

Indian Telecom Services Market: An Analysis of Late Entrant and Market Disruption

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Abstract

The Indian economy is growing at a fast pace. There were many disruptions in the Indian market across industries. The objective of this study was to determine whether the late entrant in India's telecom services market disrupted the market. Three variables were considered for the study namely, telecom subscribers, internet subscribers and sales revenues of telecom companies. We applied these variables to the three litmus tests developed by Harvard professor Clayton Christensen to determine whether market disruption had happened. To undertake this study, data were collected from telecom companies between 2010 and 2022. The data were retrieved from the website of the telecom regulatory authority of India. Regression analysis was used to understand the trends, Pettit test was used to know whether there is a change point and Chows test was used to identify when the break in time series data had occurred. The study found that the late entrant had indeed disrupted the telecom services market.

Keywords: Market disruption, later entrant, market disruption, India, technology.

INTRODUCTION

Disruption is often characterized by fast-paced developments accompanied by unanticipated changes that can upend established companies and, in the process, create opportunities for new entrants. Disruptions are not new to the Indian markets and have been documented in areas like technology, economic policies, introduction of low-priced passenger vehicles, artificial intelligence driven peer to peer lending fintech apps and the introduction of unified payments interface (UPI) (Ahworegba et al., 2020; Zhou et al., 2022; Sutar et al., 2022). Challenges posed to established MNCs as well as domestic firms by religious ikons entering the consumer market with their brands is yet another instance (Arli et al., 2022). The COVID-19 pandemic also affected supply chain vulnerabilities and thereby disrupted the market (Kumar et al 2015; Kumari et al., 2022).

We observed the telecom services market in India and found intense competition characterizing it ever since it was opened up for private sector participation in 1991. The launch of mobile telephony attracted several companies, both domestic and foreign, to this market. With the progression of time consolidation happened in the form

of mergers and acquisitions. In September 2016 there were twelve players in this market (TRAI, 2016). By September 2019, in a span of three years, there were five players left surviving, of which two were government owned. The remaining three private sector operators, amongst themselves, had nearly 90 percent market share (TRAI, 2019). This urged us to take a closer look at what had transpired in this market.

In September 2016, Reliance Jio, a new entrant in this market, launched its operations. The striking features of its market entry were one, introduction of new 4G LTE technology along with laying fibre optic cables. This technology was IP or internet protocol enabled compared to the circuit-based technology adopted by the incumbents. The IP-based LTE was more efficient and improved service quality. Second, offering free telecom services, initially for six months, followed by a deep discounted price. And third, offering a bundle of services including live television, movies on demand, news and music streaming. From a market share of 1.52 percent in September 2016, Reliance Jio's share rose to 35 percent in September 2020 in a period of just four years. With this market share became the market leader ahead of the remaining three major incumbents (Airtel 28.44 percent, Vodafone Idea 25.73 percent and BSNL 10.36 percent). (TRAI, 2020). This dramatic rise in market share of the new entrant prompted us to explore whether this was a case of market disruption by a late entrant or just a case of normal business growth. This became the major objective of our study.

The rest of the paper is outlined as follows. The section on Literature review captures the extant research on late mover advantage as well as market disruption in an industry. The section on Objectives and hypotheses, highlight the objectives of the study along with the hypotheses to be tested. The next section is on Research methods, presents the variables and statistical tools used in the analyses of data. The section on Empirical Analysis captures the empirical analysis done to arrive at inferences. The penultimate section is on discussion, and finally, we wrap up the paper in the section on Conclusion.

LITERATURE REVIEW

Late Mover Advantage

Several studies have indicated that a late entrant into a market has distinctive advantages. These include free rider effects, gaining market share via economies of scale, technical transcendence, exploit market changes, leverage benefits of shared experience (Schnaars, 1994), ability to respond to demand uncertainty, compress R&D expenditure, reduce promotion expenses and respond positively to new customer segments (Onzo, 1977). In a business to business situation it was observed that in an industry with established design and process, it was advantageous for late entrants since the risk of change is very low permitting focus on manufacturing (Nagamo, Ishida & Gemba, 2013).

In the pharmaceutical industry it was found that an innovative late mover can create a sustainable advantage by enjoying a higher market potential and a higher repeat purchase rate than either the pioneer or non-innovative late entrant (Shankar, Carpenter & Krishnamurthi). Drawing on behavioral research on consumer preference formation, it was observed that preference asymmetry can contribute to the persistent competitive advantage of dominant entrenched competitors (Carpenter & Nakamoto, 1990). However, optimal positioning, advertising and pricing strategies of a late entrant can offset such advantages.

Some studies have shown that the early movers in an industry dominate and lead because of advantages that a late entrant cannot overcome. A study has found that first-movers and early-movers enjoy, both, a highly sustainable pricing advantage as well as a moderately sustainable market share advantage (Makadok, 1998). A study on disadvantages, if any, of later entrants in the European mobile telephony industry vis-à-vis incumbents and early mover entrants revealed that there is clear evidence of early mover advantage, mainly caused by the influence of the penetration rate: it pays to enter when still few people have acquired a mobile telephone (Bijwaard, Janssen & Maasland, 2008).

Late mover firms leapfrog first-mover firms as user needs evolve over time. They start searching when several functionalities are already known to customers and typically come up with superior product design (Querbes & Frenken, 2016). Latecomer firms, especially in the emerging economies context, can successfully introduce disruptive technologies even from advanced economies through secondary business-model innovations. They can also tactfully bypass the first-mover advantages and leverage their latecomer advantages like low price and local savvy (Wu, Ma & Shi, 2010).

In the French mobile phone market, a late entrant with its complementary assets and strategies including its innovative business model enabled it to compete on the basis of low cost, which impacted the marketplace dynamics. The firm grew at the expense of the incumbent mobile network operators (Berne, Vialle & Whalley, 2018). A study was conducted in pursuit of determining when new entrants might have an advantage over the industry's incumbent firms focused on value networks – the context within which a firm competes and solves customers' problems. It was found that in such situations, where the focus was on value networks, that the late entrants via innovations disrupted established trajectories of technological progress in established markets (Christensen & Rosenbloom, 1995).

Market Disruption

Disruption can be caused by an incumbent firm or a new entrant. However, generally, incumbents are tied down to the pressures of short-term targets and so do

not create disruptions (McKinsey & Company, 2016). Joseph Schumpeter was one of the earliest to write on how new technologies lead to massive economic change (Schumpeter, 1934). But it was Christensen who coined the term disruptive technologies to describe how large incumbent firms lose market share to new market entrants that initially introduce products with inferior technology, but improve the same incrementally (Bower & Christensen, 1995). New entrants following the S-curve (improving a product over time and over several iterations) provide significant value to customers through the new product (Christensen, 1997).

Disruptive innovations stem from technological or business model advantages that can scale up even as disruptive businesses move upmarket in search of more-demanding customers, maintaining competitive advantage even as they improve performance vis-à-vis other incumbent firms in the industry (Raynor, 2011). In a study on disruptive technologies in multiple markets (Sood & Tellis, 2010), it was found that contrary to extant theory, technologies that adopt lower attack (i.e. potentially disruptive technologies) are introduced as frequently by incumbent as by later entrants, are not cheaper than older technologies, rarely disrupt firms and both entrants as well as lower attack significantly reduce the hazard of disruption.

Disruption doesn't happen only when some new product/service is introduced to the market. It is a continuous process requiring allocation of resources to drive technological evolution to meet customer needs (Roblek et al., 2021). Disruptive innovation differs from incremental improvements. The former may destroy competitive advantage of established player in the market. This may in turn, affect the established dynamics leading to diverse responses from incumbent firms (Kammerlander et al., 2018). A manager's competency and intuition play a significant role in success or failure of disruptive initiatives (Sadiq & Hussain, 2018).

Disruptive innovation theory can assist in understanding how disruptive innovation alters established business models and market dynamics (Henderson, 2005; Rubin & Abramson, 2018). According to Zubizarreta disruptive innovation completely changes established markets and can even throw established incumbents out of competition (Zubizarreta et al., 2020). Vermicelli observed that disruptive innovation can have a profound impact on industries and society, representing a shift in the dominant logic that governs current industry practices (Vermicelli et al., 2020). Majority of the companies which are successful in disruptive innovation have a culture of continuous innovation. Innovations in such organizations are a daily activity rather than a one-time event (Roblek et al., 2021). Disruptive innovation is not a linear process but more akin to a spiral or circular development involving continuous feedback loops (Assink, 2006).

Disruptive innovations challenge existing norms and require organizations to embrace a mindset that fosters continuous evolution and adaptation (Roblek et al., 2021). Understanding disruptiveness requires measuring it relative to the existing

business model rather than just the technology involved (Christensen, 2005). Disruption can be better understood by considering its impact on interconnected systems and the underlying assumptions that drive disruptive changes (Christensen et al, 2017).

Organizations must be agile and leverage their capabilities to rapidly evolve new products or services that can reshape industry dynamics (Bond, 2023). The disruptive innovation theory emphasizes the need for organizations to adapt to changing technological landscapes and evolving consumer demands (Wan et al., 2015). Anticipating disruptive changes is essential for organizational survival, and tools like competitive intelligence can help established companies respond effectively to disrupt technologies (Vargas et al., 2017). By pre-empting full-blown disruption, organizations can better position themselves to navigate turbulent market conditions and avoid failure (Gerber & Matthee, 2019). However, the theory of disruption has faced criticism and calls for further exploration to enhance its explanatory and predictive capabilities (Markides, 2005; Kumaraswamy et al, 2018; The Economist, 2015; Teece, 1986; Yoo et al., 2012).

It is important to determine whether a disruption has truly happened or it is a simple price competition that is not sustainable. Three litmus tests were proposed (Christensen & Raynor 2003) to determine whether a firm has disrupted a market. Each test has a bunch of questions, which can be converted into three distinct questions that address each test. The question for the first test is, does a growth opportunity exist in an industry? The question for the second test is, can it attract customers away from the core of the mainstream market? The question for the last test is, can the incumbents respond successfully?

The first test is to explore new-market disruption. It attempts to measure the ability of a firm to introduce a technology, different from what exists in the industry, to enable a large number of customers to buy the product at an affordable price. The second question intends to explore the possibilities for a firm to execute a low-end disruption backed by low price for the product. The business model here may have wafer thin margins per unit, but with large sales volume, aggregate profits could be high. The last question is to assess the ability of incumbents to replicate the innovation of new-market or low-end disruption successfully.

OBJECTIVES AND HYPOTHESES

The underlying objective of our study is to determine whether there was market disruption in the Indian telecom services market during the period 2010 and 2022. We propose to examine the above proposition using telecom subscriber basedata, internet subscriber base data and sales revenue data of companies in the market. The specific objectives and hypotheses of the study are as follows,

1. To ascertain whether the Indian telecom services market was in a growth trajectory.

1Ho: For the telecom services market, slope of the growth trajectory is constant

1.1Ho: The slope of the growth trajectory of telecom subscribers is zero.

1.2Ho: The slope of the growth trajectory of internet subscribers is zero.

1.3Ho: The slope of the growth trajectory of sales revenue of the industry is zero.

2. To determine whether a new entrant could succeed in attracting customers away for Incumbents in the industry.

2Ho: For the new entrant, slope of the growth trajectory is constant

2.1Ho: For the new entrant, the slope of the growth trajectory of telecom subscribers is zero.

2.2Ho: For the new entrant, the slope of the growth trajectory of internet subscribers is zero.

2.3Ho: For the new entrant, the slope of the growth trajectory of sales revenue is zero.

3. To assess whether the incumbents in the industry could counter the moves of the new entrant.

3Ho: For the incumbents, slope of the growth trajectory is constant

3.1Ho: For the incumbents, the slope of the growth trajectory of telecom subscribers is zero.

3.2Ho: For the incumbents, the slope of the growth trajectory of internet subscribers is zero.

3.3Ho: For the incumbents, the slope of the growth trajectory of sales revenue is zero.

RESEARCH METHODS

We wanted to, through this study, explore whether there was a market disruption by a late entrant in the Indian telecom services market. To execute this study, we collected data pertaining to the following parameters: number of telecom subscribers, number of broadband subscribers and sales revenues of the players in the market. These data were collected from secondary sources published by Telecom Regulatory Authority of India (TRAI). The analysis was done to compare the performance of the incumbents and the late entrant on the above parameters. The intention was to establish whether there were any changes in the existing trends in terms of telecom subscribers, internet subscribers and sales revenue.

Our study was done based on the data from the period 2010 to 2022. In India, 4G technology was introduced around 2016-17 and the incumbents had already launched the 4G services by then. We wanted to determine the role played by the late entrant whose entry coincided with the launch of 4G in India.

Statistical Tools

Regression Analysis

Regression analysis is a statistical technique used to measure the strength of association between variables. The least squares method is the foundation of regression (Legendre: 1805, Gauss: 1809). The method was coined by Francis Galton (1889).

Regression analysis is used to get insights into relationships between variables, supporting prediction, interpretation, and decision-making across many fields. In regression analysis the line is fitted such that the total squared distance between each observation to the line is minimized. This is called least squares method. A general regression model takes the form,

$$Y = a + \beta X_1 + e$$

Y is the dependent variable, X represents the independent variable(s), a is the intercept.

β represents the coefficients associated with each independent variable, and e denotes the error term, accounting for random variability. Where a and β are parameters, which are calculated for the given data. The value of β explains rate of change in Y with respect to X . A positive β indicates both X and Y change in the same direction.

One special application of regression analysis is to find the break in the fitted line showing shift in relationship. One may use Chows test or Bai-Perron test (Bai and Perron, 1998) depending on the purpose. Chows test (1960) is used when breakpoint is known.

Pettit test

There are many approaches to detect a change point in a time series. Few approaches are parametric and others non-parametric. The nonparametric approach like the Pettit test has definite advantages over parametric tests as it can be applied to any unknown distribution to obtain robust solutions when distributional changes occur. The change point detection is as simple as any other test like 'z' or 't' test. The Pettit test checks whether any change in central tendency has occurred at a point in a given time series $X_1, X_2, \dots, X_n$. The observations are ranked (r_i) and the $U_{t,T}$ statistic is

calculated in the same way as Mann Whitney statistics. The series 't' and 'T' are compared.

$$Kt = \max_{1 < t < T} |U_t, T|$$

$$\text{Where, } U_{t,T} = \sum_{i=1}^t \sum_{j=t+1}^T \text{sgn}(X_i - X_j)$$

If the maximum 'Kt' occurs at point 't', then point 't' is a change point. The value of 'Kt' will be significantly different from zero. The probability that 't' is a change point is calculated as,

$$p = 2 \exp^{-6Kt^2 / (T^3 + T^2)}$$

If the value of 'p' is less than the significance level (alpha) at a point 't' then we divide the time series into two, pre and post period 't' (Pettit: 1979, Mallakpour and Villarini: 2016). This study makes use of the trend package (Pohlert T: 2023) to find change points using Pettit test.

Chows test

In time series analysis, if the presence of structural break point is known a priori, Chows test could be used. Chow (1960) proposed a test to know for a given model $Y = a + Bx$, whether 'm' additional data points belonged to the same model. If the new observations had the same intercept (A) and slope (B) as the original model, he argued that 'm' observations belonged to the same regression. If the values of 'A' and 'B' differed, then there was a breakpoint. Thus, Chows test evaluates the null hypothesis,

$$a_1 = a_2 \text{ and } b_1 = b_2$$

Chows test runs a pooled regression for the whole data and collects residual sum of squares (RSS). Then the data series is broken into two parts and RSS is calculated. The process is repeated for each subsample. Chow statistic is calculated as follows,

$$Chow = \frac{(RSS_p - (RSS_1 + RSS_2))/k}{(RSS_1 + RSS_2)/(N_1 + N_2 - 2k)}$$

Chow test statistic follows F- distribution with 'k' and $N_1 + N_2 - 2k$ degrees of freedom. If the calculated value is more than the critical value for the given significance level alpha, the null hypothesis is rejected. The study makes use of R package strucchange (Zeileis A et al.: 2002, 2003) to find a breakpoint.

EMPIRICAL ANALYSIS

Analysis for Telecom Subscribers

Figure 1 shows the number of telecom subscribers' pre and post entry of the new market entrant. The total number of telecom subscribers, prior to the entry of new

entrant, is the same as that of the industry. Post entry of the challenger firm, the subscribers of incumbents have reduced while subscribers of the challenger (new entrant) have increased. However, the overall telecom subscribers in the industry have increased. The trend line for industry subscribers is given by,

$$y_{ind_tel} = 823.16 + 9.76 * x_t$$

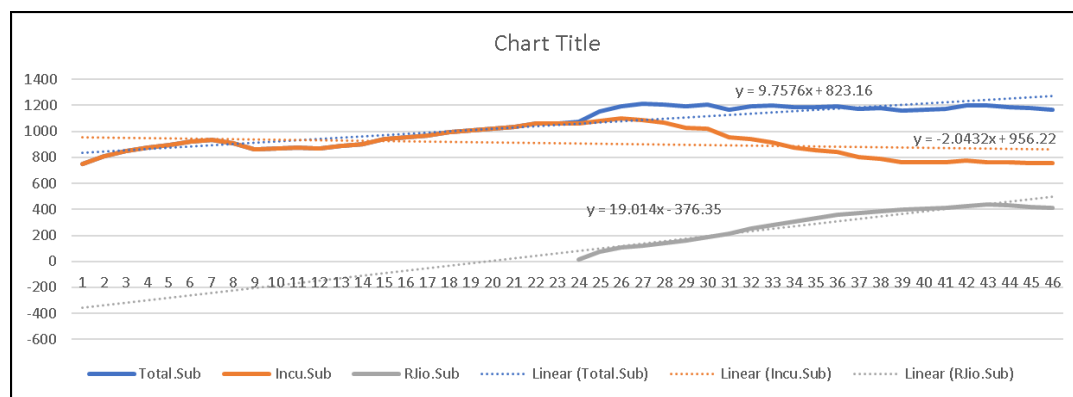


Figure 1. Break point analysis for telecom subscribers

Source: Microsoft Excel output

There is a growth in the number of subscribers as the slope is positive with a value 9.76 for the given period. But, for the incumbents there is a break in the trend line. As a result, two regressions are required,

$$y_{pre_tel} = 797.73 + 10.56 * x_{t \text{ pre-entry of new player}}$$

$$y_{post_tel} = 1537.4 - 18.441 * x_t \quad \text{post entry of the new player}$$

The slope of the trendline is positive before the entry of the new player and negative after the new entrant's entry. Whereas, the slope for the new player is positive,

$$y_{new_tel} = -376.35 + 19.014 * x_t$$

Based on the above analysis we can infer that the number of telecom subscribers increased for the industry. The incumbents lost some telecom subscribers. From the date of entry, the new player gained telecom subscribers.

Change point analysis for telecom subscribers

The Pettit test was used to find the breakpoint for the telecom subscribers. Fig. 2 shows that for the total number of telecom firms, the median distribution changed at $t=23$ ($K_t=529$, $p=0.00$). Further, we confirmed whether the break point actually occurred at $t=23$, using the Chows test ($F=210.76$, $p=0.00$). The change point for the new entrant Jio overlaps with that of the industry at $t=23$ ($K_t=529$, $p=0.00$, $F=106.9$,

$p=0.00$). However, for the incumbents, change point is $t=33$ ($Kt=383$, $p=0.002$, $F=41.525$, $p=0.00$). Since, both Pettit and Chow statistics are significant, the null hypotheses were rejected.

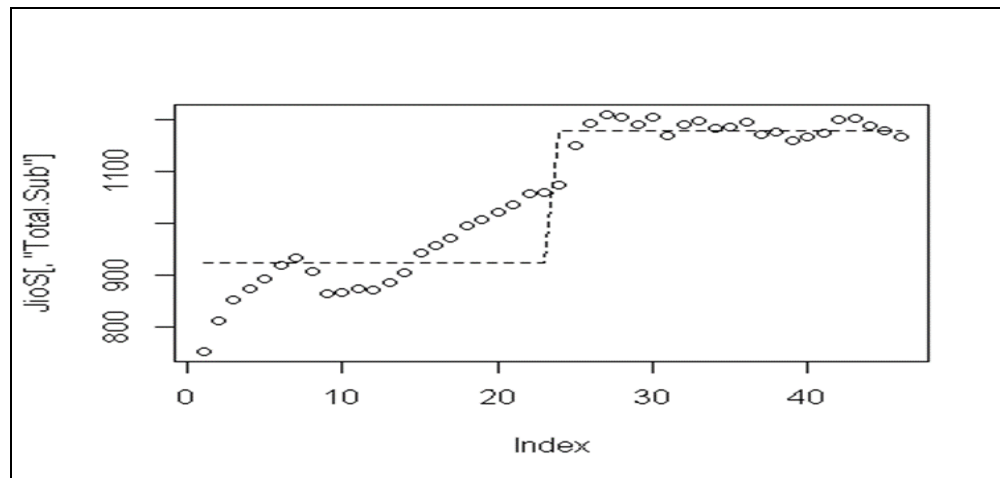


Figure 2. Breakpoint detection for total telecom subscribers for the industry

Source: Output of trend package

Analysis for Internet Subscribers

The figure 3 shows the number of internet subscribers pre and post entry of the new player. The total number of internet subscribers, pre-entry of new entrants is the same as that of the industry. Post entry of the challenger firm, the internet subscribers for incumbents have reduced and for the challenger (new entrant) the subscribers have increased. However, the overall subscribers in the industry have increased. The trend line for internet subscribers is given by,

$$y_{ind_int} = -102.82 + 21.105 * xt$$

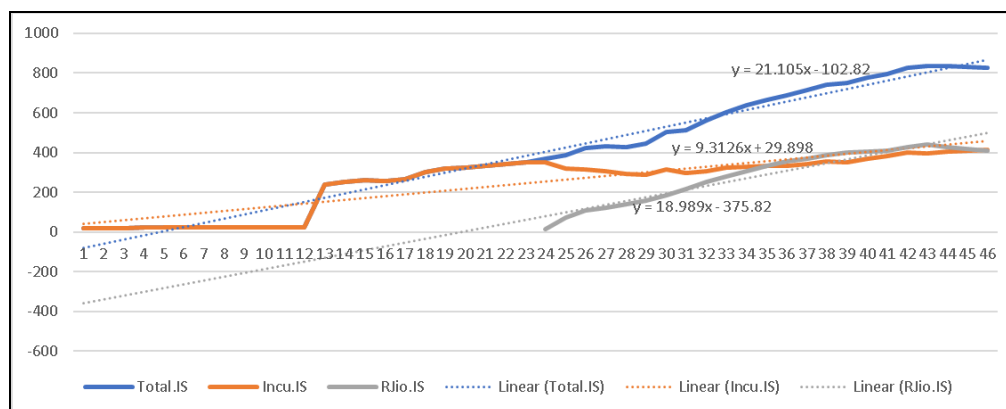


Figure 3. Break point analysis for internet subscribers

Source: Microsoft Excel output

There is a growth in the number of internet subscribers as the slope is positive with a value 21.105 for the given period. But for the incumbents there is a break in the trend line. As a result, two regressions were required,

$$ypre_int = -77.525 + 19.162 * xt \quad \text{pre-entry of new player}$$

$$ypost_int = 166.89 - 5.091 * xt \quad \text{post entry of the new player}$$

The slope of the trendline is positive before the entry of the new player and negative after the new entrant's entry. Whereas, the slope for the new player is positive,

$$ynew_int = -375.82 + 19.989 * xt$$

Based on the above analysis we can infer that the number of internet subscribers increased for the industry. The incumbents lost some telecom subscribers. From the date of entry, the new player gained telecom subscribers.

Change point analysis for internet subscribers

The Pettit test was used to find the breakpoint for the internet subscribers. Fig. 4 shows that for the incumbents, change point for revenue is $t=23$ ($Kt=344$, $p=0.000$, $F=78.245$, $p=0.00$). Whereas, for the telecom industry, the median distribution for revenue changed at $t=27$ ($=483$, $p=0.00$, $F=72.42$, $p=0.00$). The change point for a new entrant Reliance Jio overlaps with that of the industry at $t=27$ ($Kt=513$, $p=0.00$, $F=173.39$, $p=0.00$). Since both Pettit and Chow statistics are significant, the null hypotheses were rejected.

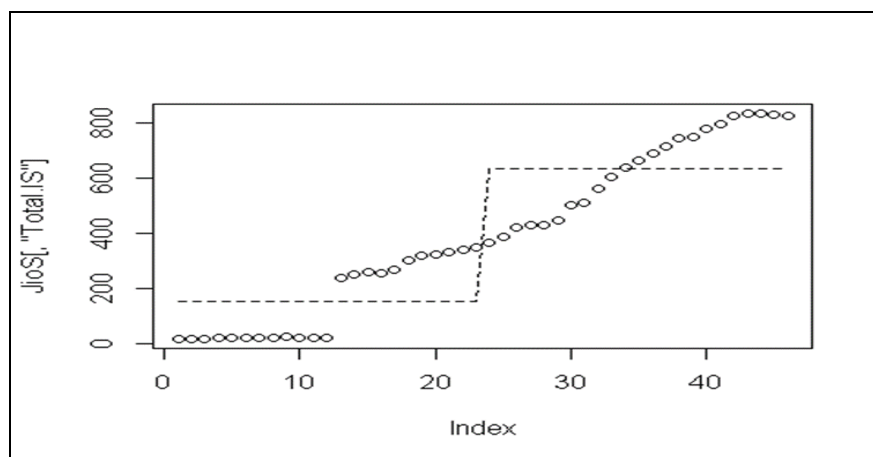


Figure 4. Breakpoint detection for internet subscribers for the industry

Source: Output of trend package

Analysis for Sales Revenue

The sales revenue for incumbents changed prior to new entrants at $t=23$. But, the revenue for incumbents and new entrants changed at $t=27$.

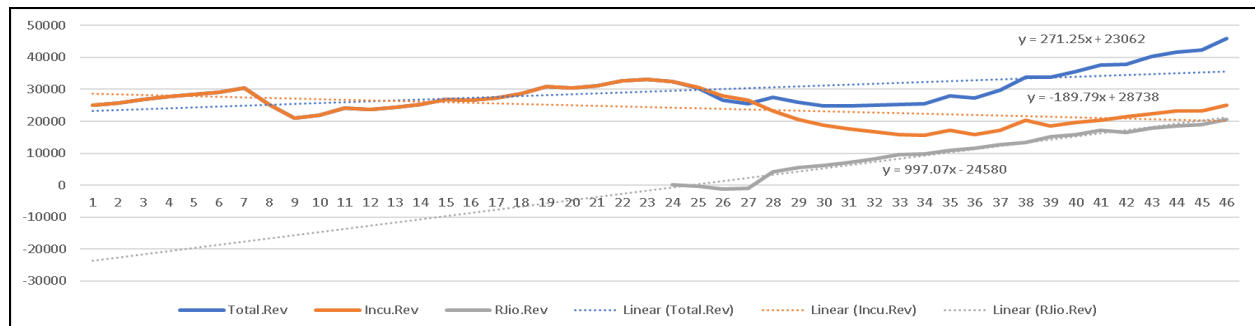


Figure 5. Break point analysis for industry revenue

Source: Microsoft Excel output

The figure 5 shows the revenue of the industry pre and post entry of a new player. The revenue of incumbents before the entry of the new entrant is the same as that of the industry. Post entry of the challenger firm, the revenue for incumbents has reduced and for the challenger (new entrant) the revenue has increased. However, the overall revenue of telecom industry has increased. The trend line for revenue is given by,

$$y_{ind_rev} = 23062 + 271.25 \cdot x_t$$

There is a growth in the revenue as the slope is positive with a value 271.25 for the given period. But for the incumbents there is a break in the trend line. As a result, two regressions are required,

$$y_{pre_rev} = 24295 + 245.29 \cdot x_t$$

pre-entry of new player

$$y_{post_rev} = 23933 - 217.99 \cdot x_t$$

post entry of the new player

The slope of the trendline for revenue is positive before the entry of the new player and negative after the new entrant's entry. Whereas, the slope for revenue of new player is positive,

$$y_{new_int} = -1647.8 + 997.07 \cdot x_t$$

Based on the above analysis we can infer that the overall revenue increased for the industry. The incumbents lost some revenue. From the date of entry, the new player started earning some revenue after four quarters.

Change point analysis for sales revenue

The Pettit test was used to find the breakpoint for the revenue of the telecom industry. Figure 6 shows that for the telecom industry, the median distribution for internet subscribers changed at $t=36$ ($Kt=344$, $p=0.000$, $F=78.245$, $p=0.00$). For the incumbents change point for revenue is at $t=27$ ($Kt=483$, $p=0.000$, $F=72.42$, $p=0.00$). The change point for a new entrant Jio overlaps with that of the industry at $t=27$ ($Kt=513$, $p=0.00$, $F=173.39$, $p=0.00$). Since both Pettit and Chow statistics are significant, the null hypotheses were rejected. The revenue for incumbents and new entrants changed at $t=27$. But, revenue of the industry changed at $t=36$.

DISCUSSION

We analysed data pertaining to telecom subscribers, broadband or internet subscribers and gross revenue of incumbent firms as well as the late entrant. The intent was to analyse whether there was a disruption in the telecom services market because of the entry of a new firm in an established market. Our study clearly reveals that the late entrant R-Jio was able to substantially increase its subscriber base in telecom and broadband services by using an effective strategy that resulted in phenomenal growth in its revenues. R-Jio offered full scale services to its customers and did not follow the path suggested by Christensen and Raynor, 2003, where a late mover entered with low-end disruption at the bottom of the market to gain a foothold and then moved up-market and finally dominated the entire market.

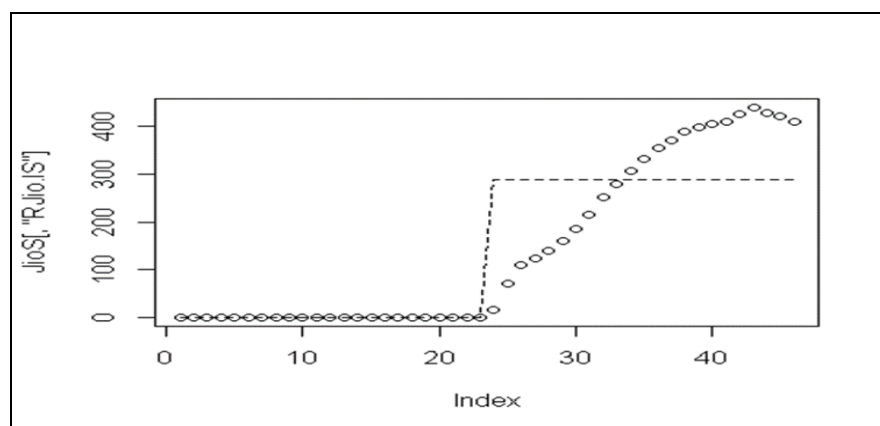


Figure 6. Breakpoint detection for sales revenue for the industry

Source: Output of trend package

Some studies (Benner and Tripsas, 2012; Kaplan and Tripsas, 2008) have found that incumbents ignore, to their long-term disadvantage, innovations that threaten their identities, templates and mental models. This is what incumbents did with the late mover R-Jio in the Indian telecom services market. They were confident of their

business model and hold on customers. They continued with their existing operations including marketing strategies ignoring the new entrant along with its different business model and eventually paid a heavy price.

Hsu and Cohen (2021) observed in their study that incumbents respond differently to innovations owing to several reasons like their customer orientation, channel relationships as well as technological and product development experiences. We also found that incumbent firms responded differently to the late entrant R-Jio. Bharti Airtel took the challenge upfront and worked on its 5G network and tried to project itself as a premium player but could grow only at a slower pace than the late entrant. Some of the incumbents like Vodafone and Idea merged to take on the competition but still performed miserably. While the rest continued their business as usual and remained unprofitable.

Some researchers (Kumarswamy et al., 2018; Ozalp et al., 2018) found that Christensen's approach to market disruption theory did not adequately address the dynamics of innovations made by, for example, Apple or Uber. Their innovations, besides being systemic, serve as a platform for others to build on, and tend to disrupt existing relationships among members of an industry and its ecosystem. We are also of the view that market disruption may not just be a function of product innovation but as a consequence of an entrant employing a distinct platform assisted by strong network effects. R-Jio's strategy utilized a bundle of services on its mobile service platform. These services included voice, data, OTT amongst others. The incumbents had to play a catch-up game.

This confirmed our thinking that a relational perspective on innovation (Teece, 1986) is required that highlights the critical role of complementary assets in successfully commercializing innovation. This view is further reinforced by other researches (Kumarswamy et al., 2018). Supporting this view is a study (Yoo et al., 2012) suggesting that digital innovations, characterized by convergence and generativity are blurring the boundaries between industries. As a consequence, platforms tend to be more successful in disrupting markets and posing a greater challenge for incumbents to retaliate. The same happened in the Indian telecom market as well where incumbents were focusing on few services like voice calls and offered internet as an extended service. R-Jio blurred the boundaries of the telecom services market by bundling voice calls, internet, live television, movies on demand, news and music streaming.

CONCLUSION

This study investigated whether there was market disruption in the telecom services market in India and if this was caused by a late entrant. Data for the analysis were collected from the website of the telecom regulatory authority of India (TRAI) for

the period 2010 to 2022. Clayton Christensen's three litmus tests were applied to three variables namely telecom subscribers, internet subscribers and sales revenues of the service providers. The first test/objective ascertained if there was a growth opportunity in the market. The second test/objective determined whether the new entrant succeeded in attracting customers away from incumbents. And, the last test/objective assessed if the incumbents in the market could counter the moves of the late entrant. The nonparametric Pettit test was used to detect change point in time series data and the Chows test was used to identify structural breaks in time series data.

The findings revealed that R-Jio, the new entrant cleared the three litmus tests proposed by Clayton Christensen, that there indeed was a growth opportunity, the new entrant succeeded in attracting customers to its services away from the incumbents and that the incumbents could not counter the moves of the late entrants. Thus, the study established that the late entrant had disrupted the telecom services market.

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