Impact of Foreign Direct Investment and Information Communication Technology on Economic Growth: An Empirical Analysis from Selected Developing Countries

Dr. Rubeena Tashfeen
Associate Dean & Associate Professor, FOMS, UCP Business School
rubeenatashfeen7@gmail.com
Dr. Syed Muhammad Amir Shah
Professor/ Chairman Department of Commerce, AIOU, Islamabad
dramirshah@aiou.edu.pk
Muhammad Sadil Ali
Research associate Department of Commerce, AIOU, Islamabad
Wasif Anis
Lecturer, Department of Management Sciences, Women University, Swabi
Corresponding author: sadil.ali@aiou.edu.pk

Abstract

In this research, we investigate the imperative role of foreign direct investment and information and communication technology on economic growth in selected developing countries by using panel data from 2004 to 2019. GDP per capita is used as the dependent variable, and foreign direct investment, information and communication technology, urban population, and exports are taken as independent variables. The study has used the random effect technique to find a link between variables. The study's findings show that foreign direct investment, information and communication technology, and urban populations have all played important roles in determining and enhancing economic growth in a number of developing countries. It is recommended that the government should provide more economic and political stability to encourage high exports and attract more foreign direct investment in these economies.

Keywords: FDI, ICT, GDP, and Developing Countries

1. Introduction

The world economy is changing very rapidly. Now every economy makes an effort to have a significant increase in economic growth and an improved status of its economy. As a result, economies strive to highlight all of the factors that promote economic growth and development. Moreover, countries must focus on social and economic infrastructure to have growth and welfare. Infrastructural development enhances the development of many economies. Infrastructure services can provide for a high quality of life while also improving production and efficiency. Public

services such as telecommunication, piped installation, sanitation, solid waste collection and disposal, piped gas, roads, major dams, and canal work for irrigation are also beneficial in terms of maximising growth and production (World Bank, 1994).

Infrastructure for information and communication technology (ICT) also plays a vital role in determining growth and development in the country (Lee et al., 2012; Pradhan et al., 2014). The improved information communication technology makes reductions in transaction costs and boosts production and growth (Röller & Waverman, 1996). Investment in transport such as roads, railways, and aviation shows important growth as it lessens distance, saves time and energy, enhances security and protection, and makes improvements in social production. This type of transportation and communication infrastructure also increases trade volume.

Urbanization is defined as the demographic procedure whereby an increasing part of the national inhabitants lives within urban expenditures. Urbanization is carefully associated with the economic development of a people. As an economy grows, relative and absolute changes in demand enhance the significance of the manufacturing and service sectors. Urbanization contributes much to prosperity and welfare.

Urbanization strengthens and recovers economic growth and consequently enhances the nation's wealth and welfare, and it has long-lasting effects on economic growth. It is a difficult phenomenon. Towns and small cities can quickly grow, and new monetary and politically approachable constructions can arise. All this inspires extra investment, generates increasing demand for workers, and provokes movement to the city as an additional tool of urban growth. As a result, people have a better and higher quality of life.

This research demonstrates the impact of foreign direct investment, information and communication technology, urban population, and exports on economic growth in selected developing countries. This research will be used further for policy implications and suggestions. The structure of the study is as follows. Section II shows the literature review. Section III reveals data and methodology. Section IV demonstrates the results and the discussion. However, Section V shows the conclusion.

2. Literature Review

There has been a significant amount of investigation into the ways in which population growth, openness to commerce, and foreign direct investment all influence economic outcomes. However, the existing research underlines the significance that urban population, information and communication technology, and foreign direct investment all play in increasing economic growth, particularly in developing economies.

In their study from 1996, Roller and Waverman concluded that the behaviour of telecommunications infrastructure was a significant influence on economic development in 21 OECD nations. The findings indicated that both population and infrastructure contributed to the expansion of the economy. According to the research of Bende-Nabende (1999), foreign direct investment led to greater levels of knowledge transfer, capital formation, commercial activity, and overall economic growth.

Using the VAR model, Nabende et al. (2003) explored how the presence of foreign direct investment affects the rate of economic growth in Asian economies. It was discovered that these countries saw greater growth as a result of increases in foreign direct investment. Gorg and Greenwood (2003) claim that a slowdown in economic growth can be attributed to increased foreign direct investment. Hermes and Lensink (2003) analysed data from 67 developing nations throughout Asia, Africa, and America and discovered that foreign direct investment has a detrimental impact on economic growth.

Rosenthal and Strange (2003) focused their attention on the part that cities play in the expansion of the economy. They found that increasing the size of cities improved productivity by approximately 5%, from 3% to 8%, which implied that urban areas contributed 85% of GDP in economies with high incomes. Lix and Liu (2005) examined secondary data from 84 economies between the years 1970 and 1999 to determine whether or not there was a correlation between GDP and foreign direct investment. The findings indicated that direct investment from outside contributed positively to economic growth; however, this positive effect was hampered by a lack of technology advancement. This gap in technological advancement also had a negative impact.

Fedderke and Luiz (2006) emphasised the significance of the country's physical infrastructure to the country's overall economic expansion. The findings of the study were derived

from data collected over a thirty-year period. The ARDL method was applied, and the findings revealed that the quality of the infrastructure had an impact on both labour productivity and overall productivity. According to Sahoo (2006), in 1997 the government of Pakistan made it possible for foreign corporations to engage in the agricultural and service sectors, which had previously been off-limits to these types of investors. Because of this, the expansion of the economy has accelerated. Shabu (2010) investigated how the urbanisation of economies in underdeveloped countries as well as industrialised ones influenced economic growth. According to the findings of the study, rising urbanisation led to lower rates of economic growth in emerging countries while simultaneously leading to higher rates of economic growth and productivity in developed nations.

On the basis of panel data for sub-Saharan African countries, Babatunde (2011) found the impact of trade openness, infrastructure, foreign direct investment, and growth. The findings suggested that trade liberalisation and economic expansion were the primary drivers of foreign direct investment. Owolabi-Merus (2015) conducted research into how growth in Nigeria was influenced by foreign direct investment. The author consulted data spanning the years 1983 to 2013. According to the findings of the regression analysis, increases in foreign direct investment have been associated with faster economic growth in the Nigerian economy. In addition, the nation has demonstrated signs of structural growth and development.

Saidi et al., (2018) focused on the impact of transport infrastructure on growth by using data from 2002 to 2016 in Middle Eastern and African countries. Their research was conducted in Africa as well as the Middle East. The findings indicated significant improvements were made to the transportation infrastructure in every state. Sabir (2020) has demonstrated the connection between infrastructure and economic expansion by making use of time series data covering a period of 17 years using the ARDL method. The study demonstrated that roads had a detrimental effect on the rate of expansion. Increases in life expectancy, the number of people enrolling in secondary schools, and the usage of electricity and other forms of energy all led to faster economic growth.

Using data ranging from 1976 to 2019, Rehman et al. (2022) examined the impact on economic growth in Pakistan of factors including foreign direct investment, personal remittances, total reserves, gross savings, and information and communication technologies. The findings indicated that rising levels of personal remittances as well as direct foreign investment contributed

to the expansion of the Pakistani economy. The advancement of information and communication technologies, on the other hand, hampered Pakistan's economic expansion.

Data and Methodology

This study utilised data gathered from panels gathered from secondary sources between the years 2004 and 2019. This effort was made to investigate whether or not there is a connection between the variables. This study was carried out in a total of 12 different developing nations, including Bangladesh, Bhutan, China, India, Indonesia, Iran, Jordan, Malaysia, Nepal, Pakistan, the Philippines, and Sri Lanka. The World Development Indicators provide these secondary pieces of information (WDI). The dependent variable in this study is the US dollar value of GDP per capita, and the independent variables are the information and communication technology index, the urban population as a percentage of the total population, foreign direct investment as a percentage of GDP, and exports as a percentage of GDP.

The econometric model for the study is as follows

The equation is:

$GDPPC = \beta_0 + \beta_1 FDINVit + \beta_2 ICTINDXit + \beta_3 URBNPOitP + \beta_4 EXPRTSit + uit$

GDPPC= Economic growth (GDP per capita)

FDINV= Foreign direct investment net inflows (% og GDP)

ICTINDX= Information communication technology index

URBNPOP= Urban population (% of total population)

EXPORTS= Exports of goods and services (% of GDP)

$_{it}$ = (time trend)

ui_t= (error term)

In this section, the descriptive statistics pertaining to the factors that were the subject of the investigation and analysis are presented. In this section, we conduct an empirical investigation into the ways in which the explanatory variables contribute to environmental deterioration in a number of the Asian countries that we have chosen. The descriptive statistics of major variables are presented in Table 1, with consideration given to the significance of these factors in relation to this research. The data that is being used here has revealed a significant portion of the significant discrepancy. The sample of countries used to calculate the information and communication technology index include nations whose indices range all the way from -2.243605 percent to -1.6043 percent. The Foreign Direct Investment Net Inflow across all emerging economies is expected to average 2.9532 percent during the years 2004 and 2019. In a similar manner, the variances in the urban population run anywhere from 14.841 to 91.203, in addition to other variables. The percentage of these countries' populations that lives in urban areas is, on average, 45.6092 percent.

Table 1: Descriptive statistics of important variables

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
LGDPPC	192	3.3887	0.3551	2.6898	4.0964
FDINV	192	2.9532	4.1695	0.0567	28.3462
ICTINDX	192	0.1585	0.9308	-1.6043	2.2436
URBNPOP	192	45.6092	21.1029	14.841	91.203
EXPORTS	192	30.4642	20.5761	8.2573	115.3733

Empirical Estimations

Table 2 highlights random effects results and the dependent variable is GDP per capita.

Hausman specification test (REM): This test is commonly based on method used in comparing fixed and random effects estimates of coefficients. To select FEM or REM, Hausman test is taken into consideration.

Probability of chi_2= 0.55

The p- value by Hausman has recommende for random effects

Table 2: Random Effect Results, Dependent Variable is Log GDP per capita

Variables	Coefficients, Standard Errors and Z-values
FDINV	0.0032*
	0.0010
	(3.23)
ICTINDX	0.0651*
	0.0063
	(10.39)
URBNPOP	0.0110*
	0.0016
	(7.05)
EXPORTS	0.0008
	0.006
	(1.32)
C	2.8419
	0.1002
	(28.37)
R-Square within	0.74
R-Square between	0.59
R-Square overall	0.60
Wald Chi2	528.10
Probability	0.0000

z-values are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The findings of random effects are displayed in table 2, which can be found below. Table 2 displays the findings obtained through the use of the random effects methodology. Developing countries' future prosperity is heavily influenced by the amount of foreign direct investment that countries receive. In these countries, higher levels of output lead to higher levels of investment, growth, improvement in living standards, and overall economic development. The findings have demonstrated that increases in direct investment from outside contribute to favourable economic growth. In certain developing nations, an increase of 0.0032 percentage points in economic growth is associated with a one percent rise in foreign direct investment. The outcome is statistically significant in a good way. The findings of this study are in line with those found by Owolabi-Merus (2015) as well as those found by Rehman et al (2022).

The advancement of information and communication technologies has a considerable impact on the expansion of the economy. It boosts both the economic and social infrastructure, which, as a consequence, contributes to increased economic expansion and development. The value of the ICTINDX coefficients comes in at 0.6510. It demonstrates that an increase of one unit in information and communication technology results in an increase of 0.6510 percent in overall growth. The findings of Pradhan et al. (2014) and Saidi et al. both lend credence to the conclusion, which was reached (2018).

Migration to cities and urbanisation have had a substantial bearing on the expansion of the economy. The majority of the population moves and migrates to urban areas in search of increased earning potential and to take advantage of the numerous opportunities that are available in urban areas. Therefore, because the majority of educated, talented, and semi-skilled people make use of their potential and immerse themselves in work prospects, this characteristic contributes to an increase in growth. The expansion of the economy is facilitated in this manner. The value of the URBNPOP coefficient is 0.0110, which is positive and has statistical significance. There is a 0.0110 percentage point boost to economic growth for every one percent increase in urban population.

Rosenthal and Strange (2003) and Lu et al. also provide their credence to the conclusion reached here (2021). In developing countries, the majority of the economic expansion comes from increased exports. This variable is important for continued growth and development because of its significance. The finding demonstrates that increased exports contribute to growth, although the

outcome is not statistically significant. The most important factor is that energy and other issues are preventing emerging countries' exports from contributing significantly more to their countries' overall economic growth.

1. Conclusion

This study is an effort to emphasise the influence of foreign direct investment and information and communication technology with an urban population on economic growth in selected developing economies. The goal of this study is to highlight the role of these factors. In this particular investigation, the random effect methodology was used. GDP per capita is taken as a dependent variable. Nevertheless, there are more independent variables, such as the information and communication technology index, foreign direct investment, urban population, and exports that should be investigated for the significance of the impact they have on economic growth. As a result of increased expansion, economies are growing and developing. This study exposes additional essential aspects that are important determinants of economic growth for economies. Some of these important factors are roads, transportation, and infrastructure. The findings indicate that urban population growth, technological advances in information and communication, and international direct investments all contribute favourably to economic expansion.

The findings of the study imply that there is a requirement for these countries to make improvements to their fundamental infrastructure in order to boost their exports and their overall rate of economic growth. To do this, the standard of education must be raised while simultaneously expanding access to free academic and vocational training for the general populace. In order to achieve significant economic growth, the energy problem must be alleviated, and serious efforts should be made to achieve this goal. In addition, worldwide networks need to increase their economic openness as well as their international ties in order to entice a greater number of international investors. In order to accomplish this goal, these economies require both economic and political stability.

References

Babatunde, A. (2011). Trade Openness, Infrastructure, FDI and Growth in Sub-Saharan African Countries. *Journal of Management Policy and Practice,* 12(7), 27-36.

Bende-Nabende, A. and J. L. Ferd. (1998). FDI, policy adjustments and endogenous growth multiplier effects from a small dynamic model for Taiwan 1959-1995. *World Development*, 26 (1998), 115-130.

Fedderke, J and luiz, J.(2006). Infrastructural investment in long-run economic growth: South Africa 1875–2001. *World Development*, 34(6):1037-1059. DOI:10.1016/j.worlddev.2005.11.004.

Gorg, H and Greenaway, D. (2004). Much ado about nothing. Do domestic firms really benefit from FDI. *The world Bank research Observer*, 19(2), 171-197. Niels Hermes, N and Lensink, R.(2003). Foreign direct investment, financial development and economic growth.

Lee, S. H; John, L and Luis, G. (2012). Telecommunications and economic growth: An empirical analysis of Sub-Saharan Africa. Applied Economics 44: 461–69. *The Journal of Developmental studies*, 4(1), 142-163.

Lix and Liu, X. (2005). Foreign direct investment and economic growth: An increasingly endogenous relationship. *World Development*, 33, 393-407.

Lu,S Zhou,Y and Song,W.(2021). Uncoordinated urbanization and economic growth-The moderating role of natural resources. *Growth and Change*. 52(4), 2071-2098. doi.org/10.1111/grow.12564.

Owolabi-Merus, O. (2015). How important is foreign direct investment to economic growth? New Evidence from Nigeria. *Pacific Business Review international*, 7(8),11-16.

Pradhan,R.P. & Bagchi,T.P.(2014). Effect of transportation infrastructure on economic growth on India: the VECM approach. *Research in Transportation Economics*, 38(1), 139-148.

Röller, L & Waverman, L. (1996). Telecommunications infrastructure and economic development: a simultaneous approach, WZB Discussion Paper, No. FS IV 96-16, Wissenschaftszentrum Berlin für Sozialforschung (WZB), Berlin

Rehman, A; Radulescu, M; Ahmad, F; Khan, M. K and Iacob,S.E & Cismas, L.M. (2022). Investigating the asymmetrical influence of foreign direct investment, remittances, reserves, and information and communication technology on Pakistan's economic development. *Economic Research-Ekonomska Istraživanja,* 1-22. DOI: 10.1080/1331677X.2022.2131591.

Rosenthal, Stuart S. and William C. Strange .(2003). Geography, Industrial organization, and aglomeration. *Review of Economics and Statistics,* 85(2), 377- 393.

Rudra P; Mallik,G and Bagchi,T.P. (2014). Information communication technology (ICT) infrastructure and economic growth: A causality evinced by cross-country panel data. *IIMB Management Review*,30(1), 91-103. https://doi.org/10.1016/j.iimb.2018.01.001.

Sahoo, P. (2006). Foregin direct investment and growth in south Asia: policy , trend, impact and determinats, (56). Asis Development Bank Insittute Discussion Papers. https://www.econstor.eu/dspace/bitstream/10419/53445/1/521368502.pdf (Accessed on 26 Feb 2016 at 10:00).

Shabu. T. (2010). The Relationship between urbanization and economic development in developing countries. *International Journal of Economic Development Research and Investment,* 1(2), 30-36.

Saidi, S., Muhammad,S., and Pervaiz, A. (2018). The long-run relationshipsbetween transport energy consumption, transport infrastructure, and economic growth in MENA countries". Transportation Research Part A: *Policy and Practice*, 111:78-95. ISSN 0965-8564.

Sahoo, P., Dash, R.K., and Nataraj, G. (2012). China's Growth Story: The role of physical and social infrastructure. *Journal of Economic Development*, 37(1), 52-75.

World Bank (1994) World development report: infrastructure for development. World Bank, Washington, DC.