Foreign Direct Investment in Telecommunication Sector of Pakistan: An Empirical Analysis

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Abstract

This study examines evidence concerning the empirical relevance between foreign direct investment (FDI) attraction in telecommunication sector of Pakistan and its determinative effects. In this paper, we focus on assessing the relative significance of the factors that may attract FDI in telecommunication sector by using regression analysis for quarterly data (2000Q1-2006Q4). FDI in telecommunication sector of Pakistan was taken as dependent variable. Market size, Competition, Literacy rate, Foreign trade and Per capita income were taken as independent variables. All variable showed their positive and significant impact on FDI in telecommunication sector of Pakistan.

Introduction

During 1980s, utility of telecommunication sector was globally recognized and it was considered as the pre-requisite for the economic growth. Thus gradually in all countries various telecom sector regulatory reforms like opening of boundaries for foreign direct investment (FDI), liberalization and privatization were introduced. Japan has low foreign direct investment in the past few decades especially in telecom sector but now this trend has changed. Share of FDI in telecommunication sector of the country was 0.9%, 16.2% and 12.3% in 1989-97, 1998-2003 and 1989-2003 respectively. There were some restrictions on foreign capital

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like foreign capital participation in Nippon Telegraph and Telephone Corporation (NTT).[1]

India started its liberalization process in telecommunication by allowing private competition in value added services in 1992 followed by the opening of cellular and basic services for local area to private competition. National Telecom policy, 1994 stated that license bidding process should be initiated to end the monopoly on basic telephone and mobile services. As a result India was divided into 21 telecom circles. One fixed operator other than department of telecom was allowed in each circle for the period of 10 years after which the situation was to be reviewed. In 1996 licenses were issued to 34 private companies to operate in 18 of the 20 circles opened for bidding. Foreign firms were allowed to hold up to 49 % of shares in private consortium. Investment of foreign firms in telecom sector of India enhanced gradually.[2] FDI in telecom sector of India was Rs. 9, 950.94. Rs.700 to 900 million FDI in telecom sector is expected in coming five years. Europe, Korea and Japan are showing their active participation in investment in telecom sector of India.[3]

Liberalization of telecom sector in Sri Lanka was started in early1980s. To solve managerial problems of Sri Lanka Telecom government welcomed foreign direct investment in 1996. Government transferred its 35% of Sri Lanka Telecom to NTT of Japan and handed over the management to them in 1997. In 1998 government of Malaysia increased foreign direct investment from 30% to 49% including telecommunication sector. Foreign investors in Malaysia can own on 30% shares in telecommunication sector. In February, 1998 foreign ownership was enhanced to 49% and even 61% in April 1998.[4] Foreign direct investment in transport and telecommunication sector arose greatly

in OECD countries from 1999(0.9%) to 2002 (15.7%).UK and USA received more FDI in transport and communication. Since 1990 the two countries almost attracted 60% of the OECD's countries total direct investment in this sector. FDI in the less developed countries' service sectors increased rapidly in the late 1980s and in early 1990s and increased FDI in telecommunication sector by US$ 84 billion.[5]

FDI in Pakistan is increasing year by year and have reached to US$ 5,124.9 million in 2006-07 as compare to US$ 484.7 million in 2001-02. However, it declined in 2007-08 i.e. US$ 3,038.8 million. Similarly rising trend in FDI in telecom sector was also observed from 2001-02 (US$ 6.1 million) to 2005-06 (US$1,905.1 million). However, decline in investment in telecom sector from foreign side was observed in 2006-07(US$ 1,824.3 million) and further in 2007-08 (US$ 811.6 million).[6] The main reason of this decline in FDI is the overall disturb political situation of the country, which has discouraged the foreign investors. Details of overall FDI and FDI in telecom sector of Pakistan are given in table 1:

Table 1: Foreign Direct Investment in Pakistan (US $Million)

Years	Total FDI	FDI in Telecom Sector	Telecom Share (%)	Overall FDI Growth (%)	Telecom FDI Growth (%)	Telecom share in GDP (%)
2001-02	484.7	6.1	1.3	-	-	1.6
2002-03	798	13.5	1.7	64.6	121.3	1.7
2003-04	979.9	207.1	21.1	22.8	1,434.1	1.7
2004-05	1,524.0	494.4	32.4	55.5	138.70	1.8
2005-06	3,521.0	1905.1	54.10	131.03	285.33	2.0
2006-07	5,139.6	1,824.3	35.66	45.96	(4.24)	-
2007-08	3,038.8	811.6	26.70	(40.87)	(55.51)	-

Source: PTA, Annual Reports, (2005-06, 2007-08), Economic Survey of Pakistan, (2005-06, 2007-08)

Major FDI in telecommunication sector of Pakistan has been come from cellular companies like Mobilink, Paktel, PakCom, Warid and Telenor. Paktel and PakCom, (Malaysian based) entered in Pakistan in 1990, Mobilink (Egypt based) in 1994, Telenor (Norway based) and Warid both in 2005.

This study is mainly conducted to show the significance of various factors that can stimulate the FDI in telecommunication sector of Pakistan. This study is organized as follows: This study is organized as follows:

- Review of literature by including the theoretical and empirical findings.
- Description of research methodology and about dependent and independent variables.
- Regression results and their interpretation and analysis.
- Conclusion.

Literature Review

Here we take review of few important studies:

Shah & Ahmed (2004)[7], empirically investigated the determinants of foreign direct investment in Pakistan, using time series data for the period from 1961-2000. He used following model:

$$RFDI_t = \beta_0 + \beta_1 CCFA + \beta_2 PCGNP + \beta_3 TARIFF + \beta_4 CRGDP + \beta_5 REXPTC + \beta_6 DM1 + ut$$

Where

RFDI = Real FDI annual flows in Pakistan at time "t"

CCFA = Unit cost of capital for foreign firms

PCGNP = Per capita GNP in terms of US$

TARIFF = Incidence of import duty

CRGDP = Change in real GDP

REXPTC = Real expenditures on transport and communication by the public sector

DM1 = Dummy capturing the effects of ruling regimes, D=1 for democratic government and 0 otherwise.

Results indicate that FDI flows in Pakistan have long run relationship with the factors like market size, cost of capital, expenditures on transport and communication and political stability.

Gholami et al (2006)[8], examined the causal relationship between information and communication technology (ICT) and foreign direct investment by using a sample of 23 countries for the period from 1976-1999. They used both time series and panel data analysis methods including least square, dummy variables and instrumental variable estimation methods. Results indicate that there is no long run co-integration relation between FDI and ICT in most of the countries like Denmark, Japan, Malaysia, Singapore and Norway. So they conclude that in developed countries ICT contribute positively towards economic growth but developing countries require to develop the ICT infrastructure to attract FDI.

Agiomigianaks et al (2006)[9], examined the determinants of FDI in 20 OECD countries for the period from 1975-1997. Empirical study reveals the positive impact of highly educated and trained labor force. Results also indicate that GDP and openness to trade are significantly correlated with FDI in OECD countries. Theses factors are expected to enhance the attractiveness of host countries.

Zaman et al (2006)[10], empirically investigated the economic determinants of FDI in Pakistan for the period from 1971-2003. Results indicated that unit labour cost, inflation, market size, and trade balance revealed their significant impact, while service sector showed its insignificant contribution towards FDI.

Methodology

FDI in telecom sector of Pakistan was started in 1990. FDI in this sector has greatly increased after 2000. This study mainly deals with the major determinants of FDI in telecom sector of Pakistan. Model used in this study is based on the work of Shah & Ahmed (2004).[11] For this study time series data have been taken from 2000-2006 on quarterly bases, keeping in view of data availability.

The functional equation is based on theoretical formulation, developed earlier in this section. The equation is given in log –linear form as:

$$LFDI\ TEL = \delta_0 + \delta_1\ LMS + \delta_2\ LCOMP + \delta_3\ L\ L.R + \delta_4\ LFT + \delta_5\ LPCI + Q_1 + Q_2 + Q_3 + ut$$

Where

FDI TEL= Foreign Direct Investment in Telecommunication Sector

MS= Market Size

COMP= Competition

L.R= Literacy Rate

FT= Foreign Trade

PCI= Per Capita Income

It is hypothesized that

$\partial L\ FDI\ TEL / \partial L\ \delta_1\ MS > 0$ $\partial L\ FDI\ TEL / \partial L\ \delta_4\ FT > 0$

$\partial L\ FDI\ TEL / \partial L\ \delta_2 COMP > 0$ $\partial L\ FDI\ TEL / \partial\ \delta_5\ LPCI > 0$

$\partial L\ FDI\ TEL / \partial\ \delta_3\ L\ L.R > 0$

Specification of Variables

Dependent Variable

FDI in telecom sector (FDI TEL) is taken as dependent variable. Data for FDI in telecom sector has been taken from various issues of PTA annual reports (2005-06, 2006-07)[12].

Explanatory Variables

Market size (MS), Competition (COMP), Literacy rate (L.R), Foreign trade (FT), Per Capita Income (PCI) are taken as independent variables.

The host country gross domestic product measures market size.

Competition is measured as total number of telephone, mobile and wireless local loop companies per million of the people.

Data for literacy rate has been taken in percentage.

Foreign trade is the sum of total exports and total imports of the country each year.

Data for per capita income is taken in Rs. in millions per capita.

Data for all independent variables have been taken from various issues of Economic Survey of Pakistan (2001-02, 2003-04, 2005-06)[13].

Regression Results And Analysis

The empirical investigation on the determinants of foreign direct investment in telecommunication sector of Pakistan uses quarterly data (2000Q1-2006Q4). Various summary statistics, correlation and results of Augmented Dickey fuller (ADF) Test and regression results are given below.

Table 2: Summary Statistics (Sample period: 2000Q1 to 2006Q4)

Variable(s)	*LFDI TEL*	*LMS*	*LCOMP*	*LLR*	*LFT*	*LPCI*
Maximum	5.5290	14.4916	2.9332	2.7657	13.1602	9.4458
Minimum	0.18648	11.7314	4.9240	2.4660	12.4064	8.8346
Mean	2.3428	13.7507	-3.7607	2.5903	12.7863	9.0936
Std. Deviation	2.2012	0.87666	0.91510	0.10013	0.26459	0.21192
Coef of Variation	0.93956	0.063754	0.24333	0.038656	0.020693	0.023305

Table 3: Correlation between Lfdi Tel and Other Variables

	L FDI TEL	L MS	L COMP	L LR	L FT	L PCI
L FDI TEL	1.0000					
L MS	0.47937	1.0000				
L COMP	0.80204	0.11248	1.0000			
L LR	0.95746	0.41567	0.76449	1.0000		
L FT	0.95382	0.34565	0.84799	0.95333	1.00000	
L PCI	0.97274	0.37805	0.81522	0.99566	0.96542	1.00000

Table 4: Results of Adf Test

Variables	Level/Difference	Without trend	Conclusion
FDI TEL	Level	-0.43970	
	First Difference	-5.1565	I(1)
MS	Level	-1.6947	
	First Difference	-4.4801	I(1)

COMP	Level	-1.4414	
	First Difference	-4.6564	I(1)
LR	Level	0.0073829	
	First Difference	-5.6881	I(1)
FT	Level	-0.74628	
	First Difference	-5.0460	I(1)
PCI	Level	-0.13350	
	First Difference	-5.8662	I(1)

95% critical value for ADF Statistics for all variables: -3.0039(without trend)

Regression Results (2000Q1- 2006 Q4)

Table 5: Dependent Variable: FDI Telecom

Variables	*Coefficient*	*t-Statistics*
Constant term	-289.9511	-9.3995
L Market size	0.23328	2.1203
L Competition	1.2547	3.9189
L Literacy rate	95.0991	8.5042
L Foreign Trade	1.3746	2.4564
L Per Capita Income	56.8853	9.3803
Q1	0.00	None
Q2	0.00	None
Q3	0.00	None
R^2	0.99761	
Adjusted R^2	0.99661	
D.W	0.72619	
No. of Observations	28	

Table 6: ECM Results

Variables	*Coefficient*	*t-Statistics*
Constant term	-295.7440	-11.1542
DL Market size	0.20477	2.2208
DL Competition	1.3024	4.7607
DL Literacy rate	97.3655	10.0201
DL Foreign Trade	1.4289	3.1705
DL Per Capita Income	58.1151	11.0035
Q1	0.0029786	0.084363
Q2	-0.9929E-3	-0.030108
Q3	-0.9929E-3	-0.030108
PP(-1)	0.67012	3.5404
R^2	0.99858	
Adjusted R^2	0.99783	
D.W	1.74	
No. of Observations	27	

The empirical investigation on determinants of FDI in telecommunication sector of Pakistan uses time series data has been taken for the period from 2000-2006 (on quarterly basis).

Various summary statistics and correlation are shown in tables 2 and 3 respectively. In order to determine the order of integration of variables, ADF test (table 4) was employed for unit roots to find out that the variables are concluded to be integrated of the same order. ADF test shows that all variables have stationarity in the levels of 95% critical values without trend. All variables were in first difference. Thus from the Unit Root test we conclude that all of the variables are integrated of order 1(1).

Regression result (table 5) shows that all variables were found statistically significant with positive sign at 1% level of significance. R^2 and adjusted R^2 were 0.99. But serial correlation lies so Error Correction Model (ECM) (table 6) was applied. After applying ECM all variables were significant with the same sign. No serial correlation lies and residual also found significant. Result also indicates that the rate of adjustment was 67%. All results were obtained, as they were hypothesized so null hypothesis is rejected.

Conclusion

The central attention area of this paper was the study of factors that stimulate the FDI in telecommunication sector of Pakistan. No one can ignore the importance of investment in telecommunication sector, since this issue is nowadays gaining popularity throughout the world. There are many research studies throughout the world on various issues of telecommunication and FDI in telecommunication sector. Researchers have done a lot of work on the impact of competition, regulatory reforms and privatization etc on telecom sector's efficiency. Unluckily, this sector of economy in Pakistan has little bit ignored from research view point, although it has received a bulk of FDI especially in the last seven years. This study is mainly conducted to study the determinants of FDI in telecommunication sector of Pakistan. For the purpose of analysis time series data has been chosen (2000Q1-2006Q4). Regression result shows that all variables were found statistically significant with positive sign at 1% level of significance. But serial correlation lies so ECM was applied. After applying ECM all variables were significant with the same sign. No serial correlation lies and residual also found significant. This indicates that FDI in telecom sector of Pakistan has greatly enhanced with the rise in literacy rate and per capita income. With the rise in

domestic and foreign trade demand for telecom services have also increased to minimize transaction cost and for quick and cheapest communication. Competition has further encouraged foreign investors to make heavy investment to meet rising demand of the growing population. This is because of the fact that they have enhanced their investment in both rural and urban areas of the country. So it is concluded that market size, competition, literacy rate, foreign trade and per capita income, all have very strong impact and are playing an essential role in stimulating the FDI in telecom sector of Pakistan.

End Notes

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