

# Major Determinants of Investment in Emerging Markets: A Case Study of Telecommunication Sector of Pakistan

Dr. Shumaila Hashim

Associate professor, Dept of Business Administration, Gomal University, D.I.Khan

Furqan Khan

MS in Computer Science (M.phil Scholar) Gomal university, D.I.Khan

Afnan Khan

P.hD scholar in Management Sciences. Gomal university, D.I.Khan

Shahneela Khan

Lecturer in statistics Department. Gomal university, D.I.Khan

## Abstract

As early as 1980s telecommunication sector's importance was recognized and assumed that advancement in telecom sector is a pre-requisite to economic development especially in developing countries of the world. This was started with various reforms like opening of boundaries for foreign direct investment, liberalization and privatization of the economies. This paper empirically investigates some of the major determinants of investment in telecommunication sector of Pakistan using time series data for the period from 1980 to 2006. Investment in telecommunication sector is taken as dependent variable while market Size, investment in financial sector, investment in education sector and foreign trade are the explanatory variables of the model. By using the multiple regression model in log-linear form we obtained the results (co-efficient given in the text) in which market size (0.31682), investment in education sector (0.25424) and foreign trade (0.39621) are playing significant role while the impact of investment in financial sector is insignificant. This study shows that investment in telecommunication sector increases whenever there is increase in trading activities as well as when the market size and investment in education sector is enhanced.

**Keywords:** Emerging markets, telecommunication sector, market size, investment in financial sector, Pakistan.

**JEL Classification:** C13, C22, C87, F41, G15, L96,

## I. INTRODUCTION OF EMERGING MARKETS IN TELECOMMUNICATION SECTOR

Strong overall infrastructure plays a very important role in the development of a country. Infrastructural investments make significant contribution towards favorable investment climate, poverty reduction and overall economic growth. Telecommunication is an important sector of economy, is now growing very fast in all countries in the world. The primary economic benefit of advanced telecommunication set up is improved efficiencies in all sectors of economy. The primary benefits include reduced transport cost, improved marketing information and increasing efficiency of industrial production. In all sectors of economy like agriculture, manufacturing and services advanced telecommunication system are becoming an integral part of business operations.

Telecommunication sector is not only playing an important role in developed countries of the world but also contributing significantly to the emerging economies of the developing world such as India, China, Malaysia and Pakistan etc.

Japan has low foreign direct investment in the past few decades especially in telecom sector but now this trend has changed. Total FDI in manufacturing industry was of 31.8% while on non-manufacturing side, it was 68.2% for the period 1989-2003. Share of FDI in telecommunication sector of the country was 0.9%, 16.2% and 12.3% in 1989-1997, 1998-2003 and 1989-2003 respectively. There were some limitations on foreign capital like foreign capital participation in Nippon Telegraph and Telephone Corporation (Paprzycki and Fukao, 2005).

According to International Telecommunication Union (ITU) data base, in 2001 annual investment in telecommunication sector in Asia Pacific region increased from amounted US\$ 45 billion in 1993 to over US \$80 billion, reaching in total more than US\$ 600 billion for the whole period, just under 40% of investment in world telecommunication sector. The investment rose to US\$74 billion in 1996. But great decline (US\$65 billion) was observed in 1997 due to Asian Economic Crisis and then started recovery. Taking the mean of annual investment 1998-2001, as a percentage of mean for the whole period, China showed tremendous growth of 60%. Taiwan was at 35% while Australia, India, Nepal, South Korea and Sri Lanka were between 13% and 17%. China showed little influence of cyclical growth. Less than 20% of investment in China's telecommunication sector came from foreign sources such as vendor credits, development loans etc. Around 40% of investment came from installation and connection fee. China-China foreign scheme was adopted by China Unicom to attract

foreign investment and advanced technology especially from Western companies. In 1997 investment in telecommunication sector was greatly declined and improved afterward. Australia's growth of investment in telecommunication sector remained quite steady while South Korea was growing at that time. Hong Kong, Japan, Macau, New Zealand, Philippines, Singapore, Thailand and Bangladesh badly affected during 1997 crises. Thus showed a great decline in annual telecommunication investment from 1994 and then rose gradually from 1998. Indonesia, Malaysia and Pakistan's annual telecommunication investment rates were fell to 61%, 83% and 59% respectively. Cambodia at the same time opened its boundaries for investment in telecommunication sector and obtained good results (Ure, 2004).

Liberalization of telecom sector in Sri Lanka was started in early 1980s. 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. Incredible improvement was observed in Sri Lankan Telecom sector during 8 years periods that is between 1996 and 2002. The number of fixed line subscribers was increased to 883,108 in 2002 from merely 255,049 in 1996. Similar upward trend was also observed in case of mobile phones where the number of subscribers was reached to 931,580 in 2002 from just 71,029 in 1996 (Venugopal, 2003).

In 1998 government of Malaysia improved foreign direct investment from 30% to 49% in all sectors including telecommunication sector. Foreign investors in Malaysia can own 30% shares in telecommunication sector. In February, 1998 foreign ownership was enhanced to 49% and even 61% in April 1998 (Venugopal, 2003).

India started its liberalization process in telecommunication sector by allowing private competition in value added services in 1992. At the same time cellular and basic services were opened 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 (Venugopal, 2003).

With more than 270 million connections, India's telecommunication network is the third largest in the world and the second largest among the emerging economies of Asia. The telecom sector continued to register significant growth during the year and has emerged as one of the key sectors responsible for India's resurgent economic growth. FDI in telecom sector has also increased. The total FDI equity inflows in the telecom sector from August 1991 up to July 2007 have been Rs. 20,718 crore which is 8.1 % of the total FDI equity inflows into India during the period (Economic Survey of India, 2007-2008).

Table 1 is showing the growth of Indian telecom industry.

**Table 1 Growth of Indian Telecom industry (in Million)**

Items	Mar.2004	Mar.2005	Mar.2006	Mar.2007	Dec.2007
Fixed lines	40.92	41.42	40.23	40.77	39.25
CDMA	9.46	15.92	32.67	44.62	61.40
GSM	26.15	41.03	69.19	120.47	172.23
Wireless (CDMA and GSM)	35.61	56.95	101.86	165.09	233.63
Gross total	76.53	98.37	142.09	205.86	272.88
Annual growth (%)	40.0	28.5	44.4	44.8	-

Source: Economic Survey of India, (2007-2008)

Table 2 is showing a view of regional teledensities, out of these countries Pakistan has high teledensity.

**Table 2 Regional teledensities (%)**

Countries	2003	2004	2005	2006	2007(April)
Pakistan	4.3	6.3	11.9	26.2	40.2
India	7.1	8.9	11.5	12.8	15.4
Sri Lanka	12.7	16.6	23.4	29.0	37.0
Bangladesh	1.6	2.0	4.5	9.0	15.0
Nepal	1.8	2.0	3.0	3.5	6.5

Source: Economic Survey of Pakistan (2006-2007)

Mobile density is increasing year by year as shown in table 3

**Table 3 Mobile penetration of regional countries (%)**

Countries	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Hong Kong	115.6	123.1	124.4	137.2	140.9
Singapore	84.0	93.7	100.7	109.5	121.9
Malaysia	54.6	60.1	76.8	-	87.8
Pakistan	5.7	14.0	22.2	40.1	55.6
Sri Lanka	11.3	17.1	17.4	21.5	-
India	4.3	6.8	8.1	11.3	20.7
Bangladesh	2.0	3.9	7.8	19.83	24.9
Nepal	0.33	0.98	1.5	5.26	-

Source: Pakistan Telecommunication Authority, Annual report (2005-2006, 2007- 2008)

Pakistan, has greatly invested over the past two decades in this field to improve its infrastructure. In 1947, in Pakistan there were only 14,000 operational telephone lines. Primarily the telegraph and telephone services were separated from the postal department in 1962. The telegraph and telephone department was converted into Pakistan Telecommunication Corporation on December 15, 1990. Later on, as a part of deregulation policy, the telecommunication industry was reorganized into various sub organizations like Pakistan Telecommunication Authority (PTA) in Jan 1997, The National Telecommunication Corporation (NTC) in 1996 and the Frequency Allocation Board (FAB). The Pakistan Telecommunication Company limited (PTCL) was established in 1996. More recently part of PTCL has been privatized (26% shares to Etisalat Company) (Ahmad et al, 2006). The promulgation of telecom sector (reorganization) act in 1996 laid the foundation for the development of telecom sector in Pakistan. This has encouraged many foreign investors for investment in Pakistan. Mobile services have started in Pakistan in 1990 and nowadays Paktel, Mobilink, Ufone, Telenor and Warid are competing in cellular industry.

Foreign direct investment in telecom sector was also increased from 2001-2002 (US\$ 6.1 million) to 2005-2006 (US\$1,905.1 million). However, decline in investment in telecom sector from foreign side was observed in 2006-2007(US\$ 1,824.3 million) and further in 2007-2008 (US\$ 811.6 million) [(PTA, Annual Reports, 2005-2006, 2006-2007), (Economic Survey of Pakistan, 2005-2006, 2007-2008)]. Overall growth of telecommunication sector in 61 years can be judged from the table 4.

**Table 4 Growth of telecommunication industry**

Year	Telephone Connections (ooo, No)	Internet Connections (ooo, No)	Cities with internet Connections	No. of PCOs	Mobile Phones
1947-48	12.4	-	-	-	-
1949-50	14.2	-	-	-	-
1959-60	60.1	-	-	355	-
1969-70	149.00	-	-	683	-
1979-80	336.3	-	-	1,634	-
1989-90	922.5	-	-	3,393	-
1995-96	2,376	-	-	9,410	68,038
1999-2000	3,124	500	-	10,400	306,463
2000-01	3,340	800	-	66,968	742,606
2001-02	3,656	1,000	-	97,751	1,698,536
2002-03	4,940	1,600	1,350	139,493	2,404,400
2003-04	4,460	2,000	1,898	180,901	5,022,908
2004-05	5,191	2,200	2,210	217,597	12,771,203
2005-06	5,128	2,400	2,389	353,194	34,506,557
2006-07	4,806	3,500	2,419	387,490	63,160,874
2007-08	4,546	3,700	3,002	449,121	88,019,812
Jul-Mar 2008-09	3,700	3,700	3,002	384,187	91,442,411

Source: Pakistan Economic Survey, (1987-1988, 2003-2004, 2008-2009)

The purpose of this paper is to highlight those factors that help to stimulate the investment in telecommunication sector of Pakistan. Section II reviews the literature by including the theoretical and empirical findings from the past studies. Section III describes research methodology and about dependent and independent variables. Section IV explains regression results and analysis. Finally the section V provides some concluding remarks.

## II. LITERATURE REVIEW

The significance of investment in telecom sector is recognized by various studies. Let we review the most outstanding research studies.

Hashim et al (2009), empirically investigated the determinants of FDI in telecommunication sector Pakistan for the period from 2000Q1-2006Q4. They used following model:

$$\text{LFDI TEL} = \alpha + \beta_1 \text{LMS} + \beta_2 \text{LCOMP} + \beta_3 \text{L.LR} + \beta_4 \text{LFT} + \beta_5 \text{L PCI} + \text{Q1} + \text{Q2} + \text{Q3} + \text{ut}$$

Where

<b>FDI TEL</b>	= Foreign Direct Investment in Telecommunication Sector
<b>MS</b>	= Market Size
<b>COMP</b>	= Competition
<b>LR</b>	= Literacy Rate
<b>FT</b>	= Foreign Trade
<b>PCI</b>	= Per Capita Income

Results indicated the positive and significant impact of all independent variables on foreign direct investment in telecommunication sector of Pakistan.

Contessi (2004) extended Mattoo, Oralleaga and Saggi work to model FDI in the telecommunication sectors of transition and developing economies by considering explicitly a demand function with network externalities and capacity constraints. In this three-stage game the government decided how to liberalize, either through acquisition of national monopolists or direct entry of new operators, while the multinational corporations decide on capacity expansion and on technology transfer. Empirical study on a panel of 46 transition and emerging economies for the period from 1989-2000 was conducted. The results show that privatization processes are significantly correlated with increases in teledensity and also the foreign participation in the incumbent generates positive benefits.

Riaz (1997, a, b), studied the effect of telecom sector on economic development in Malaysia and found that advancement in telecommunications infrastructure resulted in overall economic development of the country.

Antonelli (1996), studied the Italian market for the period from 1985-1988. Antonelli (1996) observed that manufacturers were well equipped with advance telecommunication instruments, significantly enhanced their productivity by minimizing the information cost and by making quick and timely contacts with stakeholders.

Garbade and Silber (1978), studied the performance of financial markets after introducing advance communication technology. Garbade and Silber (1978) arrived at the conclusion that advances and effective telecommunication network ensures price stability in the stock markets. Since flow of information becomes quick.

Hirschman (1967), examined various development projects. Hirschman (1967) found that a credit market for the coffee trade developed in Ethiopia after the installation of a long distance telephone networks. So he recognized the importance of telecom infrastructure in trade development.

## III. RESEARCH METHODOLOGY

This work is based upon the model of Hashim et al (2009) who studied the determinants of FDI in telecommunication sector of Pakistan. Here it is used in modified form. For this study time series data have been taken for the period from 1980-2006.

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

$$\text{LIT} = \delta_0 + \delta_1 \text{LMS} + \delta_2 \text{LIF} + \delta_3 \text{LIE} + \delta_4 \text{LFT} + \text{ut}$$

Where

<b>IT</b>	= Investment in Telecommunication Sector
<b>MS</b>	= Market Size
<b>IF</b>	= Investment in Financial Sector
<b>IE</b>	= Investment in Education Sector
<b>FT</b>	= Foreign Trade
<b>ut</b>	= Error term.

**It is hypothesized that**

$$\begin{aligned} \partial \text{LIT} / \partial \text{L} \delta_1 \text{LMS} &> 0 & \partial \text{LIT} / \partial \text{L} \delta_3 \text{LIE} &> 0 \\ \partial \text{LIT} / \partial \text{L} \delta_2 \text{LIF} &> 0 & \partial \text{LIT} / \partial \text{L} \delta_4 \text{LFT} &> 0 \end{aligned}$$

### Specification of variables

#### Dependent variable

*Investment in telecommunication sector (IT)* is taken as dependent variable. Investment in transport and communication sector is taken as a proxy for investment in telecommunication sector. Data for investment in

transport and communication sector has been taken from various issues of Economic Survey of Pakistan (1987-1988, 2001-2006).

***Explanatory variables***

Details of independent variables are as follows:

**Market size (MS)** Domestic market characteristics expressed by the market size, measured by the host country gross domestic product.

**Investment in financial sector (IF)** Financial Sector is the large subscriber of telecom sector. Investment in finance and insurance is taken as a proxy for investment in financial sector.

**Investment in education sector (IE)** is the new variable that was not considered earlier by any researcher as per our studies. Now Pakistan's literacy rate is 53%, out of which 65% are male and 40 % are females. Literacy rate is higher in urban areas that is 71% than 44% in rural areas (Pakistan Social and Living Survey, 2004-2005).

**Foreign trade (FT)** is very important factor. Foreign trade is the sum of total exports and imports.

Data for all independent variables have been taken from various issues of economic survey of Pakistan (1987-1988, 2001-2006).

**IV. REGRESSION RESULTS AND ANALYSIS**

This section deals with the results and interpretation of major determinants of total investment in telecommunication sector of Pakistan. Various summary statistics, correlation table, results of Augmented Dickey Fuller (ADF) test and regression results are given below:

**Table 5 Summary statistics (sample period: 1980-2006)**

Variables	L IT	L MS	L IF	L IE	L FT
Mean	10.0136	10.4979	7.3564	9.7704	12.0810
Std. Deviation	1.4893	0.58880	2.2525	1.6412	1.5505
Coef of Variation	0.14873	0.056088	0.30620	0.16797	0.12835

**Table 6 Correlation between IT & other variables**

	L IT	L MS	L IF	L IE	L FT
L IT	1.0000				
L MS	0.42223	1.0000			
L IF	0.87421	0.19096	1.0000		
L IE	0.98606	0.38552	0.89968	1.0000	
L FT	0.96203	0.29009	0.92366	0.97255	1.0000

**Table 7 Results of ADF test**

Variables	Level/Difference	Without trend	Conclusion
LIT	Level	-1.91180	I(1)
	First difference	-6.8096	
LMS	Level	-2.0291	I(1)
	First difference	-6.4433	
LIF	Level	1.0119	I(1)
	First difference	-6.2097	
LIE	Level	-3.2989	I(0)
LFT	Level	-2.6396	I(1)
	First difference	-7.8625	

95% critical value for ADF Statistics for all variables: -2.9499(without trend)

**REGRESSION RESULTS (1980-2006)**

**Table 8 Dependent variable: L IT**

Variables	Coefficient	t-Statistics
Constant term	3.9167	2.6285
L Market size	0.19465	2.2778
L Investment in financial sector	0.015741	0.31136
L Investment in education sector	0.60619	4.1492
L Foreign trade	0.20296	1.3828
R <sup>2</sup>	0.95128	
Adjusted R <sup>2</sup>	0.94243	
D.W	1.4953	
No of observations	27	

**Table 9 ECM results**

Variables	Coefficient	t-Statistics
Constant term	6.1848	5.0123
DL Market size	0.31682	4.5219
DL Investment in financial sector	0.019358	0.51103
L Investment in education sector	0.25424	2.0241
DL Foreign trade	0.39621	3.5580
PP(-1)	0.20514	1.2058
R <sup>2</sup>	0.96954	
Adjusted R <sup>2</sup>	0.96192	
D.W	2.0283	
No of observations	26	

The empirical investigation on the determinants of investment in telecommunication sector of Pakistan uses time series data has been taken for the period from 1980-2006. Various summary statistics (table 5) and correlation between variables (table 6) was calculated. In order to determine the order of integration of variables, Augmented Dickey Fuller (ADF) test (table 7) 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 except investment in education sector (IE) that was at level. Thus from the Unit Root test we conclude that all of the variables are integrated of order I(1) except IE that is integrated of order I(0).

Ordinary Least Square (OLS) estimation (table 8) was applied on data for the period from 1980-2006. Results indicated that only two variables MS and IE were positively significant. R<sup>2</sup> and adjusted R<sup>2</sup> were 0.95 and 0.94 respectively. Due to serial correlation, an error correction model (ECM) (table 9) was applied. After applying ECM results revealed improvement by indicating the positive and significant impact of foreign trade (FT) on investment in telecommunication sector along with other variables like MS and IE. Impact of investment in financial sector (IF) still remained ineffective. R<sup>2</sup> and adjusted R<sup>2</sup> were raised to 0.96. No serial correlation lies and residual showed 20% rate of adjustment.

**V. CONCLUSION**

The central attention area of this study is to check the impact of some factors in stimulating the investment in telecommunication sector of Pakistan. In Pakistan there is little empirical work available on this burning issue. This paper uses time series data (1980-2006), to study the major determinants of investment in telecom sector of Pakistan. Various summary statistics and correlation between variables were calculated. ADF test was applied to check the data stationarity and then estimated the data by using OLS technique. ECM was also applied. Results indicate the positive and significant impact of three variables that is market size, investment in education sector and foreign trade.

Results obtained in this study help to conclude that enhancement of market size in Pakistan have always supported the investment in telecommunication sector. Investment in Education Sector is statistically significant with positive sign. Government is making heavy expenditures in education sector as well as private sector is also opening many educational institutions. There are many schools and even colleges in those villages where there are no proper telecommunication facilities. So with the rise in literacy rate people are demanding for computers, mobile phones, television, fax machine and other advance telecom tools to get fast, updated and valuable knowledge at the cheapest possible rates. Impact of foreign trade was not strong during 1970 since lower imports and exports but during 1980 and onward both sides have shown increasing trend. Now importers and exporters are trying to prefer to use advance telecom equipments to minimize their transaction cost. So they always

welcome innovative telecom techniques and expansion of telecom network throughout the country and even throughout the world. Since the concept of e-business is not strong in Pakistan so results were not favorable in case of investment in financial sector. This case study can be hopefully useful for the investors as well as for subscribers in relation to the growth of the Pakistan's economy. Furthermore, this empirical study will encourage other researchers from the emerging economies of the world such as China, India, Malaysia, South Korea etc to collect data and investigate the impact of telecommunication sector.

## REFERENCES

- Ahmed, M.A.; Wahid, U. and Ahmed, N. (2006). "Industry Profile: Telecommunication Industry in Pakistan". (Fiscal Research and Statistics) CBR. Pakistan.
- Antonelli, C. (1996). "The Network of Networks: Localized Technological Change in Telecommunications and Productivity Growth". Information Economics and Policy 8.
- Contessi, S. (2004). "FDI in Telecommunication Sector of Transition and Developing Countries". Department of Economics, Johns Hopkins University. Baltimore.
- Economic Survey of India (2007-08). pp: 228-230. <http://indiabudget.nic.in>
- Economic Survey of Pakistan. (1987-88, 2001-02, 2003-04, 2005-06, 2006-07, 2007-08). Finance division. Economic adviser's wing. Islamabad. Pakistan.
- Garbade, K.D. and Silber, W.L. (1978). "Technology, Communication and the Performance of Financial Markets, 1840-1975". Journal of Finance, Volume. No. 33. pp: 819-832.
- Hashim, S, Munir. A. and Khan. A. (2009). "Foreign Direct Investment in Telecommunication Sector of Pakistan: An Empirical Analysis". Journal of Managerial Sciences, Volume.No. III (1). Qurtuba University of Science & Information Technology, Peshawar.
- Hirschman, A. (1967). "Development Projects Observed". Washington DC: Brookings Institutions.
- Pakistan Telecommunication Authority. Annual Reports, (2004-05, 2005-06).
- Paprzycki, R. and Fukao, K. (2005). "The Extent and History of Foreign Direct Investment in Japan". Discussion Paper Series No.84. Institute of Economic Research Hitotsubashi University, Kunitachi, Tokyo, 186-8603. Japan.
- Riaz, A. (1997, a). "Role of Telecommunications in Economic Growth. Media, Culture and Society", Volume No. (19).
- Riaz, A. (1997, b). "Telecommunication in Economic Growth of Malaysia". Journal of Contemporary Asia, Volume No.27 (4). pp: 489-510.
- Ure, J. (2004). "FDI in Telecommunication Services in Asia". High Level Policy Seminar on Services FDI and Competitiveness in Asia UNCTD and ASEAN, Ritsumeikan, University, Tokyo.
- Venugopal, K. (2003). "Telecommunication Sector Negotiation at the WTO: Case Studies of India, Sri Lanka and Malaysia". ITU/ESCAP/WTO Regional Seminars on Telecommunications and Trade Issues. Bangkok, Thailand.