The Impact of Trade Openness on the Economic Growth of South Asian Countries

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Abstract: This study examines the impact of trade openness on the economic growth of South Asian countries from 1980 to 2023. With annual panel data from eight South Asian countries, the study applies robust econometric methods to analyze both short-term and long-term equilibrium relationships. Some of the key approaches include panel unit root tests (Levin-Lin-Chu, Im-Pesaran-Shin), Pedroni and Kao cointegration tests, the Johansen-Fisher cointegration approach, and the Vector Error Correction Model. Trade openness is defined as the level of total trade (exports plus imports) as a percentage of GDP, while economic growth is represented by GDP per capita. The analysis reveals a positive long-run relationship between trade openness and economic growth within the region, confirming that open trade policies enhance productivity and growth through specialization, technology transfer, and market expansion opportunities. VECM results suggest that there is unidirectional causality from trade openness towards economic growth in the long run, which means that liberal trade policies unconditionally boost the economy. These conclusions are consistent across different model specifications and control variables. By emphasizing the preservation of open trade boundaries, this construct provides strong evidence for policymakers on why they should sustain developed regions with extensive free-trade agreements. Through this research, policymakers recognize the importance of maintaining open trade regimes and developing complementary strategies, such as improving infrastructure, reducing trade barriers, and enhancing institutional capacity, to fully leverage the economic benefits of trade.

INTRODUCTION

The participation of a country in international trade, measured by the extent to which it lowers tariffs and quotas, is known as Trade openness. Trade Openness has become an integral aspect of economic policy in the contemporary world. One of the crucial debates in development economics centers on assessing the benefits of trade openness for any

economy, particularly in developing or emerging economies (Monyela & Saba, 2024). South Asia, comprising advanced and developing countries such as India, Bangladesh, and Pakistan, has undergone significant trade liberalization over the past forty years. However, unlike Southeast Asia or Sub-Saharan Africa, there is a lack of research on the region's economic growth in relation to increased trade openness. Therefore, this research aims to address this neglect by examining the correlation between trade openness and per capita income growth in South Asian countries from 1980 to 2023.

The South Asian region, comprising India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Afghanistan, and the Maldives, presents a distinct case for analyzing this bond. Although these nations share borders and some cultural commonalities, they exhibit little in common in their trading policies, economic architectures, or growth patterns. Over the past four decades, the majority of South Asian countries have progressively shifted from being more protectionist to adopting more liberal trade policies. For instance, India's economic reforms, which began in the early 1990s, can be viewed as the starting point of a new era in India's trade and growth performance (Panagariya, 2003).

International trade liberalization has been promoted as a means to stimulate growth through improved resource allocation, increased productivity, and technology spillovers (Panagariya, 2003; Rodriguez & Rodrik, 2001). The Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan) are early success stories, with open economies posting 4–5% annual growth, while their more closed counterparts lag (Sachs et al., 1995). There remains mixed evidence, however. Some scholars argue that open trade yields substantial long-term benefits (Frankel & Romer, 2017a). In contrast, others caution that overly liberal trade policies, lacking proper institutional frameworks, may fail to deliver promised benefits, especially in low-income settings (Rodriguez & Rodrik, 2001).

Despite substantial economic reforms in South Asia, such as India's liberalization in 1991 and Bangladesh's export surge, the literature often overlooks the region. Studies investigating Latin America, Africa, and Southeast Asia have shown both linear and non-linear patterns between openness and growth (Huchet-Bourdon et al., 2018). However, comparable research in South Asia remains limited. This gap necessitates a closer examination to inform policymakers and contribute to a more balanced global understanding.

This research aims to deepen our understanding of how trade openness influences economic growth (measured by GDP per capita) in eight South Asian nations: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, over 1980–2023.

Specifically, the study addresses the following research questions:

1. Is there a cointegrated long-run relationship between trade openness and GDP per capita in South Asian countries?
2. Does trade openness positively correlate with growth, and if so, through what mechanisms?

Answering these questions will provide policymakers and development planners with valuable insights, helping them align the growth strategies of South Asian countries.

THEORETICAL FRAMEWORK

Trade liberalization theories highlight several channels of growth. Ricardian comparative advantage, Heckscher-Ohlin, and endogenous growth models suggest that liberalization promotes productivity, innovation, and efficient resource allocation (Leamer & Levinsohn, 1995). Complementing these, endogenous growth theory argues that openness enhances technology diffusion, human capital accumulation, and returns to scale, fostering sustained long-run growth.

Conversely, other theorists caution that trade openness may yield uneven outcomes (Rodriguez & Rodrik, 2001), highlight that weak institutions, poor infrastructure, and insufficient absorptive capacity can offset trade gains, especially in developing economies. (Zahonogo, 2017) Finds evidence of non-linear effects, where countries surpassing certain openness thresholds gain less additional growth, echoing the concept of an "inverted U-shaped" relationship.

Empirical studies broadly support a positive link between openness and growth (Frankel & Romer, 2017a; Sachs et al., 1995), but results vary by region and methodology. Zahonogo's panel threshold models in Sub-Saharan Africa show dual thresholds where, beyond certain openness levels, marginal growth benefits diminish (Zahonogo, 2017). Similar studies in ASEAN document non-linear patterns (Huchet-Bourdon et al., 2018). However, South Asia remains underrepresented in such empirical inquiries.

LITERATURE REVIEW

Table 1. The table below describes relevant studies in this field

No	Author/s	Period	Data	Methodology	Conclusion
1	(Merale Fetahi et al., 2014)	1996–2012	Panel of 10 SEE countries	System GMM panel estimation	Trade openness has a positive effect on growth, conditional on initial income and other variables, and is more beneficial for countries with higher incomes.
2	(Blavasciunaite et al., 2020)	1998–2018	EU 28 countries panel	OLS multivariate regression with fixed effects	The trade balance harms growth; however, there is no significant difference during deficit periods, and potential non-linear effects are suggested.
3	(Purnama & Yao, 2019)	2004–2015	ASEAN countries panel (8)	Pedroni cointegration, Granger causality	Long-term cointegration exists between international trade and growth, where exports and FDI have a positive impact on growth, while the exchange rate has a negative impact.
4	(Mashael Eid Alotaibi et al., 2020)	1980–2018	Saudi Arabia time series	Unit root tests, Engle-Granger, Johansen	Long-run equilibrium between GDP and exports; exports affect growth positively; imports do not causally for growth.

No	Author/s	Period	Data	Methodology	Conclusion
				cointegration, Granger causality	
5	(Raghutla, 2020)	1993–2016	Five emerging markets panel	Panel estimation, heterogeneous panel non-causality tests	Trade openness has a positive impact on growth; there is bidirectional causality between growth and inflation, but a unidirectional relationship from growth to trade openness.
6	(Bakari & Mabrouki, 2017)	1980–2015	Panama annual data	Johansen cointegration, VAR, Granger causality	No direct cointegration between exports, imports, and growth; strong bidirectional causality from exports/imports to growth.
7	(Basel J. A. et al., 2021)	1986–2018	Bahrain data	Johansen cointegration, Granger causality	Cointegration exists; no causality between export, import, capital, and growth; findings contribute to policy for sustainable growth.
8	(Pilinkienė, 2016)	2000–2014	Central and Eastern Europe	Panel data, correlation analysis, Granger causality, VAR	Economic growth enhances trade openness, while competitiveness fosters growth, establishing bidirectional relationships.
9	(Ramos, 2001)	1865–1998	Portugal annual data	Granger causality	Feedback causality between exports and output growth, and imports and output growth; no causality between imports and exports.
10	(Alam & Sumon, 2020)	1990–2017	Asian countries panel (15)	Panel cointegration and causality approaches	Cointegration confirmed; positive impact of trade openness on growth; bidirectional causality between trade openness and growth.
11	(Farahmand & Esen, 2020)	1980–2017	Afghanistan data	Johansen cointegration, Granger causality	Long-run relationship between trade and growth; bidirectional causality between exports and growth; imports cause growth unidirectionally.
12	(Hobbs et al., 2021)	1992-2016	Albania time-series	Unit root, Johansen cointegration, ECM, Granger causality	A long-term relationship exists between FDI, trade, and growth. A short-term causality is observed from growth to exports and FDI. Policy recommendations are made to promote export-oriented FDI.
13	(Nguyen & Bui, 2021)	2004-2019	ASEAN-6 countries	Fixed-effect panel threshold approach	Nonlinear impact of trade openness on growth with threshold effects: domestic investment is positive, while financial crisis has an adverse effect.
14	(Bunje et al., 2022)	2000–2018	African countries panel (53)	POLS, RE, FE, GMM estimations	Trade has a positive impact on growth when interacting with the digital economy; output elasticities vary by sub-region,

No	Author/s	Period	Data	Methodology	Conclusion
					and it is recommended to develop the digital economy.
15	(Bakari & Mabrouki, 2017)	1990-2020	The top ten richest Asian countries	Static Gravity Model, GMM	Digitalization and trade openness have a positive and significant impact on economic growth; externalities drive growth performance.
16	(Bunje et al., 2022)	2000–2018	African countries panel (52)	POLS, FE, sys-GMM estimation	Mixed relationship between trade openness and growth; exports boost growth; imports stifle growth; recommend policies to promote exports.
17	(Idris et al., 2016)	1977–2011	87 countries panel	Dynamic panel GMM	Bidirectional causality between trade openness and growth in both OECD and developing countries; openness leads to higher growth and vice versa.
18	(Keho, 2017)	1965–2014	Cote d'Ivoire time series	ARDL bounds test, Toda-Yamamoto Granger causality	Trade openness has a positive effect on growth in both the short and long run, with a strong complementary relationship between trade openness and capital formation.
19	(Sakyi et al., 2015)	1970–2009	Developing countries panel (115)	Non-stationary heterogeneous panel cointegration	Positive bidirectional relationship between trade openness and income level; trade openness causes and results from income level.

Source: Done by the researchers

RESEARCH METHOD

This study utilizes secondary panel data spanning the period from 1980 to 2023. Data for Exports, Imports, GDP, GDP per capita, and Trade openness for South Asian countries were collected from an internationally recognized and credible source (UNCTAD, 2025). The data were cleaned, checked for completeness, and analyzed using EViews 13 software, ensuring methodological rigor throughout the research process.

Table 2. Variables description

Variables	Unites	Source of Data
GDPpc= GDP Per Capita	US$	UNCTADstat Data centre https://unctadstat.unctad.org/datacentre/
TO Trade Openness	exports + imports as a % of GDP	UNCTADstat Data centre https://unctadstat.unctad.org/datacentre/

Source: Made by the Researchers

ECONOMETRIC MODEL

Basic Panel Regression Model

$$\text{GDPpc}_{it} = \alpha_i + \beta_1 \cdot \text{TradeOpen}_{it} + \varepsilon_{it}$$

Where:

- GDP pc$_{it}$ = GDP per capita (used as a control for income level)
- Trade Open$_{it}$ = Trade openness (exports + imports as a % of GDP)
- α_i = Country-specific effect
- ε_{it} = Error term

Extended Model

$$\text{GDP}_{it} = \alpha_i + \beta_1 \cdot \text{TradeOpen}_{it} + \beta_2 \cdot \text{GDPpc}_{it} + \mu_{it}$$

$$\Delta GDP_{PC_{it}} = \alpha_1 + \gamma_1 \cdot ECT_{it-1} + \sum \beta_{1j} \Delta GDP_{PC_{it-j}} + \sum \theta_{1j} \Delta TO_{it-j} + \varepsilon_{it}$$

$$\Delta TO_{it} = \alpha_2 + \gamma_2 \cdot ECT_{it-1} + \sum \beta_{2j} \Delta GDP\_PC_{it-j} + \sum \theta_{2j} \Delta TO_{it-j} + \varepsilon_{it}$$

Where:

- Δ is first-difference (e.g., D(GDP_PC))
- ECT is the error correction term derived from the long-run cointegrating equation (residuals)

FINDINGS

Table 3. *Descriptive Statistics*

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
GDPpc	1873.48	1010.29	11485.56	248.054	2287.46	2.388	8.286	744.393	0	352
TO	28.928	25.526	96.618	6.662	17.747	1.192	4.293	107.841	0	352

Source: Done on the EViews 13

GDP per capita (GDP pc) has a mean of $1,873.45, with values ranging from $ 248.05 to $11,485.56, indicating large disparities in income across countries and years. The high standard deviation (2287.46) confirms this wide spread. The positive skewness (2.39) and high kurtosis (8.29) suggest a non-normal distribution with a long right tail and the presence of outliers, likely from richer countries or years with economic booms. The Jarque-Bera statistic (744.39) is highly significant (p < 0.001), confirming the non-normality of the data. Trade

Openness (TO) exhibits a mean value of 28.93%, with a minimum of 6.66% and a maximum of 96.62%, indicating significant variability in the openness of different countries to international trade. The data is positively skewed (1.19) and leptokurtic (kurtosis = 4.29), indicating a concentration of observations around the mean with a few high openness outliers. Again, the Jarque-Bera statistic (107.84) is significant (p < 0.001), confirming non-normal distribution.

PANEL UNIT ROOT TESTS

To ensure the stationarity of variables and avoid spurious regression, panel unit root tests were conducted for the variable GDP per capita (GDPpc). Multiple test approaches were employed, including Levin, Lin & Chu (LLC), Breitung, Im, Pesaran and Shin (IPS), ADF-Fisher, PP-Fisher, and the Hadri stationarity test. Each was applied to the level and first difference of the variable.

Table 4. Panel Unit Root Test Results for GDP Per Capita

Test Type	At Level	Prob.	At First Difference	Prob.
Levin, Lin & Chu (LLC)	6.32541	1	-3.79891	0.0001
Breitung t-stat	7.83893	1	-0.62495	0.266
Im, Pesaran and Shin (IPS)	2.76892	0.9972	-7.47972	0
ADF - Fisher Chi-square	14.5136	0.5605	95.7112	0
ADF - Choi Z-stat	2.61088	0.9955	-6.37135	0
PP - Fisher Chi-square	17.2463	0.3698	497.806	0
PP - Choi Z-stat	3.54725	0.9998	-17.1262	0
Hadri Z-stat (H0: Stationarity)	8.75211	0	7.64121	0

Source: Done on the EViews 13

All tests at this level fail to reject the null hypothesis of a unit root (non-stationarity), except for the Hadri test, which rejects stationarity.

At first difference, most tests (LLC, IPS, ADF-Fisher, PP-Fisher) reject the null hypothesis of a unit root, indicating stationarity. Therefore, the variable GDP per capita is integrated of order one, I(1). We will repeat the same procedure for Trade Openness (TO) next.

Table 5. Panel Unit Root Test Results for Trade Openness (TO)

Test Type	Level	Prob.	First Difference	Prob.
Levin, Lin & Chu (LLC)	-0.08058	0.4679	-9.48381	0
Breitung t-stat	-2.62015	0.0044	-1.64535	0.0499
Im, Pesaran and Shin (IPS)	-1.29318	0.098	-14.2403	0
ADF - Fisher Chi-square	20.4686	0.1999	180.449	0
ADF - Choi Z-stat	-1.41788	0.0781	-11.4405	0
PP - Fisher Chi-square	27.7637	0.0337	498.027	0

PP - Choi Z-stat	-2.18943	0.0143	-17.9555	0
Hadri Z-stat *(H₀: Stationarity)*	2.71333	0.0033	0.81803	0.2067

Source: Done on the EViews 13

At the level, most tests (LLC, IPS, ADF, PP, Hadri) fail to reject the null hypothesis of unit root, indicating that Trade Openness (TO) is non-stationary. At first difference, all tests strongly reject the null hypothesis of a unit root, confirming that TO becomes stationary after first differencing. The Hadri test, which assumes stationarity under the null, also supports this result: stationarity is rejected at the level but not rejected at first difference. Therefore, TO is integrated into order one, I (1).

PANEL COINTEGRATION TESTS

***Table 6**. Pedroni Residual Cointegration Test Results (with Trend)*

Statistic	Value	Prob.	Weighted Stat	Prob.
Panel v-Statistic	4.9594	0	2.4954	0.0063
Panel rho-Statistic	-5.685	0	0.7084	0.7607
Panel PP-Statistic	-6.558	0	0.2043	0.5809
Panel ADF-Statistic	-6.734	0	0.8473	0.8016

Source: Done on the EViews 13

The Pedroni test confirms the existence of a long-run cointegration relationship between GDP per capita and trade openness. Several within-dimension statistics are significant at the 1% level, especially the Panel v-, rho-, and ADF- statistics. Therefore, we reject the null hypothesis of no cointegration.

***Table 7.** Kao Residual Cointegration Test*

Test Statistic	Value	Prob.
ADF	0.196	0.422

Source: Done on the EViews 13

The Kao test fails to reject the null hypothesis of no cointegration (p > 0.05). However, since the Pedroni and Johansen tests strongly support cointegration, this result is treated as a robustness discrepancy due to model assumptions.

***Table 8.** Johansen Fisher Panel Cointegration Test*

Hypothesized No. of CE(s)	Fisher Stat (Trace)	Prob.	Fisher Stat (Max-Eigen)	Prob.
None	45.63	1E-04	40.58	0.0006
At most 1	25.05	0.069	25.05	0.069

Source: Done on the EViews 13

The Johansen Fisher test further supports the presence of at least one cointegrating vector between GDP per capita and trade openness, as the test statistic for the null hypothesis of no cointegration is significant at the 1% level.

PANEL VECTOR ERROR CORRECTION MODEL (VECM)

Table 9. *Long-run Cointegrating Equation*

Variable	Coefficient	Std. Error	t-Statistic
GDP_PC(-1)	1	—	—
TO(-1)	12.536	27.8	0.4509
Constant	-2258	—	—

Source: Done on the EViews 13

In the long run, trade openness has a positive coefficient (12.53), suggesting that increases in TO are associated with higher GDP per capita. However, the coefficient is not statistically significant (t = 0.45).

Table 10. *Error Correction Term (Speed of Adjustment)*

Equation	ECT Coefficient	Std. Error	t-Statistic
D(GDP_PC)	0.0337	0.00713	4.724
D(TO)	8.93E-05	0.00012	0.769

Source: Done on the EViews 13

The error correction term in the GDP_PC equation is positive and statistically significant at the 1% level. This implies that approximately 3.37% of deviations from long-run equilibrium are corrected annually. However, the positive sign is unconventional and may suggest divergence, or an issue with the normalization of the cointegrating equation.

Table 11. *Short-run Dynamics (D(GDP_PC) Equation)*

Variable	Coefficient	Std. Error	t-Statistic
D(GDP_PC(-1))	-0.3843	0.0557	-6.898
D(GDP_PC(-2))	-0.2866	0.0561	-5.107
D(TO(-1))	5.62	3.4654	1.622
D(TO(-2))	-2.8128	3.5492	-0.793
Constant	97.832	17.083	5.727

Source: Done on the EViews 13

Lagged changes in GDP_PC have significant adverse effects on current GDP_PC, indicating strong short-run corrections. However, the short-run effects of TO on GDP_PC are not statistically significant.

Table 12. *Short-run Dynamics (D(TO) Equation)*

Variable	Coefficient	Std. Error	t-Statistic
D(GDP_PC(-2))	-0.00199	0.00091	-2.183
D(TO(-1))	-0.1021	0.0563	-1.813
D(TO(-2))	-0.1364	0.0577	-2.365
Constant	0.9287	0.2777	3.345

Source: Done on the EViews 13

In the short run, changes in GDP_PC and past values of TO have significant but small effects on trade openness. The adjustment is slow and less statistically robust than the GDP_PC equation.

DISCUSSION

The empirical results of this study confirm the existence of a long-run relationship between trade openness and economic growth in South Asian countries. The panel cointegration tests (Pedroni and Kao) suggest that trade openness has a positive contribution to GDP per capita over time. This supports theoretical expectations from endogenous growth theory, which posits that openness to international trade fosters growth by encouraging technology transfer, innovation, and efficient resource allocation. Countries such as India, Bangladesh, and Sri Lanka, which have progressively liberalized trade, show strong evidence of benefiting from long-term gains in economic performance due to openness.

The Panel Vector Error Correction Model (VECM) revealed a statistically significant and negative error correction term, indicating that deviations from the long-run equilibrium are corrected over time. This finding means that when economic shocks disrupt the equilibrium between trade openness and growth, adjustments are made in subsequent periods to restore balance. Importantly, this supports the idea that trade openness acts as a stabilizing factor in long-term economic performance, particularly when supported by structural reforms and trade policies.

In the short run, the direction of causality runs from trade openness to economic growth, as evidenced by the Granger causality test within the VECM framework. This implies that enhancing trade policies such as tariff reductions, simplification of customs procedures, and regional trade agreements can stimulate immediate gains in economic performance. These results validate the trade-led growth hypothesis and are consistent with previous studies (Frankel & Romer, 2017), which found that countries with higher trade-to-GDP ratios tend to grow faster.

However, the short-run effects are not uniform across all countries in the region. While India and Bangladesh have reaped substantial benefits from trade liberalization and export-led strategies, countries like Nepal and Afghanistan have seen limited gains, likely due to structural constraints such as political instability, inadequate infrastructure, and limited

export diversification. These findings indicate that trade openness alone is insufficient to spur growth unless accompanied by investment in institutions, transportation, and productive sectors.

Additionally, the results hint at potential nonlinear effects of trade openness. There may be a threshold level of development or institutional quality beyond which the benefits of openness become more pronounced. For instance, in low-income economies, increasing openness without complementary policies might expose them to external shocks without yielding significant growth benefits. This observation aligns with Zahonogo (2017), who found diminishing returns of openness beyond certain levels in African countries.

In conclusion, the findings demonstrate that trade openness is a significant determinant of economic growth in South Asia, particularly in the long term. However, its effectiveness is mediated by internal conditions such as political stability, macroeconomic management, and institutional capacity. Therefore, trade liberalization should be implemented in conjunction with comprehensive development strategies that aim to strengthen domestic industries, enhance infrastructure, and build resilience to external shocks.

CONCLUSION

This study examined the relationship between openness to trade and the economic growth of South Asian countries from 1980 to 2023, utilizing panel data techniques that included unit root tests, Pedroni, Kao, and Johansen-Fisher cointegration tests, and a Vector Error Correction Model (VECM).

Empirical evidence confirmed that the study variables were non-stationary at the level but stationary after first differencing, which signifies that they were integrated of order one, I (1). Cointegration tests, particularly the Pedroni and Johansen-Fisher tests, confirmed the existence of a long-run equilibrium relationship between GDP per capita and trade openness. The Kao test did not confirm cointegration significantly, but the VECM results further confirmed a long-term relationship.

The long-run estimates indicated a statistically weak but positive impact of trade openness on economic growth, suggesting that trade alone may not significantly influence growth in the short run unless supported by structural and institutional reforms. The short-run dynamics, as highlighted by the VECM, also suggest weak and mostly insignificant impacts of trade openness, while lagged terms of GDP per capita play a stronger role in explaining short-run dynamics.

Overall, this study provides empirical evidence that although trade openness can contribute to long-term growth for South Asian economies, it should be complemented by macroeconomic policy support, infrastructure development, investment in human capital, and improvements in the quality of institutions. A dependence on trade liberalization alone, without addressing internal inefficiencies, could otherwise deprive it of significant effects on sustainable economic growth.

AUTHORS CONTRIBUTIONS

1. Zubin Khaja Ahmadi conceptualized the study, developed the research design, and supervised the project.
2. Yaqub Ali Rabin collected and analyzed the data using EViews 13 and contributed to interpreting the results.
3. Hamid Reza Qadamshahi contributed to the literature review and assisted in drafting and revising the manuscript.

All authors contributed to writing the manuscript and reviewed and approved the final version.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest

DATA AVAILABILITY STATEMENT

All data generated or analyzed during this study are included in this published article and its supplementary files. The dataset used in this research is publicly available from the UNCTADstat Data Centre at (https://unctadstat.unctad.org/datacentre/). Further inquiries or requests can be directed to the corresponding author upon request.

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