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Does Digital Connectivity Promote Sustainable Economic Performance? Evidence from South Asian Economies

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Abstract
The study examines whether digital connectivity promotes sustainable economic performance in South Asia. Adjusted net savings, including particulate-emission damage as a percentage of gross national income, is used as the dependent variable because it captures the net accumulation of produced, human, and natural capital. Digital connectivity is measured through internet use, mobile cellular subscriptions, and fixed broadband subscriptions. Annual World Development Indicators data for Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka are arranged as an unbalanced panel covering 2000-2021. The analysis applies descriptive statistics, correlation analysis, variance inflation factors, panel unit-root tests, pooled ordinary least squares, fixed-effects models, random-effects models, and specification diagnostics. Non-stationary variables are transformed before estimation. Model-selection tests support one-way individual random effects estimated with the Wallace-Hussain procedure, while Driscoll–Kraay standard errors are reported. Baseline findings show that internet use is statistically insignificant, mobile subscriptions are positive but significant only at the 10% level, and fixed broadband is positive and significant at the 5% level. The broadband result remains significant after excluding the Maldives but weakens when secondary-school enrolment is included. Overall, fixed broadband shows the strongest association with adjusted net savings, although the findings indicate correlation rather than causation within the study's limited regional sample.

Keywords: Digital connectivity; adjusted net savings; sustainable economic performance; panel data; fixed broadband; South Asia

1. Introduction

Sustainable economic performance is not just about short-run growth, but also about whether economies can grow their productive capacity over time without diminishing human and natural assets. This broader understanding of sustainability also includes improvements in human well-being, such as maternal and newborn survival and the prevention of stillbirths (World Health Organization, 2023). This is crucial in South Asia, where urbanisation, infrastructure deficit, environmental fragility, and divergent human-capital development go hand in hand with growing digital markets. Adjusted net savings are appropriate, as they adjust traditional savings to reflect the costs of education spending, natural-resource extraction, and environmental harm. It has a wealth-oriented perspective in which the only way to sustain prosperity is to maintain or expand the asset base of the future. Similarly, Brunnhuber (2024) underscores the move towards redirecting wealth and capital formation to long-term sustainability over present income. Digital connectivity can facilitate this process by reducing information and transaction costs, increasing information spread, enhancing services, and user-market linkages. Mobile networks enable communication and payment services where fixed infrastructure is scarce, while fixed broadband offers capacity and reliability for cloud and remote working, digital education, and data-heavy production. But digital expansion must be met with energy, skills, equipment, cybersecurity, and regulation. Its impact on sustainability is thus not guaranteed. Curtis et al. (2022) demonstrate that meaningful connectivity is about more than just available connections, but about affordability, capability, governance, and use.

Digital technology can foster formal engagement through identification, mobile banking, payments, and platform services. Daud (2023) connects digital technology to financial inclusion and economic growth, indicating that connectivity could have an impact on development via financial channels. This distinction is important as mobile subscriptions can provide a measure of reach while internet usage can be an indicator of adoption, and the quality of infrastructure can be measured by fixed broadband. Rather, growth in GDP is not a good metric to use to assess comprehensive wealth, and adjusted net savings is a better metric to use for this purpose. In the context of South Asian emerging economies, Din et al. (2022) provide proof of the applicability of adjusted net savings as a tool for sustainability analysis. There is a multidimensional connection between digitalization and sustainability. While digital tools can enhance the logistics, resource tracking, service provision, and renewable energy management, they can also lead to higher electricity consumption, e-waste, market concentration, and inequality. Guandalini (2022) states that the results will depend on the way digital transformation is regulated and integrated in the institutional process. Since the effects are diverse in South Asia, they are likely to be different for infrastructure, urbanization, and education. The multi-faceted relevance of ICT, human development, and urbanization is pointed out by Gyamfi et al. (2024), and Hosan et al. (2022) link digitalization with demography and energy conditions. These learnings support the need for control over urbanisation, electricity, capital, trade, foreign investment, inflation, and secondary enrolment.

The impact of connectivity on sustainability could be shaped by finance and investment. Huang et al. (2022) demonstrate that digital financial inclusion can affect energy-environment performance in three ways: participation, allocation, and technology adoption. A similar link between ICT and financial inclusion with sustainable economic development in developing countries has also been found by Hussain et al. (2023). However, investment and foreign capital do not necessarily lead to good results if they are channeled into resource-intensive activities. Therefore, Karlilar et al. (2023) emphasize that digitalization should be taken into account along with financial development, renewable energy, and green innovation. Measurement also matters. Kende et al (2022) emphasize universal and meaningful connectivity, which encompasses affordability, skills, safety, and quality. Mobile subscription rates could be an indicator of multiple SIMs per person, and Internet-use rates may not reflect Internet quality. For businesses, schools, households, and public institutions, fixed broadband might be more of a stable access option. Connectivity can contribute to inclusion by lowering transportation expenses, broadening access to information, and facilitating rural producers' market access. While recognizing the potential of digital financial inclusion for contributing to poverty alleviation and sustainable development, Lee et al. (2023) acknowledge that inequitable access can hinder this progress.

The experience at the cross-country level indicates that digitalization can help in innovation, efficiency, and structural change. According to Lei et al. (2024), there are connections between digitalization and sustainable development in OECD economies. Digital technologies are called tools to reach the Sustainable Development Goals (Mondejar et al., 2021). But such results cannot be directly translated in South Asia as institutional capacity and energy systems are different, infrastructure quality varies, and digital skills are different. Oanh and Dinh (2024) further demonstrate that digital-finance relationships can evolve along different distributions and over time.

Accordingly, this study has three objectives:

1. To describe the distribution and interrelationships of digital connectivity and sustainable economic performance
2. To estimate the separate associations of internet use, mobile subscriptions, and fixed broadband with adjusted net savings after accounting for stationarity, controls, and country effects
3. To test the stability of these relationships through education-augmented models

2. Methodology

2.1 Research Design and Data Source

The research design used in this study is a quantitative explanatory design with secondary data obtained from countries per year. Annual secondary data were obtained from the World Bank's World Development Indicators database (World Bank, 2026). The selected countries are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka for the years 2000-2021. However, Afghanistan was excluded from the empirical analysis because adjusted net savings data were unavailable. The final analytical sample therefore consisted of 128 country-year observations covering seven countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

2.2 Measurement of Variables

Adjusted net savings, including particulate-emission damage as a percentage of gross national income, are used to measure sustainable economic performance. Digital connectivity is captured in the number of individuals using the internet as a percentage of the population, mobile cellular subscriptions per 100 people, and fixed broadband subscriptions per 100 people. The controls include gross capital formation as a percentage of GDP, trade as a percentage of GDP, foreign direct investment net inflows as a percentage of GDP, consumer-price inflation, urban population as a percentage of total population, access to electricity as a percentage of the population, and gross secondary-school enrolment.

2.3 Data Preparation

The original World Bank data was changed from wide format (indicator-by-year) to a country-year panel. The pivoting indicators were converted to columns by removing missing series codes. All baseline variables are well defined except for missing values. Thus, complete-case samples are used for the model. Prior to stationarity transformations, 126 observations are in the internet baseline sample, 128 observations are in the mobile baseline sample, and 106 observations are in the broadband baseline sample. Following the differencing and the requirement of consecutive years, there are 110 observations for internet, 120 observations for mobile, and 98 observations for broadband. Only differences are calculated between observations if separated by one year, so as to avoid differences between series in a country.

2.4 Econometric Specification and Stationarity

Available observations are used to calculate descriptive statistics and the Pearson correlations, using pairwise deletion when computing correlations. Variance inflation factors measure multicollinearity. The Maddala-Wu test with individual intercepts, zero augmentation lags, and country-specific available time lengths is primarily used to test the properties of the panels for unit roots, while the Im–Pesaran–Shin test is used to assess the properties of the same panels for adjusted net savings and internet use. Levels of net savings, trade, FDI, inflation, and urban population remain unchanged. First differences are taken of mobile subscriptions, broadband, capital formation, electricity access, and secondary enrolment. The use of the internet is second-differenced, as its first difference is non-stationary. Three equations are estimated separately by substituting the digital-connectivity variable with Δ^2Internet, ΔMobile, or ΔBroadband. Each equation also includes ΔCapital, trade, FDI, inflation, urban population, and ΔElectricity as control variables.

2.5 Model Selection, Diagnostics, and Robustness

Pooled OLS, one-way country fixed effects, and one-way country random effects are estimated for each digital indicator. Random effects are estimated by the Wallace–Hussain variance-component method. The F-test is a test for fixed effects versus pooled OLS, the Breusch–Pagan Lagrange multiplier test is a test for random effects versus pooled OLS, and the Hausman test is for fixed effects versus random effects. The Breusch–Godfrey and Wooldridge panel tests are used to test for serial correlation, whereas the studentized Breusch–Pagan test is used for heteroskedasticity and the Pesaran CD test is used for cross-sectional dependence. Final inference is reported using the Driscoll–Kraay standard errors with one lag, as some models have significant or near-significant serial and cross-sectional diagnostics. The secondary enrolment is first-differenced, and countries with fewer than 6 usable observations are omitted from robustness models. The Maldives has a very short time dimension, which is why it is not included in the sensitivity models. Table 1 shows the variables, indicators, and their role in the study.

Table 1. Variables, indicators, and transformations

Construct	WDI indicator	Model form	Role
Sustainable performance	Adjusted net savings (% of GNI)	Level	Dependent variable
Internet connectivity	Individuals using the internet (% of the population)	Second difference	Main explanatory variable
Mobile connectivity	Mobile subscriptions per 100 people	First difference	Main explanatory variable
Broadband connectivity	Fixed broadband subscriptions per 100 people	First difference	Main explanatory variable
Investment	Gross capital formation (% GDP)	First difference	Control
Trade integration	Trade (% GDP)	Level	Control
Foreign capital	FDI net inflows (% GDP)	Level	Control
Macroeconomic stability	Inflation, consumer prices (%)	Level	Control

Urbanization	Urban population (% total)	Level	Control
Infrastructure	Access to electricity (% of population)	First difference	Control
Human capital	Secondary-school enrolment (% gross)	First difference	Robustness control

Note. *Δ denotes a first difference, and Δ^2 denotes a second difference. Transformations follow the reported panel unit-root tests.*

3. Results

3.1 Descriptive Statistics

Table 2 shows a summary of the available observations prior to stationarity transformations. Net savings average 19.724% of GNI (range of -0.688 to 43.387), reflecting significant variation in comprehensive saving. The electronic indicators vary significantly in size and spread. The average Internet penetration is 17.638% of the population with a standard deviation greater than the average, which shows that the region is moving from negligible penetration to high penetration in some country-years. Mobile lines per 100 population are 60.868 and 196.410 in markets with several lines per person. Fixed broadband, on the other hand, is considerably less common, with an average of 2.103 subscriptions per 100 people. The control variables also have a wide range of values; trade is between 165.979% and GDP, FDI is between -0.639% and 16.783%, the coverage of electricity is in the range of 24.6% to universal coverage, and the coverage of secondary education is in the range of 19.839% to 95.911%. The distributions reinforce the structural variety of the regional sampling as shown in Table 2.

Table 2. Descriptive statistics

Variable	N	Mean	SD	Minimum	Maximum
Adjusted net savings	128	19.724	9.116	-0.688	43.387
Internet use	126	17.638	21.139	0.071	85.637
Mobile subscriptions	128	60.868	49.166	0.042	196.410
Fixed broadband	106	2.103	2.846	0.002	14.825
Gross capital formation	128	31.159	11.723	14.535	69.449
Trade openness	128	54.139	30.947	21.460	165.979
FDI net inflows	128	1.623	2.657	-0.639	16.783
Inflation	128	6.432	3.704	-1.370	22.564
Urban population	128	34.709	12.539	14.574	66.144
Electricity access	128	77.669	19.000	24.600	100.000
Secondary enrolment	108	58.550	18.985	19.839	95.911

Note. *Statistics use all available country-year observations in the 2000 to 2021.*

3.2 Correlation and Multicollinearity

The results of the correlation indicate why the three digital indicators were estimated separately. The correlation between Internet use and mobile subscriptions is 0.804; between mobile and broadband is 0.780; and between Internet use and broadband is 0.710. The partial coefficients for all three would not be easy to interpret and could increase uncertainty. Their simple correlations with adjusted net savings, in contrast, are small: −0.034 with internet use, 0.148 with mobile subscriptions, and 0.047 with broadband. These unconditional relationships are not regression results and do not consider country effects, trends, controls, or transformations. The net savings are adjusted with a higher positive correlation with capital formation (0.514) and secondary enrolment (0.463). Although there are some large correlations between the regressors, the largest are VIF = 3.626 for the internet model, VIF = 3.909 for the mobile model, and VIF = 4.092 for the broadband model. None of the separate specifications have severe multicollinearity, with all being below the conventional threshold of 5, as shown in Table 3.

Table 3. Selected correlations and variance inflation factors

Relationship or diagnostic	Value	Interpretation
Internet–mobile	0.804	High
Mobile–broadband	0.780	High
Internet–broadband	0.710	High
Adjusted savings–capital	0.514	Moderate positive
Adjusted savings–secondary	0.463	Moderate positive
Adjusted savings–internet	-0.034	Near zero
Adjusted savings–mobile	0.148	Weak positive
Adjusted savings–broadband	0.047	Near zero
Maximum VIF: internet model	3.626	Acceptable (<5)
Maximum VIF: mobile model	3.909	Acceptable (<5)
Maximum VIF: broadband model	4.092	Acceptable (<5)

Note. *Pearson correlations use pairwise-complete observations. VIF values refer to the corresponding baseline level-form diagnostic regression.*

3.3 Panel Unit-Root Results

The regression forms were determined by the panel unit-root decisions of the Maddala–Wu test, which are reported in Table 4. The unit-root null is rejected at the level for adjusted net savings, adjusted trade, FDI, adjusted inflation, and urban population, which are assumed to be I(0). Mobile subscriptions, fixed broadband, capital formation, electricity access, and secondary enrolment fail to reject the unit-root null at level but reject it after first differencing. Only second differencing rejects Internet use. This is a significant discovery because the internet coefficient indicates the change in the annual growth rate of internet users and not the impact of the level of internet use. The transformations decrease the number of observations available and make the estimation samples model-specific.

Table 4. Panel unit-root decisions

Variable	Tested form	Panel p-value(s)	Order used
Adjusted net savings	Level	<.001	I(0)
Internet use	Level / first / second	1.000 / .268 / <.001	I(2)
Mobile subscriptions	Level / first	.229 / .027	I(1)
Fixed broadband	Level / first	1.000 / .001	I(1)
Gross capital formation	Level / first	.770 / <.001	I(1)
Trade openness	Level	.036	I(0)
FDI	Level	.005	I(0)
Inflation	Level	.004	I(0)
Urban population	Level	<.001	I(0)
Electricity access	Level / first	.163 / <.001	I(1)
Secondary enrolment	Level / first	.846 / <.001	I(1)

Note. *Maddala–Wu tests use individual intercepts, zero augmentation lags, and available country-specific time lengths. Values shown as <.001 were reported by R as zero to the displayed precision.*

3.4 Model Selection and Diagnostics

All three models are significant at the 1% level for the F-tests of individual effects; this indicates that country-specific heterogeneity is important. There is also high importance of the Breusch–Pagan LM statistics, which favor random effects over pooling. The Hausman p-values are 0.504 for internet, 0.809 for mobile, and 0.518 for broadband, and the tests do not reject the random-effects estimator in favor of fixed effects. The models estimated at the final stage are one-way individual random effects models estimated using the Wallace-Hussain method. The mobile model displays a marked degree of serial correlation at the 5% level and this is near the 10% level for the internet and the broadband tests, as shown in Table 5. The problem of heteroskedasticity is not detected, and Pesaran CD tests do not reject the cross-sectional independence at the 5% level, and the internet p-value is also close to the 5% level of significance. In the presence of these diagnostics and a few countries, the final coefficient inference is based on one-lag Driscoll–Kraay standard errors.

Table 5. Model selection and diagnostic tests

Model	F test	LM test	Hausman	Serial p	BP p	CD p	Selected
Internet	38.472 (<.001)	335.13 (<.001)	6.311 (.504)	.063	.343	.067	Random effects
Mobile	40.573 (<.001)	413.72 (<.001)	3.743 (.809)	.023	.392	.132	Random effects
Broadband	30.768 (<.001)	204.38 (<.001)	6.190 (.518)	.090	.178	.399	Random effects

Note. *F and LM entries report statistics (p-value). BP = studentized Breusch–Pagan heteroskedasticity test; CD = Pesaran cross-sectional dependence test.*

3.5 Baseline Random-Effects Estimates

Table 6 reports the baseline estimates of the random-effects regression model, with standard errors clustered around each regression in the model using the Driscoll–Kraay cluster-robust approach. The only variable of significance in this model is the share of the population living in an urban area, which is related to the adjusted net savings in such a way that a one-percentage-point rise in the urban share is accompanied by a 0.376-percentage-point rise in adjusted net savings, controlling for the other regressors. The internet model is co-significant but only moderately explanatory, with an R^2 of 0.157. The relationship between adjusted net savings and growth in internet use isn't stable. The mobile model shows ΔMobile to be positive at 0.171, and the p-value is 0.074, with strong significance. The coefficient is significant at 10%, suggesting that there is a positive association between an increase in annual mobile subscriptions of 1 per 100 people and an increase in adjusted net savings of 0.171 percentage points. Urban population is once again positive and very significant, with the coefficient being 0.406. The mobile model has the highest R^2 (baseline: 0.272), but the result is associational and marginal. The broadband model has the highest value for the coefficient (3.994) and the highest value for the p-value (0.011). For every additional 100 persons, an additional fixed broadband subscription per capita is associated with about a 3.99% rise in the adjusted net savings, holding the controls and random country effects constant. The R^2 value of the broadband model is 0.177. The broadband coefficient is not to be mechanically compared with the mobile coefficient because the mobile coefficient measures the scale of the industry and the annual rates of change, both of which are low. The result backs the positive connection between higher capacity connectivity and sustainable economic performance in the base sample.

Table 6. Baseline random-effects models with Driscoll–Kraay standard errors

Variable	Internet β (SE)	p	Mobile β (SE)	p	Broadband β (SE)	p
Digital indicator	-0.127 (0.254)	.619	0.171 (0.095)	.074	3.994 (1.531)	.011
Δ Capital	0.178 (0.200)	.378	0.120 (0.194)	.536	0.122 (0.171)	.477
Trade	0.052 (0.085)	.542	0.043 (0.081)	.601	0.024 (0.064)	.704
FDI	-0.172 (0.521)	.742	-0.411 (0.400)	.306	-0.699 (0.275)	.013
Inflation	-0.063 (0.148)	.670	-0.159 (0.161)	.325	-0.066 (0.144)	.651
Urban population	0.376 (0.075)	<.001	0.406 (0.084)	<.001	0.104 (0.199)	.601
Δ Electricity	0.151 (0.146)	.305	0.148 (0.121)	.221	0.206 (0.165)	.215
Observations	110		120		98	
Countries	7		7		7	
R^2	0.157		0.272		0.177	
Model p-value	.006		<.001		.007	

Note. *The digital indicator is* Δ^2*Internet in column 1, ΔMobile in column 2, and ΔBroadband in column 3. Standard errors are Driscoll–Kraay with one lag.*

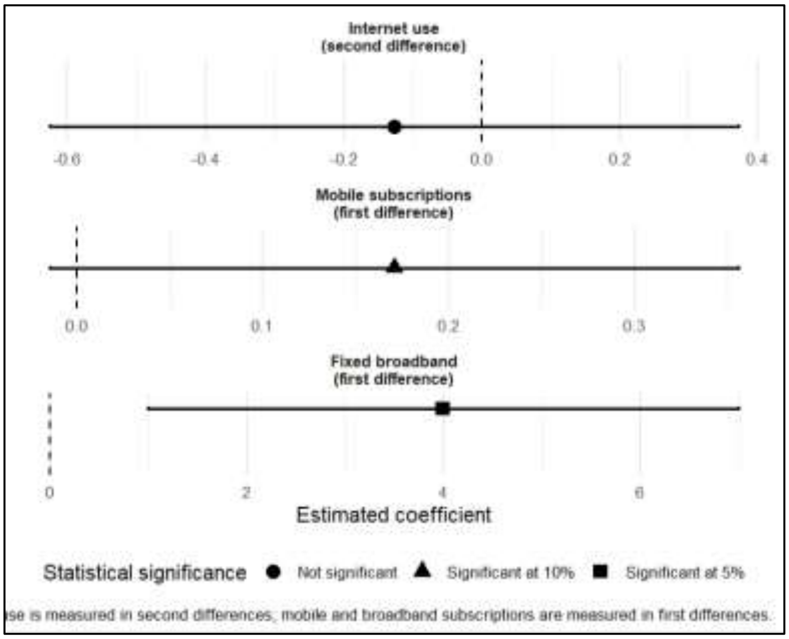

Figure 1. Baseline effects of digital connectivity on adjusted net savings.

Figure 1 shows that there are different digitization-economic performance relationships in different technologies. The positive correlations are the largest for fixed broadband and mobile connectivity, with the latter having a slightly smaller positive association. Relationships between sustainable economic performance and the change in growth of internet use are weaker and less consistent.

3.6 Robustness and Sensitivity Analysis

The augmented models with education change the samples in the material sense. With ΔSecondary added, plus at least six usable observations, there are 5 countries and 84 observations of the internet, and 6 countries and 94 and 78 observations of mobile and broadband, respectively. In the reduced internet model, Δ^2Internet is significant and negative (at −0.289, p = 0.042), while secondary enrolment is positive and significant with the exclusion of Maldives and Sri Lanka. For the mobile robustness model, the digital coefficient is positive but not significant (0.143; p = 0.132). The coefficient takes a value of 0.488 (p = 0.732) in the broadband robustness model, and trade is positive, and FDI is negative. The changes reflect the sensitivity of the digital estimates to the lack of educational information and changing country composition. Maldives is removed to give a "cleaner" sensitivity test as it maintains the baseline controls and the shortest country series. All taken together, the sensitivity evidence positions the digital indicators clearly: broadband is the most consistent positive correlate, mobile is positive but marginal, and the internet is unstable and reliant on transformation and sample composition. The hypothesis for broadband is best supported, the mobile hypothesis is partly supported, and the internet hypothesis is not supported. As shown in table 7.

Table 7. Robustness and sensitivity results for digital-connectivity coefficients

Specification	Indicator	Countries / N	Coefficient (SE)	p	Decision
Baseline	Internet	7 / 110	-0.127 (0.254)	.619	Not significant
Baseline	Mobile	7 / 120	0.171 (0.095)	.074	Positive at 10%
Baseline	Broadband	7 / 98	3.994 (1.531)	.011	Positive at 5%
With secondary enrolment	Internet	5 / 84	-0.289 (0.139)	.042	Negative; reduced sample
With secondary enrolment	Mobile	6 / 94	0.143 (0.094)	.132	Not significant

With secondary enrolment	Broadband	6 / 78	0.488 (1.421)	.732	Not significant
Excluding Maldives	Internet	6 / 104	-0.343 (0.175)	.053	Marginal at 10%
Excluding Maldives	Mobile	6 / 113	0.168 (0.092)	.071	Positive at 10%
Excluding Maldives	Broadband	6 / 91	4.217 (1.728)	.017	Positive at 5%

Note. *All coefficients use random effects and Driscoll–Kraay standard errors. Education models include ΔSecondary and drop countries with fewer than six complete observations.*

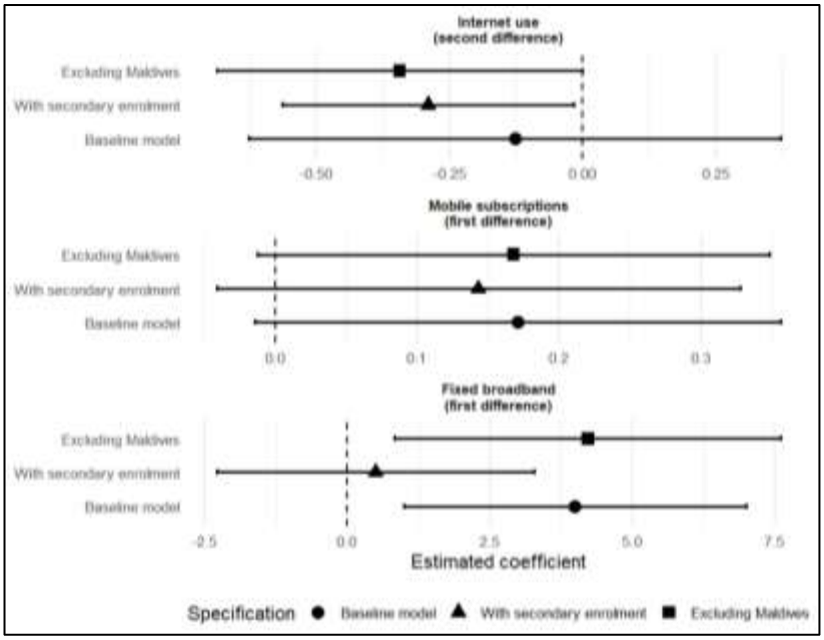

Figure 2. Robustness of digital-connectivity estimates across alternative

The estimated relationships are shown to vary by specification in Figure 2. The estimates for mobile subscription usage are on the positive side of all the models. The fixed-broadband estimate remains positive in all specifications but becomes considerably smaller when secondary-school enrolment is included. Overall, the figure suggests that broadband offers the most uniform positive pattern, whereas the internet result is more model-specific.

Discussion

The results provide mixed evidence on the relationship between digital connectivity and sustainable economic performance in South Asia, with stronger support for fixed broadband than for internet use or mobile subscriptions. The examples indicate that the developmental potential of digitalization is more about reliability, capacity, and additional investments. There is also recent evidence in South Asia that connects digitalization, green investment, and financial inclusion to economic sustainability, with a focus on the importance of these channels being complementary, not competing, for the economic sustainability of people (Rani et al., 2025). The second difference of internet use is statistically insignificant in the baseline model and becomes negative only in reduced-sample specifications. The study suggests that net savings rates are not persistently related to changes in the rate of Internet expansion after controlling for other factors and country effects. Digitalization can generate efficiency benefits but can also raise the use of electricity and rebound effects, as well as electronic waste. Similar to the previous two, research on digitalization and carbon footprints identifies conditional and offsetting mechanisms as well (Škare et al., 2024). Mobile subscriptions are positive and significant at the 10% level in the baseline and no-Maldives specifications but become insignificant when secondary-school enrolment is included. This may indicate a positive trend, but the connection isn't sufficiently confirmed. The introduction of mobile connectivity could help to enhance market information, payments, and access to services, but it can overestimate unique users by means of subscription counts. It might be influenced by financial development, institutional capacity, and digital skills. The data across countries reveals that digital financial inclusion plays different roles in supporting sustainable development goals (SDGs) depending on the financial development level (Van & Le Quoc, 2025). The obvious positive outcome is fixed broadband. The baseline random-effects model estimates that for each additional subscription per 100 people, net savings are increased by about 3.99 percentage points, on average, all else equal. This coefficient is positive and significant if Maldives is not included. When secondary enrolment is added, it becomes small and insignificant. The correct answer is that broadband has the highest and most enduring relationship, rather than that it has an unchanging impact. Adjusted net savings do not include all aspects of sustainability. There are still a number of adjustments that need to be made to the indicator in human and resource aspects, as stated by Pezzey (2022). Structural conditions are reinforced by the control variables. The baseline mobile and Internet models show a positive and significant urban population, which could suggest that higher density helps facilitate infrastructure sharing, service delivery, and market access. Negative and significant FDI are found in the broadband baseline and education-augmented models, suggesting that the mix of inward investment could be more important than its level. The importance of trade, capital formation, electricity, and education is limited only to certain specifications. Regional policy analysis also emphasises that digital transformation needs to be linked with overall institutional and infrastructural policies and not considered as a separate action (Observer Research Foundation, 2024). Policy implication is not just to maximize connection counts. Key elements that South Asian governments should focus on are: affordable broadband, backbone capacity, last-mile competition, resilient electricity, digital skills, and productive applications. In practice, policy needs to focus on interoperability and meaningful use for mobile expansion to become important for inclusion. Broadband programmes should focus on rural and low-income connectivity in order to avoid exacerbating spatial inequality through higher capacity connectivity.

Conclusion

The purpose of this study was to evaluate whether digital connectivity fosters sustainable economic performance among seven South Asian economies from 2000 to 2021. It used adjusted net savings as the dependent variable and separate panel models for internet usage, mobile cellular subscriptions, and fixed broadband subscriptions. Analysis included handling missing data, testing stationarity, transformation of non-stationary variables, and comparing pooled, fixed-effects, and random-effects estimators, as well as reporting Driscoll–Kraay standard errors. Random effects were favored over pooled least squares and were not rejected in favor of fixed effects in model-selection tests. The results distinguish between the different measures of connectivity. The internet hypothesis is not supported by the second difference of the Internet use, which is insignificant and unstable in reduced samples. The mobile hypothesis is only partially confirmed since the annual changes in mobile subscriptions.are positive and generally only significant at the 10% level, especially when education is added to the analysis. In the baseline sample and the no-Maldives sample, the effect of changes in fixed broadband is positive and significant, with the former having the strongest evidence. The results shown here are those of conditional associations and do not imply cause and effect. Future research should extend the analysis by using a larger and more balanced panel, incorporating additional South Asian and comparable developing economies, and applying alternative estimation techniques that can better address endogeneity and unobserved country-specific effects.

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