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Foreign Direct Investment in Telecommunications Sector of Pakistan: A Determinative Approach

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Abstract: Foreign direct investment and telecommunications development are essential for the economic development of a country. Pakistan, although being an underdeveloped country, has managed to excel in the telecommunications sector by manifold since 2001. An increasing number of telephony and cellular subscribers along with the broadband and 3G/4G users, have created an enchanting market for foreign investors. The purpose of this study is to explain the casual relationship between foreign direct investment and economic factors that attract FDI in Pakistan. Among the many economic factors here is telecom infrastructure, market size and trade openness, whereas FDI is taken as the dependent variable. A time series analysis is carried out to determine the growth trend while an ordinary least square test is applied to determine the coefficient of correlation between the variables. The result of the study specifies a positive relationship is observed between the per capita GDP and openness to trade and influx of FDI.

Key Words: Foreign Direct Investment, Telecommunications Sector, Determinative Approach

Introduction

Telecommunication Sector in Pakistan

The telecommunications sector is among some of those industries that will never retire from innovation. Each day new dimensions are being explored in the telecommunications sector encompassing better local loop services to superfast 3G & 4G technology. The telecom sector remains a vulnerable portion of the economy, comprising the national security and control over the local market. It is certain that FDI in the telecom sector is a gateway for foreign funding, new technical skills and development of the sector, but some countries' strict trade and legal polices do not allow a liberalized entry into the telecom

sector in order to protect their economic identity. [Chun Hung Lin. \(2008\)](#)

Pakistan's Telecom sector has played a vital role in economic, social, educational and business development. Advancement in the Telecom sector is the top priority of any government as it has created a number of job opportunities along with ease of operations. From landline services to the broadband, from mobile services to mobile banking, the options are unlimited. Pakistan has largely shifted its focus from Industrial growth & agricultural sector to the development and expansion of the service sector.

The telecom sector is one of the major contributors to Pakistan's growing economy. From taking over PTCL over Pakistan telecom

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and telegraph to Induction of Cellular companies and 3G/4G services; the contribution of the telecom sector to GDP is noticeable. Estimated revenue of Rs. 449,546 million is reported by the telecom sector in 2014-15; while its contribution to the National exchequer is recorded as Rs. 243.3 billion.

(PTA sources). Market size has grown substantially from 2003 to 2015, as per PTA annual fixed line, cellular, Broad band and 3G/4G subscribers' data indicates (Fig.1), especially cellular and the broadband sector proving to be emerging fields after 2005-06.

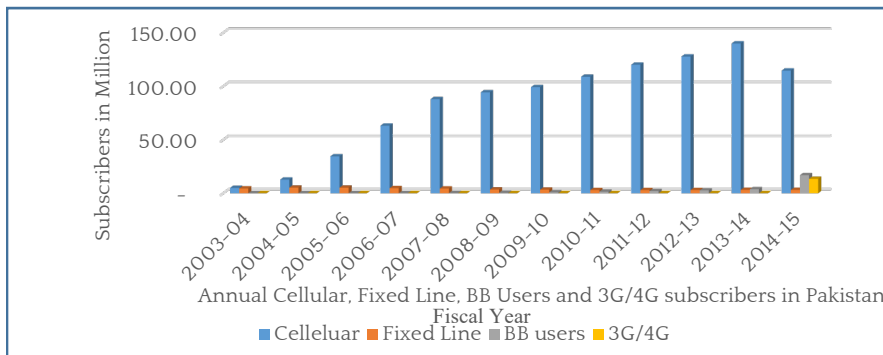


Figure 1: Annual Telecom Market Size of Pakistan

Source: PTA

Privatization era of Telecommunication in Pakistan

After the 1990s a global evolutionary escalation has been observed with an enlarged growth of Information and Communication Technologies. A large number of private telecom service providers have jumped into the field, providing live broadcasting, satellite communication, public telephony, IP networking and mobile internet. After the dissolution of British Telecom and AT&T business merger in 1994 and the privatization of British Telecom backed a new era of telecom sector's liberalization and deregulation was introduced but the trend of privatization was slowly followed in developing countries as compared to underdeveloped countries.

In 1991, under the act of Pakistan Telecommunication Corporation of 1991, Pakistan Post & Telegraph department was taken over by the PTC. Pakistan welcomed the private sector's participation in telecom and a number of cellular licenses were issued along with the regularization of card operating payphone companies to improve telecom services in Pakistan. In 2006 a Dubai-based company "Etisalat Telecommunications Company," purchased 26% shares of Pakistan

Telecommunication Company Limited with management rights.

Role of Foreign Direct Investment in Pakistan's Economy

Foreign direct investment has emerged as a major global economic contributor in the past few decades; it has served the developed and underdeveloped countries in the private sector as well as in the Government sector. DI usually works as a two-way bridge of economic development; MNCs, in return of expanding their business in host country, produce extensive economic benefits to that country in the shape of bringing excess foreign capital, advanced business techniques and technology, trade development and foreign exchange opportunities. A correlation between investment in telecommunications and economic development is proven empirically. (Chun Hung Lin, March 2008).

Openness to trade servers is a critical factor to allure FDI, but increased FDI may pose a threat to local businesses, creating a demand and supply gap for the host country. Government can control the FDI influx by imposing limits on FDI, laws for the MNCs operation in the country, bounding the investing company to employ domestic

human resources etc. Creating a balance between the economic benefits from an FDI with the control over national economic dominion is a substantial historical problem in many countries; however, it has been empirically proven through discussion that a more liberalized foreign investment environment does not always disturb national economic control. ([Chun Hung Lin, March 2008](#)).

The study intends to measure the potency of the influence of economic variables on the FDI (Telecom) influx in Pakistan and its contribution to the growth of overall GDP. The study will help in identifying the factors having a positive effect on the FDI (Telecom) influx. Table 1.2 shows the foreign direct investment in the telecommunication sector of Pakistan from 2001.

Table 1. Country wise FDI Inflow in \$ millions

Country	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
USA	869.9	468.3	238.1	227.7	227.1	212.1	223.9
UK	263.4	294.6	207.1	205.8	63.3	157	169.6
U.A.E	175.1	242.7	284.2	36.6	22.5	-47.1	213.6
Japan	74.3	26.8	5.2	29.7	30.1	30.1	71.1
Hong kong	156.1	9.9	125.6	80.5	2426	228.5	136.2
Switzerland	227.3	1706	110.5	127.1	149	209.8	-6.5
Saudi Arabia	-92.3	-155.5	6.5	-79.9	3.2	-40.1	-64.8
Germany	76.9	53	21.2	27.2	5.5	-5.7	-18.2
Korea (South)	2.3	2.3	7.7	25.4	25.5	24.4	14.5
Norway	101.1	0.4	-45	-275	-25.54	-21.6	2.7
China	-101.4	-3.6	47.4	126.1	90.6	695.8	319.1
Others	1,964.20	1,019.60	631.5	259.7	255.5	255.4	-73.1
Total including pvt. Proceeds Privatization Proceeds FDI Excluding Excluding	5,710.90	2,150.80	1,634.80	820.7	1,456.50	1,693.60	987.9
	0	0	0	0	0	0	0
	3,719.90	2,150.80	1,634.80	820.7	1,456.50	1,698.60	987.9

Source: Board of Investment Website

Table 2. Sector Wise FDI Inflows (\$ Million)

Sector	2003-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Gil & Gas	775	741	512	629	560	502	301
Financial Bu	707	163	310	64	314	193	256
Textiles	37	28	25	30	10	0	44
Trails	167	117	53	25	6	-3	51
Construction	93	102	61	72	46	29	54
Power	131	-121	156	-85	28	71	282
Chemicals	74	112	31	96	72	95	60
Transport	93	132	105	19	44	3	6
Communication	879	291	-34	-313	-386	434	40
Others	763	586	416	282	766	375.2	-106
Total Including Privatization FDI Exclude	3,720	2,151	1,635	821	1,457	1,699	988
	-	-	-	-	-	-	-
	3,720	2,151	1,635	821	1,457	1,699	988

Factors affecting FDI Influx

Different countries have their own FDI policy devised determining in which sectors foreign investors may put their investment. For example, in India, a business sector can receive FDI in two ways.

Automatic Route

In some sectors, a permissible amount of FDI in different sectors can directly be employed without prior approval of the Government. Such sectors include advertising sectors, Hoteling, Forex brokerage houses, house financing etc.

Government Route

Other sectors that are not permissible for FDI under automatic routes requires prior government approvals and such proposal for FDI are enquired by the Department of economic affairs, Ministry of Finance and Foreign investment promotion board.

Factors affecting the influx of FDI in a country are identified in the following categories.

1. Government policies
2. Privatization
3. Potential economic growth
4. Tax rates
5. Exchange rates
6. Terrorism

Government Polices

Liberalization of trade policy brings new opportunities for investors. Studies have shown that statically speaking, trade liberalization has positively impacted Pakistan's economic growth from 1974 to 2015 as trade openness and economic growth are positively co-related. The more the openness to trade is found the more positive impact will be observed on economic growth. An overview of imports and exports and the trade openness of Pakistan can be estimated from the following table.

Table 3. Trade Openness of Pakistan (\$ Million)

Years	GDP	Imports	Exports	Openness to trade
2001	72,310	11,361	10,600	30%
2002	72,307	11,073	11,008	31%
2003	83,245	13,424	13,918	33%
2004	97,975	14,337	15,350	30%
2005	109,502	21,423	17,180	35%
2006	137,264	29,577	19,401	36%
2007	152,386	30,136	20,137	33%
2008	170,078	39,478	21,060	36%
2009	168,153	33,086	20,844	32%
2010	177,407	34,333	23,979	33%
2011	213,587	40,524	29,831	33%
2012	224,384	45,794	27,816	33%
2013	231,219	46,374	30,699	33%
2014	244,361	45,594	29,916	31%

Source: World Development Indicators

Privatization

During the 1970s and 1980s Pakistan government took solid measures to put checks and balances on rest distribution of national assets from the private sector to state owned sector. The reason behind this is stated to bring national wealth to the masses instead of constraining it to some families. This strategy was intended to support the

interests of the poor was an attempt to replicate the success of the Soviet Union and the socialist economic model.

Privatization mainly includes selling-off of the State Owned Enterprises (SOEs) along with contracting out of State services to other foreign and local bidders like in the case of PTCL. Pakistan, despite being a developing country with strong geographical importance,

has not participated in extensive privatization of government assets till a certain time. A study conducted by [Mehmood, K.A. & Faridi, Muhammad \(2013\)](#) attempts to explore the effects of privatization on the economic growth of Pakistan. Data for the study is taken from 1992 to 2008 and the study concludes that there is a persistent and gradual rise in the economic growth & GDP of Pakistan, whereas the idea of privatization remains unstable. ([Mehmood, K.A. & Faridi, Muhammad, 2013](#))

Potential Economic Growth

Potential Economic growth enriches the investment opportunities for foreign investors in the form of in-house resources, experiences human capital, potential market size and per capita income level. After 2000, as market orient reforms were launched, Pakistan emerged as one of the fast paced growing countries in southeast and offered open opportunities to foreign investors. Pakistan's trade liberalization and potential economic growth have played a robust role in attracting FDI influx. Total trade in 2005 was recorded as 23.5 times higher with respect to 1986 and the total FDI influx in Pakistan from 2001-2005 was about 13 times greater as compared the to 1988-2000 periods, and more over a high growth rate in GDP of 7.5% was recorded annually.

In case of Pakistan, certain measures need to be taken in order to boost the FDI influx as much as possible. FDI influx in Pakistan can increase due to its competitiveness as a potentially high returning investment location as compared to other countries. In Pakistan, many MNCs working in the consumer goods sector have taken a good share of profit while other major industries like the pharma industry have winded up their businesses due to a lack of intellectual property rights protection. According to a State bank of Pakistan's 2017 report, FDI has increased gradually with a net increase in FDI influx of 4.4% i.e. \$2.1 billion, from July-March 2017-18. Whereas a major contributor to this investment in China, with 55% of the overall influx, other countries

including UK and Malaysia have also invested in Pakistan's economy.

Taxation

It is a difficult question to answer as to how FDI the influx will react to a new tax policy in the host country. FDI investors carry out cost & benefit analysis of investing, tax relief provided, potential economic growth of the host country, potential tax policy reforms and impact of tax reforms on earnings after taxes.

In Pakistan, Corporate tax is inversely related to FDI influx both in the short run and long run. Higher the rates, the lower the influx. Discounted CTR has a positive impact on domestic investment too. ([Khalid Mahmood Lodhi, 2017](#)).

In 1990 Government of Pakistan supported liberalizing trade and investment to attract foreign investors by providing great tax relations, easy credit, tariff reduction and easy forex controls. ([Mahmood Pannu, Qaisar, 2010](#)).

In order to attract more FDI, Pakistan needs to promote itself as an emerging company that caters the local businesses through relaxed taxation, so they are able to compete in the national and international markets and create an attractive competitive field for foreign investors. A flat, low rated and predictable tax regime is the most suitable option for Pakistan to attract foreign investors and facilitate its major investor that is China.

Exchange Rates fluctuation

Exchange rate fluctuations are another enticing factor for MNCs' to prioritize their investment options; they are more likely to fund the country when the country is on a growth route and its currency is expected to boom. However, studies have shown different relationship outcomes between FDI and exchange rate. Even FDI and exchange rate relations can work backward, where an increase in the influx of FDI can influence the local exchange rate. Hence the direction of the relationship between FDI and exchange rate remains an enigma now.

Studies have shown that appreciation in Malaysian ringgit, Philippine peso and Singapore dollar the appreciation of

Singapore dollar has a significant positive impact on the foreign, direct influx in these countries. (Lily, Kogid, Mulok, Lim, Sang & Asid, 2014).

Terrorism

Terrorism has been an unresolved issue for long throughout the world. Terrorists not only affect the life & property of a host country, but they also sabotage the economic growth and ability to attract foreign investment to that country in the long run.

Investors look for a safer business environment for their investment and seek

economic stability to ensure their returns on the risk taken but terrorism withdraws all these facilities for investors as written in an Economist article, "This fear of defenselessness is mainly destructive to trade or foreign direct investment (FDI) influx because investors always prefer to invest in countries lesser prone to terror."

Following is the list of 12 countries that were the main target of terrorist activities from 2001 to 2012. These countries mainly faced almost 79% of the global terror incidents.

Table 4. Terrorism Incidents, 2001–2012

Country	Total Incident	Domestic Incidents	Transnational Incidents
Pakistan	3,048	2,737	191
India	2,438	2,229	78
Thailand	1,027	985	21
Nigeria	842	712	92
Somalia	810	708	91
Russia	722	670	21
Philippines	702	621	51
Colombia	620	540	37
Israel	546	482	42
Nepal	323	282	27
Turkey	321	264	32
Yemen	313	261	42
World	14,820	12,899	1,296

History of Foreign Direct Investment in the Telecom Sector of Pakistan

It's a proven fact that the telecommunication sector is one of the major enticers for foreign investors. Investment in telecommunications not only helps in technology transfer but also injects more abundant capital from foreign money markets into the host country. This also increases the market competition and fosters a national telecommunication market.

Pakistan growing telecom sector has managed to attract a noticeable amount of FDI in past years. During 2005–06 Telecom sector of Pakistan grabbed a 54% share of the

total FDI influx in the country, but this influx decreased to the point that in 2001–12 Telecom sector's share in total FDI was calculated as negative 44%.

The main reason behind this massive decline is deemed as the political instability in the country. However, this trend has changed and a huge increase in FDI is observed in the shape of 3G/4G in Pakistan. Moreover, banking, mobile marketing and mobile e-payment services are providing opportunities for further FDI. Table 1.1 (PTA Annual report 2013–14) depicts a clearer picture of FDI in the Pakistan Telecommunication Sector.

Table 5. Foreign Direct Investments in 3G/4G

Applicant	Winner in 2100 MHz Band	Winner in 1800 MHz Band
Zong	2x10 MHz (US\$ 306,920,000)	2x10 MHz (US\$210,000,000)
Mobilink	2x10 MHz (US\$ 300,900,000)	-

Applicant	Winner in 2100 MHz Band	Winner in 1800 MHz Band
Ufone	2x5 MHz (US\$ 147,500,000)	-
Telenor	2x5 MHz (US\$ 147,500,000)	-
Total	US\$ 902,820,000	US \$210,000,000

Thus the auction produced a total of US\$ 1,112,820,000.

Source: PTA Annual Report 2013-14

Recently telecommunication sector has achieved a record influx of FDI. It was assumed that this investment trend might go along for the next 5 years as a huge business potential exists for all telecom operators due to the demand and supply gap for quality telecommunication services. But the overall FDI level has substantially decreased in the current year. According to the State Bank of Pakistan (SBP), the overall influx of FDI was

recorded at \$120 million in the first half of the financial year 2015-16 as compared to the handsome influx of \$876 million recorded in the similar period of last financial year. The overall FDI after outflows of investment is \$76 million because local investors and companies invested \$43.7 million outside Pakistan in different projects and businesses related to the telecom sector (SBP data, 2016).

Table 6. SBP figures for FDI in telecom in Pakistan

Foreign Direct Investment in Telecom Sector (US \$ million)			
FY	FDI in Telecom	Total FDI	Telecom (%) Share
2001-02	6.1	484.7	1.26%
2002-03	13.5	798	1.69%
2003-04	207.1	949.4	21.80%
2004-05	494.4	1,524.00	32.40%
2005-06	1,905.10	3,521.00	54.10%
2006-07	1,824.20	5,140.00	35.50%
2007-08	1,438.60	5,410.00	26.60%
2008-09	815	3,720.00	21.90%
2009-10	373.62	2,199.44	17.00%
2010-11	79.2	1,574.00	5.00%
2011-12	-361.4	820.6	-44.00%
2012-13	-404.1	1,576.00	-25.60%
2013-14	429.9	1,667.60	16.30%
2014-15	121	529	21.00%

Source: State Bank of Pakistan

But this investment paid off in the form of extra revenue for the country. It's an

important source of taxes for the Government over the past ten years, as shown in Table 2.

Table 7. Telecom Revenue

Telecom Revenues (Rs. Millions)						
FY	Cellular	L. Loop	LDI	WLL	VAS (Estimated)	Total
2003-04	27,840	76,444	1,336	1,152	10,056	116,827
2004-05	48,880	78,828	3,672	275	12,570	144,226
2005-06	89,896	71,186	7,199	12,453	13,827	194,562
2006-07	133,132	68,368	15,567	2,645	15,901	235,613
2007-08	182,122	63,693	23,396	2,704	8,048	279,964
2008-09	212,423	62,568	47,969	2,670	8,179	333,809
2009-10	236,047	61,464	44,964	2,880	10,202	355,557

Telecom Revenues (Rs. Millions)						
2010-11	262,761	58,342	34,195	4,978	7,052	367,327
2011-12	298,510	63,805	32,675	5,861	11,175	412,026
2012-13	311,145	80,661	38,572	5,617	3,526	439,521
2013-14	322,683	88,512	43,901	6,278	4,123	463,497
2014-15	317,016	80,813	40,765	3,874	7,078	449,546

Source: PTA

Trade liberalization has attracted huge FDI in recent years, as shown in Table 3.

Table 8. Annual Trade %age of GDP of Pakistan

YEAR	Trade (% of GDP)
2001	30.37
2002	30.54
2003	32.54
2004	30.3
2005	35.25
2006	35.68
2007	32.99
2008	35.59
2009	32.07
2010	32.87
2011	32.94
2012	32.81
2013	33.34
2014	31

Source: World Development Indicators

Table 9. Annual GDP per Capita (Current US \$)

Year	GDP Per Capita (Current US \$)
2001	510.66
2002	499.86
2003	563.59
2004	649.8
2005	711.47
2006	950.43
2007	873.77
2008	1,039.31
2009	1,006.60
2010	1,040.14
2011	1,226.22
2012	1,261.21
2013	1,272.44
2014	1,316.98

Source: World Development Indicators

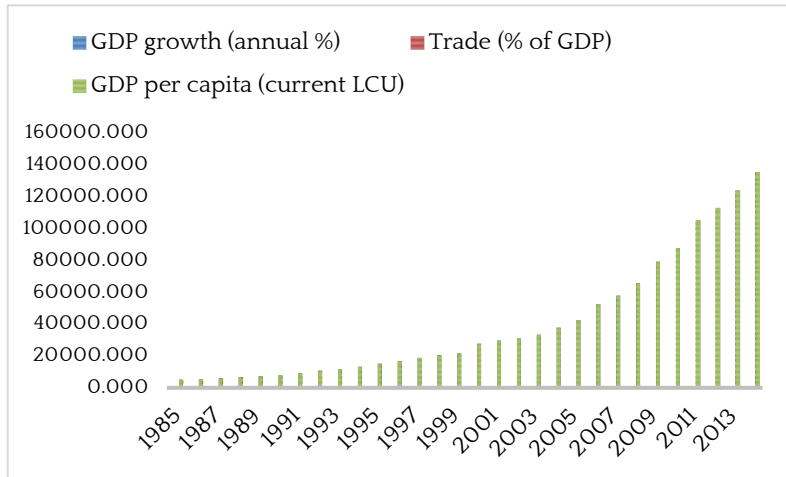


Figure 2: GDP growth, GDP per capital, Trade % age of GDP 1985 to 2015

Source: World Development Indicators

Literature Review

FDI and the Host country perspective

Foreign investment can be beneficial to the host country and harmful to its domestic business at the same time. Most of the time, investors choose to invest in such countries that offer cheap resources in the form of labor, raw material, and poor interest rates on loans or technology. The government's degree of willing to induce FDI in the host country plays a significant part in the FDI influx.

A country's Technological advancement is a widely accepted essential element for economic growth. (Romer, 1994). FDI plays a critical role in developing infrastructure through upgrading the technological framework that supports the host country's technological base. (Ramesh & Samal, 2015).

During the last two decades, India has made itself the most suitable host for FDI with policies such as openness to privatization, trade, economic and financial liberalization. Since 2013, the Indian Government has revised FDI limits for the telecom sector up to 100% in order to increase the influx of FDI. The Indian government is paving the way to building a lucrative telecommunication sector and making the business environment more investor friendly. ([Papori & Rashmi, 2014](#))

Domestic profitable sectors are monopolized by foreign investors as they tend to invest more in machinery and intellectual property than in increasing the salaries of locals. Terrorism affects a country's overall economy and business, resulting in security issues for foreign investors and reducing the speed of overall business growth. (Mobeen, Akram & Zahid, 2017)

Determinants of Global FDI

There have been a number of experiential studies carried out to find the link between foreign direct investment and a variety of macroeconomic variables. An Ownership Location Internalization (OLI) paradigm was introduced by him to explain FDI by Multinational Enterprises. The theory is based on a framework that classifies

a significant set of variables influencing FDI. The major categories of variables are cultural, social, economic and political in nature.

The infrastructure of Host Country

Infrastructure development is significantly vital for economic growth; a world bank study suggests that purchasing power parity is higher in countries with developed infrastructure as compared to that

underdevelopment. Economists classified infrastructure as logistics, communication, administration, markets, and innovations.

FDI influx can be allured into the economy by the provision of usable infrastructure. Infrastructure serves as the foundation for the economic growth of a country. It encourages

agriculture and industry while providing support for operations. This support comes in the shape of health and education services, power supply, transportation, telecom, irrigation etc. (Ramesh & Samal, 2015).

The study suggests that in the case of Pakistan: the host country's development via public sector enterprise is not suitable due to insufficient funds and bad governance; however, the Foreign influx of individual investment in financial equities or bonds is more suitable but this requires greater financial liberalization from the government. Infrastructure improvement can be achieved through initial funding from foreign investments, mainly from China, in the form of CPEC. ([Ayub Mehar, 2017](#))

Human Capital of Host Country

Human capital is another important factor that has a close relationship with FDI influx and economic growth of a country, creating a continuous trio for growth where a change in one factor leads to change in other. FDI influx promotes exports of the host country by creating new jobs and enhancing productivity.

There are a number of factors that economic growth; however, Human Capital and FDI have gained a lot of attention in the recent era. Mixed results are observed using these two sources. Due to a lower supply of skilled labor Malaysia should shift focus on these two factors, especially human capital. ([Gulam Hassan, Mohamed Aslam and Abou Sakar, Sameer, 2013](#))

An increased work remittance increases the ratio of enrollment in schools to produce skilled human capital and hence FDI is positively correlated with human capital. Also, it was found that the FDI influx promotes the education level in these 34 countries and hence contributes to the

development of human capital. ([Azam, Saleem, Zainal, Karupiah and Farah Khan, 2015](#))

Trade openness of Host Country

Trade openness or trade liberalization also showed its positive and negative effects on the economic growth of a country, restating from FDI. It has been observed that FDI does not always have a positive effect on the host country as expected. Cheap human capital, loose trade policy, and easy access to unimpaired and worthy resources can actually be the sole motives of a multinational for foreign direct investment.

Thus, creating a small relationship between economic growth and FDI. In a study by Dr. M. Umer Chaudhry and Kasloom Akther, it has been highlighted that there exists a positive effect of Trade liberalization or trade openness on the economic growth of Pakistan meanwhile showing the significantly negative effect of same Trade liberalization in post-financial liberalization era. (Umer & Kasloom, 2016).

A study concludes that Pakistan's GDP is still not mature enough to play its role in manipulating the interest of foreign investors. The economic instability is the main deciding factor as due to this instability, the foreign investors are not attracted to invest in Pakistan (Irfan, Kamal & Sumayya, 2009).

Determinants of FDI in the Telecom Sector of Pakistan

A large number of telecom subscribers are not in favor of handing over the tax levy rights to the provincial or local government due to their low confidence in provincial government for tax collection rather than the FBR. According to a survey conducted by the Directorate General of Training and Research (IR), Lahore an average of 67.6% of the population was of the opinion that the telecommunication sector is heavily taxed, that not only affects the daily living expenses but also increases the cost of doing the business. ([Fahad & Umar, 2010](#))

Another study by [Khalid & Chaudhry \(2017\)](#) concludes that major factors affecting FDI influx in a country can be Political stability and Dictatorship, GDP/PC, gross national income, fluctuation in the exchange rate and

openness to trade. Time series data for study and Autoregressive-Distributed Lag (ARDL) technique for data analysis. The study reveals that served that during the Dictatorship the FDI influx reached to the maximum in the history of Pakistan. This mainly depicts the relationship between Government's relaxed policies and openness to trade. ([Khalid & Chaudhry, 2017](#))

Methodology

Theoretical Framework

The study identifies and explains the casual relationship, using the multiple regression analysis, between the influx of FDI in the telecommunications sector of Pakistan and the macro-economic variables affecting the influx of Foreign Direct Investment in the country.

Data of FDI in Pakistan is taken from 2001 to 2014 (PTA), while the data for Telecom infrastructure in Pakistan, Market size of the country and Trade %age of GDP are taken for 2001 to 2014 from PTA and World Development Indicators respectively. For in-depth analysis, quarterly data is used. Data is on the next pages. Variables are defined as:

Dependent Variable

ε = residual/error for the regress

1. Foreign Direct Investment in the Telecom Sector of Pakistan

Independent Variables

1. Telecom infrastructure in Pakistan (Fixed land line and mobile cellular users)
2. The market size of the country. Determined by the GDP per capita of the country
3. Openness to trade. Represented by the Trade %age of GDP

For this purpose, following regression model is used.

$$FDI_{tele} = \beta_0 + \beta_1 INF + \beta_2 MKT + \beta_3 OT + \varepsilon$$

Where

FDI_{tele} = Foreign Direct Investment Influx in Telecommunication Sector of Pakistan

INF = Total infrastructure of the Telecommunication users (Mainly comprised of Fixed land line and mobile cellular users)

MKT = Market size of the country (Represented by the GDP per capita of country)

OT = Openness to trade by the Government (Represented by the Trade %age of GDP)

Table 10. Data used for Analysis

Quarters	Exp Goods	FDI In Telecom	GDP US *	Imp Goods	INFRA	MKT Size	OT
2001Q1	2,748.73	11.01	18,676.04	3,011.66	0.36	132.75	7.69
2001Q2	2,656.83	2.75	18,163.00	2,869.95	0.35	128.58	7.6
2001Q3	2,604.15	-2.61	17,820.92	2,769.47	1.05	125.58	7.55
2001Q4	2,590.51	-5.05	17,649.78	2,710.23	1.14	123.74	7.52
2002Q1	2,615.33	-4.59	17,649.60	2,692.21	1.22	123.07	7.54
2002Q2	2,680.54	-1.22	17,820.37	2,715.43	1.3	123.56	7.58
2002Q3	2,784.21	5.06	18,162.09	2,779.88	1.33	125.21	7.66
2002Q4	2,926.38	14.25	18,674.76	2,885.56	1.45	128.03	7.77
2003Q1	3,264.33	29.36	19,637.52	3,191.68	1.43	134.05	8.18
2003Q2	3,423.11	43.53	20,380.44	3,316.14	1.53	138.38	8.25
2003Q3	3,558.81	58.56	21,182.66	3,418.15	1.66	143.07	8.25
2003Q4	3,671.42	75.05	22,044.17	3,497.70	1.32	148.1	8.16
2004Q1	3,687.63	52.78	23,238.56	3,257.59	1.88	155.33	7.52
2004Q2	3,783.43	88.29	24,109.24	3,411.12	2.16	160.33	7.48
2004Q3	3,885.33	141.35	24,929.78	3,661.10	2.52	164.95	7.55
2004Q4	3,993.56	211.97	25,700.19	4,007.50	2.36	169.19	7.75
2005Q1	4,108.25	402.29	25,660.84	4,649.67	3. T9	165.16	8.53

Quarters	Exp Goods	FDI In Telecom	GDP US *	Imp Goods	INFRA	MKT Size	OT
2005Q2	4,228.74	467.15	26,634.82	5,109.21	3.32	171.79	8.76
2005Q3	4,355.33	508.71	27,862.52	5,585.46	4.87	181.18	8.93
2Q05Q4	4,488.01	526.96	29,343.93	6,078.42	6.02	193.34	3.03
2006Q1	4,700.01	475.54	32,207.09	6,926.58	7.66	227.53	9
2006Q2	4,815.61	465.72	33,744.71	7,317.55	9.11	237.54	8.98
2Q06Q3	4,308.01	451.14	35,084.82	7,589.82	10.66	242.61	8.91
2006Q4	4,977.22	431.8	36,227.43	7,743.40	12.31	242.75	3.79
2007Q1	4,958.00	405.1	36,578.37	7,138.40	14.42	216.17	8.29
2007Q2	5,006.92	377.28	37,563.63	7,310.55	16.12	215.16	8.21
2007Q3	5,058.76	345.74	38,589.06	7,619.95	17.76	217.94	8.2
2007Q4	5,113.50	310.48	39,654.66	8,066.62	19.36	224.5	8.28
2008Q1	5,222.88	255.09	41,627.11	9,608.34	21.44	252.05	8.89
2Q08Q2	5,262.74	218.97	42,426.35	9,946.40	22.73	259.3	8.96
2Q08Q3	5,284.82	185.69	42,919.07	10,038.60	23.75	263.45	8.93
2Q08Q4	5,289.12	155.25	43,105.28	9,884.94	24.52	264.51	8.81
20D3Q1	5,100.29	129.04	41,781.98	8,572.35	24.49	252.13	8.18
2003Q2	5,139.16	103.75	41,836.34	8,292.19	24.35	251.12	8.03
2003Q3	5,230.39	80.76	42,065.37	8,131.40	25.35	251.15	7.34
2003Q4	5,373.97	60.06	42,463.08	8,089.37	25.7	252.21	7.32
2010Q1	5,594.65	53.11	42,432.33	8,273.18	25.63	250.93	8.17
2010Q2	5,833.04	32.43	43,431.43	8,428.38	26.06	255.41	8.21
2010Q3	6,113.89	9.46	44,851.27	8,660.83	26.5	262.23	8.24
2010Q4	6,437.20	-15.8	46,691.83	8,970.55	27.01	271.52	8.25
2011Q1	7,216.43	-64.59	50,996.50	9,586.67	27.7	235.01	8.24
2011Q2	7,459.27	-85.31	52,861.16	9,959.23	28.31	304.28	8.24
2011Q3	7,579.18	-101.01	54,323.18	10,317.39	28.96	311.19	8.24
2011Q4	7,576.17	-103.9	55,400.57	10,661.15	29.64	315.74	8.23
2012Q1	6,951.59	-131.27	55,238.50	11,137.68	30.56	312.95	8.19
2012Q2	6,902.19	-120.24	55,851.37	11,393.76	31.22	314.77	8.19
2012Q3	6,929.32	-95.51	56,402.34	11,576.56	31.83	316.21	8.2
2012Q4	7,032.98	-57.08	56,891.42	11,686.09	32.39	317.28	8.23
2013Q1	7,547.73	73.93	56,917.48	11,592.29	32.83	315.76	8.4
2013Q2	7,670.64	108.2	57,443.22	11,607.30	33.31	316.93	8.39
2013Q3	7,736.27	124.61	58,067.51	11,601.06	33.77	318.72	8.33
2013Q4	7,744.61	123.16	58,730.35	11,573.57	34.2	320.38	8.22
2014Q1	7,695.66	103.85	53,611.75	11,524.84	34.61	323.77	8.07
2014Q2	7,583.42	66.63	60,531.70	11,454.86	35	327.07	7.87
2014Q3	7,425.30	11.67	61,550.20	11,363.63	35.36	330.3	7.63
2014Q4	7,205.10	-61.21	62,667.25	11,251.15	35.69	335.24	7.34

Hypothesis

Based on the question of interest following hypotheses are developed.

H₀: FDI Influx in the Telecommunication Sector of Pakistan is unaffected by Infrastructure, Market size and Openness to trade

H₁: FDI Influx in the Telecommunication Sector of Pakistan is affected by

Infrastructure, Market size and Openness to trade OR

H₀: $\beta_1 = \beta_2 = \beta_3 = 0$ (There is no correlation between the variables)

H₁: At least one beta is not zero or $\beta \neq 0$ (There is a correlation between the variables)

Level of significance

The level of significance is taken as $\alpha = 0.05$

Test Statistics

- The multiple regression technique, has opted for testing if any correlation exists between the independent and dependent variables of the study.
- ANOVA and F test further clarify the relationship.
- F ratio is simply the ratio between the Mean Squares of regression and residual.
- The degree of freedom for regression is one less than the number of parameters being tested. In our study, this is 3.

- The degree of freedom for Residual is simple the difference between the sample size and the number of parameters being estimated. i.e.
- $df(\text{Residual}) = n - k - 1$
- so In our study it is
- $df(\text{Residual}) = 56 - 3 - 1 = 5$

Estimates & Discussions

After running the regression test following estimates are found.

Descriptive Statistics

- Descriptive results of the time series data of independent and dependent variables are as under and define the mean and the standard deviation..

Table 11. Descriptive Statistics

	Mean	Std. Deviation	N
FDI in Telecom	123.9679	183.76496	56
Infrastructure	17.2193	12.95462	56
Market Size	230.7589	71.51462	56
Openness to Trade	8.1875	.45914	56

Correlation Estimates

- Correlation between dependent and independent variables is a statistical measure of how well they are related to each other. Pearson Correlation is the commonly used correlation measure. Pearson correlation coefficients amongst the independent variable i.e. FDI & the dependent variables i.e. Infrastructure (Telephone and Mobile users), Market Size of the country (per capital GDP) and Openness to trade (Trade %age of GDP) are respectively - 0.317, -0.192 and 0.635

- The results conclude that there is a negative correlation between the influx of FDI in the telecom sector of the country and its infrastructure when taken as only the fixed landline users along with the mobile users of the country. This result contradicts some of the studies such as [Zahra, Azim & Mahmood \(2008\)](#). This could be because my study focus is only on the combination of fixed landline and mobile cellular users; however other studies might have included the numbers of transmission booster, users per booster, broadband user, broadband width etc. (Table 11)

Table 11. Correlation Statistics

		FDI	INFRA	MKT SIZE	OPENESS_TRDE
Pearson Correlation	FDI	1	-0.317	-0.192	0.635
	INFRA	-0.32	1	0.966	0.144
	MKT_SIZE	-0.19	0.966	1	0.272
	OPENESS_TRADE	0.635	0.144	0.272	1

		FDI	INFRA	MKT SIZE	OPENESS_TRDE
Sig. (1 tailed)	FDI	.	0.009	0.078	0
	INFRA	0.009	.	.	0.144
	MKT_SIZE	0.078	0	.	0.021
	OPENESS_TRADE	0	0.144	0.021	.56
N	FDI	56	56	56	56
	INFRA	56	56	56	56
	MKT_SIZE	56	56	56	56
	OPENESS_TRADE	56	56	56	56

- The correlations results of the Market size of the country i.e. GDP per capita, shows a mild negative tendency towards the influx of FDI in the telecom sector of Pakistan. As the GDP per capita defines the ability of the targeted market to afford the service industry and the potential amount that can be saved in comparison with the country's consumer price index, this measure gives a glimpse of the potential.
- The real effect on the FDI in telecom in Pakistan is observed from the Trade openness by the country. As measured by the Trade percentage of GDP a strong positive correlation exists between the influx of FDI and openness to trade in the country. This indicates that as the Government liberalizes its trade policies new opportunities arise for the MNCs and more trade activity is observed in every

sector of the economy, which boosts the economy of the host country by creating competition but also is beneficial for the funding country to generate more and more business. The results coincide with the study conducted by Shumai, Munir, & Khan (2008).

Model Summary

- As R^2 , called the determination coefficient of multiple regression, basically measures the nearness of the data to the regression line. As the resulted value gets nearer to 100% or 1, the better, the model explains the data variation around its Mean value. In my study, the resulted value of $R^2=0.584$ and $Adj R^2=0.560$ clearly depicts that the model is partially fit and explains about 56.0% of the total variation of the regression line.

Table 12. Model Summary b

Model	R	R ²	Adjusted R ²	Standard Error of the Estimate
1	.764a	.584	.560	121.95764

- a. Predictors: (Constant), Openness to Trade, Infrastructure, Market Size
- b. Dependent/Criterion Variable: FDI in the Telecommunication sector

ANOVA

- The value of the F-ratio in the ANOVA table

is 24.291 indicating a linear relationship among the Model's variables. (Table 13)

- Either positively or negatively; the selected independent variables do affect the dependent variables.
- As the $p < 0.05$, hence the model suggests a good prognostic ability

Table 13. ANOVA a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1083895.172	3	361298.391	24.291	.000 ^b
	Residual	773430.612	52	14873.666		
	Total	1857325.784	55			

a. Dependent/Criterion Variable: FDI in Telecommunication sector

b. Predictors: (Constant), Openness to Trade, Infrastructure, Market Size

outcome/dependent variable: FDI in telecom with the values -0.286, 1.189 & 253.137 respectively.

- Here the actual p-values determine the acceptance or rejection of H_0 .
- As the p-values of constant is zero, less than 0.05 for infrastructure and zero for openness to trade but is greater than 0.05 i.e. 0.263 for market size thus this concludes that we reject H_0 and accept the alternative hypothesis inferring that there is an acceptable relationship between the influx of foreign investment in telecom sector of Pakistan and infrastructure, market size and openness to trade combined.

Coefficients

- The regression model for the study is

$$FDI_{tele} = \beta_0 + \beta_1 INF + \beta_2 MKT + \beta_3 OT + \epsilon$$

$$FDI_{tele} = -2014.140 + (-0.286) INF + 1.189 MKT + 253.137 OT$$

- Hence from the following results it is interpreted: a single unit increase in value of independent/predictor variables: infrastructure, market size and OT will bring a combined average variation in the value of

Table 14. Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics		
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF	
(Constant)	-2014.140	296.285		-6.798	.000						
1	Infrastructure	-12.132	5.634	-.855	-2.154	.036	-.317	-.286	-.193	.051	19.696
	Market Size	1.189	1.049	.463	1.133	.262	-.192	.155	.101	.048	20.823
	Openness to Trade	253.137	42.402	.632	5.970	.000	.635	.638	.534	.714	1.402

a. Dependent Variable: Foreign Direct Investment in Telecom

Plots

- The normal P-P plot of regression (Fig 3.1) shows the normality statement of regression error. As the errors are

normally distributed around the diagonal reference line hence, it is assumed that the normality assumption exists in the regression model.

Table 15. Estimated Distribution Parameters

	FDI	INFRA	Mkt size	Openess trade
Location	123.9679	17.2193	230.7589	8.1875
Scale	183.76496	12.95462	71.51462	0.45914

The cases are unweighted.

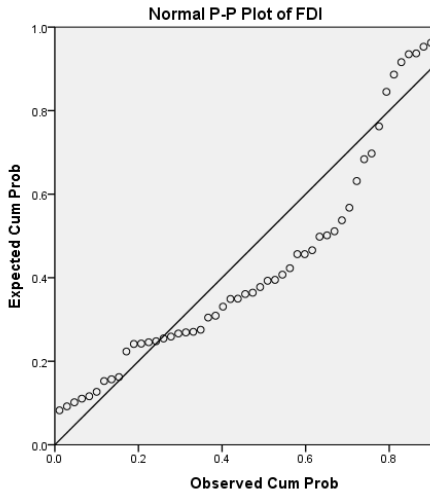


Figure 3: Normal P-P Plot for FDI

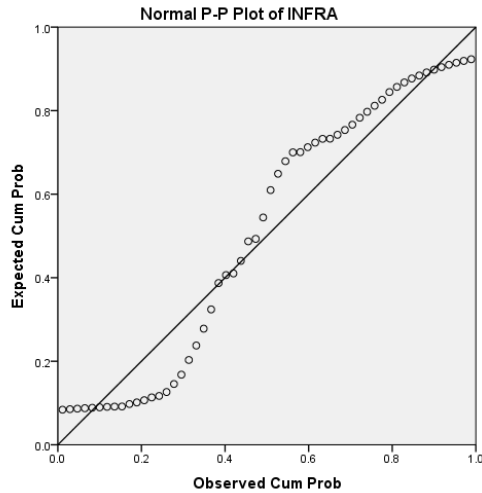


Figure 4: Normal P-P Plot for Infrastructure

Other plots are here as under.

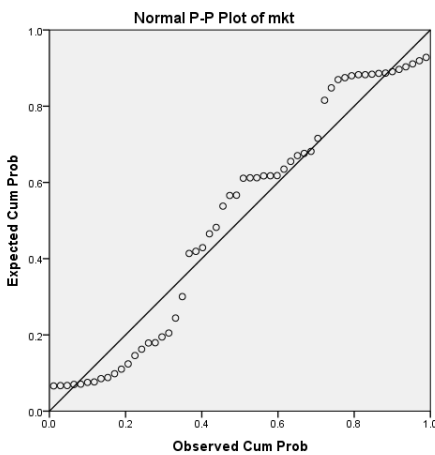


Figure 5: Normal P-P Plot for Market Size

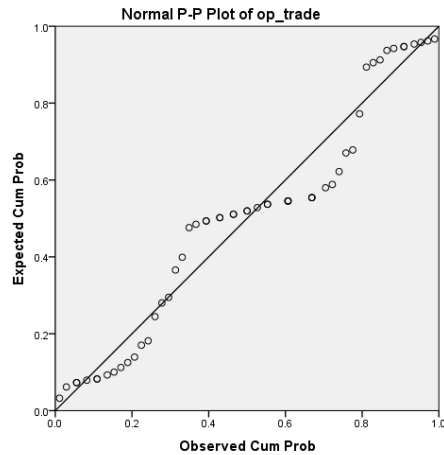


Figure 6: Normal P-P Plot for Openness to Trade

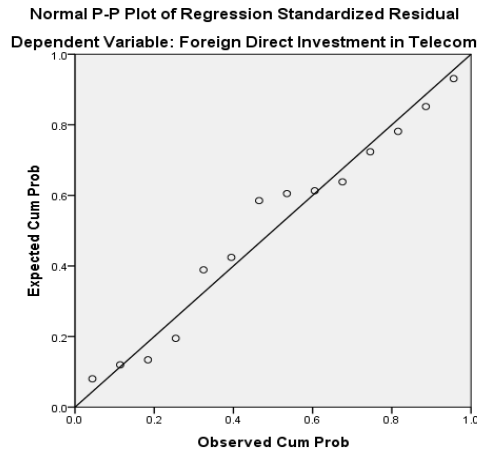


Figure 7: Normal P-P Plot of Regression Standardized Residual

Conclusion

Foreign direct investment and telecommunications development are vital for the financial development of any country. Pakistan, although being an underdeveloped country, has managed to excel in the telecommunications sector manifold since 2001. An increasing number of telephony and cellular subscribers, along with broadband and 3G/4G users, have created an enchanting financial marketplace for FDI investors. This study intends to explain the casual relationship between FDI influx and economic factors that attract FDI in Pakistan. Among the many economic factors here are telecom infrastructure, market size and trade openness, whereas FDI is taken as a dependent variable. A time series analysis is carried out to determine the growth trend while an ordinary least square test is applied to determine the coefficient of correlation between the variables. The results of the study help us in concluding that there is a

negative correlation observed between the influx of foreign direct investment in the telecom sector and telecom infrastructure when confined only to the number of users of landline and cellular mobiles in the country. However, a positive relationship is observed between the per capita GDP and openness to trade and the influx of foreign direct investment in the telecom sector of Pakistan. Here Pakistan Government ought to focus on improving the per capita GDP to make it mature to upgrade the living standard of people and hence create an alluring market for the MNCs. Also, openness to trade, tariff agreements, quota and short & long term development contracts with the foreign countries will bring more foreign investors to the country. Here it must be mentioned that liberalization of the trade policy is only effective if MNCs are given a business friendly environment with relaxed tax levels, low barrier to entry and safety & security of their capital to ensure return.

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