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The Dynamics of Services Exports and Macroeconomic Performance: Evaluating the role of SATIS in South Asia

Asif Javed [a] **and Naimat Ullah**[b1]

Abstract

The global shift towards the services sector indicates the increasing reliance of economies on services-led growth. This transition has enhanced competitiveness, economic diversification, and sustainable development. South Asian countries have experienced substantial services sector growth, contributing significantly to gross domestic product. This study evaluates the impact of services exports on macroeconomic performance in South Asian countries for the period 2000-2022. The study quantifies the interconnected effect of service export and implementation of the SAARC Agreement on Trade in Services (SATIS) on macroeconomic performance, measured by Gross Domestic Product. Employing the least square, robust estimators, and Instrumental Variable-Generalized Method of Moments technique, the findings indicated that services exports positively influence Gross Domestic Product, with the SATIS further enhancing trade efficiency, reducing transaction costs, and improving competitiveness. The joint effect of the SAARC Agreement on Trade in Services implementation along with increased service exports expedite economic growth significantly, suggesting that South Asian economies can leverage services trade for economic output under the umbrella of the SAARC Agreement on Trade in Services effective implementation. However, institutional and regulatory factors shape the effectiveness of the SAARC Agreement on Trade in Services in each country. To fully utilize benefits, removing trade barriers and expanding market access under the SAARC Agreement on Trade in Services is crucial. Regional cooperation and services trade liberalization remain key to sustaining economic performance in South Asia.

Key words: Services exports, macroeconomic performance, SATIS, regional integration
JEL Classifications: F1, F63, O14

[1] [a] Associate Research Fellow, Sustainable Development Policy Institute (SDPI). Email: asifjaved@sdpi.org
[b] Sustainable Development Policy Institute (SDPI)

1. Introduction

The global transition from agriculture to services can be observed in both developed and developing countries where the services sector is contributing significantly towards their GDP (Mujahid and Alam, 2014). Service-led growth enables economies worldwide to diversify their resources and enhance their competitiveness (Loungani et al., 2017). Economic development becomes feasible when the services sector experiences growth (Hoekman and Mattoo, 2008). Hoekman and Eschenbach (2005) found a positive impact of services sector growth on overall economic progress. Yusuf (2016) and Mishra et al. (2011) also emphasized that the services sector provides a basis for economic growth. In the case of the South Asian region, a substantial growth in the services sector has been observed, particularly in countries like India, Pakistan, and Sri Lanka (Nabi, 2010). The rapid growth of services has shifted away from manufacturing to intangible services. Furthermore, the share of the services sector in GDP in respective countries consistently exceeds that of the industrial and agricultural sectors, highlighting its growing importance in their respective economies.

Table 1: Growth rate of services sector and percentage share in GDP

Country	2019		2020		2021		2022		2023	
	Growth rate	Share in GDP (%)	Growth rate	Share in GDP (%)	Growth rate	Share in GDP (%)	Growth rate	Share in GDP (%)	Growth rate	Share in GDP (%)
Bangladesh	6.9	50.8	3.9	51.5	5.7	51.3	6.3	51.0	5.4	51.1
Bhutan	15.3	49.6	-7.6	50.0	5.8	50.2	6.8	51.2	6.8	51.2
India	6.4	50.1	-8.3	47.9	9.2	47.8	10.0	49.6	7.6	49.6
Maldives	9.5	71.3	-31.7	70.8	43.0	73.2	14.3	73.6	4.8	70.6
Nepal	6.8	52.0	-4.5	53.9	4.7	51.5	5.3	52.4	2.4	55.4
Pakistan	5.0	53.6	-1.2	53.7	5.9	52.0	6.7	52.2	-0.02	50.8
Sri Lanka	2.9	55.7	-1.9	57.8	3.4	55.9	-2.6	57.0	-0.2	59.9

Source: World Development Indicators (2024)

Table 1 demonstrates the increasing reliance on the services sector across South Asia, with each country showing a substantial share of services in their GDP. Apart from the negative impact of COVID-19 on the services sector during 2020, the growth rate in each country remained positive.

The expansion of the services trade has been instrumental in facilitating labor reallocation and generating employment, thereby playing an important role in mitigating global employment challenges (Loungani et al., 2017). Shieh (2020) pointed out that services trade is vital in optimizing resource allocation and enhancing the sector's overall competitiveness. Economic development took place more rapidly in countries that have experienced higher service exports. Moreover, services trade remains relatively stable, especially in developing countries, in contrast to goods trade, which is highly vulnerable to economic shocks due to supply chain disruptions and demand fluctuations.

Services trade has emerged as a driving force in global trade during the past two decades, offering substantial opportunities for developing and least-developed countries. The rapid expansion of services trade has supported export-led growth, promoted economic diversification, attracted foreign direct investment (FDI), and facilitated deeper integration into global chains (World Bank, 2022). Despite this global momentum, regional value chains in South Asia remain underdeveloped. Progress has been hindered by slow advancements in trade facilitation, a limited number of comprehensive free trade agreements, and the persistence of non-tariff barriers. These challenges continue to impede the cross-border transfer of skills and technology within the region (Ahmed et al., 2015).

Services exports play an essential role in improving production efficiency and facilitating the inflow of foreign capital and technology into a country (Priyankara, 2018; Gabriele, 2006). In India, for example, service exports have been integral to the economic growth of the country (Dash and Parida, 2012)

Table 2: Services exports of South Asian countries

Country	**2019**	**2020**	**2021**	**2022**	**2023**
India	214,762	203,145	240,656	309,371	336,152
Pakistan	5,870	5,392	6,544	7,359	7,499
Bangladesh	6,214	6,020	7,475	8,270	6,095
Sri Lanka	7,474	3,035	2,475	3,062	4,981
Maldives	3,381	1,529	3,699	4,696	4,696

Nepal	1,615	881	798	1,225	1,669
Bhutan	168	135	22	22	337

Source: International Trade Centre

Table 2 shows that India and Pakistan are the top two services exporters in the South Asian region. Services exports of India increased from $214,762 million in 2019 to $336,152 million in 2023. Services exports of Pakistan increased from $5,870 million in 2019 to $7,499 million in 2023. The SAARC Agreement on Trade in Services (SATIS) was signed in 2010 to promote regional services trade. The agreement focused on encouraging progressive liberalization of services in the South Asian region. SATIS aligns with Article V of the General Agreement on Trade in Services (GATS), supporting regional integration and cooperation in the services sector. Future economic growth in South Asia depends on promoting regional cooperation and integration (UNESCAP, 2018). Thus, the implementation of SATIS is important to boost the intraregional services trade, which can lead to higher GDP growth by increasing exports, attracting foreign direct investment and improving market efficiency.

Considering the significance of the services sector and its trade, and the role of SATIS, the key objective of this study is to examine the impact of services exports on the economic growth of South Asian countries for the period 2000-2022. In particular, the study analyzed and quantified the unilateral and the joint impact of service export and SATIS on economic productivity. Empirically, the study relies on WDI data and employs the least square technique in baseline estimations. The baseline results are supported by alternate estimators for robustness checks, and an IV-GMM approach is employed to address endogeneity issues. Further, we employ interaction terms to estimate the interconnected effect of SATIS and service export on gross domestic product (GDP).

This study contributes meaningfully to the existing literature by empirically analyzing the impact of services exports and regional trade agreements-specifically the SATIS agreement, on economic growth in South Asian countries. Despite the rising prominence of the services sector in both global and regional economies, there remains limited empirical research on its direct and interactive effects on regional agreements in the South Asian context. This study addresses this gap by providing evidence-based insights into the role of services trade and regional integration in driving economic performance.

The study is structured as follows: Section 2 provides a brief literature review covering the impact of the services sector and exports on economic growth, section 3 specifies the

methodology and empirical framework, section 4 presents results and discussion, while the last section is based on conclusion and policy recommendations.

2. Literature Review

The literature emphasized the positive relationship between exports and economic growth. The export-led growth hypothesis illustrated that technological spillovers and other externalities help in boosting economic growth. Balassa (1978, 1985) examined that the export-led growth hypothesis holds true in both developed and developing countries. Helpman and Krugman (1985) argued that export growth encourages knowledge accumulation and human capital development, both of which are essential for long-term economic growth. Carbaugh (2015) emphasized that an export-oriented approach helps developing countries focus on industries where they have a comparative advantage. It also allows domestic producers to benefit from economics of scale, reducing costs and improving efficiency as production increases.

Howitt. And Weil (2010) emphasized that improvement in living standards reflects that the country is experiencing economic growth. Sermcheep (2019) observed that both modern and traditional services exports have a significant impact on economic growth. Shieh (2020), by using data from 89 countries, found the positive impact of exports of services on economic performance. Gani and Clemes (2010) showed that Pacific Island countries experienced economic growth largely due to the expansion of the services sector. Javed (2023) found that policy reforms in ASEAN countries played a crucial role in achieving service export-led growth. Anwar and Sam (2008) attributed the economic development of Singapore to its strong services sector. Chen and Whalley (2014) argued that services trade made a significant contribution towards China's economic progress. Maune (2019) found that from 1992-2015, Southern African countries benefited from service exports. The study stressed the importance of reducing services trade barriers to further boost growth. Javed and Khan (2024) pointed out that domestic restrictions and barriers from trading partners hinder services export growth.

Various studies explored the relationship between the services sector and economic growth in the context of South Asian region. Sadiq et al. (2023) found that during 1990-2020, the services sector significantly contributed to economic growth and employment generation in South Asian countries. In the case of India, Nayyar (2002) and Singh (2010) identified a strong positive impact of the services sector on economic growth, while Singh and Kaur (2014) reported that

services activities contributed to per capital GNP growth. Similarly, Mukerjee (2015) emphasized that the services industry has been a key driver of overall economic expansion in India.

For Bangladesh, Hasan and Hoque (2024) demonstrated that growth in the services sector promoted an increase in per capital income. CUTS International (2008) also found a significant contribution of the services sector to the economic growth of Bangladesh. Ahmed and Ahsan highlighted that the services sector of Pakistan provided substantial support to economic growth and employment creation. Mujahid and Aslam (2014) observed that the services sector served as an engine of growth for Pakistan as it contributed towards promoting overall trade and foreign direct investment in the country. Jalil et al. (2016) examined that the services sector significantly contributed towards the economic growth of Pakistan. Similar findings were observed by Hasan and Rahman (2017), who reported that the services sector of Pakistan provided economic stability. In the case of Sri Lanka, the services sector is the major contributor to GDP and economic growth (LMD, 2017).

Priyankara (2018) examined that services exports increased output growth in Sri Lanka from 1984-2013. Javed and Khan (2024) observed that services exports provided valuable foreign exchange earnings to Pakistan and helped in decreasing the trade deficit. Sub-sectors of services also have an important role in promoting growth. Growth in financial services is useful in enhancing capital accumulation and innovation in a country (Levine, 1997). Javed and Khan (2023) found that financial inclusion in Pakistan increased due to the expansion of digital financial services. Besides, digital financial services supported individuals, businesses, and government in improving efficiency in their daily operations, which increased economic growth (Manzoor et al. 2021). Javed and Ahmed (2022) found that an increase in digital trade in Pakistan, including both goods and services, supported small businesses to access global markets.

Sub-sectors of services also have a profound impact on economic growth. Arnold et al. (2008) identified finance, transport, and telecommunications as critical services sectors that support business operations and enhance competitiveness in international markets. In a subsequent study, Arnold et al. (2010) found that the development of banking, insurance, telecommunication, and transport services significantly improved productivity in the manufacturing sector, thereby contributing to broader economic development in India. In the case of Pakistan, the growth of the

Information and Communication Technology (ICT) sector has not only boosted services exports but also facilitated the expansion of e-commerce platforms (Zia et al., 2022). Hasan and Hoque (2024) observed that sub-sectors of services, including accounting, financial intermediation, ICT, and professional and business services, promoted efficiency and innovation in other industries in Bangladesh.

Although there has been extensive literature that explored the impact of the services sector and its sub-sectors on economic growth, however, a limited number of studies have focused on evaluating the relationship between service exports and economic growth. In the case of South Asian countries, exploration of this relationship is even more limited, where most of the studies mainly focus on the contribution of the overall services sector and its sub-sectors and do not examine in detail the impact of service exports under the umbrella of SATIS on macroeconomic performance.

3. Methodology and Empirical Framework

This section presents an empirical framework for the empirical assessment of services exports on economic growth. Constructing datasets comprised of pertinent variables in line with literature, we utilize data from World Bank Indicators over the period 1998-2022. The study begin by using the least square estimator, followed by robust estimation technique addressing potential concerns such as outlier, high-break points, and non-normality. To address simultaneity bias, we employ an IV-GMM approach. The focus of the study is on the mediating role of the SAARC Agreement in Trade Services (SATIS) policy in the relationship between services export GDP. We capture the joint impact through interaction terms. The analysis evaluates how SATIS policy influences the extent to which service exports can potentially stimulate macroeconomic performance in South Asian economies. Formally, our empirical assessment relies on the following generic econometric model.

$$y_{it} = \alpha + \beta(X_{it}) + \gamma(Z_{it}) + \delta_t + \mu_i + \varepsilon_{it} \qquad (1)$$

Where y_{it} is the main dependent variable, measuring the economic performance of ith country at time t in terms of GDP, we replace it with GDP per capita for a robustness check. X_{it} is the variable of interest, capturing the export services performance of the selected economies. We replace our main independence with an ICT export service to ensure consistency of results. Z_{it} is

a vector of control variables, which are gross fixed capital formation, inflation, exchange rate, labor force, trade, education expenditure, and regulatory quality. δ_t represents time dummies, μ_i captures a country's unobserved heterogeneity affecting economic growth, and ε_{it} is the error term. Table A1 in the Appendix provides a description of variables and A2 presents summary statistics.

Recent studies have increasingly focused on understanding how service-oriented trade influences economic growth, especially in developing economies. These studies suggest that service exports can work as a new engine for economic growth (Sermcheep, 2019) and economic growth increased due to higher service exports. Furthermore, the sophistication and diversification of services exports drives economic growth (Mishra et al. 2011; Gnangnon, 2021). In our analysis, we use GDP as an explained variable and export service as the main variable of interest. We are interested in quantifying how much service export stimulate economic growth of South Asian economies.

We also include control variables in the regression analysis to account for their implication on the outcome variable. For instance, gross fixed capital formation is included as a control variable. Gross fixed capital formation refers to investment and accumulation of physical capital. Higher capital accumulation is noted as a pivotal factor of increased productivity and a significant factor in GDP growth (lnadowska et al., 2025). Next, inflation is added as a control variable. Money supply poses significant challenges for economic growth. According to Quantity Theory of Money, an increase in money supply affects economic growth through different channels. Theoretically, it is established that inflation discourages saving and investment, thereby hindering economic growth (Foluso and Nicholas, 2017). The study also incorporate the exchange rate on the grounds that it affects economic growth through trade competitiveness and investment and capital formation. For instance, an undervalued exchange rate stimulates economic growth (Rodrik, 2008), as it facilitates a country's export performance by making its goods affordable internationally. Exchange rate stability, especially in developing economies, has significant implications for domestic and foreign investors, FDI, and economic growth (Chikwira and Jahed, 2024).

Labor market concentration and investment in human capital led to increased productivity and innovation, which are key drivers of economic growth. Endogenous growth theory, as proposed by Romer (1990), emphasized that education has a significant role in the economic growth of a

country. Public spending on education fosters technological innovation and supports long-term economic growth. Together, higher labor force participation and better-educated workers transform economic growth from being resource-driven to being more sustainable, inclusive, and productivity-driven, which is especially critical for the long-term development of developing countries (Hussain et al., 2012; Lechman, 2014). Labor force participation rate and public expenditure on education are included in the regression analysis to capture the impact of the labor force and human capital on economic growth.

Next, trade openness is recognized as a key determinant of economic growth, particularly in the case of developing economies. Trade liberalization increases economic growth by improving efficiency, promoting competition, and increasing capital inflow. Studies show that trade openness increases economic growth through productivity enhancement and increased investment flow (Singh, 2010). Similarly, industrial production plays a pivotal role in GDP growth by generating employment opportunities and deriving structural transformation (Haraguchi et al., 2017). To account for the contribution of trade openness and industrial activity to economic growth, the study includes international trade and industry production, measuring industrial activity as control variables. In addition, the study considered the impact of institutional and regulatory quality on economic growth. Regulatory quality has a crucial role in shaping economic development, as higher regulatory standards create an inclusive business environment that fosters a stable and conducive climate for business and operation and investment (Haidar, 2012).

4. Results and Discussion

4.1 Baseline results and alternate checks

Table 3 reports our baseline results, indicating that models are jointly significant given the p-values toward the bottom. The reported r-square value of 0.99 indicates that the explanatory variables jointly explain the substantial proportion of the variation in GDP. The inclusion of time and country-fixed effect account for unobserved heterogeneity and macroeconomic shocks over time and across economies. In column 1, the coefficient for service exports is positive and statistically significant at the 1 percent level, suggesting a positive relationship. In terms of elasticity, the estimated coefficient suggests that a 1 percent increase in service exports is associated with a 0.07 percent increase in GDP, implying service exports play a positive and

significant role in GDP growth. These results are in line with previous studies such as Sermcheep (2019) and Gnangnon (2021). To check consistency of results, GDP per capita is used as an explained variable which is reported in column 2 and the results suggest consistency in terms of sign and magnitude. In columns 3 and 4, we use ICT export services as an alternate explanatory variable, the reported results remain positive and significant at the 1 percent level, suggesting the significance of services export diversification and its contribution to GDP.

Table 3: Baseline estimations

	(1)	(2)	(3)	(4)
VARIABLES	GDP	GDPPC	GDP	GDPPC
ServiceExport	0.079***	0.037***		
	(0.024)	(0.010)		
ICTServiceExport			0.180***	0.032***
			(0.023)	(0.012)
Capitalformation	0.396***	0.242***	1.007***	0.292***
	(0.100)	(0.045)	(0.047)	(0.051)
Inflation	0.007**	0.004*	0.008*	0.003
	(0.004)	(0.002)	(0.004)	(0.002)
ExchangeRate	-0.006***	-0.002***	-0.000	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
LabourForce	0.024***	-0.007***	0.016*	-0.012***
	(0.006)	(0.003)	(0.009)	(0.003)
Trade	-0.009***	-0.001	-0.011***	-0.002*
	(0.002)	(0.001)	(0.002)	(0.001)
EducationExp	-0.047**	-0.010	0.057*	-0.006
	(0.022)	(0.009)	(0.029)	(0.012)
RegulatoryQuality	-0.236***	0.061*	-0.134	0.068**
	(0.058)	(0.031)	(0.088)	(0.034)
CountryFE	YES	YES	YES	YES
YearFE	YES	YES	NO	YES
Observations	100	100	100	100
R-squared	0.999	0.998	0.998	0.998

Prob p value	0.000	0.000	0.000	0.000

Note: see Table A1 for variables description. Robust standard errors in parentheses

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

The baseline results may suffer statistical issues such as outliers, model misspecification, and non-normality, making estimated results skeptical (Huber, 1973). To overcome these issues, we employ robust estimators such as robust regression using iterative weighting a high breakdown points S estimator, potentially reducing the outlier impact. These estimators improve the reliability of our estimate.

The results given in Table 4 are based on robust estimators, indicating their alignment with baseline results. The results are in line with baseline results in terms of sign and slight changes in magnitude. The coefficient of service export given in column 1 is 0.062 and 0.027 in column 2, which is slightly lower than the baseline, suggesting that the least square estimates may suffer from outlier influence insignificantly. Similarly, the coefficient of ICT export services, given in column 3 and 4, remains consistent with the baseline estimation, authenticating the positive and significant impact of services exports on economic growth.

Table 4: Alternate estimators as robustness check

VARIABLES	(1) GDP	(2) GDPPC	(3) GDP	(4) GDPPC
ServiceExport	0.062***	0.027***		
	(0.020)	(0.009)		
ICTServiceExport			0.061***	0.05***
			(0.017)	(0.004)
	(0.094)	(0.027)	(0.117)	(0.022)
Inflation	0.012***	0.005***	-0.000	-0.001
	(0.003)	(0.001)	(0.003)	(0.001)
ExchangeRate	-0.005***	-0.004***	-0.007***	0.001***
	(0.001)	(0.000)	(0.002)	(0.000)
LabourForce	0.036***	-0.011***	0.048***	-0.011***
	(0.005)	(0.002)	(0.004)	(0.002)
Trade	-0.015***	0.001	-0.013***	-0.003***
	(0.002)	(0.001)	(0.003)	(0.001)
EducationExp	0.000	-0.010*	-0.037	0.041***
	(0.022)	(0.006)	(0.026)	(0.008)
RegulatoryQuality	-0.339***	0.023*	-0.312***	-0.022
	(0.033)	(0.013)	(0.054)	(0.064)

CountryFE	YES	YES	YES	YES
TImeFE	YES	YES	YES	NO
Observations	100	100	100	100
Pseudo R-Square	0.670	0.668	0.669	0.557
Prob > chi2	0.000	0.000	0.000	0.000

Note: see Table A1 for variables description. Robust standard errors in parentheses

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

4.2 Simultaneity and policy interaction

Empirical estimations often suffer from statistical issues such as simultaneity, omitted variable bias, and measurement error, undermining the consistency and unbiasedness of least square estimates (Wooldridge, 2019). In our case, the relationship between services exports and economic growth can be bidirectional. For instance, on the one hand, service exports contribute to economic growth through increased GDP and foreign revenue/earnings (Mishra et al., 2011). On the other hand, higher economic growth facilitates export through increased productivity, competitiveness, capacity utilization, and enabling environment (Gabriele, 2006). In the presence of such reverse causality, isolating the causal impact of service export on GDP becomes difficult, and the estimated coefficient may be under or overestimated. To overcome this issue, we employ an IV approach (Wooldridge 2010).

The study uses two instrumental variables for service exports from the WDI database: internet users, which refer to the percentage of population using internet and secure internet services per 1 million in country refer to online security and digital infrastructure. Theoretically, it can be argued that digital infrastructure and connectivity increase service-oriented business, showing that digital connections have a direct impact on service export expansion and diversification, while the digital infrastructure has an indirect impact on economic growth through digital services (Freund and Weinhold, 2004; Gnangnon, 2021). Statistical justification of the IVs is given toward the bottom of Table 5 in columns 1 and 2. Anderson-Rubin Wald test confirmed the joint significance of the instruments. The given value of J Hansen statistics shows that the instruments are exogenous and not correlated with error time. Given the validity and relevance of the instrument variables, the coefficient of service export is in line with the baseline estimation, showing the robustness of the impact of services exports on economic growth.

One of the crucial aspects of the paper is that it integrates policy intervention into the econometric analysis. We employ interaction terms to evaluate the joint effect of SATIS policy and services exports on economic growth across South Asian countries. SATIS, as a policy intervention, aims to promote trade liberalization and market expansion by reducing regulatory constraints on cross-border services and streamlining investment regulation; enhancing institutional and regulatory cooperation and improving the business environment. These policy instruments could stimulate economic growth along with improved digital and ICT, financial, and transportation services exports (ADB, 2003).

The coefficient reported in columns 3-8 of table 5 indicates that, conditional on effective implementation of SATIS, a 1 percent increase in service export is associated with a 0.159 percent increase in GDP in case of India (column 3); 0.171 % increase in the case of the Maldives (column 4); 0.125 % increase in case of Nepal (column 5); 0.133 % increase in case of Pakistan (column 6); 0.127 % increase in case of Sri Lanka (column 7); 0.024 % increase in case of Bangladesh (column 8); and 0.131 % increase in case of Bhutan. The higher magnitude of coefficients, as compared to baseline estimates given in Table 3, suggests that the joint effect of SATIS implementation and service export is higher on GDP. The varying magnitude of coefficients across countries imply that a country-specific institutional and regulatory environment plays a critical role in shaping economic growth with increased services exports and effective implementation of SATIS simultaneously. Stephenson (2017) also reported that trade liberalization through regional agreements can potentially enhance economic growth, trade efficiency, reduce transaction costs, and improve competitiveness in services export sector.

Table 5: Simultaneity and joint effect: IV GMM and interaction term results

VARIABLES	(1) GDP	(2) GDPPC	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP	(9) GDP
ServiceExport	0.207***	0.039***							
	(0.042)	(0.013)							
ServiceExport#SATIS#India			0.159***						
			(0.055)						
ServiceExport#SATIS#Maldives				0.171***					
				(0.048)					
ServiceExport#SATIS#Nepal					0.125**				
					(0.048)				
ServiceExport#SATIS#Pakistan						0.133***			
						(0.036)			
ServiceExport#SATIS#Srilanka							0.127**		
							(0.051)		
ServiceExport#SATIS#Bangladesh								0.024**	

								(0.034)	
ServiceExport#SATIS#Bhutan									0.131***
									(0.021)
Capitalformation	0.265**	0.175***	0.787***	0.780***	0.763***	0.871***	0.794***	0.925***	0.166***
	(0.127)	(0.050)	(0.056)	(0.055)	(0.056)	(0.038)	(0.058)	(0.036)	(0.058)
Inflation	0.005	0.003*	0.019**	0.015*	0.006	0.001	0.005	0.002	0.002
	(0.005)	(0.002)	(0.009)	(0.009)	(0.009)	(0.006)	(0.009)	(0.005)	(0.002)
ExchangeRate	-0.006***	-0.001***	-0.000	0.000	-0.001	-0.001	0.004***	-0.002**	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LabourForce	0.025***	-0.004*	0.015***	0.016***	-0.016*	0.004*	0.017***	0.021***	-0.010***
	(0.006)	(0.002)	(0.003)	(0.004)	(0.008)	(0.002)	(0.003)	(0.002)	(0.003)
Trade	-0.009***	-0.003***	-0.024***	-0.024***	-0.022***	-0.016***	-0.020***	-0.026***	-0.001
	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Education	0.020	0.009	0.015	0.024	0.047	-0.002	-0.041	-0.041*	0.007
	(0.024)	(0.010)	(0.047)	(0.034)	(0.030)	(0.021)	(0.033)	(0.023)	(0.011)
RegulatoryQuality	-0.352***	-0.031	-0.056	-0.073	-0.184	-0.077	0.257**	-0.316***	0.046
	(0.089)	(0.041)	(0.107)	(0.107)	(0.128)	(0.076)	(0.122)	(0.068)	(0.034)
CountryFE	YES	YES	NO	NO	NO	NO	NO	NO	NO
YearFE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	72	72	100	100	100	100	100	100	100
R-squared	0.996	0.842	0.996	0.996	0.997	0.999	0.997	0.999	0.999
Prob P value			0.000	0.000	0.000	0.000	0.000	0.000	0.000
Anderson-Rubin Wald test	53.51***	7.46***							
Underidentification test	9.905***	9.905***							
Hansen J statistic P-value	0.384	0.135							

Note: see Table A1 for variables description Robust standard errors in parentheses

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

5. Conclusion

The global shift from the agriculture sector to the services industry reflects an increasing reliance on services-led growth in both developed and developing countries. This shift has enabled countries to diversify their economic foundations, boost competitiveness, and achieve sustainable development. Empirical literature highlights the strong positive correlation between the expansion of the services sector and overall economic growth, underscoring the critical role this sector plays in shaping the future trajectory of global economies. In South Asia, countries have witnessed substantial growth in their service sectors, with many economies moving toward a service-oriented model.

Service trade has become a key driver of macroeconomic performance, job creation, and resource efficiency worldwide. Increased services exports are closely associated with rapid economic development, enhanced competitiveness, and deeper integration into global value chains. For both developing and least-developed economies, services trade offers substantial prospects for export-led growth, economic diversification, and foreign investment inflows. Given the significance of the services sector, particularly its exports, this study empirically examines the unilateral and interconnected effect of services exports and the implementation of SATIS on macroeconomic performance in the case of South Asian countries.

The study finds that promoting service exports significantly enhances macroeconomic growth in South Asian economies, with these results remaining consistent across alternative specifications. Additionally, the findings underscore the interconnected effect of SATIS implementation and service export on GDP, suggesting that the combined impact of SATIS and increased services exports accelerates macroeconomic performance. The observed effects across the countries support the argument that regional trade agreements can boost economic performance by improving trade efficiency, reducing transaction costs, and increasing competitiveness in the service export sector. However, the study highlights the implications of country-specific institutional and regulatory environments in shaping the effectiveness of SATIS in driving economic growth. These findings align with trade liberalization theories, which emphasize the potential of regional agreements to promote economic development by integrating markets, facilitating resource allocation, and improving overall trade efficiency.

To fully leverage the benefits of SATIS, it is crucial to remove trade barriers and enhance market access in line with the SATIS agreement. SATIS can help South Asian countries increase their service exports and achieve economic growth. The liberalization of the services sector, particularly in areas like telecommunication and financial services, will create job opportunities and stimulate economic growth. With a strong ICT sector, South Asian countries stand to benefit from SATIS by facilitating technology transfer, reducing regulatory barriers, and enabling seamless digital trade, thus helping businesses integrate more effectively into regional and global markets.

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Appendix

Table A1 Description of variables

Variable Name	Description	Source
GDP	Log of GDP, measured at current U.S dollar, is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	WDI
GDPPC	Log of GDP per capita is gross domestic product divided by midyear population. Data are in constant 2015 U.S. dollars.	WDI
ServiceExport	Log of service export refers to economic output of intangible commodities that may be produced, transferred, and consumed at the same time. Data are in current U.S. dollars.	WDI
ICTServiceExport	Log of ICT services export refers to Information and communication technology service exports include computer and communications services (telecommunications and postal and courier services) and information services (computer data and news-related service transactions). Data are in current U.S. dollars.	WDI
Capitalformation	Log of gross fixed capital formation measure the country's long term investment in physical assets such as capital and infrastructure, reflecting economic development and building future production capacity.	WDI
Inflation	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.	WDI
ExchangeRate	Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market.	WDI
LabourForce	Labor force participation rate is the proportion of the population ages 15-64 that is economically active	WDI
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
EducationExp	General government expenditure on education (current, capital, and transfers) is expressed as a percentage of GDP.	WDI
RegulatoryQuality	Regulatory quality measure the ability of f implementing sound policies and regulations	WDI
SecureInternet	Secure internet servers per 1 million population in a country refer to the number of publicly trusted TLS/SSL certificates used by secure internet servers. It shows the widespread secure website and digital infrastructure in a country.	WDI
InternetUsers	Internet users are individuals who have used the Internet from any location in the country	WDI

SATIS	Binary variable refers to the SAARC Agreement on Trade in Services (SATIS) launched in 2010. The variable take value 1 if year is 2010 or greater, otherwise 0	SAARC

Table A2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	190	24.25	2.284	19.94	28.88
GDPPC	190	7.375	0.900	5.654	9.353
ServiceExport	175	21.60	1.966	16.81	26.55
ICTServiceExport	166	19.26	2.962	12.89	25.79
Capitalformation	127	23.79	2.082	19.80	27.63
Inflation	183	6.624	5.606	-6.811	49.72
ExchangeRate	187	71.95	40.73	11.77	280.3
LabourForce	192	53.22	7.986	36.95	69.93
Trade	141	49.52	21.64	21.46	108.1
EducationExp	155	3.457	1.378	1.204	7.470
RegulatoryQuality	176	-0.634	0.479	-2.080	0.987
SecureInternet	120	188.99	304.93	0.202	1249
InternetUsers	173	17.50	21.02	0.005	86.84