

DIGITAL CONNECTIVITY AND HIGH-TECHNOLOGY EXPORT COMPETITIVENESS: EVOLUTION, EMERGING TRENDS, AND GLOBAL TRANSFORMATION

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ABSTRACT

The role of digital connectivity for trade competitiveness has grown, and it is having a differential impact on the performance of high-technology exports in developing economies. This study explores the patterns of change in the digital connectivity and high-technology export competitiveness of South Asian economies over the period 2000–2023 by using a quantitative longitudinal panel-data approach. The main indicators of digital connectivity were Internet usage and high-technology exports as a percentage of manufactured exports; export competitiveness. Temporal patterns and structural relationships were assessed using descriptive statistics, trend analysis, correlation analysis, pooled regression and country fixed-effects models. The findings show that while there has been a considerable increase in the use of the internet across the region, there was a large spread in the performance of high-technology exports. No Clear association of Internet use and high-technology exports was found in the alternative model specifications. Foreign direct investment, on the other hand, was the most stable positive influence, and country-specific effects accounted for a significant share of the variance observed. These results suggest that the mere connectivity is not enough to boost up Technological export competitiveness. The role of investment, productive capacity, innovation capacity, skills, and suitable institutional features in driving digital transformation and enhancing the trade benefits. The study strongly emphasizes the necessity of making efforts to strengthen the export growth in the case of technology-intensive products through integrated digital, industrial and investment policies.

Keyword: Digital connectivity; High-technology exports; Export competitiveness; Digital transformation; Foreign direct investment

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1. Introduction

Digital connectivity has emerged as a key enabler of modern economic change, changing the way companies, sectors, and nations engage in global commerce. The spread of internet access, digital platforms, data infrastructure, and information and communication technologies (ICTs) has minimized communication delays and facilitated quicker interactions between producers, suppliers, and customers and between producers and institutions. These changes have impacted the sources of competitiveness and the way they are traditionally perceived; access to information, coordination, and markets is increasingly digitalized. However, the advantages of digitalization are not guaranteed in emerging economies, as unless productive capacity, technological capability and institutional readiness to sustain export gains, no benefits can be expected to emerge from connectivity (Banga & Banga, 2020). In addition, the recent evidence confirms that digital connectivity can reduce trade costs, if combined with a supportive regulatory framework, further strengthening its contribution to international competitiveness (Bellucci et al., 2025).

The high-technology exports, especially, are significantly important as they reflect the economic ability to create and market knowledge intensive and innovation-based products. Technology has a differential effect on countries: those with more technology have a wider choice in access to the more technologically demanding parts of the global production networks and derive higher value from international trade. As a result, innovation has been recognized as one of the key factors in the export competitiveness of high technology products, particularly for the rapidly industrializing economies (Durmaz & Yıldız, 2020). Concurrently, digital connectivity can serve to export upgrading purposes by enabling knowledge access and reducing search costs, as well as by allowing access to technologically advanced markets (Cariolle & da Piedade, 2023). Increased digital intensity has also been linked to reduced trade costs and exports' technological composition, implying a possible impact of digital infrastructure on the volume and technological composition of exports (Chiappini & Gaglio, 2024).

Connectivity's economic benefits go beyond market access. Digital networks help companies synchronise and orchestrate complex processes, share information in real-time, tie up supply chains, and create data-driven production or service models. This connectivity can create ongoing value by improving the responsiveness and inter-firm integration of the organization (Franzè et al., 2024). The national level development of the digital economy can also shape the role of countries in global value chains, whose magnitude can be affected by institutional quality and general structural conditions, among other factors (Junyan & Yida, 2022). This institutional dimension is significant because it is not only about the technology being adopted, but also governance frameworks, state capacity, development priorities, and policy implementation that drive digital transformation (Kalema, 2024).

Digitalization is getting more and more important for both manufacturing and services export competitiveness. Digital economy development can enhance the competitiveness of services exports, by widening the market scope and lowering transaction costs (Li et al., 2023). The relationship between Internet use and trade performance has also been examined in developed and developing economies, but the magnitude of the impact is very different across country groups (Rodriguez-Crespo et al., 2021). The manufacturing sector also shows that the development of the digital economy has the potential to improve the export competitiveness through facilitating export efficiency, innovation, and market integration (Wang et al., 2023). Furthermore, digitalization can help to foster technological advancement and enhance export performance through better information flows and production efficiency (et al., 2022).

However, the correlation between digital connectivity and export performance is not expected to be linear and uniform. However, empirical evidence from European economies suggests that the impact of digitalisation on export activity can be nonlinear, suggesting that benefits will be dependent on levels of digital development and complementary capabilities (Nham & Bao, 2023). It is particularly applicable to economies with uneven infrastructure, investment and technological capacities. Digital transformation also alters the possible transformation of global value chains, resulting in new possibilities as well as risks of dependence, capability gaps and unequal value capture (Zhen et al., 2022). So, a greater level of connectivity does not automatically equate to export competitiveness in high technology.

While there has been a body of literature on digital trade, export upgrading, and technological change, little is known about the relationship of longer-run shifts in digital connectivity with high-technology export competitiveness across developing economies with diverse structural conditions. This relationship is crucial to understanding if it is only the greater connectivity that is needed or if some complementary economic abilities are needed.

Objectives:

- To explore the development of digital connectivity and the competitiveness of exports of high technology goods over time.
- To evaluate how digital connectivity affects the performance of high-technology exports after controlling for important economic conditions.
- To uncover cross-country variations and evolving trends between digital transformation and export competitiveness of the technological products in South Asia.

2. Methodology

2.1 Research Design

This study used a quantitative and longitudinal research design to investigate the impact of digital connectivity on the competitiveness of high-technology exports in South Asian economies. The panel-data framework was the appropriate one because it is able to reflect both country differences and temporal variations. The study period was 2000–2023, and thus long-term changes in digital connectivity and high-technology export performance could be analyzed.

2.2 Data Source

Data for this study were used from South Asian Growth & Development Data (2000-23). Because of its data availability, the authors selected annual socioeconomic, technological, trade, institutional and development indicators for the South Asian countries as the appropriate data set for studying the relationship between digital connectivity and high-technology export performance (Ahmed, 2024).

2.3 Study Sample

South Asian countries included in the sample were Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The period of the data set included 24 years (2000-2023) and 192 country-year observations. The variable effective sample size, however, changed from one analysis to another, due to the fact that some variables, especially the high technology exports, had missing observations.

2.4 Variable Selection and Measurement

High-technology exports as a percentage of manufactured exports was used as a proxy measure of high-technology export competitiveness as the dependent variable. The independent variable was individuals using the Internet as a percentage of population (digital connectivity). The variables controlled were GDP per capita, GDP growth, FDIC net inflows as a percentage of GDP and trade as a percentage of GDP. For supplementary analysis, research and development expenditure was included due to its relatively limited availability of data.

2.5 Data Screening and Preparation

Prior to the analysis, the dataset was checked for any missing values, country-year duplicates, format inconsistencies, and extreme values. All variables were transformed to the proper numeric variables, and those variables that were missing for an observation in a particular model were dropped from that model analysis. To prevent adding artificial variation, missing observations were not replaced with the mean or median. Continuous variables with high skewness were assessed and log transformed as appropriate.

2.6 Descriptive Statistical Analysis

Descriptive statistics were computed to describe the characteristics of the selected variables. This comprised the mean, standard deviation, minimum, maximum and the number of valid observations. The country level summaries were also analysed to see whether there are any variations in connectivity to and from the digital domain, in economic status and in export of high technology goods between the South Asian Economies.

2.7 Trend and Comparative Analysis

Trend analysis was done to track the growth of the internet usage and high-tech exports between the period 2000 to 2023. Changes in digital connectivity and the export competitiveness over time were detected through annual and country-specific trends. Additionally, country comparisons were undertaken to see how fast digital transformation is happening and how much technological exports are developed.

2.8 Correlation Analysis

Pearson correlation was used to determine the direction and strength of the relationships between the major variables of this study. A particular focus was placed on the link between use of the internet and high technology exports. To check for multicollinearity among the explanatory variables and before estimating the regression models, there were also correlations checked.

2.9 Panel Regression Analysis

Digital connectivity was estimated to be associated with high-technology export competitiveness with the help of panel regression analysis, after adjusting for the relevant macroeconomic variables. The general model was set to:

$$HTE_{it} = \beta_0 + \beta_1 INT_{it} + \beta_2 GDPPC_{it} + \beta_3 GDPG_{it} + \beta_4 FDI_{it} + \beta_5 TRADE_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

High-technology exports (HTExports), Internet use (INTERNET), GDP per capita (GDPPC), GDP growth (GDPGrowth), foreign direct investment (FDI) and trade openness (TRADE). The country-specific and year-specific effects were added when appropriate.

2.10 Model Diagnostics and Robustness Analysis

Pooled ordinary least squares, fixed-effects and random-effects models were examined, depending on the availability of data and suitability of the models. To make the model selection for random-effects versus fixed-effects specifications, a Hausman test was employed. Homoscedasticity, multicollinearity and residual dependence were also checked. Standard errors were clustered by standards where applicable and were robust. Further robustness checks were carried out by varying the set of control variables and, where possible, research and development expenditure was added as a further innovation-related control variable.

2.11 Ethical Considerations

The study focused exclusively on an existing secondary publicly available data, which consists of aggregated country-level economic, technological and trade indicators. There were no human subjects, personal identifiers, confidential records, surveys or experimental procedures. Thus, informed consent was not relevant. The data set was only used for academic purposes, and the original data source must be cited and used in accordance with the requirements of the data source.

3. Results

3.1 Descriptive Statistics

The main variables used in the analysis are summarized in Table 1. There were 173 country-year observations, with the average coverage of the population at 17.50%, ranging from 0.005% to 86.84% for the Internet. Only 76 observations were available for high-technology exports, which averaged 2.51% of manufactured exports. The standard deviation around the mean is very high, at 3.28 percentage points, suggesting significant variation in technology-intensive export performance across countries.

The average GDP per capita was US\$2,161.42 and the annual growth of GDP was 5.07%. The inflow of FDI averaged 1.91% of GDP and the level of trade openness averaged 49.53% of GDP. There were only 48 valid observations for R&D expenditure, giving it a second-class position as a regression variable, although it was included in the analysis as a supplementary variable.

Table 1. Descriptive Statistics of the Study Variables

Variable	N	Mean	SD	Minimum	Maximum
Internet users (% population)	173	17.504	21.027	0.005	86.840
High-technology exports (% manufactured exports)	76	2.509	3.280	0.000	12.482
GDP per capita (US\$)	190	2,161.422	2,465.328	142.903	12,667.436
GDP growth (%)	189	5.065	6.265	-32.909	37.687
FDI net inflows (% GDP)	187	1.914	2.960	-0.639	16.783
Trade (% GDP)	141	49.525	21.645	21.460	108.158
R&D expenditure (% GDP)	48	0.438	0.288	0.054	0.859

3.2 Evolution of Digital Connectivity

There was a positive long-term trend in digital connectivity across the region. The penetration of the internet was very low, across almost all eight economies, at the start of the study period, but grew significantly after around 2010 as indicated in Figure 1. The average internet penetration across countries with available data rose from approximately 0.68% in 2000 to 10.18% in 2010, 21.77% in 2015, and 57.50% in 2022. Bhutan exhibited the fastest growth and had over 80% penetration in its most recent measurement, as well as Maldives. In 2023, Nepal and Sri Lanka were around 50% and Bangladesh was 44.50%, respectively. These trends suggest significant, but uneven, digital transformation in South Asia.

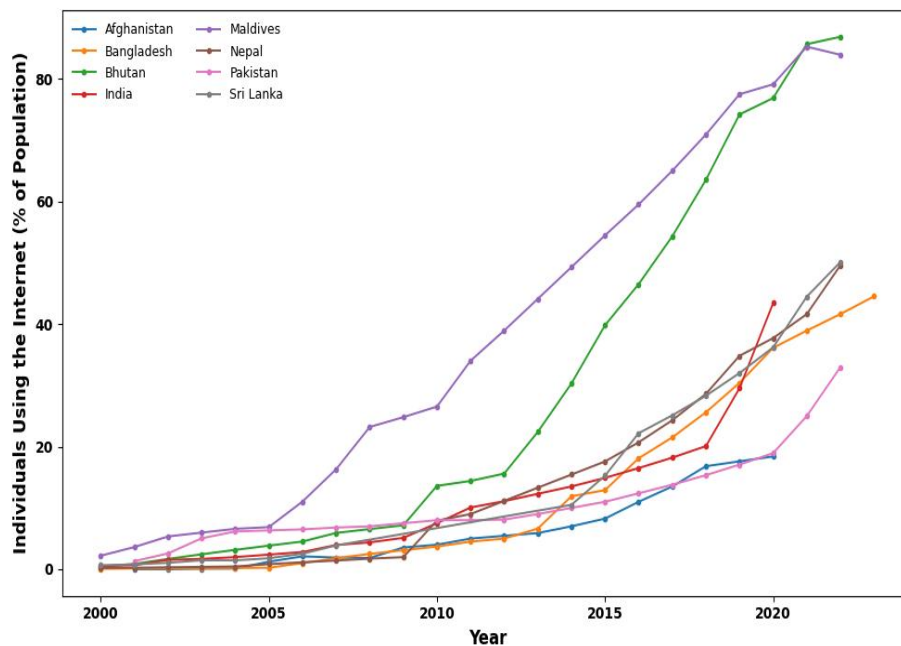


Figure 1. Evolution of Internet Connectivity Across South Asian Economies, 2000–2023

3.3 Country-Level Digital and Export Performance

A country-by-country comparison is included as Table 2. Connectivity differences were significant. The highest internet penetration in this period is in Maldives at 38.02% followed by Bhutan with 28.72%. The mean level for Afghanistan was the lowest at 6.19%.

This was more true for high-technology exports. India had an average export share of high technology products which was much higher than that of other economies. In 2022, its last recorded figure went up to 12.48%. The Maldives had the highest rate, 4.10 %, among the countries in the latest available observation, whilst Pakistan, Sri Lanka and Nepal were significantly lower. The country-level results are thus suggestive of the fact that the high level of digital connectivity does not necessarily translate into a proportionately high level of high-technology export intensity.

Table 2. Country-Level Digital Connectivity and High-Technology Export Performance

Country	Mean Internet Use (%)	Latest Internet Use, % (Year)	Mean High-Tech Exports (%)	Latest High-Tech Exports, % (Year)	Valid HTE Observations
Afghanistan	6.187	18.400 (2020)	0.000	0.000 (2019)	2
Bangladesh	12.947	44.503 (2023)	0.317	0.308 (2015)	7
Bhutan	28.715	86.840 (2022)	0.209	0.023 (2012)	6
India	10.577	43.405 (2020)	9.069	12.482 (2022)	14
Maldives	38.015	83.912 (2022)	1.569	4.096 (2022)	4
Nepal	13.928	49.561 (2022)	0.807	0.539 (2022)	14
Pakistan	10.853	32.949 (2022)	1.823	1.431 (2022)	15
Sri Lanka	16.335	50.107 (2022)	1.094	1.086 (2022)	14

3.4 Evolution of High-Technology Export Competitiveness

High-technology exports display much greater variability across time than internet penetration does as seen in Figure 2. The percentage of exports accounted for by high-technology goods was always the highest among the observations made in India. It accounted for around 9.6% in 2009, dropped in some years in the 2010s and then rose to 12.48% in 2022.

On average, Pakistan's inflation rate was in the 1.5–2.3% range, and Sri Lanka's inflation rate was close to 1%. The situation was more dynamic in Nepal, which saw a temporary rise to around 2.4% in 2020. The Maldives had a significant rise in 2022 (4.10%), but there were fewer observations in the series. This means that the levels of technological export competitiveness did not follow the same regional pattern as internet connectivity.

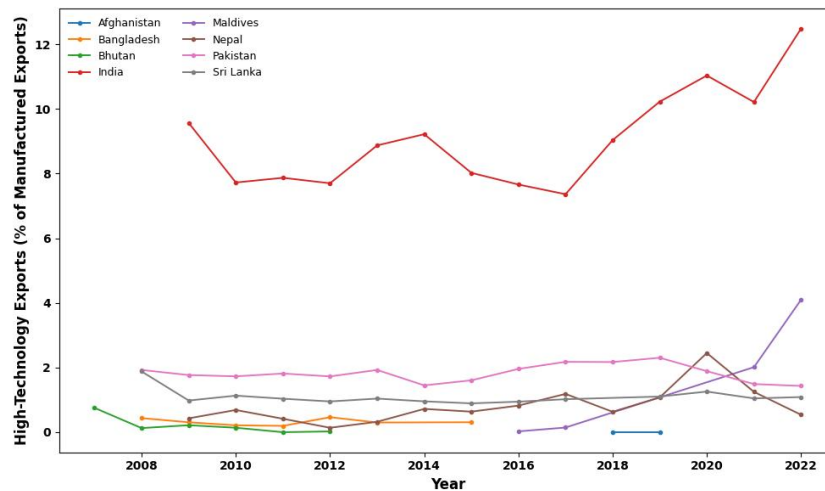


Figure 2. Evolution of High-Technology Exports Across South Asian Economies

3.5 Correlation Analysis

Pairwise Pearson correlation coefficients are shown in Table 3. The unconditional linear correlation between Internet use and high-technology exports was negligible, 0.011.

The usage of the Internet was strongly positively correlated with GDP per capita ($r = 0.733$), and moderately positively correlated with FDI ($r = 0.462$). There was also a strong correlation for GDP per capita and FDI with $r = 0.843$. This was due to the regression sample and the log transformation changing the covariance structure, so variance inflation factors were then explored prior to the interpretation of the multivariate models.

Table 3. Pearson Correlation Matrix

Variable	HTE	Internet	GDP per Capita	GDP Growth	FDI	Trade
High-tech exports	1.000					
Internet users	0.011	1.000				
GDP per capita	-0.045	0.733	1.000			
GDP growth	0.038	-0.086	0.073	1.000		

FDI	0.066	0.462	0.843	0.110	1.000	
Trade openness	-0.125	0.145	0.286	0.120	0.219	1.000

This is also evident in the weakness of the unconditional relationship shown in Figure 3. There was significant variation in high technology exports at similar penetration rates of the internet and the fitted regression line was virtually flat. This finding indicates that the differences in the export structures with greater intensity of technology between the economies observed in the present case cannot be accounted for by the factor of connection.

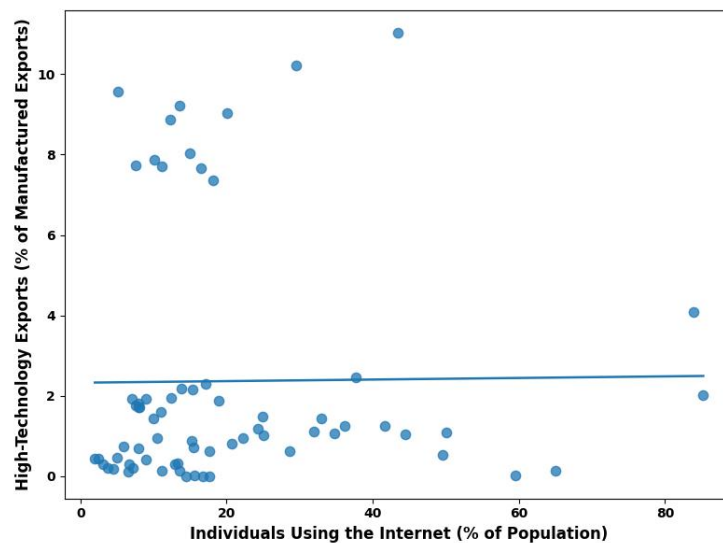


Figure 3. Relationship Between Digital Connectivity and High-Technology Export Competitiveness

3.6 Regression Results

Table 4 displays four increasingly detailed regression models. Model 1 explored the bivariate association between internet use and high technology exports, and resulted in a coefficient of 0.002 that was not statistically significant at $p = 0.906$.

Further controlling for log GDP per capita and FDI in Model 2, the internet coefficient turned negative, but still insignificant. Model 3 had all of the macroeconomic controls. Again, high-technology exports were not significantly associated with Internet penetration ($\beta = 0.016$, $p = 0.567$).

FDI, however, had a positive coefficient of 1.668, which was significant statistically in Model 3, implying that for every percentage-point change in the ratio of FDI inflows to GDP, this variable was associated with about 1.67 percentage points change in the high-technology export share, given the rest of the variables included in the model. The coefficient of trade openness was negative (-0.066) and was not statistically significant in the pooled specification.

We estimated model 4 with country fixed effects. The coefficients for the internet penetration were not negative and were statistically insignificant with $\beta = 0.014$ and $p = 0.199$. The results showed that FDI remained positive and statistically significant with the value of $\beta = 0.292$, $p < 0.001$. Within-country, the coefficient for GDP growth was statistically significant and negative (-0.070). The statistical significance of trade openness was lost when controlling for country-specific effects.

Table 4. Regression Estimates for High-Technology Export Competitiveness

Predictor	Model 1: Pooled	Model 2: Pooled	Model 3: Full Pooled	Model 4: Country FE
Internet users	0.002 (0.017)	-0.019 (0.029)	0.016 (0.028)	0.014 (0.011)
Log GDP per capita	—	0.412 (0.550)	0.675 (0.696)	0.235 (0.511)
GDP growth	—	—	0.005 (0.133)	-0.070* (0.032)
FDI inflows	—	0.097 (0.162)	1.668* (0.695)	0.292*** (0.086)
Trade openness	—	—	-0.066*** (0.019)	-0.016 (0.020)
Country fixed effects	No	No	No	Yes
Observations	68	68	61	61
R ²	0.000	0.012	0.247	0.978
Adjusted R ²	-0.015	-0.035	0.178	0.974

Robust standard errors are shown in parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$.

The R² for Model 4 is much higher than before, suggesting that many of the differences in export shares of high technology goods were caused by country-specific characteristics that were not captured by the model. This does not, however, imply that all of the included predictors became good explanatory factors; most of the continuous predictors continued to lack a statistical significance.

3.7 Model Diagnostics and Robustness

The results of the diagnosis are summarized in Table 5. All of the model variables had variance inflation factors between about 1.53 and 1.71, indicating low levels of problematic multicollinearity.

Homoskedasticity was rejected by the Breusch–Pagan test which gave $\chi^2 = 28.00$ and $p < 0.001$. Reliable standard errors were therefore adopted to make inferences.

Most importantly, the estimated internet coefficient remained statistically insignificant in all of the alternative pooled specifications. The sign of its difference was found to have changed a little based on the controls included, but the amount of its substantive was small. This meant that this finding was not due to any single control-variable specification.

Table 5. Diagnostic and Robustness Results

Test/Specification	Result	p-value	Interpretation
Maximum VIF	1.711	—	No serious multicollinearity
Breusch–Pagan LM	27.995	<0.001	Heteroskedasticity detected
Internet only	$\beta = 0.002$	0.906	Not significant
Internet + GDP per capita	$\beta = -0.014$	0.591	Not significant
Internet + GDP per capita + FDI	$\beta = -0.019$	0.521	Not significant
Internet + GDP per capita + FDI + Trade	$\beta = 0.016$	0.631	Not significant
Full pooled specification	$\beta = 0.016$	0.567	Not significant

3.8 Relative Effects of the Explanatory Variables

The coefficient estimates and their corresponding 95% CI for each country under a country fixed-effects specification are shown in Figure 4. There was no statistically significant connection found, as the Internet penetration rate is still within the range of the confidence interval. In the within-country model GDP growth had a negative estimate and the FDI coefficient was distinctly positive.

The evidence presented in this regression indicates that digital access in South Asia has grown quickly but with no commensurate automatic rise in competitiveness of exports using high technology. By contrast, export performance of high-tech products seemed to have relied on other structural and investment-related variables, and the role of FDI was most persistently positive in the estimated models.

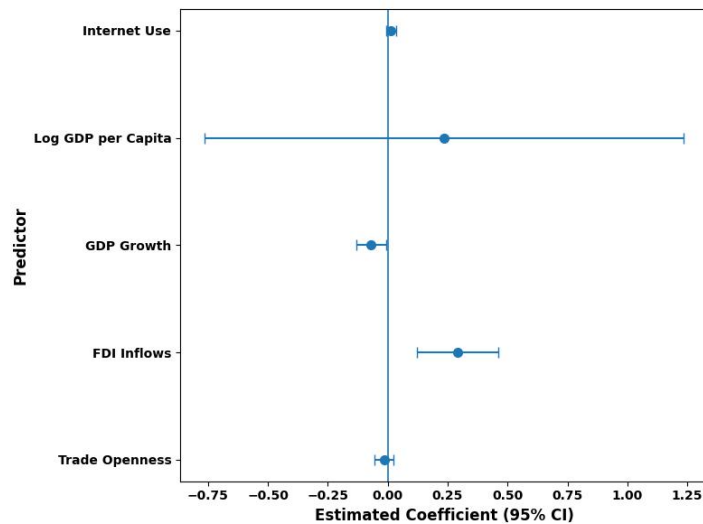


Figure 4. *Estimated Effects on High-Technology Export Competitiveness in the Country Fixed-Effects Model*

3.9 Summary of Results

Overall, the findings suggest that the connectivity of the economies of South Asia increased significantly from 2000-2023, although this increase was not consistent in increasing the competitiveness of high technology exports. The relationship with high-technology exports was very weak and statistically insignificant with the Internet use, and foreign direct investment was the most consistent positive determinant of the regression models. The level of high-technology export performance was also found to differ significantly from country to country, with India being at the top of the list. The results indicate that digital connectivity is not enough to boost high-tech exports, and that other factors, like investment, productive capacity, innovation capability and the specific economic structure of a country, play a role in the impact of digital connectivity.

4. Discussion

The findings highlight the differences in high-technology export competitiveness and digital connectivity across South Asian countries. High-technology export performance was still largely skewed with India being the biggest winner as Internet penetration was seen to have gone up. This trend implies that while connectivity may be fostering, it is not guaranteeing technologically advanced export products. There is similar evidence that digital infrastructure can mitigate market frictions and assist in trade among countries, but the benefits that can be realized are contingent on productive capacity, institutions and complementary economic capacities (Afolabi & Fatai, 2025).

The lack of any significant relationship between use of the Internet and high-technology exports in the pooled and fixed-effects models is noteworthy. It suggests that increased Internet use does not necessarily improve export sophistication. Digital technologies have a number of intermediate effects

on trade, such as firm-level learning, production upgrading, access to data, the coordination of supply chains, and quality improvement of products. At an enterprise level, digital technologies can enhance export product quality if firms have complementary capabilities that enable embedding of digital technologies in production and market process (Liao et al., 2026). Similarly, digital transformation has been linked to the quality of export products, but the impact of such transformation on product quality is contingent on the organizational and technological preparedness (Qian & She, 2023).

The results are also in line with the arguments for nonlinear or threshold effects of digitalisation. Economies must build up their industrial capacity, innovation capacity, human capital, and digital integration to a certain extent to improve their high-technology export competitiveness. The competitive advantages of digitalization have been studied in manufacturing exports and have been found to differ depending on the development phase of the manufacturing activity and threshold conditions (Zhanqi, 2022). This is a possible reason why there is no direct correlation between a growth in Internet connectivity and a corresponding increase in technology-heavy exports. Digital competence could open-up opportunities but meaningful systems need to turn those opportunities into exportable technological value (Thang & Van Luong, 2025).

A foreign direct investment was the most stable positive variable. Therefore, factors other than connectivity, such as capital, technology transfers, managerial know-how and multinational production networks, could be at play in technological export upgrading. Previous studies suggest that digitalization is becoming increasingly related to international investment, as firms' digital capabilities affect their international investment strategies and decision-making on cross-border expansion (Peng et al., 2022). Research in developing economies also shows that the combination of FDI with digitalization can have a joint impact on structural economic outcomes, indicating that investment is another channel complementing digitalization for its impact on development (Sinha et al., 2023).

However, the mixed pattern of trade openness is especially significant in view of the fact that it shows that high-technology competitiveness is not necessarily a direct consequence of an increase in trade openness. The trade openness was significant in the pooled model, but it was no longer significant after controlling for country-specific effects. This suggests that domestic structural characteristics condition the benefits derived from external integration. Furthermore, the impact of digitalization on the relationship between trade openness and economic performance is not just a one-to-one relationship, as shown by evidence from G20 economies (Bouattour et al., 2026). Likewise, digital intermediate exports can enhance the quality of exports by offering access to technologically advanced inputs, knowledge, and production factors (Ren et al., 2024). Firm-level technological upgrading also has been reported to be associated with improvements in export product quality in the context of digital product imports (Zhang et al., 2023).

The “sticky” national characteristics that are identified in the analysis suggest that the variation in high-technology exports is driven to a large extent by persistent national characteristics. The effectiveness of the conversion of digital connectivity into export competitiveness is therefore likely to differ between industrial sectors, depending on the differences in the innovation ecosystems, skills, policy capacities, investment environments and integration into global production networks. More evidence from India also indicates that the benefit from digital transformation outcomes is contingent upon the exporting firm's organizational resources and strategic capacities to leverage digital technologies successfully (Rana et al., 2024). In addition, digital transformation has been found to be linked with export technology complexity when manufacturing companies successfully integrate digital tools into their technological capabilities (Wang & Huang, 2025).

The overarching message is that the digital connectivity should be part of a complementary development system. Connectivity, coupled with innovation, advanced inputs, investment, and production capacities, can help enhance the quality and sustainability of exports for digital economies (Ou et al., 2025). Policies that have a narrow focus on promoting Internet access might then not be enough for South Asian economies. More efforts are needed to bring in FDI in technology, enhancing domestic innovation systems, improving skills, access to advanced inputs in digital technology, and enabling the firms to use connectivity for high technology production and sales.

5. Conclusion

This study investigated the link between digital connectivity and export competitiveness with high technology in the South Asian economies in the time frame 2000-2023. The results indicate a significant increase in internet penetration, demonstrating the digital transformation process taking place in the region. But there was no consistent relationship between the improvement in connections and the increase in high-tech export performance. The results show that internet usage has a direct influence on high-technology exports, but it is low and not statistically significant across the estimated models, suggesting that connectivity is not sufficient to be a source of technological export competitiveness. Foreign direct investment (FDI) proved to be the most stable positive factor, indicating the significance of inputs in the form of capital inflows, technology transfer, managerial knowledge, and integration into international production networks. In addition, the significant country-specific effects suggest that the export performance of industrial development, innovation systems, institutional quality, structural characteristics, and productive capacity are important. The study overall recommends that digital infrastructure be considered as enabler and not stand alone as a high-tech export vehicle. Digital transformation can provide more benefits in export opportunities for South Asian economies when supported by connectivity, investment, technological potential, skills development and innovation support, and better production ecosystems. More comprehensive digital

infrastructure measures and full high-tech export data is needed for future research to shed more light on these relationships.

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