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DOES DIGITAL INFRASTRUCTURE ATTRACT FOREIGN DIRECT INVESTMENT?

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Abstract

This article examines the role of digital infrastructure in attracting foreign direct investment. The analysis uses the share of individuals using the Internet and fixed broadband subscriptions as key indicators of digital development, while foreign direct investment is measured by FDI net inflows as a percentage of GDP. Based on World Bank data for 2024, 17 countries at different levels of development are compared using descriptive and correlation analyses. The results indicate a weak positive relationship between Internet usage and FDI. However, the considerable differences observed across countries suggest that foreign investment cannot be explained by digital infrastructure alone. The article concludes that digital infrastructure is an important factor supporting investment attractiveness, but its impact depends on broader economic, institutional, and business environment conditions.

Keywords: digital infrastructure, foreign direct investment, FDI, digitalization, Internet usage, fixed broadband, investment environment.

INTRODUCTION

Digital transformation has become one of the main forces reshaping the global economy. Business activities that were once heavily dependent on physical infrastructure are increasingly supported by digital networks, broadband connectivity, cloud technologies, data centers, and online platforms. As a result, digital infrastructure is no longer viewed only as a technological asset; it has become an important component of economic competitiveness, productivity, and the overall business environment. At the same time, attracting foreign direct investment remains a key priority for many countries. FDI can contribute to economic growth, employment, technology transfer, access to international markets, and the integration of domestic economies into global value chains. Traditionally, investors have based their location decisions on factors such as market size, macroeconomic stability, trade openness, labor costs, institutional quality, and physical infrastructure. However, the growing digitalization of production and services has increased the importance of reliable and high-quality digital connectivity in investment decisions.

Well-developed digital infrastructure can reduce communication and transaction costs, improve access to information, facilitate coordination between companies and their foreign affiliates, and support more efficient business operations. These advantages may strengthen a country's attractiveness to international investors. Nevertheless, the relationship is not necessarily straightforward. Countries with similar levels of Internet penetration may receive very different levels of foreign investment, while some economies with relatively limited digital infrastructure may still attract substantial FDI due to natural resources, market size, geographical advantages, or favorable investment policies.

This article examines the relationship between digital infrastructure and foreign direct investment through a comparative data-based approach. Particular attention is given to Internet usage, fixed broadband connectivity, and FDI net inflows as a share of GDP. Using World Bank data for 2024, selected countries with different levels of economic and digital development are compared through descriptive and correlation analysis. The aim is not to establish a strict causal relationship, but rather to identify whether a visible statistical association exists between digital development and foreign investment and to assess how this relationship differs across countries. The analysis is intended to provide a clearer understanding of the role digital infrastructure may play within the broader investment environment. In this context, digital connectivity is considered not as the sole determinant of FDI, but as one of several factors that may influence a country's ability to attract foreign capital.

The Role of Digital Infrastructure in the Economy and Investment Environment

In the modern era, digital transformation has become one of the key forces shaping economic dynamics. The integration of core business functions such as management, logistics, finance, and sales into digital environments has elevated the importance of digital infrastructure to a level comparable with that of traditional physical infrastructure. While business performance in the past depended largely on transport networks and energy supply, today it is increasingly difficult to imagine economic development without cloud technologies, broadband Internet, data centres, and mobile communication networks. It is therefore not surprising that the Internet is now regarded as a critical production factor across many areas of the global economy, alongside transport and energy infrastructure (World Bank, 2016). Digital infrastructure, however, should not be understood simply as access to the global network. Increasing attention is now being paid to the accessibility, speed, security, and reliability of connectivity. According to the International Telecommunication Union, effective digital connectivity is built around six core dimensions: availability, quality, affordability, access to devices, cybersecurity, and digital literacy (ITU, 2025). In other words, having technical access to the Internet does not automatically mean that a country has a fully developed digital infrastructure. For businesses and investors to make effective use of digital opportunities, networks must also be fast, reliable, and financially accessible.

The economic value of investment in digital infrastructure can first be observed through improvements in operational efficiency and cost optimisation. Digital platforms allow firms to obtain essential information almost instantly, coordinate with partners across geographical boundaries, and automate a wide range of business processes. Faster information flows make it possible to take more timely decisions in areas such as supply chain management and resource allocation. The adoption of these technologies can improve operational efficiency, strengthen capital management, and enhance the competitive position of firms in the market (World Bank, 2016).

The positive relationship between technological adoption and productivity has also been supported by firm-level studies. Research conducted across European Union countries shows that enterprises that make more intensive use of digital technologies tend to achieve higher levels of productivity (Gal et al., 2019). At the same time, this pattern is not equally strong in every context. Organisational capacity, managerial quality, and the skills of employees often play an important complementary role in determining whether digital technologies translate into measurable economic gains. Digital tools can further improve efficiency by facilitating knowledge exchange and supporting innovation within firms and across industries (OECD, 2019).

Digitalisation also creates new opportunities for firms to access markets beyond their immediate geographical environment. In the past, physical distance often created substantial financial and organisational barriers to cooperation with foreign customers, suppliers, and business partners. Digital technologies have reduced at least part of these constraints. Cloud-based solutions, online payment systems, and e-

commerce platforms now allow even relatively small businesses to participate in international markets. In this sense, the availability of Internet infrastructure can reduce information gaps, broaden the geographical reach of firms, and support their export potential (World Bank, 2022). These developments have gradually made digital networks an important component of a country's overall investment attractiveness.

The decision of a foreign investor to allocate capital to a particular country is influenced by a broad set of factors. Traditionally, macroeconomic stability, market size, the quality of institutions, and labour market conditions have been among the most important determinants. In recent years, however, the quality of communication infrastructure has become increasingly relevant in investment decisions as well (UNCTAD, 2009; UNCTAD, 1998). From an investor's perspective, digital infrastructure affects both the technical possibilities of doing business and the costs associated with economic activity. Multinational companies, for example, depend on reliable digital networks to coordinate offices located in different countries, manage operations from centralised systems, and maintain continuous contact with suppliers. This is particularly important in service-oriented sectors such as information technology, e-commerce, consulting, and finance, where the quality of digital connectivity can become a direct element of location decisions. By reducing information and coordination costs, high-quality digital infrastructure can therefore strengthen a country's attractiveness to potential investors.

The relationship between investment flows and digital technologies has attracted academic attention for many years. One of the earlier studies in this area identified a positive association between the expansion of Internet use and inward foreign direct investment. The findings suggested that a 10 percent increase in Internet infrastructure in a host country could be associated with an increase of more than 2 percent in foreign direct investment inflows (Choi, 2003).

Later studies, however, showed that the relationship does not necessarily operate in the same way across different groups of countries. In developed economies, investment in information and communication technologies has been found to support foreign direct investment, whereas in developing economies the relationship may sometimes work in the opposite direction. In such cases, incoming foreign investment itself can contribute to the expansion of the domestic ICT sector. This suggests that digital infrastructure should not be viewed as an isolated mechanism that automatically generates investment. Its benefits are more likely to emerge when it operates within a broader environment of economic development and institutional capacity (Gholami, Lee & Heshmati, 2006).

Research approaching the issue from a different perspective has also highlighted the role of network effects. Positive externalities associated with Internet use may make developed economies more attractive to foreign capital, while weaker supporting systems in developing countries can limit these advantages (Ko, 2007). This means that the issue is not only the number of people connected to the network. The cost and quality of connectivity, as well as the ability of the domestic economy to make productive use of digital opportunities, are equally important. More recent empirical studies have again drawn attention to the role of high-speed Internet in attracting foreign capital. For example, research examining the arrival of submarine fibre-optic

cables in Africa found that improved high-speed connectivity significantly increased investment in sectors such as retail, finance, and technology. Importantly, the effect was stronger in areas where basic infrastructure, particularly electricity and road networks, was already more developed (Mensah & Traore, 2024).

This finding underlines the importance of viewing digital infrastructure as part of a broader system rather than as a stand-alone factor. Even where Internet connectivity is attractive from an investor's perspective, digitalisation alone may not be sufficient to transform the investment environment if human capital is weak, electricity supply is unreliable, or the legal environment lacks transparency. Under such conditions, the economic benefits of connectivity depend on the presence of what the World Bank describes as “analogue complements”, including appropriate regulation, a skilled workforce, and effective public institutions (World Bank, 2016).

The growing volume of international investment directed specifically towards the digital economy further illustrates the global importance of this transformation. According to available reports, digital sectors accounted for only 5.5 percent of global foreign direct investment during 2012–2014, whereas their share increased to 8.3 percent during 2021–2023. Nevertheless, a large proportion of greenfield investment in digital activities remains concentrated in a relatively small number of countries. This indicates that countries differ considerably in their ability to attract digital capital and benefit from the expansion of the digital economy (UNCTAD, 2025).

These differences cannot be explained solely by whether Internet access is available. Innovation capacity, digital skills, investment risks, and the quality of the regulatory and legal framework also play an important role. Digital connectivity may therefore improve investment attractiveness, but its economic impact cannot be assessed separately from the wider business environment. This is particularly relevant for developing economies. On the one hand, digital technologies can reduce geographical barriers and make communication with international partners easier. On the other hand, weak governance and outdated physical infrastructure can prevent this potential from being converted into actual investment flows (UNCTAD, 2025).

Overall, the macroeconomic significance of digital infrastructure cannot be measured simply by growth in the number of Internet users. High-quality digital connectivity that meets modern standards can improve productivity, deepen access to domestic and international markets, and reduce operating costs. These improvements can also contribute to a more attractive environment for foreign capital. However, empirical studies show that the effect of technological development on foreign investment is not automatic. It depends closely on the level of economic development, education and skills, institutional capacity, and the quality of traditional physical infrastructure in each country.

Data-Based Analysis of the Relationship Between Digital Infrastructure and Foreign Investment

Assessing the relationship between digital infrastructure and foreign direct investment solely on the basis of theoretical approaches is not sufficient. To obtain a clearer understanding of the issue, it is also important to compare actual indicators across

countries. For this purpose, the analysis uses data from the World Bank's World Development Indicators database. The indicators "Individuals using the Internet (% of population)" and "Fixed broadband subscriptions (per 100 people)" were selected to assess digital development, while "Foreign direct investment, net inflows (% of GDP)" was used to measure foreign investment. The primary data on Internet usage and broadband connectivity are derived from the International Telecommunication Union (ITU), while the FDI indicator is based on the World Bank's balance of payments and national accounts data (World Bank, World Development Indicators).

The main reason for selecting these indicators is that they are both straightforward and suitable for cross-country comparison. The share of the population using the Internet shows the extent to which digital connectivity has spread within a country. The number of fixed broadband subscriptions per 100 people provides a more specific indication of the availability of high-speed and relatively stable Internet infrastructure. Using foreign investment as a percentage of GDP also helps to reduce, to some extent, the differences arising from the size of national economies. For example, directly comparing the nominal amount of foreign investment entering the United States with that of a much smaller economy may produce misleading conclusions. Expressing FDI as a share of GDP helps to partially adjust for this difference.

A review of global indicators shows that substantial regional disparities in digital infrastructure still remain. According to World Bank data, in 2024 there were, on average, 19.3 fixed broadband subscriptions per 100 people worldwide. The corresponding figure was 39.2 in North America, 34.8 in East Asia and the Pacific, and 33.5 in Europe and Central Asia. By contrast, South Asia recorded only 3.9 fixed broadband subscriptions per 100 people, while Sub-Saharan Africa recorded just 0.8. The increase in the global figure from 18.6 in 2023 to 19.3 in 2024 indicates that digital connectivity continues to expand. Nevertheless, the gap between regions remains considerable (World Bank, 2026).

An interesting point emerges when foreign investment indicators for the same regions are considered. The pattern observed in broadband development is not replicated in FDI. In 2024, global foreign direct investment inflows amounted to approximately 1.3% of GDP. The corresponding figure was 1.2% in North America, 1.5% in East Asia and the Pacific, and 0.6% in Europe and Central Asia. FDI inflows accounted for 2.8% of GDP in Latin America and the Caribbean and 2.3% in Sub-Saharan Africa. In other words, regions with more advanced digital infrastructure do not automatically record the highest FDI-to-GDP ratios.

Table 1.

Regional digital infrastructure and FDI indicators, 2024

Region	Fixed broadband subscriptions per 100 people	FDI inflows, % of GDP
World	19.3	1.3
North America	39.2	1.2
East Asia and Pacific	34.8	1.5
Europe and Central Asia	33.5	0.6
Latin America and the Caribbean	19.4	2.8
South Asia	3.9	0.7
Sub-Saharan Africa	0.8	2.3

Source: World Bank, World Development Indicators, 2024.

When interpreting the figures in the table, it should be kept in mind that a high FDI-to-GDP ratio does not always mean that a country or region attracts a larger absolute volume of foreign investment. In relatively small economies, even a single large-scale investment project can significantly affect the FDI-to-GDP ratio. In addition, major natural-resource projects, privatisation processes, or large investment transactions occurring in particular years can cause substantial fluctuations in the indicator. Therefore, the FDI-to-GDP ratio should not be regarded as a direct outcome of digital infrastructure, but rather as one of the indicators that enables comparison of foreign investment activity across countries.

To observe how the relationship appears at the country level, 2024 data for 17 countries representing different regions and levels of development were compared separately. In this comparison, the share of the population using the Internet was used as a general indicator of digital development, while FDI inflows as a percentage of GDP were used as an indicator of foreign investment activity.

Table 2.

Internet usage and FDI inflows in selected countries, 2024

Country	Individuals using the Internet, % of population	FDI inflows, % of GDP
Georgia	84	4.7
Kazakhstan	93	0.7
Uzbekistan	90	2.6
Poland	89	2.2
Germany	93	1.0
France	89	1.6
United States	95	1.0
Canada	94	2.8
Australia	96	3.0
Japan	86	0.4

Republic of Korea	98	0.7
Singapore	94	24.7
United Arab Emirates	100	8.3
Saudi Arabia	100	1.7
Brazil	84	3.4
Indonesia	73	1.7
South Africa	78	0.6

Source: World Bank, World Development Indicators. Compiled by the author.

The table suggests that there may be a certain positive tendency between digital development and FDI, although the differences across countries are also substantial. For example, in the United Arab Emirates, Internet usage covered almost 100% of the population in 2024, while FDI inflows amounted to 8.3% of GDP. By contrast, in the Republic of Korea, the share of Internet users was 98%, whereas FDI inflows accounted for only 0.7% of GDP. In Germany, Internet users represented 93% of the population, while the FDI indicator stood at 1.0%. Singapore is particularly notable in this comparison: Internet usage reached 94%, while FDI inflows amounted to 24.7% of GDP.

These differences indicate that although digital infrastructure is an important component of the investment environment, the level of foreign investment cannot be explained by digitalisation alone. Two countries may have identical or very similar levels of Internet usage, while differing considerably in terms of market size, tax systems, geographical location, investment legislation, political and macroeconomic stability, and their role in the regional activities of multinational companies. Therefore, substantial differences in FDI levels among countries with similar digital indicators should not be considered unusual.

Simple descriptive statistics for the 17 selected countries further illustrate this pattern. According to the calculations, the average share of Internet users was approximately 90.4%, while the median was 93%. The average FDI inflow as a share of GDP was approximately 3.6%, whereas the median was only 1.7%. One of the main observations responsible for the mean FDI value being more than twice the median is Singapore. Its FDI-to-GDP ratio of 24.7% significantly raises the overall average. This demonstrates once again that assessing FDI indicators solely on the basis of the mean may be insufficient, as the influence of countries with exceptionally high values should also be taken into account.

To examine the relationship between Internet usage and FDI as a share of GDP more specifically, the Pearson correlation coefficient was calculated for the selected countries. The resulting correlation coefficient was approximately +0.19. This indicates a weak positive relationship between the two variables. In other words, among the selected countries, higher levels of Internet usage are associated with somewhat higher FDI indicators, although the relationship is relatively weak. To determine whether Singapore's exceptionally high FDI level had a significant impact on the result, the correlation was recalculated after excluding Singapore. In that case, the coefficient increased slightly to approximately +0.22. Thus, the overall direction of the

relationship does not change, and it remains weakly positive.

An important point should be emphasised when interpreting this result. It would not be appropriate to conclude that “an increase in Internet usage increases foreign investment.” Correlation shows how two variables move in relation to one another, but it does not establish a causal relationship. The volume of foreign investment is influenced not only by digital infrastructure but also by numerous other factors, including market size, labour costs, trade openness, tax policy, the institutional environment, political stability, and other economic conditions. The purpose of this article is not to measure the individual impact of each of these factors. Rather, the main objective is to use available data to identify the general pattern between digital development and foreign investment.

A separate look at Azerbaijan also presents a similar picture. According to World Bank data, net foreign direct investment inflows into Azerbaijan amounted to approximately 0.3% of GDP in 2024. The latest figure currently provided by the World Bank for the share of the population using the Internet is 91% in 2025. Since these two indicators refer to different years, it would not be methodologically appropriate to include them together in the 2024 correlation analysis above. Nevertheless, the combination of widespread Internet usage and a relatively low FDI-to-GDP ratio provides another interesting example of why digital development alone may not be sufficient to attract large volumes of foreign investment.

The weak positive relationship obtained from the simple correlation analysis is not inconsistent with the findings of earlier academic studies. A review of the literature shows that the relationship between digitalisation and foreign investment varies depending on country characteristics and economic conditions. Choi (2003), in a study covering 14 source countries and 53 host countries, identified a positive relationship between the growth in the number of Internet users and Internet hosts and FDI inflows. According to the author’s findings, a 10% increase in the number of Internet users or Internet hosts in the host country was associated with an increase of more than 2% in FDI inflows. Choi linked this relationship to the ability of the Internet to reduce the costs of accessing information and communicating for international companies (Choi, 2003).

Other studies on the subject, however, indicate that the relationship is not identical across all countries. Gholami, Lee and Heshmati (2006), analysing data for 23 countries, found evidence of a positive relationship from information and communication technologies to FDI in developed economies. For developing countries, however, the same relationship could not be confirmed unambiguously. In some cases, the relationship appeared to operate in the opposite direction, suggesting that foreign investment inflows themselves may encourage investment in domestic ICT infrastructure. This finding shows that the relationship between digital infrastructure and foreign investment is difficult to assess separately from a country’s overall level of development and broader economic conditions (Gholami, Lee & Heshmati, 2006).

One of the more recent studies was conducted by Mensah and Traore (2024) for African countries. The authors examined the expansion of high-speed Internet infrastructure by analysing the gradual arrival of submarine fibre-optic cables across Africa. Their findings indicate that access to high-speed Internet increased the

probability of receiving FDI by approximately 6.3 percentage points. The effect was found to be particularly strong in finance, information technology, retail trade, and other service sectors. Another notable finding was that the impact of digital connectivity was stronger in areas with better electricity and road infrastructure (Mensah & Traore, 2024). This suggests that digital infrastructure does not operate separately from other economic and physical conditions, but rather functions as a complementary factor.

Overall, both the comparison of selected country indicators and the findings of earlier studies suggest that a certain relationship exists between digital infrastructure and foreign direct investment. However, this relationship is neither equally strong across all countries nor fully linear. The weak positive correlation of +0.19 calculated for the selected countries indicates that digital development may be one of the factors supporting a favourable investment environment, but it is not sufficient on its own to explain the level of foreign investment. Therefore, digital infrastructure should be viewed not as the sole determinant of FDI, but as one of the elements shaping a country's broader business and investment environment.

CONCLUSION

The analysis shows that digital infrastructure is an important part of the investment environment, but it does not determine foreign direct investment on its own. The correlation results indicate only a weak positive relationship between Internet usage and FDI, which means that digital development can support investment attractiveness but is not sufficient by itself.

Differences across countries also show that factors such as market size, economic stability, institutional quality, taxation, and physical infrastructure remain important. Therefore, digital infrastructure should be considered as one of the factors that can strengthen a country's ability to attract foreign investment when supported by a favourable business and institutional environment.

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