the verge of shutting down, and the market is likely to become a duopoly, or perhaps even a monopoly. If the telecom industry becomes a monopoly, prices will rise substantially, and barriers to entry will also increase, making it impossible for new firms to join the market in the future.

### **7. ROLE OF THE GOVERNMENT (TRAI)**

In any oligopolistic market it is the role of antitrust or regulatory agency to ensure collusion does not take place. The overall aim of these agencies is to keep prices low, competition fair, and ensure that consumer welfare is maximized. The TRAI, Telecom Regulatory Authority of India, follows the basic principle of forbearance: not intervening in prices as long as they are low.

Over the past few years Vodafone Idea has made substantial losses and is on the verge of shutting down. Furthermore, they have unpaid AGR (Adjusted Gross Revenue) dues of Rs. 60,000 crores to the government, which they are unable to pay. The shutting down of a large firm such as Vodafone will have dire repercussions on the state of the telecom industry: The industry will become a virtual duopoly, and prices will be bound to increase as competition reduced and collusion becomes ever simpler.

TRAI has not yet accepted the proposal of the price floors discussed earlier. However, this leads us to believe that all TSPs are in the view of increasing data prices. Without the price floors Vodafone may be forced to shut down, as it cannot maintain output at the current price level and may increase prices in an attempt for survival. This is another reason why price hikes can be expected in the future. The TRAI must implement strategies of its own to prevent the market from becoming a duopoly, or possibly even a monopoly. For example, it could forgo the AGR dues of Vodafone and Airtel (around Rs.40,000 crore). It could intervene in prices, by setting a price ceiling which ensures consumer welfare, but does not promote a potential monopoly.

### **8. REFERENCES**

- [1] Bhagwati, J. (1970). Oligopoly Theory, Entry-Prevention, and Growth. *Oxford Economic Papers*, 22(3), new series, 297-310. Retrieved July 18, 2020, from [www.jstor.org/stable/2662534](http://www.jstor.org/stable/2662534)
- [2] Bhattacharjea, Aditya. (2018). Predatory Pricing in Platform Competition: Economic Theory and Indian Cases: Insights on Innovation, Patents and Competition. 10.1007/978-981-13-1232-8\_11.
- [3] Bhattacharjea, A. (2000). Predation, Protection and the 'Public Interest'. *Economic and Political Weekly*, 35(49), 4327-4336. Retrieved July 18, 2020, from [www.jstor.org/stable/4410033](http://www.jstor.org/stable/4410033)
- [4] Fershtman, C., & Pakes, A. (2000). A Dynamic Oligopoly with Collusion and Price Wars. *The RAND Journal of Economics*, 31(2), 207-236. Retrieved July 18, 2020, from [www.jstor.org/stable/2601038](http://www.jstor.org/stable/2601038)
- [6] George J. Stigler, "A Theory of Oligopoly," *Journal of Political Economy* 72, no. 1 (Feb, 1964): 44-61. <https://doi.org/10.1086/258853>
- [7] *James Friedman*, (1983), *Oligopoly Theory*, Cambridge University Press
- [8] Rubinfeld, & Pindyck. (2018). *Microeconomics*.
- [9] Katz, M., & Shapiro, C. (1985). Network Externalities, Competition, and Compatibility. *The American Economic Review*, 75(3), 424-440. Retrieved July 18, 2020, from [www.jstor.org/stable/1814809](http://www.jstor.org/stable/1814809)
- [10] Sagi, Guy, The Oligopolistic Pricing Problem - A Suggested Price Freeze Remedy (June 10, 2007). Available at SSRN: <https://ssrn.com/abstract=992567>
- [11] *Schumpeter, Joseph A., 1883-1950. (1962). Capitalism, socialism, and democracy. New York :Harper & Row,*