International Journal of Business and Economic Affairs (IJBEA)
9(2), 57-70 (2024)
DOI: 10.24088/IJBEA-2024-92006
ISSN: 2519-9986

Impact of Communication Infrastructure on FDI Inflows in Pakistan: Moderating Effect of Country Level Governance

Sadar Ayub Khan[1*], Dr. Syed Hassan Raza [2]

[1,2] Department of Business Administration, Allama Iqbal Open University, Islamabad, Pakistan

Abstract: The literature revealed that Foreign Direct Investment has always been beneficial for the economy. For considering such benefits, the study was conducted to investigate the impact of communication infrastructure on FDI inflows. It further gauged the effect of country level governance commendation for the attraction of FDI inflows towards the economic modifications. Such modifications will bring positive impact on the improvements in daily life and economic prosperity of population. Further, the literature gives grounds that communication infrastructure as one of the subgroups of physical infrastructure in relation to FDI. Data for the study was collected for Pakistan from the open sources of the World Bank. Various econometric tests applied for time series data analysis like ADF for unit root for the Stationarity of data, ARDL, VECM for finding the results for the data analysis. Further, various diagnostic tests like autocorrelation and heteroscedasticity are also applied. The results show cointegration among the variables in both short run and long run. It is an indication for the policy makers to consider the significant of impact of communication infrastructure on the FDI inflows in Pakistan and the country level governance is a part of such impact.

Keywords: Communication infrastructure, FDI, Country level governance, ARDL, Pakistan

Received: 15 April 2024 / Accepted: 21 May April 2024 / Published: 21 June 2024

INTRODUCTION

Foreign Direct Investment (FDI) occurs when a corporation invests directly in manufacturing or other facilities in a foreign country over which it exercises effective control (Shenkar et al., 2021). They added that internationalization has been introduced as trade and FDI growth. The service sector has significant importance on globalization and related spillover patterns trended as an internationalization in all respects. Some distinguish characteristics of service sector whether it may be positive spillover or negative spillover from FDI for home and host-countries.

Communication infrastructure refers to the fundamental aspects of communications that serve as the foundation upon which a variety of broadcasting and telecommunication services are being provided to facilitate the end users. The construction of this infrastructure can be completed by the utilization of copper cable, upgraded fiber, and modern wireless technologies that make possible the use of radio frequency spectrum. In order to connect the upstream production, which includes voice, data, and audiovisual services, the infrastructure is one of the fundamental components which are necessary for creating and maintaining such connections (Gillwald, 2008).

Communications infrastructure includes physical and virtual networks, systems, and technology. These solutions simplify data flow between people, companies, and gadgets. It underpins modern communication. It allows voice, data, video, and other information communication. This information can now move in detail across local, regional, national, and global networks (Andress & Winterfeld, 2013).

Physical devices and virtual systems are seamlessly connected across the internet to produce a masterwork of architecture with a transformational paradigm. Business organizations can eliminate the manual synchronization by automating these complex channels for the modernization of business system through advanced technologies (Allioui & Mourdi, 2023).

Pakistan is an underdeveloped country, and its economic outlook is presented in the Table 1 as under in order to understand it economic position.

*Corresponding author: Sadar Ayub Khan
†Email: sadar_ayub@aiou.edu.pk

Table 1: Pakistan economic outlook

Indicator	2017	2018	2019	2020	2021
GDP per capita (Current US$)	1,567.64	1,620.74	1,437.17	1,322.31	1,505.01
GDP growth (Annual %)	4.43	6.15	2.5	-1.27	6.49
GDP (current US$ billion)	339	356	320	300	348
Total Unemployment	3.59	3.96	4.41	5.75	5.49
Personal remittances received (% of GDP)	5.85	5.95	6.93	8.68	8.99

Source: WDI, World Bank

Market size of telecommunications sector in Pakistan reached to PKR695 billion in 2022 from PKR644 billion, which is an increase of 8% year-over-year from 2021. The growth in market size attributed to the expansion of 3G, 4G, and 5G technologies services in Pakistan. Further, the utilization of broadband data increased by 52% during the 2021 during the period of COVID-19. As a result, the communication sector was significantly influenced by the rise in the number internet users (PCRA, 2022). According to the data updated up to October 2023, there are 190 million mobile cellular subscribers, 127 million mobile broadband subscribers, 130 million broadband subscribers, and three million fixed telephone subscribers are operational in Pakistan (PTA, 2023).

Governance is a very important factor for every country. It measures the level of institutional quality of a country (Otchere et al., 2016). The way that FDI and institutional quality are related is dependent upon the measures that are applied to the latter. In fact, foreign direct investment (FDI) is directed more toward nations that score higher on measures of civil freedoms, political rights, average institutional quality, rule of law, voice, and accountability, as well as less corrupt nations. (Wako, 2021).

The literature revealed that various types of studies have already been conducted in previous and resulted in the remarkable role of FDI in the economic, financial and technological development of developing or destination nations. In this scenario, this study is conducted with the purpose of understanding some factors like communication and governance which strengthen FDI inflows.

The level of governance in a particular state or the host country for FDI, the Kaufmann et al. (2009) and (Kaufmann et al., 2011) prescribed some indicators to measure the country level of governance broadly. At the present circumstances, these indicators are endorsed by the World Bank and are indexed on its website for the information and record of the general public. Pakistan appears to have superior governance in this area as compared to other low-income nations. The indicator raises issues about why this sector's governance might be simpler in some situations and more difficult in others (Andrews et al., 2010).

This research is very important in nature to assess the impact of communication infrastructure on FDI. Several factors that have been analyzed will be helpful for decision making regarding FDI in the sample areas. The OECD reported that FDI offers a range of technological advancement and sound financial resources for the development of local financial markets and advancement in communication structure that can increase productivity, create new jobs markets, boost up exports, enhance advanced knowledge, initiate innovation, up living standards of local community and, more generally, the efforts toward the progress for the 2030 Agenda (Boluk et al., 2019).

Donaubauer et al. (2020) conducted study on Financial Markets Development and FDI. They recommended conducting a study about other factors like physical infrastructure in transportation, and communication for FDI. Further, the of the country level governance is considered as a moderating variable due to its dual role of influencing both FMD as well as physical infrastructure including communication system for the attraction of MNEs. So, there is need to work further on the country governance and FDI for the studies to be conducted in future (Dobrowolska et al., 2023; Rienda et al., 2021). However, Wang et al. (2019) did a study on the moderating influence of governance. So, the author wishes to expound on such proposals in this empirical investigation. Furthermore, Gupta et al. (2023) did research on institutional quality and FDI. They used the term "institution quality" for country-level governance and proposed a future study that may produce interesting results by investigating the influence of institutional quality on FDI.

Research Question: What is the impact of communication infrastructure on foreign direct investment with moderating effect of country level governance in Pakistan?

LITERATURE REVIEW

Information and Communication Technology impact the attraction of FDI (Bhujabal & Sethi, 2020). Further, Bhujabal et al. (2021) concluded that the applications of communication technology are very important for the attractions of FDI. They created a comprehensive index for communication infrastructure with the name of ICT index. The index consists of subscribers of telephone, mobile, broadband, internet, and secure internet servers. Further, they concluded that the availability of infrastructure of the host country attracts FDI very easily. Further, mobile Cellular Subscription has significant role and used as one important variable for the ICT index (Şahan & Tuna, 2021).

Ulzii-Ochir (2019) used fixed telephone subscriptions in the host countries as a proxy of infrastructure quality. It was found significant statistically and the indicated positively. He argued that majority of the multinational companies are attracted to countries with developed rail and road infrastructure. The number of fixed phone subscriptions per 100 people must be considered as an indicator of host infrastructure quality for the establishment of quick and reliable communication for foreign investors and local stakeholders.

Yin and Choi (2021) conducted a study and argued that increase in the internet facilities ensure the increase in economic growth, boosting trade, and attract more foreign direct investment. It has been suggested that the internet facilitate the entrepreneur are very important and necessary for the allocation of optimal capital in the business, use of modern technology, and the best utilization of human and other resources.

According to Kurniawati (2021), communication infrastructure refers to the means of communications which are divided into three components. These components are telephone lines, mobile phone users and internet users which have been found positively for the attraction of FDI. Further, Wang and Rukh (2021) created an index for ICT which includes mobile cellular, individuals using the internet, and telephone subscriptions in the host countries. They argued that strong communication systems provide quick information about the products of various foreign or multinationals companies and enable the residents of host countries to communicate easily. Such practice makes foreign investors more comfortable in the host countries.

The World Bank defined governance as the traditions and mechanisms that enable a country to exercise its authority. This includes the process of selecting, overseeing, and changing governments; the government's capacity to successfully formulate and implement sound policies; and public and state respect for the institutions that regulate their economic and social interactions. According to Andrews (2008), a good governance requires the presence of a single, most effective system of government. It has an identical influence on academic, donor, and reform activities in economies that are developing. However, even in countries with excellent governance indices, the one best technique paradigm is simply not applicable. Despite being regarded to as "effective" or "models of good government systems," countries appear to be very varied.

Ulzii-Ochir (2019) argued that level of corruption, and quality of regulations of the host country are very important factors for FDI. He concluded that the level of corruption is considered one of the significant elements which negatively related to the attraction of FDI. He has found the political instability of the host countries positive and statistically significant, which attracts FDI very quickly for their development. Government effectiveness is a very interesting and effective factor for the formulation of necessary policy and their implementation on sound. Wang et al. (2019) studies host country governance and concluded that its role positive in the relationship of risk allocation and private investment. Law and Azman-Saini (2012) have the same results of their research study.

Olaniyi and Oladeji (2021) analyzed institutional quality for governance and found control on corruption, law and order and government stability the most influential factor. Atanga Ondoa and Seabrook (2020) and Dada and Abanikanda (2021) have also been concluded institutional quality as governance of the host nation and found it as most important influential factor for the attraction of FDI. The various indicators of governance (Kaufmann et al., 2011) are voice and accountability, political stability, and absence of violence, regulatory quality, government effectiveness, rule of law and control of corruption.

The institutional quality index constructed of all six indicators exert positive significant effect on FDI inflow in Asian countries shown by the estimated coefficient. GMM is used for getting results. The results further indicate that institutional quality is enough improved in Asian countries, and thus, it is positively related to FDI inflow (Khan et al., 2023)

Governments must work collectively to maintain the rule of law, which includes a strong and independent

judicial system, effective contract enforcement, respect for property rights, and shareholder protection, as well as democratic accountability, advanced bureaucracy, and political stability. The formation of anti-corruption structures and committees improves a nation's institutional quality. Countries with unstable institutions tend to have corrupt administrations and poor judicial systems. They consequently struggle to attract money, which restricts economic progress (Pradhan et al., 2022).

Although increasing interest in FDI and institutional changes in host countries, there is a limited grasp of how MNE operations influence the institutional environment of host country. there is no evidence that FDI has an overall influence on institutional quality in the host countries (Fon et al., 2021).

Sinha and Saha (2022) investigated the impact of information and communication technology infrastructure, which has recently surpassed traditional factors in attracting foreign capital, as well as country-specific corruption levels, on the long-term location of foreign direct investment (FDI) to developing countries. The findings of this study suggest that, while corruption and ICT are ineffective in attracting FDI on their own, they are helpful when combined, as seen by the positive and statistically significant parameter of the interaction term between corruption and ICT. Furthermore, nations with high levels of corruption are more likely to upgrade their ICT infrastructure in order to attract foreign direct investment.

According to Bouchoucha and Yahyaoui (2019), governance has a positive and significant influence on the attraction of foreign direct investment in Africa and its subregions. On the other hand, several developing countries have received a substantial amount of FDI inflows; as a result, these countries have challenges related to weak institutional quality. FDI inflows are viewed as a tool to improve institutional quality. However, if foreign investors take advantage of tax concessions by operating underground, they may have a negative influence on institutional quality in host countries (Huynh, 2022).

Theoretical Framework

Theoretical framework formed that shows the relationship of variables in the study. Such relationship for this study is as under:

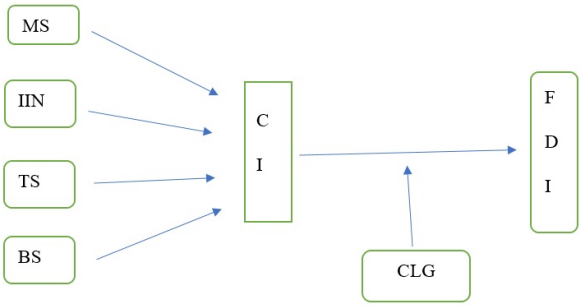

Figure 1: Model of the study

RESEARCH METHODOLOGY

Variables are operationally defined using existing literature and data acquired from the World Development Indicators (WDI) of the World Bank's open sources from 2002 to 2021. Microsoft Excel 365 and EViews 10 are used to organize and analyze data accurately. Variables are mentioned in detail as below in Table 2 and 3.

Table 2: Operationalization of variables

Variable	Definition	Reference	Data source
Foreign Direct Investment (FDI)			
FDI	Natural log of FDI	(Yakubu, 2020) (Sinha et al., 2020) (Warsame, 2021) DadaDada and Abanikanda (2021) (Singh & Kapuria, 2022)	WDI
Communication Infrastructure			
MS	Mobile subscribers (per 100 people)	Bhujabal and Sethi (2020) Kurniawati (2021) Bhujabal et al. (2021) Cheng et al. (2021) Şahan and Tuna (2021)	WDI
IND INT	Individuals using Internet (% of population)	Cheng et al. (2021) Bhujabal and Sethi (2020) Bhujabal et al. (2021) Kurniawati (2021)	WDI
TS	Telephone subscriptions	Bhujabal and Sethi (2020) Bhujabal et al. (2021) Kurniawati (2021)	WDI
BS	Broadband subscriptions	Bhujabal and Sethi (2020) Bhujabal et al. (2021)	WDI
Country Level Governance			
VA	Voice and Accountability	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) DadaDada and Abanikanda (2021)	WGI
PSAV	Political Stability and Absence of Violence	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) Dada and Abanikanda (2021)	WGI

Table 3: Cont...

Variable	Definition	Reference	Data source
RQ	Regulatory Quality	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) Dada and Abanikanda (2021)	WGI
GE	Government Effectiveness	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) Dada and Abanikanda (2021)	WGI
RL	Rule of Law	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) Dada and Abanikanda (2021)	WGI
CC	Control of Corruption	Otchere et al. (2016) Wang et al. (2019) Ulzii-Ochir (2019) Atanga Ondoa and Seabrook (2020); Ulzii-Ochir (2019); (Wako, 2021) Dada and Abanikanda (2021)	WGI

Country Level Governance used in previous studies as a moderating variable. The researchers used different titles for governance. Some of them are mentioned in the table 4 below:

Table 4: Application of governance as a moderator

Variable	Definition	Reference	Data source
INST	Governance	Dada and Abanikanda (2022)	WGI
CPI	Corruption[1]	Kim and An (2022)	TI[2]
INST	Institutions Quality	Magbondé and Konté (2022)	ICRG[3]
INST	Institutions Quality	Khan et al. (2022)	WGI

Econometric Model

The basic econometric model is as follow:

$\mathrm{LFDI_{ith}} = \alpha + \mathrm{B_1COMMI_{it}} + \beta_2\,(\mathrm{COMM^{*}CLG}) + \mathrm{e_{it}}$.....(1)

The variables in the model are explained as under:

LFDI$_{it}$: Natural log of FDI inflow in US$ for country i at t time

CI: Communication infrastructure
CLG: Country Level Governance of the host countries
e_{it}: Error term.

Bhujabal and Sethi (2020) created index for communication with the title of ICT index which includes subscriptions related to telephone, mobile, broadband services, internet users, and secure internet servers. Such factors are indexed by PCA. Moreover, Chin et al. (2021) concluded in their study that infrastructure development as most important factor for the economic development. They constructed infrastructure index by the proxies of fixed telephone subscriptions, air transport, and percentage of the population with access to electricity. They indexed them by Principal Components Analysis for such purposes.

The Country Level Governance consists of six indicators. The World Bank collected and synthesized data for 200 counties including Pakistan from over thirty sources to reflect on the perspectives and experiences of worldwide professionals in the public, commercial, and non-governmental sectors, as well as citizens, about the quality of various aspects of governance. These indications are provided in standard normal values for each item, which has a range of -2.5 to 2.5. Higher values denote stronger governance, according to the information available on the World Bank website .

Principal Component Analysis

Principal Components Analysis is a technique used for data reduction systematically (Márquez, 2022). It is conducted for the indexing of various components of Communication Infrastructure, and the Country Level Governance (Bhujabal & Sethi, 2020; Bhujabal et al., 2021; Cheng et al., 2021; Chin et al., 2021; Ito & Kawai, 2018; Saba et al., 2021; Yemelyanova, 2021). PCA Equation (Bartholomew, 2010) is as follows:

$PCA = y1/4a1x1pa2x2p \ldots pa6x6$.....(2)

Stationarity and Cointegration of data series

Unit root test :Arltová and Fedorová (2016) stated that the identification and validation of the integration order of variables include a wide number of assessments known as unit root tests. The most prominent of which is the ADF test.

Stationarity can be described as the presence of a unit root in a time series. The improved Dickey-Fuller (ADF) tests could be used in this situation. Econometric equation of ADF test (Gujarati & Porter, 2009) is as follow:

$\Delta \mathrm{Yt} = \beta 1 + \beta 2\mathrm{t} + \delta \mathrm{Yt} - 1 + \sum_{i=1}^{\mathrm{m}} \mathrm{ai}\Delta \mathrm{Yt} - \mathrm{i} + \varepsilon \mathrm{t}$.....(3)

ARDL equation (Natsiopoulos & Tzeremes, 2022) is as follows:

$\mathrm{yt} = \mathrm{c0} + \mathrm{c1t} + \sum_{i=1}^{\mathrm{P}} \mathrm{by}, \mathrm{iyt} - \mathrm{i} + \sum_{\mathrm{j}=1}^{\mathrm{k}} \sum_{l=0}^{\mathrm{qi}} \mathrm{b}, 2\mathrm{xj}, \mathrm{t} - 1 + \epsilon \mathrm{t}$.....(4)

The error-correction model shows how Cointegrating variables adjust to the short-term equilibrium, even though they may deviate from their relationship in the near term (Rao, 2015). The equation of ECM (Gujarati & Porter, 2009) is as follow.

Yit = $\beta 1 + \beta 2$X2 it +$\beta 3$X3 it + wit.....(5)

Diagnostic Tests

There are some diagnostic tests for serial correction, heteroscedasticity, and normality of data, are conducted.

RESULTS AND DISCUSSION

Data analysis presented in this chapter. Time series data analyzed for Pakistan. Variables related to communication infrastructure and country level governance are transformed through Principal Components Analysis (Bhujabal & Sethi, 2020; Bhujabal et al., 2021; Cheng et al., 2021; Chin et al., 2021; Ito & Kawai, 2018; Saba et al., 2021; Yemelyanova, 2021). Results are structured in such a manner to present them in the order of ADF tests, cointegration tests, ARDL bond test, and Vector Error Correction Model.

Table 5: ADF test for unit root

	At level		At first difference	
Method	Statistic	Prob.**	Statistic	Prob.**
ADF - Fisher Chi-square	20.17	0.003	24.853	0.000
ADF - Choi Z-stat	-2.778	0.002	-3.165	0,000

It is assumed that the probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. Whereas all other tests assume asymptotic normality.

Table 6: Intermediate ADF Test

	Probability	
Series	At level	At first difference
D(FDI)	0.003	0.019
D(CLG)	0.414	0.464
D(CI*CLG)	0.029	0.000

The ADF test of unit root shows that data is stationary at level and at first difference, therefore, ARDL is employed to analyze the data.

ARDL Tests

The Auto Regressive Distribution Log (ARDL) is used to check the relationship among variables. The long term relationship and short term relationship are checked through ARDL Bound Test and ARDL ECM Regression respectively.

The ARDL Bound Test is employed for testing the below hypotheses, and the result is presented in Table 7.

The required hypotheses are following: Ho: There is no cointegration exist. H1: There is a cointegration exist.

Table 7: ARDL Bound Test with AIC criteria

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	7.334	10%	2.63	3.35
k	2	5%	3.1	3.87
——	——	2.50%	3.55	4.38
——	——	1%	4.13	5

Asymptotic: n=1000

The *F*-value 7.334 is greater than the upper bound and lower bound values of the ARDL test results which shows factor of cointegration among the variables for long run. However, ECM Regression is required for testing of short run cointegration, and results are presented in Table 8.

Table 8: ARDL ECM Regression (Dependent Variable FDI)

Variable	Coefficient	Std. Error	*t*-Statistic	Prob.
D(FDI(-1))	0.555	0.143	3.886	0.03
D(FDI(-2))	0.463	0.129	3.585	0.037
D(FDI(-3))	0.801	0.139	5.76	0.01
D(CI)	-0.378	0.341	-1.107	0.349
D(CI(-1))	-1.109	0.397	-2.791	0.068
D(CI(-2))	0.149	0.123	1.207	0.314
D(CI(-3))	-0.249	0.103	-2.426	0.094
D(CICLG)	0.187	0.07	2.679	0.075
D(CICLG(-1))	0.194	0.075	2.59	0.081
CointEq(-1)	-1.632	0.213	-7.66	0.005

The *P* value of cointegration in Table 8 is 0.005, which is less than 5%. It shows that results are significant. Such results indicate that there is a short run relationship exist among the variables.

Table 9: Breusch-Godfrey Serial Correlation LM Test

F-statistic	3.107	Prob. F(2,1)	0.372
Obs*R-squared	13.782	Prob. Chi-Square(2)	0.001

The probability of serial correction LM test in Table 9 exceeds 5% level which indicates that there is absence of serial correlation in the model.

Table 10: ARCH heteroskedasticity test

F-statistic	0.665	Prob. F(1,13)	0.429
Obs*R-squared	0.73	Prob. Chi-Square(1)	0.393

Table 11: Breusch-Pagan-Godfrey heteroscedasticity test

F-statistic	0.672	Prob. F(12,3)	0.733
Obs*R-squared	11.659	Prob. Chi-Square(12)	0.473
Scaled explained SS	0.319	Prob. Chi-Square(12)	1

There are two tests for heteroscedasticity conducted. The results in Table 10 and Table 11 indicate that there is absence of heteroscedasticity in the model as the probability value exceeds the 5% level.

Table 12: Ramsey Reset test

Measures	Value	df.	Probability
t-statistic	0.043	2	0.97
F-statistic	0.002	(1, 2)	0.97

The Ramsey Reset Test was conducted, and the results are presented in Table 12 which shows the probability value of 0.97. It exceeds 5%. The results show the stability, proper specification, and reliability of the model.

The ADF tests confirmed that there is no stationarity issue in the data. Furthermore, the diagnostic tests established that there is no serial correlation, no heteroscedasticity, and that the model is stable, well specified, and reliable. Furthermore, the cointegration tests revealed that there is a short-term and long-term relationship among Communication Infrastructure, Foreign Direct Investment (FDI), and Country Level Governance for Pakistan.

This study's findings indicate that ICT has a considerable influence on FDI attractiveness, which is similar with the findings of Bhujabal and Sethi (2020) for SAARC states and Chen and Jiang (2023) for 42 countries. The Country Level Governance Index consists of six indicators: voice and accountability, political stability and lack of violence, regulatory quality, government effectiveness, rule of law, and corruption control. It always helps to attract foreign direct investment. The general findings are consistent with those of Ross (2019) for 122 developing nations.

However, results related to the moderating role of country level governance performed a beneficial and significant influence in attracting FDI. Such findings are positive and significant, and they are consistent with those of Dada and Abanikanda (2022) for Nigeria, Kim and An (2022) for 16 OECD countries, Magbondé and Konté (2022) for 124 developing countries, and Khan et al. (2022) for 107 world developing and 39 Belt and Road Initiative countries.

FDI is a blessing for the host economy, as evidenced both theoretically and practically. The study found that strong and quick information and communication infrastructure makes it easier for foreign investors to make investment decisions. Such solutions are also beneficial to stakeholders such as raw material suppliers, customers, state regulatory agencies, financial institutions, and supply chain-related organizations. Furthermore, such a powerful and reliable communication infrastructure enables foreign investors in understanding various types of competitor strategies, newly introduced technology, and high-performance equipment available in both local and worldwide markets.

Country level governance requires more attention to increase FDI inflows. Six aspects are critical for the attraction and satisfaction of foreign investors. Freedom of public expression and a strong accountability system, political stability of the host country, and the absence of violence in the context of peace, regulatory quality of state organization, government effectiveness with justice, degree of implementation of the rule of law, and control of corruption are some important country-level governance factors that require serious attention for the attraction and retention of foreign investment.

CONCLUSION AND RECOMMENDATIONS

The prosperity and development of a large population relate to the production of goods and provision of services by local and foreign companies. According to the U.S. Census Bureau Current Population report presented on its website , Pakistan placed 5th ranked on population basis in the world. Moreover, Pakistan placed in the group of N11 countries which is the next set of large-population beyond the BRICS and G7 (Sachs, 2007). Such concept is further identified by Gupta and Bhatia (2022).

Technological development, labor skills and other advancements of competitive nature are necessary for the development of a large set of population which are possible through foreign direct investment. Foreign investors shift such developments from their own advanced teleological countries to the developing countries. Communication infrastructure has positive impact on the attraction of FDI in Pakistan. Country level governance is incorporated in this study as moderating variable. There are six governance indicators which are indexed through PCA.

Communication infrastructure should be faster and more reliable. It has a significant impact on the attraction of FDI. Mobile and internet facilities are not available in all the parts of the country. Such facilities should be available in all the parts of the country to facilitate foreign investors. Country Level Governance should be stricter for peace and security, investors' protection, and economic freedom. The government should take serious steps to for all the six indicators of governance. Future study to be conducted to any other developing country and results should be matched.

AUTHORS DECLARATION

It is declared that there is no funding for this paper and the authors have no conflict of interest.

REFERENCES

Allioui, H., & Mourdi, Y. (2023). Exploring the Full Potentials of IoT for Better Financial Growth and Stability: A Comprehensive Survey. *Sensors, 23*(19), 8015.

Andress, J., & Winterfeld, S. (2013). *Cyber warfare: techniques, tactics and tools for security practitioners*. Elsevier.

Andrews, M. (2010). Good government means different things in different countries. *Governance, 23*(1), 7-35.

Andrews, M., Hay, R., & Myers, J. (2010). Governance indicators can make sense: under-five mortality rates are an example. *CID Working Paper Series*.

Arltová, M., & Fedorová, D. (2016). Selection of Unit Root Test on the Basis of Length of the Time Series and Value of AR (1) Parameter. *Statistika: Statistics & Economy Journal, 96*(3).

Bartholomew, D. J., Knott, M., & Moustaki, I. (2011). *Latent variable models and factor analysis: A unified approach*. John Wiley & Sons.

Mohanty, S., & Sethi, N. (2022). The energy consumption-environmental quality nexus in BRICS countries: the role of outward foreign direct investment. *Environmental Science and Pollution Research, 29*(13), 19714-19730.

Boluk, K. A., Cavaliere, C. T., & Higgins-Desbiolles, F. (2019). A critical framework for interrogating the United Nations Sustainable Development Goals 2030 Agenda in tourism. *Journal of Sustainable Tourism*.

Bouchoucha, N., & Yahyaoui, I. (2019). Governance and foreign direct investment: A comparative analysis between low and middle income African countries.

Cheng, C.-Y., Chien, M.-S., & Lee, C.-C. (2021). ICT diffusion, financial development, and economic growth: An international cross-country analysis. *Economic modelling, 94*, 662-671.

Chin, M.-Y., Ong, S.-L., Wai, C.-K., & Kon, Y.-Q. (2021). The role of infrastructure on economic growth in belt and road participating countries. *Journal of Chinese Economic and Foreign Trade Studies*.

Dada, J. T., & Abanikanda, E. O. (2022). The moderating effect of institutions in foreign direct investment led growth hypothesis in Nigeria. *Economic Change and Restructuring, 55*(2), 903-929.

Dada, J. T., & Abanikanda, E. O. (2022). The moderating effect of institutions in foreign direct investment led growth hypothesis in Nigeria. *Economic Change and Restructuring, 55*(2), 903-929.

Dobrowolska, B., Dorożyński, T., & KunaMarszałek, A. (2023). The Quality of Governance and Its Impact on FDI Inflows. A Comparative Study of EU Member States. Comparative Economic Research. *Central and Eastern Europe, 26*(3), 7-30.

Donaubauer, J., Neumayer, E., & Nunnenkamp, P. (2020). Financial market development in host and source countries and their effects on bilateral foreign direct investment. *The World Economy, 43*(3), 534-556.

Fon, R. M., Filippaios, F., Stoian, C., & Lee, S. H. (2021). Does foreign direct investment promote institutional development in Africa?. *International Business Review, 30*(4), 101835.

Gillwald, A. (2008). Communication infrastructure. *The International Encyclopedia of Communication*.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics*. McGraw-hill.

Gupta, P., & Bhatia, P. (2022). An empirical investigation of N-11 countries as successors of BRICS using panel data modeling. *International Journal of Emerging Markets, 17*(8), 2024-2051

Gupta, S., Yadav, S. S., & Jain, P. K. (2023). Does institutional quality matter for foreign direct investment flows? Empirical evidence from BRICS economies. *International Journal of Emerging Markets*.

Ito, H., & Kawai, M. (2018). Quantity and quality measures of financial development: implications for macroeconomic performance. *Public Policy Review, 14*(5), 803-834.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). Governance matters VIII: aggregate and individual governance indicators, 1996-2008. *World bank policy research working paper*, (4978).

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues1. *Hague journal on the rule of law, 3*(2), 220-246

Khan, H., Dong, Y., Bibi, R., & Khan, I. (2023). Institutional Quality and Foreign Direct Investment: Global Evidence. *Journal of the Knowledge Economy*, 1-45.

Khan, H., Weili, L., & Khan, I. (2022). The role of institutional quality in FDI inflows and carbon emission reduction: evidence from the global developing and belt road initiative countries. *Environmental Science and Pollution Research*, 1-28.

Kim, K., & An, J. (2022). Corruption as a moderator in the relationship between E-government and inward foreign direct investment. *Sustainability, 14*(9), 4995.

Kurniawati, M. A. (2022). Analysis of the impact of information communication technology on economic growth: empirical evidence from Asian countries. *Journal of Asian Business and Economic Studies, 29*(1), 2-18.

Law, S. H., & Azman-Saini, W. N. W. (2012). Institutional quality, governance, and financial development. *Economics of governance, 13*, 217-236.

Magbondé, G. K., & Konté, M. A. (2022). Developing countries' economic fundamentals and FDI inflows: The moderating role of institutions. *Cogent Economics & Finance, 10*(1), 2028976.

Márquez, F. P. G. (Ed.). (2022). *Advances in Principal Component Analysis*. BoD–Books on Demand.

Natsiopoulos, K., & Tzeremes, N. G. (2022). ARDL bounds test for cointegration: Replicating the Pesaran et al.(2001) results for the UK earnings equation using R. *Journal of Applied Econometrics, 37*(5), 1079-1090

Olaniyi, C. O., & Oladeji, S. I. (2021). Moderating the effect of institutional quality on the finance–growth nexus: insights from West African countries. *Economic Change and Restructuring, 54*(1), 43-74.

tchere, I., Soumaré, I., & Yourougou, P. (2016). FDI and financial market development in Africa. *The World Economy, 39*(5), 651-678.

Hasmori, M. F., Memon, M. H., & Ismail, R. (2023). Critical Factors and Mitigating Measures of Construction Delays of Pakistani Building Construction Projects. *International Journal of Sustainable Construction Engineering and Technology, 14*(2), 240-249.

Pradhan, R. P., Arvin, M. B., Nair, M., Hall, J. H., & Bennett, S. E. (2022). Institutional development in an information-driven economy: can ICTs enhance economic growth for low-and lower middle-income countries?. *Information Technology for Development, 28*(3), 468-487.

Khan, I., Naushad, A., & Sheharyar, M. Impact of Quality of Service on Customer Loyalty: A Critical Study of Cellular Mobile Broadband Sector in Pakistan.

Rao, K. S. (2015). The Basics of Financial Econometrics: Tools, Concepts, and Asset Management Applications.

Rienda, L., Quer, D., & Andreu, R. (2021). Distance factors and establishment mode choice of emergingmarket multinationals: The moderating effect of administrative distance. *European Management Review, 18*(4), 460-475

Saba, C. S., Ngepah, N., & Odhiambo, N. M. (2021). Analysis of convergence in transport infrastructure: a global evidence. *European Journal of Transport and Infrastructure Research, 21*(2), 137-160.

Sachs, G. (2007). The N-11: More than an acronym. *Global economics paper, 153*, 28.

Şahan, D., & Tuna, O. (2021). Policy implications on transport infrastructure–trade dynamics: Case of Turkey. *Logistics, 5*(3), 47.

Shenkar, O., Liang, G., & Shenkar, R. (2022). The last frontier of globalization: Trade and foreign direct investment in healthcare. *Journal of International Business Studies, 53*(2), 362.

Singh, N., & Kapuria, C. (2022). The effect of sustainability on foreign direct investment inflows: evidence from developing countries. *Social Responsibility Journal, 18*(4), 681-703.

Sinha, C., & Saha, S. (2022). Foreign Direct Investment and Its Location Choice to Developing Nations: The Role of ICT Infrastructure and Corruption. *In Digitalization and Economic Development* (pp. 74-98). Routledge.

Sinha, M., Chaudhury, A. R., & Sengupta, P. P. (2020). An empirical analysis on FDI and ICT in India. *In Smart Intelligent Computing and Applications: Proceedings of the Third International Conference on Smart Computing and Informatics, Volume 2* (pp. 93-102). Springer Singapore.

Ulzii-Ochir, N. (2019). The Determinants of FDI in Landlocked Developing Countries in Central Asia. *In Trade Logistics in Landlocked and Resource Cursed Asian Countries (pp. 95-121)*. Springer.

Wako, H. A. (2021). Foreign direct investment in sub-Saharan Africa: Beyond its growth effect. *Research in Globalization, 3*, 100054.

Wang, H., Liu, Y., Xiong, W., & Song, J. (2019). The moderating role of governance environment on the relationship between risk allocation and private investment in PPP markets: Evidence from developing countries. *International Journal of Project Management, 37*(1), 117-130.

Wang, P., & Rukh, B. G. (2021). The effect of information communication technology (ICT) infrastructure availability on FDI inflow in D8 countries. In *E3S Web of Conferences* (Vol. 235, p. 02052). EDP Sciences.

Warsame, A. S. (2021). The Relationship Between Information & Communication Technology and Foreign Direct Investment Inflow to Africa. *International Journal of Economics and Finance, 13*(5).

Yakubu, I. N. (2020). Institutional quality and foreign direct investment in Ghana: A bounds-testing cointegration approach. *Review of International Business and Strategy, 30*(1), 109-122.

Yemelyanova, L. (2021). Relationship between the stock market development, banking sector development and economic growth in the cee countries. *Baltic Journal of Economic Studies, 7*(3), 118-126.

Yin, Z. H., & Choi, C. H. (2022). Has the Internet increased FDI, economic growth, and trade? Evidence from Asian economies. *Information Development, 38*(2), 192-203.

APPENDICES

Table 13: Descriptive statistics

Measures	FDI	CI	CI*CLG
Mean	9.277	1.153	2.567
Median	9.31	1.076	2.557
Maximum	9.747	1.988	5.421
Minimum	8.728	0.56	1.243
Std. Dev.	0.258	0.375	1.021
Skewness	-0.072	0.793	1.007
Kurtosis	2.94	3.098	4.052
Jarque-Bera	0.02	2.103	4.303
Probability	0.99	0.349	0.116
Sum	185.547	23.057	51.35
Sum Sq. Dev.	1.265	2.665	19.824
Observations	20	20	20

Table 14: Correlation

Measures	FDI	CI	CI*CLG
FDI	1		
CI	0.171	1	
CICLG	-0.3392	0.524	1

PCA for communication infrastructure

Table 15: Eigenvalues: (Sum = 3, Average = 1)

Number	Value	Difference	Proportion	Cumulative value	Cumulative Proportion
1	1.557	0.403	0.519	1.557	0.519
2	1.154	0.865	0.385	2.711	0.904
3	0.289	0	0.096	3	1

Table 16: Eigenvectors (loadings)

Variable	PC 1	PC 2	PC 3
FDI	-0.262	0.849	0.458
CI	0.618	0.512	-0.597
CICLG	0.741	-0.127	0.659

Table 17: Ordinary correlations

	FDI	CI	CI*CLG
FDI	1		
CI	0.171	1	
CICLG	-0.339	0.524	1

PCA for Country Level Governance

Table 18: Eigenvalues: (Sum = 6, Average = 1)

Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
1	4.938	4.239	0.823	4.938	0.823
2	0.699	0.488	0.117	5.638	0.94
3	0.212	0.13	0.035	5.849	0.975
4	0.081	0.045	0.014	5.931	0.988
5	0.036	0.004	0.006	5.967	0.995
6	0.033	0	0.006	6	1

Table 19: Eigenvectors (loadings)

Variable	PC 1	PC 2	PC 3	PC 4	PC 5
CC	0.434	0.064	-0.169	-0.872	-0.043
GE	0.402	0.462	0.401	0.144	0.653
PS	0.389	0.564	-0.211	0.229	-0.467
VA	0.392	-0.559	-0.184	0.08	0.369
RL	0.427	-0.17	-0.5	0.393	-0.045
RQ	0.403	-0.351	0.694	0.078	-0.464

Table 20: Ordinary correlations

Measures	CC	GE	PS	VA	RL
CC	1				
GE	0.857	1			
PS	0.849	0.927	1		
VA	0.811	0.589	0.545	1	
RL	0.9	0.757	0.775	0.902	1
RQ	0.819	0.737	0.614	0.882	0.825