An Empirical Study on Selected Determinants of FDI in Telecom Sector of India

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Abstract

In India, today the Major percentage of GDP is from Service Sector in which Telecom Sector is amongst the top most contributors. FDI always remained center of attraction for the researchers from the point of view of its importance in economy. FDI policy is reviewed recurrently for making it capable of attracting more investment. Government adopted liberal policy under which 100% FDI is allowed through automatic route in many sectors, however in few cases Government intervention is remained intact. In spite of being liberal on FDI front, the Telecom Sector is unable to meet the desired targets of attracting FDI; this could be because of many factors which are deterrent to FDI in our economy. The present study will try to examine few such factors like corruption, Number of Mobile and landline subscribers to analyze their impact on FDI in Telecom Sector. Few results are meeting the expectations but other contrasting.

Keywords: FDI in Telecom Sector, Corruption, Mobile Phone Subscribers, Landline Subscribers & Multiple Regression Technique

JEL Classification: F21, F30 & O20

Introduction

So you have a telephone at your place, wow, it's a matter of pride and luxury.

Yes, this was the scenario in India until 1991, when there was only one phone over hundred individuals. The teledensity was very low when compared to countries like U.S., having one telephone over 47 individuals (Information Gatekeepers Inc., 2000).

The Government of India realized that to achieve the objective of rapid growth and development, it needs to put a special attention on Telecommunication Sector. It was anticipated in NTP 1999 by Government of India that going ahead the Telecommunication Sector will serve a major part of GDP.

Celebrating more than 150 birthdays after 1851, telecom industry converted itself from monopoly to oligopoly in India. At the time of Independence, in 1948 there were only 82000 subscribers with 321 exchanges having 100000 lines (Sridhar, 2012). In 1985 after the realization of Indian Government that the telecom industry is lacking behind, the new monitoring authority was constituted named as

Telecommunication Board and Department of Telecommunications (DoT).From first five year Plan (1951-56) to 10th five year plan (2002-07), the government expenditure on telecommunication raised from 47crore to 98968 crore. But in need of more capital, economic development, growth in international telecommunication, to break the bars of fixed lines and for moving towards more developed and competitive mobile services- liberalization was necessary (Sridhar, 2012).

Foreign Direct Investment

The Department of Industrial Policy & Promotion is responsible for the policy formulation on Foreign Direct Investment (FDI) and data management on FDI into India, based upon the remittances reported by the Reserve Bank of India.

FDI policy is reviewed recurrently for making it capable of attracting more investment. Government adopted liberal policy under which 100% FDI is allowed through automatic route in many sectors, however in few cases Government intervention is remained intact.

Earlier the FDI policy in Telecom sector was narrowed but after NTP 1994, when the crunch of foreign exchange was observed, FDI policy in Telecommunication sector was opened up (Green, 2009). Current FDI Policy in Telecommunication Sector is the liberal one, which is capable of attracting huge FDI in this sector. "All telecom services including Telecom Infrastructure Providers Category-I, viz. Basic, Cellular, United Access Services, Unified License (Access Services), Unified License, National/International Long Distance, Commercial V-Sat, Public Mobile Radio Trunked Services (PMRTS), Global Mobile Personal Communications Services (GMPCS), All types of ISP licenses, Voice Mail/Audiotex/UMS, Resale of IPLC, Mobile Number Portability Services, Infrastructure Provider Category-I (providing dark fiber, right of way, duct space, tower) except Other Service Providers are allowed for 100% FDI. 49% under the automatic route and beyond that 49% Government route is allowed" (Department of Industrial Policy and Promotion, 2017).

The FDI Inflows in earlier few years are:

Table: 1

FDI Inflows in Telecommunication Sector		
Year	Rs. Crore	US $ Million
2015-16	8,637	1,324
2016-17	37,435	5,564
2017-18(April'17 to September'17)	38,926	6,084

Source: Department of Industrial Policy and Promotion (Ministry of Commerce and Industry)

Mauritius, Singapore, Japan, Russia followed by USA is the countries from last 17 years which are investing high in Indian Telecommunication Sector.

Objectives of the Study

To examine Corruption, Number of Mobile Phone Subscribers and Number of Landline Subscribers as the determinants of FDI in Telecom Sector of India.

To analyze the impact of corruption, Mobile Phone Subscribers and Landline Subscribers on FDI in Telecom Sector of India.

To formulate a model based on Multiple Regression Analysis.

Literature Review

In 2006, a study on Pakistan Telecom sector was initiated in which researcher tried to determine the effect of determinants of FDI on Telecom Sector. Researcher

considered variables such as Market size (Country's GDP), Competition, Literacy Rate, Foreign Trade and Per Capita Income as explanatory variables whereas FDI in Telecom Sector as dependent variable. Researcher mentioned that the market size of the country is measured by GDP of the host country, competition is calculated as the total number of telephone, wireless, mobile companies per million of the people. Literacy rate was taken in percentage whereas foreign trade is the total of export and import each year. Per capita Income was considered in Rupees in million per capita. The Time Period for the study was 2000 Quarter1 to 2006 Quarter4 and for analysis, time series data was chosen. For statistical analysis Regression was applied by the researcher by following the equation:

$$LFDI\ JEL = \beta 0 + \beta 1\ LMS + \beta\ 2LCOMP + \beta\ 3LLR + \beta\ 4LFT + \beta\ 5LPCI + Q1 + Q2 + Q3 + ut$$

Where FDI: FDI in telecom sector of Pakistan

MS; Market Size

COMP: Competition

LR: Literacy Rate

FT: Foreign Trade

PCI: Per Capita Income

Regression was statistically significant with all positive signs but due to serial correlation ECM test was applied and it was found that all variables were statistically significant. Thus all Independent variables have positive effect on FDI in Telecom Sector. Even high competition also encouraged FDI. But now in India as the competition is reduced after the kingdom of Jio, therefore the Indian scenario need to be analyzed (Hashimet.al., 2006).

Being a research conducted in 2017 and published thereafter, it mentioned the increased cap of FDI in telecom sector i.e. 100% through automatic route and government route. The researcher tried to study the trends of FDI in India and in Telecom Sector. The hypothesis of examining the difference between country's FDI Inflow and Inflow in Telecom sector was concluded by mentioning that the FDI inflows were not constant, neither in country nor in telecom sector, moreover the percentage inflow in Telecom Sector is very less than the Percentage Inflow in Country. Also the coefficient of correlation between the two was 0.38 as per the study. When t-test was applied, it was found that the difference between FDI Inflow in India and in Telecom Sector is significant. The second hypothesis of differentiating between the growth of subscribers among internet users, telecom, broadcasting and cable services was tested by applying chi-square and concluded that the difference in there growth is significant. The third hypothesis of difference between the growth of subscribers of some major telecom companies like MTNL, BSNL, AIRTEL, VODAFONE, RELIANCE, IDEA, TATA and Unitech was resulted in a significantly different growth rates among all. The forth hypothesis which was concerning about the impact of growth of FDI on subscriber's base concluded that there isn't any significant impact. The researcher concluded that the role played by the FDI is submissive means it is only a focal capital source and not playing any significant role in the growth of the sector. He also mentioned that the reason behind it could be the underutilization of FDI in comparison to its cost (Parvez, 2018). Al-Sadig, A. (2009) mentioned in his research that the corruption is among one of the cost of doing business internationally which ultimately decreases the profits of the investing firms. The present study will try to examine its impact on FDI in Telecom Sector which will also generalize the study of Al-Sadig, A.

Another study (Kimura, F., Ando, M., &Fujii, T., 2004) conducted in Russia mentioned that the Number of Subscribers are not of any interest to the Foreign Investors, however the present study would try to separate number of subscribers into two parts which are mobile and landline subscribers and then examine its impact on FDI.

In a research conducted in 2014 the researcher mentioned in the very first Para of her study that there is no remarkable improvement in FDI in Telecom Sector, in spite of being the fact that India stand on second position after China in Telecom Network. The researcher presented mixed views on FDI. Researcher opined that there are many countries like China who are far ahead of India in Teledensity but have still maintained restrictions on its FDI Limit. Reasons are not defined for this but as the case of India; funds are constantly required for meeting growing demands which are not available in domestic market (Gopika, 2014).

This study (Balasubramanyam, 2002) analyses two issues of FDI which were determinants of FDI and preconditions for effective utilization of the same.

Determinants extracted from this study were Market Size which was reflected with the GDP growth rates, Resources like natural and human resources, Infrastructure, Macroeconomic stability reflected by exchange rates and inflation, Political Stability and Transparent policies. It mentioned that tax concessions are of little importance to the investors and there are some determinants which are beyond the control of policy makers but still the researcher mentioned that human resources like labor can be trained and educated. Another variable which is 'competition' is mentioned as the precondition for efficacy of FDI. The study also mentioned that for accurate measure of market

size, PCY should be calculated as Purchasing Power Parity rates of exchange. It also stated that corruption is a deterrent to FDI.

Another study conducted in 2015 discussed determinants which were GDP, Real Effective Rates of Exchange and Average Real Wages which are influencing FDI in India. Auto Regressive Distribution LAG AND VAR system was used as a statistical tool for determining the major tools of FDI. It concluded that Economic Performance Indicators which are GDP and Real Effective Rates of exchange are the true factors which attract FDI into India (Mahalakshmi, 2015).

Mudambi, R.,et.al. in 2013 in his study mentioned that economic reforms have a true impact on country's FDI not corruption. The study mentioned that the individual effect of corruption is unknown on FDI. The present study would try to acknowledge the same on FDI in Telecom Sector.

A 2016's study addressed the factors that are more significant in attracting FDI in BRICS countries. Statistical Technique followed was Random Effect Panel Data Regression model following the time period of 1990-2011. Again Like studies mentioned before the variables targeted were Market Size (GDP of economy or population size), trade openness (ratio of export added to imports divided by GDP), human capital (secondary school admissions were assumed to indicate educated and trained human capital), macroeconomic stability(inflation rate), infrastructure quality reflects development in the country reflected by railways, WTO accession ('0' assigned to Non Members and '1' to Members) and growth prospects(GDP Per Capita growth rates) against the explained variable FDI. It concluded that trade openness attracts high FDI therefore less restrictive trade policies are required. WTO accession is not an effective determinant of FDI inflow (Shah, 2016). Another study of Foreign Direct Investment stated that there is an insignificant relationship between Market Size and FDI, which is in contrast to few other studies (Holland, 1998). But the case of Indian Telecommunication Sector is yet to be discussed. Research in 2003 concluded that the impact of Human Capital is insignificant on FDI, however the case of Telecom Sector of India is yet to be discussed (Banga, 2003). There is no study which discussed the impact of Mobile Phone and Landline Subscribers base on FDI in Telecom Sector of India, however there are a few which discusses the impact of subscribers base on FDI in Telecom Sector (Azhar, S., & KN, M. (2012).

Research Methodology:

Exploratory cum descriptive research designs followed in this study (Creswell, J. W., et. al., 2003). The study is based on secondary data which has been obtained from the government and international bodies. Websites of World Bank, TRAI and RBI were the major source of data in the study. Three factors which were analyzed for having some impact on FDI in Telecom Sector were Corruption, Number of Mobile Phone Subscribers and Number of Landline Subscribers. For analyzing the effect of Corruption, Corruption Perception Index has been considered (Wilhelm, P. G., 2002). This Index is prepared by Transparency International, which is a global organization, working on eliminating corruption. Corruption Perception Index is an index of 180 countries based on their perceived level of corruption among public sector undertakings. It uses a scale of 0-100 stating that '0' stands for highly corrupt nation while '100' stands for very clean nation. Corruption Perception Index data for 1993 – 2018 is has been considered for the research. The reason behind not selecting two preceding years is that there is no data available for those years (Ahluwalia, M. S., 2002).

Second Predictor is the Number of Mobile Phone Subscribers. It was clearly visible and known that from the inception of the mobile phones, the number of its users remain increasing only. The reason behind dividing total number of subscribers in two parts namely mobile and landline is that the subscribers of landline phone are decreasing with the passage of time. The reason could be the obsoleteness of the landline phones and that their features are very less in comparison to the mobile phones.

FDI in Telecom sector in India from 1991 data has been retrieved from the DIPP (Department of Industrial Policy and Promotion) and TRAI (Telecom Regulatory Authority of India). The GDI policy came into effect from 1991 and then in the year 1993 the FDI really entered in the Indian Economy.

The target population under study is itself clear from the data of the study. The study is based on the data of years 1993-2018, which itself is the target time frame/population under study (Kothari, C. R., 2004). There is no data before and after this time limit available hence completeness of the data is justified. No technique of sampling was required because the study is based on complete enumeration method. SPSS was used for the analysis of data and Multiple Regression Techniques was applied for obtaining a Regression Model. All the assumption required for application of Multiple Regression was validated (Osborne, J., & Waters, E., 2002).

Analysis and Interpretation:

For formulating Regression Model on FDI in Telecom Sector following hypothesis were tested:

Hypothesis 1: Coefficient of Corruption is equal to zero (b1

= 0) Hypothesis 2: Coefficient of Mobile Phone Subscribers is equal to zero (b2 = 0) Hypothesis 3: Coefficient of Landline Subscribers is equal to zero (b3 = 0)

Table: 2 Descriptive Statistics

	Mean	Std. Deviation	N
FDI	7641.5623	11034.66998	26
CURR	31.7538	4.99922	26
MS	396270264.8	458298736.2	26
LS	29494721.84	11331258.79	26

The data is compiled for 26 years i.e for the years 1993-2018 which can be considered good from the point of view of this study as it covers the entire population rather than focusing on a sample of few years. The policy of 1991 initiated the process of inviting FDI in Telecom Sector and it started from the year 1993. Therefore the data studied in this research is from 1993 onwards. In Table: 2 CURR, MS and LS represents corruption in India, Mobile Phone Subscribers and Landline Subscribers in India respectively. Standard deviation which is a measure of absolute variation represents high variation in the data.

Table: 3 Correlations

		FDI	CURR	MS	LS
Pearson Correlation	FDI	1.000	-.773	.770	.084
	CURR	-.773	1.000	.208	.089
	MS	.770	.208	1.000	-.038
	LS	.084	.089	-.038	1.000
Sig. (1-tailed)	FDI	.	.000	.000	.341
	CURR	.000	.	.000	.333
	MS	.000	.300	.	.427
	LS	.001	.333	.427	.
N	FDI	26	26	26	26
	CURR	26	26	26	26
	MS	26	26	26	26
	LS	26	26	26	26

The correlation Matrix (Table: 3) reflects that all the predictors correlates best with the dependent variable i.e. FDI in Telecom Sector so it is expected that the variables may predict the FDI in Telecom Sector. However it can be seen that there two predictors- Landline Subscribers and Corruption are having the highest correlation among all the predictors but the value is nor that high neither significant. Therefore there is no multicollinearity in the data. Also in the Correlation matrix, none of the value of correlation between predictors and outcome or among predictors are greater than 0.9, therefore there is no multicollinearity in the model (Field A., 2009).

Hypothesis 4: R Square = 0 (Variation explained by three variable in the FDI in Telecom sector is equal to zero)

Table: 4Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.797[a]	.636	.586	7100.20760	.636	12.794	3	22	.000	1.727

a. Predictors: (Constant), LS, MS, CURR

b. Dependent Variable: FDI

In model summary table the value of R represents the correlation between the predictors and predicted variable. The value of R (.797) signifies that all predictors are correlated with FDI in Telecom Sector. The value of R-square is .636 states that 63.6% of variation in the dependent variable FDI in Telecom Sector is explained by Corruption, Mobile Phone Subscribers and Landline Subscribers.

Adjusted R Square which tells us about how well our model generalizes is .586 in this study. We like this value very close to the value of RSquare, which states that if the model were derived from another sample or population, even then it would account for only 0.05 of variance. Even if the Stein's Formula is applied than the value of adjusted R Square will be 0.599 which is very near to the observed value of R Square reflecting that the model also cross validates (Field A., 2013).

R Square change explaining whether the change in R Square is significant or not, yielded the value of .636 and also this change is nonetheless but the amount of variance explained, which is represented by the F- ratio 12.79.Since the p-value is less than 0.001 therefore it is highly significant. Hence the Null Hypothesis 4 has been rejected.

The assumption which has been checked for the model before any prediction is of independency of errors, for which Durbin Watson Statistics is derived. The value of Durbin Watson id 1.727, which is a good value to certify that the assumption of independent errors is met (Field A., 2013).

Table: 5 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1935013682.341	3	645004560.780	12.794	.000[b]
	Residual	1109084856.501	22	50412948.023		
	Total	3044098538.842	25			

a. Dependent Variable: FDI

b. Predictors: (Constant), LS, MS, CURR

The fit of the model has been assessed by using ANOVA. In ANOVA table the F value is 12.794 which is greater than 1 and also highly significant because the p-value associated with it is less than 0.001 therefore it can be concluded that the model significantly improves our ability to predict the FDI in Telecom Sector rather than not fitting it.

Table: 6 Coefficients

Model		Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-27162.634	19059.340	-1.425	.168	-66689.286	12364.018		
	CURR	-1109.132	709.629	1.563	.000[b]	-362.548	2580.811	.260	1.241
	MS	7.435	.000	.964	.000[b]	.000	.000	.261	1.201
	LS	.0001	.000	-.869	.000[b]	.000	.000	.912	1.096

a. Dependent Variable: FDI

The model can be defined as:

FDI in Telecom Sector = -27162.634 - 1109.132 Corruption + 7.435 Mobile Subscribers + 0.0001 Landline subscribers

The Corruption Perception Index of Transparency International is considered here to identify the effect of corruption on FDI in Telecom Sector. The Index provides a score out of 100 which states that the score of 100 means very clean Country and a score of zero means the country is highly corrupt. The value of -1109.132 states that if Mobile phone and landline subscribers are held constant then if Corruption increases by 1 unit then FDI in Telecom Sector will reduce 1109.132 units. Similarly, if Corruption and landline subscribers are held constant then if Mobile phone Subscribers increases by 1 unit then FDI in Telecom Sector will increase by 7.435 units. Also, if Corruption and mobile subscribers are held constant then if Mobile phone Subscribers increases by 1 unit then FDI in Telecom Sector will increase by 7.435 units.

For this model the Corruption, t (22) =1.563, p value = 0.000<0.001, Mobile Phone Subscribers t (22) = .964, p value = 0.000<0.001 and for Landline Subscribers t (22) = -.869, p value = 0.000< 0.001 are all significant predictors of FDI in Telecom Sector. Since all assumptions are met therefore these significance tests are true. Hence we can reject the null hypothesis 1, 2& 3 in favor of alternate hypothesis that b1, b2 & b3 are not equal to zero.

Thus from the magnitude of all predictors the model predicts that all the predictors are having impact on FDI in Telecom sector however the impact of corruption is negative. Mobile Phone Subscribers are having larger impact on the dependent variable instead of Landline line Subscribers, may be because of obsoleteness of the landline phones. It is also possible that may be in future some studies will target on smart phones or smart watches.

To assess the assumption of multicollinearity, Tolerance ad VIF Statistics are given in the table of Coefficients (Graham, M. H., 2003). Since all the values of Tolerance are above 0.2 and all the values of VIF are below 10, therefore we can conclude that there is no multicollinearity in this model (Field A.,2003).

Average VIF can also be calculated by applying the formula of Sum of VIFs divided by number of predictors which is equal to 1.16, very close to 1, therefore the assumption of multicollinearity is reassessed and it can be stated that the model is not affected by multicollinearity.

Table: 7Linear Model of FDI in Telecom Sector with predictors Corruption, Number of Mobile Subscribers and Number of landline subscribers

	b	Sig.
Constant	-27162.634	.168
Corruption	-1109.132	.000[b]
Mobile Phone Subscribers	7.435	.000[b]
Landline Subscribers	.0001	.000[b]

Limitation of the Study

The study is based on the years 1993 – 2018 i.e. from the commencement of the FDI till now. However the complete enumeration method is applied but still it seems that the number of years is less from the point of view of analysis. Also some kind of biasness is expected from the point of view of Transparency International in preparing Corruption Perception Index and also errors are possible in data collection by TRAI. In highly populated country like India, people may not inform correctly the number of mobile phones or landlines phones they owns.

Implications of the Study:

The Study will provide insights to the researchers and policy makers about few additional predictors of FDI in Telecom Sector which are known but not yet tested.The model proves that the corruption negatively impacts FDI in Telecom sector of India, thus if the GoI is targeting towards high growth in FDI then corruption needs to be checked beforehand. The index prepared by Transparency

International clearly indicated that the India is amongst the most corrupted nation. Moreover the increasing number of mobile phone users is impacting positively on FDI in Telecom Sector but the impact of Landline subscribers is very low, in fact negligible. Therefore it is also important that the focus of Telecom Companies should shift from Landline Phones to Mobile Phones. Recently Reliance Jio launched a scheme in which they are offering landline phones and wi-fi at a minimal rate in few regions of Delhi NCR and our country. But looking at the high impact of mobile phones in attracting FDI, the companies could have opted for such kind of a scheme in which the mobile phone subscriptions will increase.

Conclusion:

Indian Economy and specially Telecom Sector is rapidly growing and the urge for FDI is well known to the authorities. Although the major portion of total FDI in India comprises of FDI from Telecom Sector but still the sector authorities feels the need for attracting more FDI for growth of the sector. There are many studies available which states that GDP, Inflation, infrastructure, etc. impacts FDI in Telecom Sector but no study is available which considered corruption, mobile phone users and landline users as predictors of FDI in Telecom Sector. The impacts of three predictors are very different from each other. Corruption negatively effects FDI however increase in mobile phone subscribers attracts more FDI. The effect of landline subscribers is very negligible. Thus Policies are required to be framed keeping in view the eradication of corruption, not only for the Telecom Sector but from the whole nation. Schemes could also be launched from the point of view of increasing mobile phone subscriptions instead of focusing on Landline subscribers. There is also a chunk of population in our country who don't know how to operate mobile phones or who don't own any mobile phone. Telecom authorities can organize few programs for such individuals, to make them aware of the usage of mobile phones and also schemes can be launched to provide them access to mobile phone in cheaper rates.

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