

Dash, Ranjan Kumar; Sahoo, Pravakar; Chanda, Rupa

Working Paper

How important is human capital for services exports? Evidence from South Asia

ARTNeT Working Paper Series, No. 245

Provided in Cooperation with:

Asia-Pacific Research and Training Network on Trade (ARTNeT), Bangkok

Suggested Citation: Dash, Ranjan Kumar; Sahoo, Pravakar; Chanda, Rupa (2025) : How important is human capital for services exports? Evidence from South Asia, ARTNeT Working Paper Series, No. 245, Asia-Pacific Research and Training Network on Trade (ARTNeT), Bangkok, <https://hdl.handle.net/20.500.12870/8215>

This Version is available at:

<https://hdl.handle.net/10419/339390>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

The Asia-Pacific Research and Training Network on Trade (ARTNeT) is an open regional network of research and academic institutions specializing in international trade policy and facilitation issues. ESCAP, WTO and UNCTAD, as key core network partners, and a number of bilateral development partners, provide substantive and/or financial support to the network. The Trade, Investment and Innovation Division of ESCAP, the regional branch of the United Nations for Asia and the Pacific, provides the Secretariat of the network and a direct regional link to trade policymakers and other international organizations.

The ARTNeT Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about trade issues. An objective of the series is to publish the findings quickly, even if the presentations are less than fully polished. ARTNeT Working Papers are available online at <http://artnet.unescap.org>. All material in the Working Papers may be freely quoted or reprinted, but acknowledgment is requested together with a copy of the publication containing the quotation or reprint. The use of the Working Papers for any commercial purpose, including resale, is prohibited.

Disclaimer:

The designations employed and the presentation of the material in this Working Paper do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. Where the designation “country or area” appears, it covers countries, territories, cities or areas. Bibliographical and other references have, wherever possible, been verified. The United Nations bears no responsibility for the availability or functioning of URLs. The views expressed in this publication are those of the author(s) and do not necessarily reflect the views of the United Nations. The opinions, figures and estimates set forth in this publication are the responsibility of the author(s) and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations. Any errors are the responsibility of the author(s). The mention of firm names and commercial products does not imply the endorsement of the United Nations.



ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

WORKING PAPER

How important is Human Capital for Services Exports? Evidence from South Asia

Ranjan Kumar Dash¹, Pravakar Sahoo² and Rupa Chanda³

Please cite this paper as:

Ranjan Kumar Dash, Pravakar Sahoo, Rupa Chanda (2025). "How important is Human Capital for Services Exports? Evidence from South Asia" **ARTNeT Working Paper Series** No. 245, June 2025, Bangkok, ESCAP.

Available at <http://artnet.unescap.org>

¹ Dr. Ranjan Kumar Dash (ranjan.dash@sse.ac.in), Associate Professor, Symbiosis School of Economics, Symbiosis International (Deemed) University.

² Dr. Pravakar Sahoo (pravakarfirst@gmail.com), Professor, Institute of Economic Growth, University of Delhi, North Campus, New Delhi, India

³ Dr Rupa Chanda (rupa.chanda03@gmail.com), Director, Trade, Investment and Innovation Division, UN ESCAP, Thailand

Abstract

Over the last three decades, South Asian economies have shown a continued upsurge in services exports, contributing to their external sector stability and economic growth. In this context, we examine the role of human capital in boosting services exports and revisit the other determinants of services exports by employing data from India, Nepal, Pakistan, Bangladesh, and Sri Lanka from 1980 to 2022. The findings reveal that human capital is a significant determinant of service exports. In addition, endowment factors such as financial and institutional development, telecom networks, broadband connections, and the quality of physical capital, along with other macroeconomic factors, are significant contributors to services exports. Our study distinctively establishes the role of human capital in augmenting services exports from the South Asian region. Removing supply-side bottlenecks in education, quality infrastructure, institutional governance, and broadband tele density, among others, to increase the competitiveness of the region's service exports.

Keywords: Services exports, Human capital, and South Asia

JEL Classification: F10, F12 and F14

Table of Contents

| | |
|--|-----------|
| Abstract..... | 1 |
| 1. Introduction..... | 3 |
| 2. Trends, Share, Composition, and Comparative Advantages of Services Exports | 5 |
| 3. Literature Review: Determinants of Services Exports | 9 |
| 4. Data, Methodology, and Model Specification..... | 12 |
| 5. Analysis of Results | 17 |
| 6. Sensitivity Analysis (excluding India) | 25 |
| 7. Conclusion and Policy Implications | 27 |
| References:..... | 33 |

1. Introduction

South Asia accounts for about twenty-three percent of the world's population, constitutes 40 percent of the world's poverty, and contributes to about 15 percent of world economic growth. Over the last three decades, the South Asia region has witnessed a stellar growth trajectory, making it one of the world's fastest-growing regions, essentially on account of sustained economic reforms, prudent macroeconomic policies, and greater integration with the rest of the world (Sahoo and Dash, 2012). The region's growth rates have increased from about three percent in the 1970s to around seven percent over the last decade. These durable reforms and strong per capita income growth have lifted over 200 million people out of poverty in the previous three decades. Economic diversification, increased services exports, and improved education are crucial factors that explain this success. The region also enjoys a comparative advantage concerning its demographic dividend, with more than 150 million people expected to join the labour force by 2030. However, South Asia can exploit this large workforce only if supported by a sustained growth strategy that can be achieved by leveraging service exports via investments in skilled human capital.

It has been well established that exports have had a positive spillover on productivity, efficiency, and innovation (Balassa, 1978; Bhagwati, 1982; Grossman and Helpman, 1991). Over the years, these economies have realized the importance of an export-led growth strategy to enhance their overall competitiveness via improvements in productivity, efficiency, and innovation while maintaining stability in the external sector. South Asia's liberalisation process has been accompanied by robust services exports, with the region witnessing remarkable productivity gains in information and communications technology (ICT) and tourism. Further, exports from most South Asian countries, especially India, Pakistan, Sri Lanka, Nepal, and Bangladesh, have shown an upward surge and have improved significantly over the last three decades. While services exports showed a sharp increase from US\$ 6.7 billion to over US\$ 124 billion between 1990 and 2010 and surpassed these levels by exceeding US 214 billion in 2014, the share of merchandise exports increased from US\$27 billion in 1990, exceeded US\$ 276 billion in 2010 and maintained this uptrend to reach US\$ 324 billion in 2020. Despite the better performance of services exports, most studies in South Asia have focused on merchandise exports, with only a few focusing on services exports

(Armstrong et al., 2011; Nasir and Kalirajan, 2013; Kaur et al., 2020). Armstrong (2011) finds that despite South Asia having cheap and abundant human capital, it has exploited only about 45% of its export potential compared to 58% for the East Asian region. As these economies have not been able to exploit their untapped potential, services exports from this region have remained below their potential⁴. Existing studies (Narula, 1996) suggest that investments in human capital are vital in promoting economic growth and development. These investments enable economies to register higher productivity growth rates in converging and catching up with the advanced economies and benefit the skilled workforce more than the unskilled labour force.

South Asia, an emerging region, has a comparative advantage due to its large demography, cheap skilled manpower, and low labour costs. These endowments should be complemented with policies aimed at increasing services exports. However, there exists a paucity of relevant research exemplifying the role of human capital in boosting services exports for emerging economies in general and South Asia in particular. It is thus imperative to examine the role of human capital in fostering services exports for the South Asian region, which has opened up recently from the import substitution policy adopted for a considerable period.

Against this backdrop, this study examines the role of human capital in boosting services exports in South Asia and revisits the possible determinants of services exports by controlling for both demand-side and supply-side factors. Unlike prior empirical research, this study employs four human capital indicators: gross enrolment ratio (secondary and tertiary), education development index, and human development index, and attempts to examine their role in augmenting services exports.

The rest of the paper is structured as follows: Section 2 presents the trends, composition, and comparative advantage of services exports, and Section 3 identifies possible determinants of services exports. Section 4 provides sources of data and methodology used in this study. Section 5 discusses the empirical results. Section 6 carries out sensitivity analysis. Conclusions and policy implications are presented in Section 7.

⁴ The lack of compatible data in Maldives, Afghanistan, Myanmar and Bhutan forces us to go ahead with these five countries – India, Pakistan, Bangladesh, Nepal and Sri Lanka. Together the latter five countries make up more than 96% of population and thus this study provides a near-complete picture of the region as a whole.

2. Trends, Share, Composition, and Comparative Advantages of Services Exports

The services sector has performed well in South Asia, particularly over the last three decades (1991-2021), with average growth rates in this sector remaining high compared to the GDP growth rate during this period. Further, the growth rate of services exports has been more rapid and dramatic, particularly during the decade 2001-10, suggesting that growth in the services sector has been contingent on external demand to a considerable degree as world growth was highest during this period. There has, however, been a slowdown in the growth rate of services exports in the last decade (2011-2021) due to the economic slowdown and the Covid-19 pandemic. Moreover, services exports have performed relatively better than goods exports in India, Nepal, and Sri Lanka over the three decades. Further, modern services have outperformed traditional services exports in all countries except Sri Lanka (Appendix Table A1).⁵

2.1. The Relative Importance of Modern Services in Total Services Exports

The share of modern services such as software and communication, other businesses, and financial and insurance has increased for all South Asian economies except for Sri Lanka. Within this, software and communications exports contribute as much as 70% to India's service exports and as low as 20% to Sri Lanka's services exports (Appendix Table A2).⁶

Except for Sri Lanka, the share of traditional services⁷ in total services exports has seen a consistent decline for the other economies in the region. The predominance of traditional services in Sri Lanka's services export profile can be attributed to their rising travel and tourism sector, which has grown and remained buoyant over the chosen period (1991-2021)⁸.

⁵ Appendix Table A1 shows the performance of services exports of South Asian countries over the past two decades.

⁶ Appendix Table A2 shows the composition of services exports in South Asia.

⁷ Travel and transport services are categorized as traditional services and financial, insurance, telecommunication, business processing and software services are categorized as modern services (Ghani and Kharas, 2010; Sahoo and Dash, 2017).

⁸ However, Sri Lanka's travel and tourism sector suffered heavily after the Easter bombing and the pandemic.

2.2. Performances of Component of Services Exports

The performance of components of service exports indicates that traditional services like transport and travel have declined, and modern services like software and communication, finance, and insurance have improved over time, except in Sri Lanka. However, over the last decade (2011-2021), the performance of most services has decelerated due to the global financial crisis and pandemic. Furthermore, within the modern services sector, finance and insurance services experienced relatively higher growth in South Asia over three decades. Despite high growth, the share of insurance and financial services exports as a percentage of their total services exports has remained consistently subdued compared to other segments. However, it has shown some momentum in recent years. For instance, their total share rose from 2.7% and 1.5% to 4.5% and 4.6% for Bangladesh and India, respectively, from 1990-91 to 2011-2021 (Table A2). A similar trend has been observed in Pakistan and Sri Lanka.

2.3. Importance of Services Exports

While services exports as a share of GDP have increased steadily for India, the trend has fluctuated for Nepal and Sri Lanka. In 2021, the share of services exports to GDP stood at 8% for India and Sri Lanka, 5% for Nepal, and less than 2% for Bangladesh and Pakistan (Figure 1).

Figure 1: Services Exports as a ratio (%) of GDP (1991-2021)

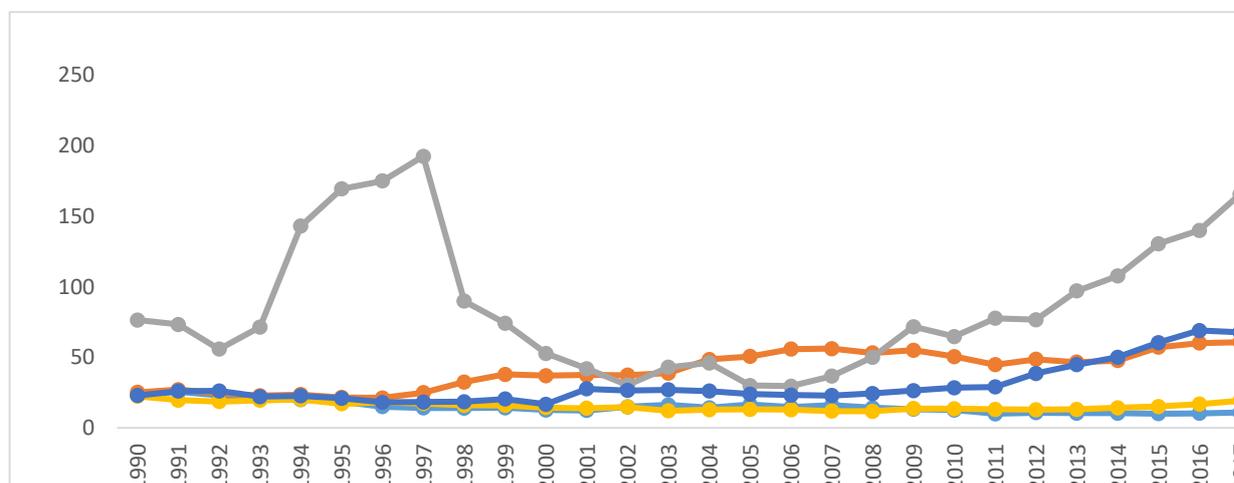


Source: Author's computations

Further, the share of services exports to goods exports has grown and hovered between 60%-100% for India, Nepal, and Sri Lanka. On the contrary, the ratio of

services exports to goods exports has remained low (20%) for both Bangladesh and Pakistan, indicating the heavy reliance of these two economies on goods exports (Figure 2).

Figure 2: Services Exports as a ratio (%) of Goods Exports (1990-2021)



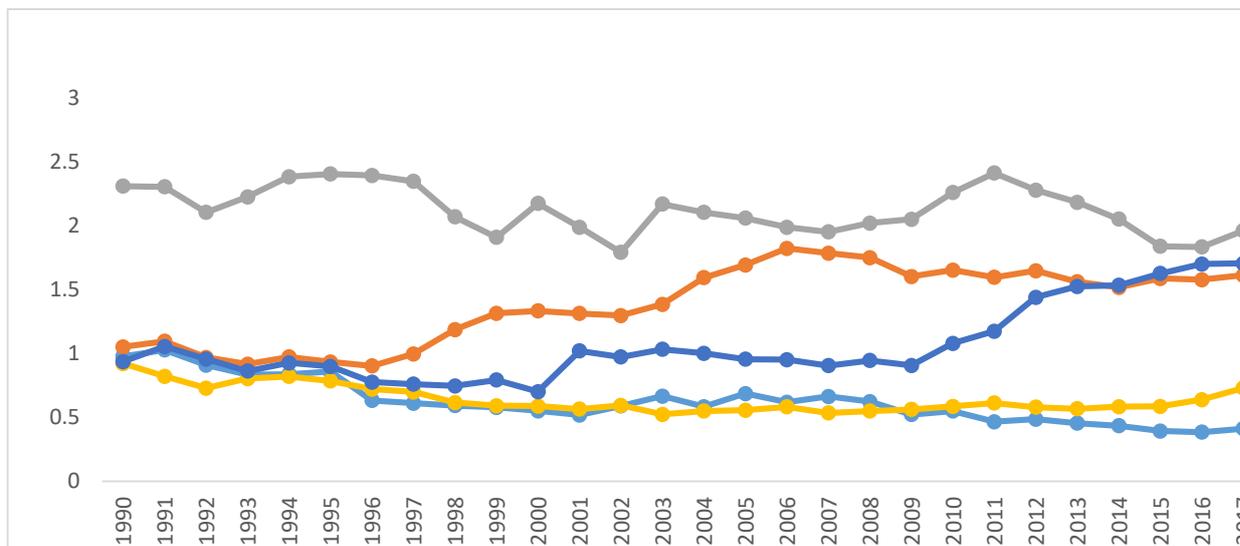
Source: Author's computations

2.4. Competitiveness of Services Exports in total, modern and traditional sectors

The competitiveness of the services sector is measured by the Revealed Comparative Advantage (RCA) index⁹ for the total, modern, and traditional services sectors, and the results are presented in Figures 3, 4, and 5, respectively. While Sri Lanka and India have increased competitiveness over time, Nepal's competitiveness in service exports has remained stagnant. Likewise, both Bangladesh and Pakistan have also shown stagnancy in their competitiveness over the years.

⁹ $RCA_{ij} = (X_{ij} / X_i) / (X_{wj} / X_w)$ where RCA_{ij} = Revealed Comparative Advantage for country i in services j , X_{ij} = value of country i 's export of services j ; X_i = value of country i 's services exports; X_{wj} = value of world export of services j and X_w = value of world total services exports.

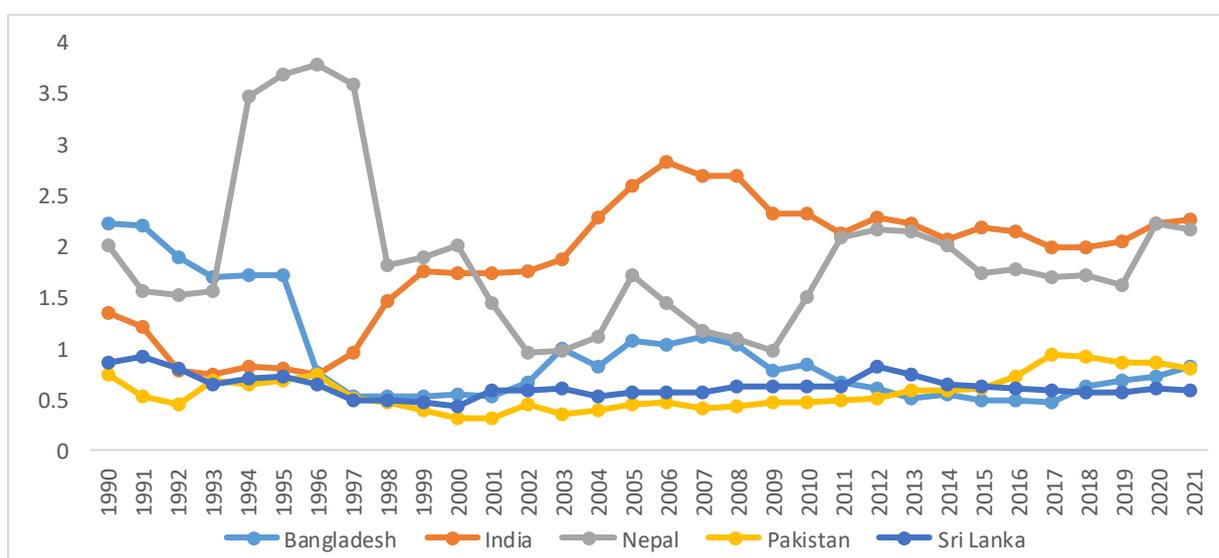
Figure 3: Revealed Comparative Advantage in Total Services Exports (1990-2021)



Source: Author's computations using data from World Bank Development Indicators.

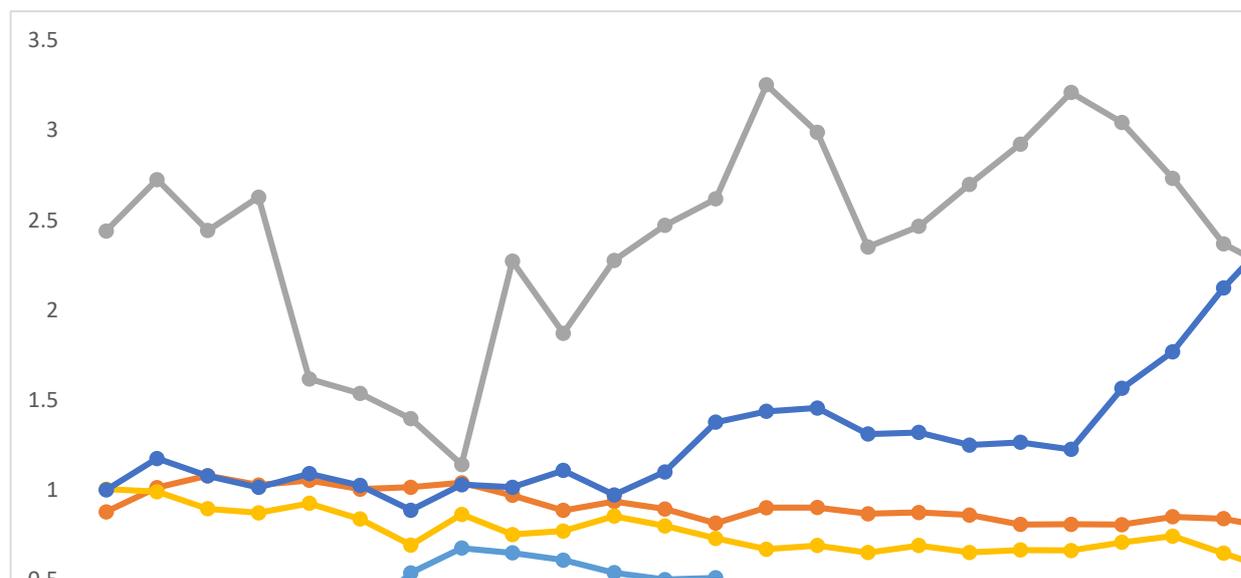
Only India and Nepal revealed higher competitiveness for modern services, whereas Sri Lanka and Nepal witnessed comparative advantage in traditional services.

Figure 4: Revealed Comparative Advantage in Modern Services Exports (1990-2021)



Author's computations using data from World Bank Development Indicators.

Figure 5: Revealed Comparative Advantage in Traditional Services Exports (1990-2021)



Author's computations using data from World Bank Development Indicators.

Thus, services exports have increased for South Asia because of the rise in modern services exports. While India and Nepal have maintained their comparative advantage in modern services, Sri Lanka and Nepal have been found to have a comparative advantage in traditional services exports. Reforms in the telecom and financial sectors and the cheap availability of skilled human capital have been responsible for the rise of modern services in South Asia (Sahoo and Dash, 2017).

3. Literature Review: Determinants of Services Exports

3.1. Demand Factors

Performance of the World Economy: Previous studies suggest that world demand or foreign income remains an important driver for augmenting services exports in developing countries (Deardorff et al., 2000; Barcenilla and Molero, 2003; Nasir and Kaliranjan, 2013; Thomas, 2015; Sahoo and Dash, 2017). Theoretically, the demand for service exports from developing economies increases in response to the rise in global income, as measured by either or both per capita GDP and GNI. The coefficient of foreign income is more than one but varies across service categories (Deardorff et al., 2000; Nasir and Kaliranjan, 2013). Others confirm the high-income elasticity of services exports, with travel exports having the highest income elasticity in the export basket

Real Exchange Rate: Even though the real exchange rate has been found to affect services exports from developing countries, there remains ambiguity about the sign of the coefficients (Deardorff et al., 2000; Mann, 2004; Biggs, 2007; Das et al., 2021). Theoretically, domestic currency depreciation vis-à-vis the trading partner's currency is expected to promote service exports via increased competitiveness. Conversely, an appreciation has the opposite effect on exports.

3.2. Supply Side Factors

Human capital: Theoretically, human capital is more vital for services exports than manufacturing exports. Human capital is embodied in the creation and delivery of services, and their quality is judged by the end user (Contractor and Mudambi, 2008). The empirical literature has corroborated that the availability of a high-quality skilled workforce is an essential determinant of service exports (Nyahoho, 2010; Marel, 2012; Eichengreen and Gupta, 2012; Nasir and Kaliranjan, 2013). A healthy and skilled workforce with access to quality education will likely augment productivity gains, boosting competitiveness and increasing exports. This is particularly true for South Asia, endowed with surplus stocks of skilled labour. Studies have employed various parameters such as average years of education (Lennon (2006), gross tertiary school enrolment (Shingal, 2010), the ratio of high-skilled to mid-skilled labour force (Marel, 2012), and the number of graduates (Nasir and Kaliranjan, 2013) to examine the impact of human capital on service exports. To decipher this, our study employs four parameters: gross secondary and tertiary school enrolment ratio, education, and the human development index.

Infrastructure Facilities: Service exports are particularly sensitive to soft infrastructure, such as telecommunications networks and internet facilities. Nath and Liu (2017) emphasized the role of ICT infrastructure in promoting services exports. They found that the quality of infrastructure in both the exporting and importing countries tends to influence service exports. However, Shingal (2010) finds that infrastructure facilities in only the importing country affect services exports. Our study thus constructs an Infrastructure Index based on Principal Component Analysis¹⁰ (PCA) and utilizes internet penetration (per 100 people) as a measure of soft infrastructure.

¹⁰The Infrastructure Index consists of six parameters: per capital power consumption (kwh), energy use (kg of oil equivalent per capita), rail density (area), road density (area) and air transport, freight (million ton-km).

Foreign Direct Investment: Prior empirical literature (Borzenstein et al., 1998, among others) confirms that foreign direct investment (FDI) inflows promote exports in the host country through increases in capital stock, technology transfer, the development of managerial skills, and the upgrading of the local labour force's skills. A recent study by Shah and Raza (2022) found that FDI in the services sector played a crucial role in promoting services exports for newly industrialized countries by helping local firms to integrate into global value chains.

Manufacturing exports: It is widely recognized that a spillover effect exists between services and manufacturing exports, as services serve not only as consumer-end products but also as intermediate inputs for goods trade. Egger et al. (2017) argued that goods trade networks are vital for services trade. Broussolle (2012) and Sahoo and Dash (2014) confirm the complementarities between services trade and merchandise trade. Others (Hoekman and Mattoo, 2008; Francois and Hoekman, 2010) have found that business, financial, and communication services are vital inputs for the manufacturing sector, implying that growth in manufacturing exports leads to higher services exports.

Financial Development: Firms with easy and affordable access to finance find it easier to fund their working capital needs and make meaningful investments for technological upgradation and innovation. As a result, their exports grow over time (Beck 2003; Aghion and Griffith 2005). Agosin et al. (2011) utilized a large dataset of countries spanning a considerable period, from 1962 to 2000, and found that developing the financial sector helps countries diversify their export baskets. Our study, therefore, develops the Financial Development Index (FDI) using the PCA method, considering three parameters: accessibility (number of bank branches per million people), efficiency (bank credit to GDP), and depth (broad money to GDP).

Institutions: Both resilience and institutional quality tend to impact service exports. In developing countries, weak institutions have been found to impede exports (Méon and Sekkat, 2008). While identifying the determinants of service trade for OECD countries, Grunfeld and Moxnes (2003) find that corruption levels (proxy for the institutional variable) adversely affect services trade. Kimura and Lee (2006) use the economic freedom index as a proxy for the institutional variable and find that higher economic

freedom in importing and exporting countries has a positive effect on service exports. Kandilov and Grennes (2010) also find that the quality of legal institutions significantly influences services exports.

Number of Regional Trade (RTAs) Agreements: Regional trade agreements may boost services exports by providing market access to member countries, reducing domestic regulations, and liberalizing factor movement (Mattoo and Fink, 2002). Our study uses a cumulative number of RTAs as an additional explanatory variable.

To summarize, the existing literature draws upon the role of human capital and a skilled workforce, along with the development of telecommunication infrastructure as measured by quality internet services (Marel, 2012; Lennon, 2006, among others), higher services sector growth, economic development and institutional quality (Majeed and Ahmed, 2006; among others) and merchandise trade as the possible determinants of services exports. Services exports from South Asia are found to be income elastic, and hence, per capita income emerges as an important determinant (Sahoo and Dash, 2017), amongst others. Additionally, prior empirical research has established a correlation between foreign direct investment (FDI) inflows/outflows and services exports. However, the role of human capital in boosting services exports has not been adequately explored—our study endeavours to examine this. Before proceeding with an empirical examination of the role of human capital and the other control variables on service exports, we briefly discuss the possible determinants of service exports in the next section.

4. Data, Methodology, and Model Specification

Data required for empirical research have been sourced from the World Development Indicators (WDI) of the World Bank, the UNDP, and the respective central banks for the period from 1990 to 2020 for five South Asian countries: India, Pakistan, Bangladesh, Sri Lanka, and Nepal. The lack of consistent data for Maldives, Afghanistan, Myanmar, and Bhutan forces us to go ahead with these five countries – India, Pakistan, Bangladesh, Nepal, and Sri Lanka. These five countries comprise more than 96% of the population; thus, this study provides a near-complete picture of the region. Detailed information about the data sources, definition, and study period is provided in Table 1.

Table 1: Data Sources and Variables Used for the Study

| Variables | Definition | Source |
|-----------|--|--|
| TSER | Total Services Exports (% GDP) | WDI |
| MSER | Modern services exports (communications, computer, insurance, and finance) (% GDP) | WDI |
| TDSER | Traditional Services Exports (travel and transport) (% GDP) | WDI |
| WY | World per capita income (Base-2015) | WDI |
| RER | Real Exchange Rate | WDI |
| MEXP | Merchandise Export ((% of GDP) | WDI |
| FDI | Foreign direct investment inflows (% of GDP) | WDI |
| BC | Fixed Broadband subscription (per 100 people) | WDI |
| HDI | Human Development Index | UNDP |
| EDU | Educational Development Index | UNDP |
| RTA | Number of Regional Trade Agreements | Asia Regional Integration Centre |
| GSER | Gross Secondary Enrolment ratio (%) | WDI |
| GTER | Gross Tertiary Enrolment ratio (%) | WDI |
| FD | The Financial Development Index: M2 to GDP, Credit to GDP, and Bank branches (per million people) | WDI and the Central Bank of the respective countries |
| INF | The Infrastructure Index comprises air transport, energy consumption, power consumption, rail, and road density. | WDI |
| INST | Economic Freedom of the World | CATO Institute |

Source: Authors Compilation.

4.1. Model Specification

An interplay of possible demand and supply factors helps us estimate the functions for service exports for total, modern, and traditional services, respectively. The following equations specify the relationship between....

Total services exports (TSER)

$$TSER_{it} = \alpha_0 + \alpha_1 RER_{it} + \alpha_2 WY_{it} + \alpha_3 FDI_{it} + \alpha_4 FD_{it} + \alpha_5 INF_{it} + \alpha_6 MEXP_{it} + \alpha_7 BC_{it} + \alpha_8 RTA_{it} + \alpha_9 (GSER/GTER/EDU/HDI)_{it} + \alpha_{10} INST + \mu_i + \varepsilon_{it} \dots\dots\dots (1)$$

Modern Services Exports (MSER)

$$MSER_{it} = \alpha_0 + \alpha_1 RER_{it} + \alpha_2 WY_{it} + \alpha_3 FDI_{it} + \alpha_4 FD_{it} + \alpha_5 INF_{it} + \alpha_6 MEXP_{it} + \alpha_7 BC_{it} + \alpha_8 RTA_{it} + \alpha_9 (GSER/GTER/EDU/HDI)_{it} + \alpha_{10} INST + \mu_i + u_{it} \dots\dots\dots(2)$$

Traditional Services Exports (TDSER)

$$TDSER_{it} = \alpha_0 + \alpha_1 RER_{it} + \alpha_2 WY_{it} + \alpha_3 FDI_{it} + \alpha_4 FD_{it} + \alpha_5 INF_{it} + \alpha_6 MEXP_{it} + \alpha_7 BC_{it} + \alpha_8 RTA_{it} + \alpha_9 (GSER/GTER/EDU/HDI)_{it} + \alpha_{10} INST + \mu_i + e_{it} \dots\dots\dots(3)$$

Where TSER is total services exports, MSER is modern services exports, TDSE is traditional services exports, WY is the per capita world income, FDI is foreign direct investment, RER is the real exchange rate, FD is the financial development index, INF is the infrastructure development index, MEXP is merchandise exports, BC is broadband connection, RTA is the number of regional trade agreements, GSER is the gross secondary enrolment ratio, GTER is the gross tertiary enrolment ratio, EDU is the education development index, HDI is the human development index, INST is the institutional quality, μ_i is the unobservable country-specific effects, and ε_{it} , u_{it} , and e_{it} are the error terms.

Exports in the current period are likely to be affected by exports in previous years and by the presence of endogenous explanatory variables. Hence, given its advantages over other dynamic models, the study applies a panel ARDL model. First, our panel is dominated by a large T (32 years) and a small N (5). So, the choice of the panel ARDL seems appropriate. Second, the ARDL model is suitable because the data series is a mixture of I(0) and I(1) series. Third, the ARDL model distinguishes both short-run and long-run effects. Hence, the estimates obtained remain robust to serial correlation and endogeneity and are suitable for a short panel. Expressing equations 1, 2, and 3 in the panel ARDL framework as:

$$\begin{aligned}
DTSER_{it} = & \alpha_{0i} + \alpha_{1i}TSER_{it-1} + \alpha_{2i}WY_{it-1} + \alpha_{3i}RER_{it-1} + \alpha_{4i}FDI_{t-1} + \alpha_{5i}FD_{t-1} + \\
& \alpha_{6i}INF_{t-1} + \alpha_{7i}(GSER\backslash GTER\backslash EDU\backslash HDI)_{t-1} + \alpha_{8i}MEXP_{t-1} + \alpha_{9i}BC_{t-1} + \\
& \alpha_{10i}RTA_{t-1} + \alpha_{11i}INST_{t-1} + \sum_{j=1}^{m-1} \beta_1 DTSE_{i,t-j} + \sum_{j=1}^n \beta_2 DWY_{i,t-j} + \\
& \sum_{i=1}^n \beta_3 DFDI_{t-i} + \sum_{i=1}^n \beta_4 DRER_{t-i} + \sum_{i=1}^n \beta_5 DFD_{t-i} + \sum_{i=1}^n \beta_6 DINF_{t-i} + \\
& \sum_{i=1}^n \beta_7 (GSER\backslash GTER\backslash EDU\backslash HDI)_{t-i} + \sum_{i=1}^n \beta_8 DMEXP_{t-i} + \sum_{i=1}^n \beta_9 DBC_{t-i} + \\
& \sum_{i=1}^n \beta_{10} DTA_{t-i} + \sum_{i=1}^n \beta_{11} DINST_{t-i} + \mu_i + \varepsilon_{it} \quad (4)
\end{aligned}$$

$$\begin{aligned}
DMSER_{it} = & \alpha_{0i} + \alpha_{1i}MSER_{it-1} + \alpha_{2i}WY_{it-1} + \alpha_{3i}RER_{it-1} + \alpha_{4i}FDI_{t-1} + \alpha_{5i}FD_{t-1} + \\
& \alpha_{6i}INF_{t-1} + \alpha_{7i}(GSER\backslash GTER\backslash EDU\backslash HDI)_{t-1} + \alpha_{8i}MEXP_{t-1} + \alpha_{9i}BC_{t-1} + \alpha_{10i}TA_{t-1} + \\
& \alpha_{11i}INST_{t-1} + \sum_{j=1}^{m-1} \beta_1 DMSE_{i,t-j} + \sum_{j=1}^n \beta_2 DWY_{i,t-j} + \sum_{i=1}^n \beta_3 DFDI_{t-i} + \\
& \sum_{i=1}^n \beta_4 DRER_{t-i} + \sum_{i=1}^n \beta_5 DFD_{t-i} + \sum_{i=1}^n \beta_6 DINF_{t-i} + \sum_{i=1}^n \beta_7 (GSER\backslash GTER\backslash EDU\backslash \\
& HDI)_{t-i} + \sum_{i=1}^n \beta_8 DMEXP_{t-i} + \sum_{i=1}^n \beta_9 DBC_{t-i} + \sum_{i=1}^n \beta_{10} DTA_{t-i} + \\
& \sum_{i=1}^n \beta_{11} DINST_{t-i} + \mu_i + u_{it} \quad (5)
\end{aligned}$$

$$\begin{aligned}
DTDSE_{it} = & \alpha_{0i} + \alpha_{1i}TDSE_{it-1} + \alpha_{2i}WY_{it-1} + \alpha_{3i}RER_{it-1} + \alpha_{4i}FDI_{t-1} + \alpha_{5i}FD_{t-1} + \\
& \alpha_{6i}INF_{t-1} + \alpha_{7i}(GSER\backslash GTER\backslash EDU\backslash HDI)_{t-1} + \alpha_{8i}MEXP_{t-1} + \alpha_{9i}BC_{t-1} + \alpha_{10i}TA_{t-1} +
\end{aligned}$$

$$\begin{aligned} & \alpha_{11i}INST_{t-1} + \sum_{j=1}^{m-1} \beta_1 DTDSE_{i,t-j} + \sum_{j=1}^n \beta_2 DWY_{i,t-j} + \sum_{i=1}^n \beta_3 DFDI_{t-i} + \\ & \sum_{i=1}^n \beta_4 DRER_{t-i} + \sum_{i=1}^n \beta_5 DFD_{t-i} + \sum_{i=1}^n \beta_6 DIN_{t-i} + \sum_{i=1}^n \beta_7 (GSER \setminus GTER \setminus EDU \setminus \\ & HDI)_{t-i} + \sum_{i=1}^n \beta_8 DMEXP_{t-i} + \sum_{i=1}^n \beta_9 DBC_{t-i} + \sum_{i=1}^n \beta_{10} DTA_{t-i} + \\ & \sum_{i=1}^n \beta_{11} DINST_{t-i} + \mu_i + e_{it} \quad (6) \end{aligned}$$

Where D is the difference operator, μ_i is the country-specific fixed effects, and u_{it} is the error term. Two estimators, PMG and MG, are used to estimate equations 4, 5, and 6. The MG estimates are obtained by estimating the equations separately for each country and then deriving the long-run coefficients by averaging. While the MG estimators allow variation across both the short and long-run coefficients, the PMG estimators assume the long-run coefficients to be homogeneous across the country but allow the short-run coefficients, including the intercept and the error correction term, to vary. The validity of PMG estimators is examined using the Hausman test with the null hypothesis of slope homogeneity.

4.2. Empirical Methodology

The study follows a four-step procedure to examine the determinants of service exports in South Asia. First, the variables are checked for stationarity, as the ARDL model requires the variables to be either $I(0)$, $I(1)$, or a mix of both. For this purpose, the study applies Pesaran's (2007) CADF test, which is robust to the cross-section dependency problem. In the second step, the study employs the error correction panel cointegration method (Westerlund, 2007) to examine cointegration between service exports and their determinants. In the third step, the study estimates the effects of human capital on service exports by employing the panel ARDL model, specifically the Pool Mean Group (PMG) and Mean Group (MG) estimators. In the final step, the study examines the direction of causality between services export and human capital using the Granger non-causality approach proposed by Jodios et al. (2021).

4.2.1. CADF Panel Unit Root

The following augmented ADF equation is used to test the stationary of variables:

$$DY_{it} = \alpha_i + \beta_i Y_{i,t-1} + \sum_{j=0}^m \delta_{ij} \bar{Y}_{t-1} + \sum_{j=1}^m \mu_{ij} D\bar{Y}_t + \varepsilon_{it} \quad (7)$$

Where D is the first difference, the cross-section average counts for cross-section dependency, and m is the lag length. The null of the unit root ($\beta_i=0$) is tested against the alternative ($\beta_i<0$) for at least some i. The average ADF test is calculated and compared against the critical values using the following equation

$$CIPS = \left(\frac{1}{N}\right) \sum_{i=1}^N t_i(N, T) \quad (8)$$

Where $t_i(N, T)$ is CADF for the i-th cross-section unit.

4.2.2. Panel Cointegration Test

The study subsequently applies Westerlund's (2007) panel cointegration test for establishing the long-run relationship using the following error correction model:

$$D_{it} = \theta'_i d_t + \rho_i Y_{i,t-1} - \mu'_i X_{i,t-1} + \sum_{j=1}^{p_i} \gamma_{ij} DY_{i,t-j} + \sum_{j=-q_i}^{p_i} \lambda_{ij} DX_{i,t-j} + \varepsilon_{it} \quad (9)$$

Where ρ is the error correction, four-panel tests, consisting of two between-panel and two within-panel tests, are developed to test cointegration using the null hypothesis $H_0: \delta_i = 0$ and the alternative hypothesis $H_a: \delta_i = \delta < 0$, at least for some i.

4.2.3. Panel Granger Non-Causality

In the fourth and final step, the study examines the direction of causality by employing the Panel Granger non-causality test as proposed by Juodis et al. (2021):

$$DSE_{i,t} = \alpha_{0,i} + \sum_{k=1}^k \gamma_{k,i} DSE_{i,t-k} + \sum_{k=1}^k \rho_{ik} DHUM_{i,t-k} + e_{i,t} \quad (10)$$

$$DHUM_{i,t} = \alpha_{0,i} + \sum_{k=1}^k \gamma_{k,i} DHUM_{i,t-k} + \sum_{k=1}^k \rho_{ik} DSE_{i,t-k} + \varepsilon_{i,t} \quad (11)$$

Where SER is services exports (TSER, MSER, and TDSE), HUM is the proxy for human capital (GSER, GTER, EDU, and HDI), D represents the first difference, the parameter represents the individual fixed effect, is the heterogeneous autoregressive parameter, and are the heterogeneous feedback coefficients. Granger causality from $DHUM_{i,t}$ to $DSE_{i,t}$ is tested using the null hypothesis: $H_0: \rho_{ki} = 0$ for all i and k.

Against the alternative: $H_a: \rho_{ki} \neq 0$ for some i and k.

The pooled estimator is subject to Nickel Bias corrections and forms the basis of a Wald test for Granger causality. As $N, T \rightarrow \infty$ with $N/T \rightarrow u^2 \in [0, \infty]$, the standard Wald statistics used to establish the direction of causality is computed as:

$$\widehat{W}_{HPJ} = NT \tilde{\rho}' (\hat{f}^{-1} \hat{V} \hat{f}^{-1})^{-1} \rho \rightarrow \chi^2(K), \quad (12)$$

Where $\hat{J} = (NT)^{-1} \sum_i^1 X_i' M_{Z_i} X_i$, $Z_{i,t} = (1, y_{i,t-1}, \dots, y_{i,t-p})$ and $M_{Z_i} = I_T - Z_i(Z_i'Z_i)^{-1}Z_i'$

5. Analysis of Results

Before presenting the results of the panel unit root and cointegration test, we must examine the cross-sectional dependency of variables using Pesaran's (2021) CD test. The results are presented in Table 4. The results indicate the presence of cross-section dependency amongst all variables except merchandise trade. Having examined the cross-section dependency, we check for the stationary properties of the relevant variables considered in this study using the CADF test. The results of the CADF test for both “constant” and “constant and trend” specifications are reported in Table 2. The Test results do not reject the null of unit roots for the panel at the level for all the variables except INF and GTER. On the contrary, the differenced series is stationary, drawing us to conclude that the series are I(1) except for INF and GTER. Hence, the CIPS test indicates that most series are integrated of order one, i.e., I (1).

Table 2: Results of Pesaran (2008) CADF Unit Root test

| Variables | At Level | | First. difference Constant | Conclusion | CD Test# |
|-----------|----------|--------------------|-------------------------------|------------|----------|
| | Constant | Constant trend and | | | |
| TSER | -1.55 | -2.07 | -3.46** | I (1) | 1.24 |
| MSER | -1.44 | -2.11 | -3.73** | I (1) | 2.01 |
| TDSER | -1.23 | -1.87 | -2.98** | I (1) | 3.71** |
| FDI | -2.07 | -2.05 | -4.12** | I (1) | 4.32** |
| FD | -1.81 | -2.54 | -3.99** | I (1) | 13.26** |
| RER | -1.26 | -2.60 | -3.67** | I (1) | 16.90** |
| INF | -3.22** | | | I (0) | 16.81** |
| GTER | -2.56* | | | I(0) | 16.10** |
| GSER | -1.21 | -1.84 | -3.33** | I(1) | 12.98** |
| HDI | -1.76 | -1.83 | -3.72** | I (1) | 17.10** |
| WY | -0.67 | -1.87 | -4.14** | I (1) | 17.87** |
| MEXP | -0.37 | -1.52 | -2.98** | I (1) | 0.65 |
| BC | -1.42 | -1.34 | -2.65** | I (1) | 16.59** |
| TA | -1.14 | -1.47 | -3.25** | I (1) | 6.76** |
| EDU | -0.55 | -1.43 | -4.09** | I (1) | 16.69** |
| INST | -2.68* | | | I(0) | 14.45** |

*** and ** indicate the significance of the test at 1% and 5% levels, respectively. #Pesaran (2021) CD test.

After establishing the non-stationarity of the variables, we proceed to test for the existence of a long-run relationship between service exports and their possible determinants, as implied by Equations (1), (2), and (3), using Westerlund's (2007) cointegration test. The computed values of the panel cointegration statistics, along with their corresponding asymptotic p-values, are presented in Table 3 below. Using the asymptotic p-values, except for Pa, the null hypothesis of no cointegration is rejected in favour of the existence of cointegration at the 5% level, supporting the evidence of a long-run equilibrium relationship between total services exports and their determinants, taking into consideration their cross-sectional dependency. Similarly, when modern and traditional services exports replace total services exports, the study finds evidence of a long-run relationship among variables. Hence, we can conclude that the variables depict a cointegrating relationship for all the five South Asian countries under examination.

Table 3: Results of Panel Cointegration Test (Westerlund, 2007)

| Test Statistics | With constant | | | Constant and trend | | |
|-----------------|---------------|---------|--------|--------------------|---------|---------|
| | TSER | MSER | TDSE | TSER | MSER | TDSE |
| G _t | -3.18* | -2.82* | -3.17* | -4.34* | -3.62* | -3.43* |
| G _a | -9.78* | -10.78* | -9.21* | -11.85* | -14.32* | -12.48* |
| P _t | -7.82* | -8.77* | -6.27* | -9.78* | -10.46* | -8.65 |
| P _a | -5.14 | -6.88 | -6.25 | -7.56 | -11.87* | -9.25* |

* Denotes rejection of the no-cointegration null hypothesis at the 5% level.

The long-run coefficients are estimated using PMG and MG in the third step. The estimated results for total, modern, and traditional services exports are presented in Tables 4, 5, and 6, respectively. The Hausman test for slope homogeneity is also shown in the last column. The Hausman test prefers the PMG estimators as the p-value exceeds 5%. More importantly, the coefficient of the error correction term (ECT) is negative and significant, as expected, indicating that disequilibrium in the previous period is corrected in the next period.

Table 4: ARDL Estimation of Determinants of Total Services Exports

| Explanatory Variables | PMG | | | | MG | | | |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------------|
| | | | | | | | | |
| WY | 1.98** (3.78) | 1.59* (2.78) | 0.29 (1.48) | 0.67* (2.66) | 1.42** (3.56) | 1.39* (2.66) | 0.49* (2.48) | 0.59* (2.45) |
| RER | -0.03* (-2.39) | -0.02* (-2.34) | -0.02* (-2.56) | -0.02* (-2.38) | -0.03* (-2.39) | -0.02* (-2.34) | -0.01 (-1.68) | -0.02* (-2.38) |
| MEXP | 0.16** (3.18) | 0.18** (4.99) | 0.17** (3.12) | 0.16** (3.54) | 0.21** (3.32) | 0.24** (5.43) | 0.15* (2.79) | 0.19** (3.32) |
| INF | 1.07** | 0.93** | 0.63* | 0.53* | 1.12** | 1.13** | 0.76* | 0.49* |

| | | | | | | | | |
|------------------------|------------------|------------------|-------------------|-------------------|------------------|------------------|-------------------|-------------------|
| | (4.56) | (3.33) | (2.65) | (2.33) | (3.07) | (3.87) | (2.86) | (2.65) |
| FD | 0.23* (2.45) | 0.16* (2.08) | 0.14 (1.43) | 0.19* (2.65) | 0.20* (2.76) | 0.19* (2.54) | 0.11 (1.21) | 0.18* (2.32) |
| FDI | -0.14 (-1.54) | 0.05 (1.67) | -0.04 (-0.75) | - | -0.07 (-1.42) | 0.03 (1.32) | -0.04 (-1.22) | - |
| BC | 0.11* (2.21) | 0.10* (2.08) | - | 0.12* (2.45) | 0.12* (2.33) | 0.13* (2.31) | - | 0.14* (2.21) |
| RTA | 0.04 (0.54) | | | | | 0.05 (0.21) | | |
| GSER | 0.12* (2.67) | - | | | 0.18* (2.67) | - | | |
| GTER | | 0.14* (2.19) | | | | 0.15* (2.11) | | |
| EDU | | | 13.46** (3.24) | | | | 14.34* (2.84) | |
| HDI | | | | 12.54** (3.12) | | | | 13.45** (3.65) |
| ECT | -0.34* (2.67) | -0.45* (2.67) | -0.13** (2.67) | -0.23* (2.67) | -0.27* (2.67) | -0.38* (2.67) | -0.18** (2.67) | -0.26* (2.67) |
| Hausman Test (p-value) | 0.23 | 0.45 | 0.16 | 0.21 | | | | |

** and * indicate significance at 1 and 5% levels, respectively. The short-run coefficients are not presented.

The results show that the per capita income of the world (reflecting world demand) positively affects services exports from South Asia. However, the coefficient of world demand is more significant than unity for two specifications and less than unity for the others. The results align with the previous empirical literature on the impact of world demand for services exports (Eichengreen and Gupta, 2012; Sahoo and Dash, 2014). Therefore, it can be safely concluded that services exports from South Asia are affected by income growth in the importing country. Therefore, any demand fluctuation resulting from a change in income levels in the global economy will significantly impact service exports. The coefficient of the real exchange rate (RER) is found to be negative and significant, indicating that an appreciation of the domestic currency has an adverse effect on services exports by decreasing the competitiveness of South Asian countries. This finding aligns with the existing literature (Srinivasan, 1998; UNCTAD, 2005; Sharma and Kaur, 2013). However, compared to the income effect, the exchange rate effect on services exports from South Asia remains trivial. The impact of merchandise exports on services exports is found to be positive and significant, validating the spillover effect of merchandise exports on services exports. This is because exports of traditional services, such as transport and logistics, remain closely linked to the exports of goods and are also known to exhibit network effects (Eichengreen and Gupta, 2012; Sahoo and Dash, 2014). The coefficient of

merchandise exports is less than one, implying that services exports would increase less than proportionately to the increase in merchandise exports. The importance of services exports in manufacturing exports stems from the fact that there has been a significant rise in the contribution of the services sector to manufacturing production and exports, which is rightly termed the 'servicification' of manufacturing exports (Baldwin and Lopez-Gonzalez, 2015).

Supply-side or endowment factors (such as infrastructure stock, internet penetration, human capital, financial development, and FDI) have the expected signs. The coefficient of human capital (proxied by GSER, GTER, EDU, and HDI) is found to be positive and significant across specifications and indicators. As corroborated by existing literature (Mattoo et al., 2008; Contractor and Mudambi, 2008; Marel, 2012; Moreno-Hurtado et al., 2020), the availability of human capital is vital for the export of services. The coefficients of education and the human development index are more significant than 1, indicating that a 1% rise in education or the human development index score increases services exports by more than 1% of GDP. South Asia is competitive in services exports due to the availability of an abundant skilled workforce at low cost (ADB, 2017). Therefore, the growth trajectory of services exports in South Asia is attributed to the large pool of high-quality, low-cost human capital, as employment in the services sector is skill-intensive¹¹.

The coefficients of infrastructure stocks have a positive impact on services exports, as quality infrastructure, such as efficient transport, power, and energy use, reduces trade and transaction costs, thereby increasing competitiveness in international markets (UNCTAD, 2005). Infrastructure facilitates improvements in human capital (education, training, and healthcare systems) through a skilled labour force and hence induces services exports. Services such as communications, transportation, and computer software are capital-intensive. Therefore, better infrastructure availability increases the exports of these services (Urata and Kiyota, 2003). Alternatively, the study also examines the role of soft infrastructure (internet penetration) on services exports, and the results suggest that the availability of soft infrastructure is crucial in augmenting services exports in South Asia. South Asian countries have experienced a telecom revolution following the opening of the sector to private investment. Telecom density

¹¹ According to IMF (2019) South Asia will be the major supplier of labour force as 150 million youth will enter labour by 2030.

(per 100 people) increased from 0.55 in 1990 to more than 87 in 2021. Low-cost teleservices are a major driving factor for the sustained rise in services exports, particularly modern services exports in South Asia (Agarwal, 2019).

Financial development (as measured by the Financial Development Index) positively impacts services exports in South Asia, as it reduces trade costs by integrating exporters with importers, similar to the effect on goods exports. Furthermore, a well-developed financial sector encourages innovation and reduces uncertainty by providing credit, thereby enhancing the competitiveness of service exports (Beck, 2003). In the wake of the 2008 financial crisis, exports from the South Asian region declined significantly, highlighting the credit-intensive nature of these exports. A lack of bank credit may hinder new investments, as firms are hesitant to draw on their captive surpluses easily, thereby adversely affecting exports. Therefore, access to financial institutions and the availability of finance are important determinants of services exports from South Asia. Further, the study finds no significant impact of FDI on services exports. This may be due to the market-seeking nature of FDI. Similarly, the regional trade agreement (RTA) coefficient is also insignificant. This may be because of the nature of RTAs, which are shallow when it comes to coverage of services and commitments to liberalize services and more trade-oriented goods and have a limited impact on service exports. The coefficient of INST was also found to be insignificant and, hence, dropped from the final estimation.

Overall, the study finds that world demand, real exchange rate, human capital, infrastructure availability, merchandise exports, and financial development are significant determinants of service exports in South Asia.

Modern Services:

Having examined the determinants of aggregate services exports, the study estimates the determinants of modern services exports in South Asia using both PMG and MG estimators, and the results are presented in Table 5. The Hausman test suggests that the PMG estimators are preferred over the null of slope homogeneity. The sign of the ECT coefficients is negative and significant, indicating the presence of cointegration. Like aggregate services exports, modern services exports are influenced by global income, the real exchange rate, merchandise exports, and relative endowments such as infrastructure stocks, human capital development, internet penetration, and

financial development. However, compared to aggregate services, variables such as world demand, financial development, soft infrastructure, and human development have a more significant impact on modern services exports. As is widely known, modern services exports do not require physical proximity between consumers and the service providers, unlike traditional services. Instead, they are traded through Mode 1 (cross-border trade) and the internet platform. Furthermore, the skills required for producing and exporting modern services, such as software, communication, finance, and insurance, are higher than those for traditional services, underscoring the dual role of human skills and technology in modern services. On the other hand, variables such as real exchange rate, infrastructure stock, and merchandise exports have a higher impact on aggregate services exports compared to modern services. Like total exports, the effect of FDI and regional trade agreements is also insignificant.

Table 5: Panel ARDL Estimation of Determinants of Modern Services Exports

| Explanatory Variables | PMG | | | | MG | | | |
|-----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|
| | | | | | | | | |
| WY | 3.43** (5.45) | 3.23** (3.14) | 2.43* (2.55) | 1.67* (2.66) | 3.54** (4.45) | 3.16** (3.55) | 2.49* (3.08) | 1.61* (2.74) |
| RER | -0.01** (-3.12) | -0.01* (-2.02) | -0.02* (-2.56) | -0.01* (-2.21) | -0.02* (-2.72) | -0.01* (-2.45) | -0.01* (-2.68) | -0.01* (-1.98) |
| MEXP | 0.12** (3.34) | 0.11* (2.98) | 0.17** (3.12) | 0.11* (2.34) | 0.11** (3.32) | 0.13* (2.43) | 0.11** (3.12) | 0.09* (2.13) |
| INF | 0.67** (3.21) | 0.63** (3.09) | 0.43** (4.25) | 0.26* (2.34) | 0.52** (3.07) | 0.52** (3.87) | 0.46* (2.86) | 0.32* (2.65) |
| FD | 0.43** (4.08) | 0.45** (3.18) | 0.27** (3.21) | 0.25* (2.65) | 0.20* (2.76) | 0.19* (2.54) | 0.11 (1.21) | 0.18* (2.32) |
| FDI | -0.06 (-1.31) | -0.20 (-1.08) | 0.03 (0.67) | - | -0.07 (-1.42) | -0.09 (-1.32) | 0.06 (1.04) | - |
| BC | 0.19* (2.12) | 0.17* (2.32) | - | 0.18* (2.05) | 0.21* (2.06) | 0.19* (2.21) | - | 0.24* (2.21) |
| TA | 0.07 (0.68) | | | | 0.05 (0.72) | | | |
| GSER | 0.09** (3.07) | - | | | 0.17* (2.63) | - | | |
| GTER | | 0.08* (2.14) | | | | 0.11* (2.31) | | |
| EDU | | | 15.40** (3.39) | | | | 16.56* (2.48) | |
| HDI | | | | 13.21** (5.43) | | | | 12.09** (5.11) |
| ECT | -0.42* (-1.31) | -0.32** (-2.02) | -0.16** (-2.56) | -0.19** (-2.21) | -0.23* (-2.72) | -0.35** (-2.45) | -0.17** (-2.68) | -0.28** (-1.98) |
| Hausman Test | 0.12 | 0.17 | 0.23 | 0.29 | | | | |

** and * indicate significance at 1 and 5% levels, respectively. The short-run coefficients are not presented.

Traditional Services: We finally estimate the long-run coefficients of traditional services exports, and the results are presented in Table 6. The Hausman test provides evidence of slope homogeneity. As expected, the coefficient of ECT is negative and statistically significant, indicating that the disequilibrium created in the previous period is corrected in the subsequent period.

The results indicate an income effect, which, although positive and significant, has a coefficient smaller than for traditional services. Similarly, the coefficient of the real exchange rate is found to be negative, as in the case of total and modern services. Still, the coefficient of the real exchange rate is higher for traditional service exports in South Asia, indicating that exchange rate fluctuations have a more significant impact on traditional services than on modern services. Like total and modern services, access to quality infrastructure stock enhances traditional services in the transport and travel sector—likewise, modern services and soft infrastructure support the exports of traditional services. Human capital development, in terms of higher skills, further enhances traditional services, as in other cases. Still, its coefficient is relatively lower, indicating that human capital is more critical for modern services exports than for traditional services. Merchandise exports also boost traditional services with a higher impact on traditional services than on aggregate and modern services. On the contrary, financial development and RTAs have no significant effect on traditional services exports in South Asia.

Table 6: Estimated Coefficients of Traditional Services Exports

| Explanatory Variables | PMG | | | | MG | | | |
|-----------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | WY | 1.25** (2.65) | 1.23** (3.14) | 1.03* (2.55) | 1.12* (2.66) | 1.21** (3.01) | 1.16** (2.41) | 0.69* (2.08) |
| RER | -0.03** (-3.36) | -0.03** (-3.11) | -0.02* (-3.06) | -0.03* (-2.21) | -0.02* (-2.72) | -0.03* (-2.45) | -0.03* (-2.68) | -0.02* (-1.98) |
| MEXP | 0.21** (3.34) | 0.18* (2.98) | 0.25** (3.12) | 0.15* (2.34) | 0.21** (3.08) | 0.19* (2.51) | 0.21** (2.87) | 0.19* (2.13) |
| INF | 1.19** (4.21) | 1.04** (3.34) | 1.02** (3.01) | 0.74* (2.66) | 0.99** (3.07) | 1.05** (3.87) | 0.96* (2.86) | 0.63* (2.65) |
| FD | -0.03 (-1.08) | 0.05 (1.32) | 0.06 (1.41) | -0.03 (-0.88) | -0.05 (-1.61) | 0.04 (1.43) | 0.04 (0.81) | -0.02 (-0.76) |
| FDI | 0.06 (1.31) | 0.04* (2.18) | - | - | 0.03 (1.42) | 0.03* (2.64) | - | - |
| BC | 0.04* (2.12) | - | | - | 0.04* (2.06) | - | - | 0.05* (2.32) |
| RTA | -0.03 (-0.34) | | | | 0.02 (0.55) | | | |
| GSER | 0.13* (2.49) | - | | | 0.13* (2.14) | - | | |
| GTER | | 0.08* | | | | 0.10* | | |

| | | | | | | | | |
|--------------|--------|--------|------------------|-------------------|--------|--------|-----------------|-------------------|
| | | (2.14) | | | | (2.42) | | |
| EDU | | | 8.38** (3.16) | | | | 7.41* (2.78) | |
| HDI | | | | 11.46** (3.46) | | | | 12.42** (3.09) |
| ECT | -0.21* | -0.34* | -0.56* | -0.46* | -0.24* | -0.19* | -0.41* | -0.52* |
| Hausman Test | 0.34 | 0.18 | 0.32 | 0.04 | | | | |

** and * indicate significance at 1 and 5% levels, respectively. The short-run coefficients are not presented.

5.1. Causality between Services Exports and Human Capital

Having examined the drivers of services exports in South Asia, this section checks for the causality between human capital and services export using the Granger non-causality approach proposed by Juodis et al. (2021). The results are presented in Table 7. The causality results indicate a two-way or mutual feedback relationship between human capital and aggregate services exports, as well as between human capital and modern services. The study further finds evidence of one-way causality running from human capital to traditional services, except for GSER. The causality results support the hypothesis that human capital is vital for boosting services exports in South Asia. The causality results indicate complementarity between human capital and services exports, implying that a rise in human capital promotes services exports by increasing competitiveness. Similarly, growing services exports also increase human capital through the learning-by-doing effect. This suggests that investment in human capital will enhance services exports in South Asia, thereby promoting human capital development.

Table 7: Panel Granger Non-Causality Test using Jodios et al. (2021)

| Null hypothesis | \hat{W}_{HPJ} test | P-value |
|--|----------------------|---------|
| Causality between Human Capital and Total Services | | |
| GSER does not Granger Cause TSER | 53.05** | 0.00 |
| TSER does not Granger Cause GSER | 36.34** | 0.00 |
| GTER does not Granger Cause TSER | 19.44** | 0.00 |
| TSER does not Granger Cause GTER | 33.51** | 0.00 |
| EDU does not Granger Cause TSER | 17.68** | 0.00 |
| TSER does not Granger Cause EDU | 0.40 | 0.52 |
| HDI does not Granger Cause TSER | 39.42** | 0.00 |
| TSER does not Granger Cause HDI | 0.21 | 0.64 |
| Causality between Human Capital and Modern Services | | |
| GSER does not Granger cause MSER | 42.33** | 0.00 |
| MSER does not Granger cause GTER | 86.28** | 0.00 |
| GTER does not Granger cause MSER | 8.9* | 0.02 |
| MSER does not Granger cause GTER | 9.38* | 0.03 |
| EDU does not Granger cause MSER | 13.68* | 0.01 |

| | | |
|---|----------|------|
| MSER does not Granger cause EDU | 5.41* | 0.03 |
| HDI does not Granger cause MSER | 14.62** | 0.00 |
| MSER does not Granger cause HDI | 11.02** | 0.01 |
| Causality between Human Capital and Traditional Services | | |
| GSER does not Granger cause TDSE | 27.39** | 0.00 |
| TDSE does not Granger cause GSER | 103.45** | 0.00 |
| GTER does not Granger cause TDSE | 6.80* | 0.04 |
| TDSE does not Granger cause GTER | 0.34 | 0.56 |
| EDU does not Granger cause TDSE | 0.58 | 0.45 |
| TDSE does not Granger cause EDU | 1.48 | 0.22 |
| HDI does not Granger cause TDSE | 4.23* | 0.05 |
| TDSE does not Granger cause HDI | 0.56 | 0.56 |

The optimal lags are selected by using the BIC criterion. ** and * rejection of null at 1 and 5% significance levels, respectively.

6. Sensitivity Analysis (excluding India)

To examine the robustness of the results, we re-estimated equations 1, 2, and 3 by excluding India using the PMG method¹². The Results are presented in Tables 8 and 9. The results are similar to the results presented in 4,5, and 6. The Hausmann test does not reject the slope homogeneity null hypothesis, suggesting the validity of PMG estimators. More importantly, the coefficient of the error correction term (ECT) is negative and significant, as expected, indicating that disequilibrium in the previous period is corrected in the next period.

Table 8: Determinants of Total and Modern Services Exports (Excluding India)

| Explanatory Variables | Total Services | | | | Modern Services | | | |
|-----------------------|--------------------|-------------------|-------------------|--------------------|--------------------|--------------------|------------------|--------------------|
| | | | | | | | | |
| WY | 1.37* (2.34) | 1.78* (2.47) | 0.67* (2.18) | 1.37* (2.34) | 2.17** (3.51) | 2.56* (2.23) | 2.58* (2.35) | 0.67 (1.66) |
| RER | -0.002* (-2.67) | -0.004 (-1.32) | -0.002 (-1.06) | -0.002* (-2.27) | -0.004* (-2.09) | -0.006* (-2.12) | -0.04 (-1.06) | -0.004* (-2.23) |
| MEXP | 0.16** (3.18) | 0.08** (2.39) | 0.07** (2.28) | 0.06* (2.14) | 0.11* (2.37) | 0.09* (2.04) | 0.11 (1.12) | 0.17** (3.57) |
| INF | 1.27** (4.23) | 1.03** (2.42) | 0.55* (2.33) | 0.72* (2.87) | 1.32** (4.66) | 1.38* (2.79) | 0.63* (2.25) | 0.29 (1.45) |
| FD | 0.23* (2.45) | 0.09 (1.78) | 0.12* (1.98) | 0.11 (1.56) | 0.23* (2.08) | 0.45** (3.18) | 0.26* (2.11) | 0.36* (2.67) |
| FDI | -0.08 (-1.65) | 0.05 (0.48) | -0.05 (-1.15) | - | -0.16* (-2.31) | -0.12 (-0.98) | 0.13 (-1.37) | 0.12 (0.98) |
| BC | 0.12* (2.52) | 0.14* (2.58) | 0.15* (2.15) | 0.17* (2.66) | 0.18* (2.43) | 0.19* (2.66) | 0.17* (2.41) | 0.17* (2.23) |
| GSER | 0.19** (4.45) | - | | | 0.23** (4.36) | - | | |

¹² India is the dominant country and accounts for more than 78% in GDP, 86% in exports and 80% in imports in South Asia.

| | | | | | | | | |
|------------------------|--------|----------------|------------------|------------------|--------|----------------|------------------|-----------------|
| GTER | | 0.07 (1.69) | | | | 0.16 (2.04) | | |
| EDU | | | 18.16* (2.24) | | | | 24.40* (2.54) | |
| HDI | | | | 3.68** (5.78) | | | | 9.76* (2.51) |
| ECT | -0.44* | -0.45* | -0.43* | -0.33* | -0.26* | -0.28* | -0.22* | -0.21* |
| Hausman Test (p-value) | 0.23 | 0.32 | 0.19 | 0.27 | 0.31 | 0.23 | 0.23 | 0.32 |

** and * indicate significance at 1 and 5% levels, respectively. The short-run coefficients are not presented.

The results show that demand-side and supply actors have expected signs and are statistically significant, except for FDI. More importantly, all variables (proxy human capital) such as SENR, TENR, HDI, and EDU have the expected sign and are statistically significant, supporting the role of human capital in promoting services exports from South Asia.

Table 9: Determinants of Traditional Services Exports (Excluding India)

| Explanatory Variables | Traditional Services | | | |
|-----------------------|----------------------|--------------------|-------------------|--------------------|
| | WY | 3.41* (2.41) | 1.85* (2.64) | 2.31* (2.17) |
| RER | -0.005** (-2.45) | -0.008* (-2.57) | -0.006 (-1.44) | -0.007* (-2.21) |
| MEXP | 0.23** (4.25) | 0.26* (4.61) | 0.18* (2.65) | 0.16* (2.46) |
| INF | 0.23* (2.09) | 0.80** (2.41) | 1.03* (2.25) | 1.05* (2.14) |
| FD | 0.13* (2.56) | 0.15 (1.18) | 0.09 (1.21) | 0.07 (0.65) |
| FDI | 0.04 (0.56) | 0.05 (0.88) | 0.08 (1.17) | -0.05 (-0.56) |
| BC | 0.12* (2.09) | 0.17* (2.32) | 0.23* (2.52) | 0.13* (2.55) |
| GSER | 0.10* (2.17) | | | |
| GTER | | -0.08 (-1.14) | | |
| EDU | | | 3.46* (2.19) | |
| HDI | | | | 5.57* (2.03) |
| ECT | -0.22* | -0.12* | -0.20* | -0.20* |
| Hausman Test | 0.16 | 0.17 | 0.25 | 0.29 |

** and * indicate significance at 1 and 5% levels, respectively. The short-run coefficients are not presented.

Further, the causality between services exports and human capital also are examined by excluding India from sample and the results are presented in Table 10. The causality results reveal a two-way or mutual feedback relationship between services exports and SENR, a one-way causality from HDI and EDU to services exports in South Asia, and very weak causality between services exports and TENR. Overall, the results are in line with the whole sample, suggesting a critical role of human capital in promoting services exports in South Asia.

Table 10: Panel Granger Non-Causality Test (Excluding India)

| Null hypothesis | \hat{W}_{HPJ} test | P-value |
|---|----------------------|---------|
| Causality between Human Capital and Total Services | | |
| GSER does not Granger Cause TSER | 53.05** | 0.00 |
| TSER does not Granger Cause GSER | 36.34** | 0.00 |
| GTER does not Granger Cause TSER | 2.79 | 0.59 |
| TSER does not Granger Cause GTER | 1.89 | 0.37 |
| EDU does not Granger Cause TSER | 54.76** | 0.00 |
| TSER does not Granger Cause EDU | 15.35** | 0.00 |
| HDI does not Granger Cause TSER | 135.42** | 0.00 |
| TSER does not Granger Cause HDI | 0.09 | 0.81 |
| Causality between Human Capital and Modern Services | | |
| GSER does not Granger Cause MSER | 17.70** | 0.00 |
| MSER does not Granger Cause GTER | 66.65** | 0.00 |
| GTER does not Granger Cause MSER | 3.71 | 0.34 |
| MSER does not Granger Cause GTER | 2.51 | 0.21 |
| EDU does not Granger Cause MSER | 17.09* | 0.01 |
| MSER does not Granger Cause EDU | 1.36 | 0.16 |
| HDI does not Granger Cause MSER | 7.15* | 0.04 |
| MSER does not Granger Cause HDI | 0.88 | 0.40 |
| Causality between Human Capital and Traditional Services | | |
| GSER does not Granger Cause TDSE | 23.98** | 0.00 |
| TDSE does not Granger Cause GSER | 22.15** | 0.00 |
| GTER does not Granger Cause TDSE | 0.28 | 0.04 |
| TDSE does not Granger Cause GTER | 7.23 | 0.12 |
| EDU does not Granger Cause TDSE | 28.15** | 0.00 |
| TDSE does not Granger Cause EDU | 73.88** | 0.00 |
| HDI does not Granger Cause TDSE | 4.95* | 0.04 |
| TDSE does not Granger Cause HDI | 0.35 | 0.66 |

The optimal lags are selected by using the BIC criterion. ** and * rejection of null at 1 and 5% significance levels, respectively.

7. Conclusion and Policy Implications

Against the backdrop of the stellar growth of services exports witnessed in the South Asian region and an increase in their share of world services exports from 0.8% in 1990 to 3.1% in 2009, this study examines the determinants of services exports for

five major South Asian countries with special focus on the role of human capital. In line with the established literature, our results indicate that endowed factors like infrastructure stock, internet penetration, financial development, and human capital positively and significantly impact services exports, especially modern services, as the latter demand higher skills and a more comprehensive telecommunications network. These results have important policy implications for South Asia's modern services export, whose volumes registered an 11-fold increase from US\$11 bn in 2000 to US\$99 bn in 2010. While FDI does not have the desired impact on modern services per se, it emerges as an important determinant for both traditional services exports and services exports in particular. FDI is found to be instrumental in boosting merchandise exports, which in turn has a positive network effect on services exports, thus making it a vital determinant regardless of the nature of the services exports in question. Incentives should be provided to attract Foreign Direct Investment (FDI) to export-oriented sectors, thereby increasing competitiveness through technological spillovers.

A few policy inferences can be drawn from this study. The quality of human capital, for one, is a significant determinant of services exports in South Asia. Accordingly, policies should be enacted to focus on enhancing the skill development of the labour force. The skill deficit in the services sector is generally more acute than in the manufacturing sector, which is less skill intensive. Although there are notable increases in enrolment for primary and secondary education in South Asian countries, a supply-demand mismatch exists in the labour market regarding skills. To plug the gap, there is a need to develop curricula, courses, and certifications for a range of service occupations, mainly bordering on skill sets that employers demand. South Asia needs to invest more in human capital as it invests only 3.5% of GDP compared to the global average of 9.6%. According to the Global Business Coalition for Education (2019), there will be a shortage of 200 million workforce in South Asia with adequate skills in the near future. According to NSDC (2024), there is a shortage of around 30 million skilled workers in India in critical sectors like IT, communication services, healthcare and life sciences, financial and retail, logistics and transport, etc.

A good example of policy intervention in South Asia is Bangladesh's Computer Literacy Programme (CLP), which has 70,000 students across 56 districts in Bangladesh acquiring basic hardware and software skills. Steps such as these will help South Asian economies, whose service sectors are currently traditionally driven

(like Sri Lanka), gain a foothold in the modern services industry in the foreseeable future. South Asian governments should prioritize human resource development in emerging sectors such as financial services, design and animation, and software development. Government-promulgated skills development programmes of various scales and intents are underway in Pakistan, Sri Lanka, and Bangladesh. The mandate of such programs should be to provide comprehensive technical and vocational education and training geared to the job market requirements. India, for instance, has allocated US\$ 1 billion to train 500 million workers by 2022. In the future, focus should be placed on improving the quality of education and workforce training, particularly in skills such as digital and high-tech skills, IT competency, financial and retail, logistics and transportation.

Given the diverse nature of modern services, Internet penetration has also gained importance. With an internet penetration rate of 7% compared to the global average of 35%, South Asian governments should prioritize this to harness the potential of modern services. In its 'Outline Perspective Plan (2010-2021)', the Bangladesh government aimed to foster good governance and promote transparency in attracting Foreign Direct Investment (FDI), particularly in the services sector. This is a timely intervention as South Asia needs improvements in governance structures and FDI. Institutional quality remains an important determinant of FDI in the South Asian region. Nonetheless, South Asia's remarkably low scores in transparency and governance indices constitute a significant bottleneck, indicating the potential for FDI inflows that could be unlocked if institutions were to improve. The financial sector has a positive impact on total and modern services exports. The financial sector in South Asia is in its early stages of development and is heavily dominated by the banking sector. Policies to enhance the financial sector's depth, breadth, and diversification will foster growth and increase the export of services.

Among the necessary policy steps going forward, we conclude that there is an urgent need to enhance quality infrastructure in this region, attract Foreign Direct Investment (FDI) in strategic sectors, and invest heavily in developing job-oriented skills and education. South Asia's services exports are also partly contingent on the continued success of manufacturing exports as the two have a reciprocal relationship. In the long term, the services sector's role in exports and its provision of employment opportunities will be critical. Hence, it is a policy imperative for governments in the region to provide a planned and seamless push to services exports, both traditional

and modern. In addition, other determinants of services exports identified by this study will also merit policy attention.

Appendix

Table A1: Performance of Services Exports of South Asian countries (%)

| India | 1991-2000 | 2001-2010 | 2011-2021 | Pre-Covid (1991- 2019) | Post-Covid (2020-21) |
|-------------------------------------|-----------|-----------|-----------|------------------------------|-------------------------|
| GDP growth rate | 5.59 | 6.75 | 5.14 | | |
| Total export growth | 9.56 | 22.8 | 1.47 | 12.3 | 10.79 |
| Goods exports growth | 9.3 | 22.4 | -0.4 | 11.4 | 14.1 |
| Services exports Growth | 12.8 | 24.6 | 5.51 | 15.0 | 13.5 |
| Traditional Services exports growth | 8.1 | 20.6 | 0.8 | 11.5 | -11.3 |
| Modern Services exports growth | 19.3 | 25.6 | 6.1 | 18.1 | 11.8 |
| Bangladesh | | | | | |
| GDP growth | 4.76 | 5.57 | 6.39 | | |
| Total export growth | 11.7 | 15.08 | 7.2 | 11.6 | 8.7 |
| Goods exports growth | 12.8 | 15.4 | 6.8 | 11.9 | 8.51 |
| Total Services Exports Growth | 7.9 | 11.5 | 12.38 | 10.7 | 10.5 |
| Traditional Services exports growth | 19.2 | 6.87 | 14.1 | 14.3 | 13.9 |
| Modern Services exports growth | 4.7 | 18.9 | 11.6 | 11.26 | 9.3 |
| Pakistan | | | | | |
| GDP growth | 4 | 4.75 | 3.1 | | |
| Total export growth | 4.4 | 11.7 | -0.8 | 5.5 | 10.5 |
| Goods exports growth | 5.2 | 11.1 | -12.7 | 5.5 | 11.5 |
| Total Services Exports Growth | 0.5 | 10.9 | 3.07 | 7.0 | 6.6 |
| Traditional Services exports growth | 0.7 | 8.75 | -6.4 | 4.66 | -9.03 |
| Modern Services exports growth | 1.9 | 16.3 | 10.6 | 11.9 | 12.5 |
| Sri Lanka | | | | | |
| GDP growth | 5.3 | 5.2 | 4.0 | | |
| Total export growth | 9.5 | 8.4 | 0.8 | 7.8 | -9.1 |
| Goods exports growth | 9.3 | 8.3 | 0.3 | 6.9 | 4.2 |
| Total Services Exports Growth | 11.7 | 9.3 | 4.4 | 10.9 | -38.8 |
| Traditional Services exports growth | 8.1 | 12.6 | 4.7 | 11.6 | -54.4 |
| Modern Services exports growth | 10.2 | 8.7 | 4.5 | 12.2 | -3.4 |
| Nepal | | | | | |
| GDP growth | 4.96 | 3.92 | 4.3 | | |
| Total export growth | 10.1 | 11.41 | 2.9 | 7.5 | 5.05 |
| Goods exports growth | 13.6 | 3.0 | -0.16 | 6.5 | 42.2 |
| Total Services Exports Growth | 10 | 13.9 | 4.8 | 9.6 | -27.5 |
| Traditional Services exports growth | 5.9 | 13.2 | 0.6 | 8.04 | -46.4 |
| Modern Services exports growth | 27.2 | 17.9 | 6.4 | 17.7 | -16.05 |

Source: World Development Indicators, World Bank.

Table A2: Components of Services Exports as a Percentage of total services exports

| Types of Services | Bangladesh | | | India | | | Sri Lanka | | | Pakistan | | | Nepal | | |
|-------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1991-2000 | 2001-2010 | 2011-2021 | 1991-2000 | 2001-2010 | 2011-2021 | 1991-2000 | 2001-2010 | 2011-2021 | 1991-2000 | 2001-2010 | 2011-2021 | 1991-2000 | 2001-2010 | 2011-2021 |
| Travel | 11.4 | 11.4 | 9.6 | 34.3 | 14.5 | 12.5 | 28.6 | 24.6 | 40.6 | 8.2 | 9.9 | 9.1 | 41.9 | 58.5 | 39.8 |
| Growth rate (%) | 25.2 | 1.5 | 12.25 | 9 | 16.3 | -1.0 | 8 | 12.1 | 10.5 | -3.7 | 21.8 | -9.8 | 5.8 | 12 | -2.3 |
| Transport | 13.02 | 22.3 | 23.2 | 21.4 | 13 | 10.3 | 41.6 | 43.4 | 35.7 | 59.7 | 52.7 | 30.0 | 12.2 | 11.1 | 5.0 |
| Growth rate (%) | 21.6 | 6 | 20 | 10.1 | 19.7 | 8.74 | 9.5 | 16.6 | -3.1 | 1.25 | 16.3 | -10 | 45.2 | -3.7 | 4.4 |

| | | | | | | | | | | | | | | | |
|----------------------------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Software and communication | 74.5 | 62.9 | 62.5 | 41.2 | 67.6 | 72.5 | 25.8 | 25.5 | 18.1 | 30.6 | 33.6 | 56.4 | 46.6 | 29.9 | 51.8 |
| Growth rate (%) | 4.1 | 19.7 | 10.23 | 21.6 | 24.9 | 8.39 | 7.7 | 11.3 | 6.4 | 0.6 | 27.7 | 8.7 | 31.6 | 4.02 | 11.1 |
| Insurance and Financial | 2.74 | 4.2 | 4.5 | 1.5 | 2.6 | 4.6 | 3.34 | 3.8 | 5.7 | 1.4 | 3.7 | 4.4 | 0 | 0.4 | 1.17 |
| Growth rate (%) | 155 | 11.9 | 10 | 20.6 | 33.9 | 1.43 | 11.3 | 91 | 19.4 | 24 | 33.2 | 3.3 | - | 271 | 84 |

Source: World Development Indicators, World Bank

References:

- Aghion, P., and R. Griffith. 2005. *Competition and Growth: Reconciling Theory and Evidence*. Cambridge, MA: MIT Press.
- Agarwal, Prachi (2017) *South Asia: Formulating Services Sector Policies for Development, A Policy Perspective*, UN-ESCAP Working Paper No. 1903.
- Agosin, Manuel R. Roberto Alvarez and Claudio Bravo-Ortega (2011), *Determinants of Export Diversification Around the World: 1962–2000*, *The World Economy*, 35(3), 295-315.
- Ahmed, A.D., Cheng, E. and G. Messinis (2011), 'The role of exports, FDI and imports in development: evidence from Sub-Saharan African countries,' *Applied Economics*, Vol. 43, Issue 26, pp. 3719-3731
- Armstrong, S. (2011), 'East and South Asia in global trade and economic development', EABER Working Paper No. 70, Canberra: East Asia Bureau of Economic Research
- Asian Development Bank (2017) *Human Capital Development in South Asia: Achievements, Prospects, and Policy Challenges*, Asian Development Bank, Manila.
- Balassa, B. 1978. *Exports and Economic Growth: Further Evidence*. *Journal of Development Economics*, 5(2), 181–89.
- Baldwin, Richard & Javier Lopez-Gonzalez, 2015. "Supply-chain Trade: A Portrait of Global Patterns and Several Testable Hypotheses," *The World Economy*, Wiley Blackwell, vol. 38(11), pages 1682-1721
- Beck, T. (2003), 'Financial Dependence and International Trade', *Review of International Economics*, 11, 2, 296–316.
- Bhattarai, Keshab (2012), 'Trade, growth and poverty in South Asia' in Jha, Raghbendra (ed.) *Routledge Handbook of South Asian Economies*, Routledge.
- Barcenilla, S., and J. Molero. 2003. *Service Export Flows: Empirical Evidence for European Project SETI PROJECT*.
- Bhagwati, J.N. 1982. *Introduction to "Import Competition and Response"*. In *Import Competition and Response*, 1–8. University of Chicago Press.
- Biggs, T. 2007. *Export Promotion and Diversification: What Do We Learn from the DTISs in Low-Income Countries?* World Bank, unpublished.
- Broussolle, D. (2012), 'A note on the links between manufacturing, goods and services exports', Working Paper 2012-09, Laboratoire de Recherche en Gestion et EconomieLaRGE), Université de Strasbourg (France)
- Contractor, F.J. and Mudambi, S.M. (2008) *The Influence of Human Capital Investment on the Exports of Services and Goods: An Analysis of the Top 25 Services Outsourcing Countries*. *Management International Review*, 48, 433-445.
- Das, S., & Sarma, A. (2021). *Growth Behaviour of India's Export of Services, 1975–2018*. *Foreign Trade Review*, 56(3), 301–321

- Deardorff, A., S. Hymans, R. M. Stern, and C. Xiang (2000), *Forecasting U.S. Trade in Services*. Mimeo, University of Michigan.
- Egger, P. H., J. Francois, and D. R. Nelson. 2017. *The Role of Goods-Trade Networks for Services-Trade Volume*, *The World Economy* 40 (3): 532–543.
- Eichengreen, B. and P. Gupta (2012), *Exports of Services: Indian Experience in Perspective*. *Indian Growth and Development Review*, 6(1), pp. 35–60.
- Francois, J., and B. Hoekman (2010), *Services Trade and Policy*. *Journal of Economic Literature*, 642–92.
- Grossman, G. and E. Helpman (1991), *Innovation and Growth in the Global Economy*, Cambridge: MIT Press. chapters 1-5. Grünfeld, L.A., and A. Moxnes (2003), *The Intangible Globalization: Explaining the Patterns of International Trade in Services*. Norwegian Institute for International Affairs. Discussion paper no. 657.
- Grünfeld, L. A., & Moxnes, A. (2003). *The intangible globalization: Explaining the patterns of international trade in services*. Norwegian Institute for International Affairs Working Paper.
- Hausmann, R., J. Hwang, and D. Rodrik (2007), *What you export matters*. *Journal of Economic Growth*, 12(1), pp. 1–25.
- Hiranya K. Nath and Lirong Liu (2017) *Information and communications technology (ICT) and services trade*, *Information Economics and Policy*, 41, 2017, 81-87.
- Hoekman, B. and A. Mattoo. 2008. *Services Trade and Growth*. In *Opening Markets for Trade in Services: Countries and Sectors in Bilateral and WTO Negotiations*, pp. 21–58.
- International Monetary Fund (2019) *is South Asia ready to take off? A Sustainable and Inclusive Growth Agenda*, Departmental Paper Series.
- Juodis, A., Karavias, Y., & Sarafidis, V. (2021) *A homogeneous approach to testing for Granger non-causality in heterogeneous panels*, *Empirical Economics*, 60, 93-112
- Kandilov, I.T. and T.J. Grennes (2010), *'The Determinants of Service Exports from Central and Eastern Europe'*, *Economics of Transition*, Vol. 18, No. 4, pp. 763-794.
- Kaur, S., Khorana, S., & Kaur, M. (2020). *Is There Any Potential in Service Trade of South Asia?* *Foreign Trade Review*, 55(3), 402–417.
- Kimura, F., and H.H. Lee (2006), *The Gravity Equation in International Trade in Services*. *Review of World Economics*, 142(1), 92-121.
- Lennon, Carolina (2006), *Trade in Services and Trade in Goods: Differences and Complementarities*. Paper presented at Eighth Annual Conferences of the European Trade Study Group, Vienna, Austria, 7–9 September.
- Majeed, M.T. and E. Ahmad (2006), *'Determinants of Exports in Developing Countries'*, *The Pakistan Development Review*, Vol. 45, No. 4, Part II (Winter 2006) pp. 1265–1276

- MANN, C.L. (2004), "The US Current Account, New Economy Services and Implications for Sustainability", *Review of International Economics*, 12, pp. 262-276.
- Marel, Van der, 2012. Determinants of Comparative Advantage in Services, FIW Working Paper series 087, FIW.
- Mattoo, A., I.C. Neagu, and Ç. Özden. 2008. Brain waste? Educated Immigrants in the US Labor Market. *Journal of Development Economics*, 87(2), 255–69.
- Mattoo, Aaditya and Fink, Carsten (2002) Regional Agreements and Trade in Services. Available at SSRN: <https://ssrn.com/abstract=636216>.
- Méon, P. G., & Sekkat, K. (2008). Institutional quality and trade: Which institutions? Which trade? *Economic Inquiry*,
- Moreno-Hurtado, C., A. Plascencia, A. Lozano and J. Cano (2020), ICT exports: the role of human capital and economic complexity," *2020 15th Iberian Conference on Information Systems and Technologies (CISTI)*, Seville, Spain, 2020, pp. 1-5.
- National Skill Development Corporation, 2024, Annual Report 2021-22, Ministry of Skill Development and Entrepreneurship, Government of India.
- Nasir, S., and K. Kalirajan. 2013. Export Performance of South and East Asia in Modern Services. ASARC Working Paper 2013/07.
- Nyahoho, E. (2010). Determinants of comparative advantage in the international trade of services: An empirical study of the Heckscher–Ohlin approach, *Global Economy Journal*, 10, 1-24.
- Pesaran, M. 2021. "General diagnostic tests for cross-sectional dependence in panels," *Empirical Economics*, 60(1), 13-50.
- _____ 2007. A simple panel unit root test in the presence of cross-section dependence," *Journal of Applied Econometrics*, 22(2), 265-312.
- Sahoo, Pravakar & Ranjan Kumar Dash, 2017. "What Drives India's Surge in Service Exports?" *The World Economy*, Wiley Blackwell, vol. 40(2), pages 439-461, February.
- Sahoo, Pravakar and Ranjan Kumar Dash, (2014) India's surge in modern services exports: Empirics for policy, *Journal of Policy Modeling*, 36(6), 1082-1100.
- Sahoo & Ranjan Kumar Dash (2012) Economic growth in South Asia: Role of infrastructure, *The Journal of International Trade & Economic Development*, 21:2, 217-252.
- Shah, Syed Hasanat & Syed Ali Raza, 2022. "The Impact of Services FDI on Services Exports in NICs," *Economic Papers*, 41(2), 176-181.
- Sharma, R. and M. Kaur (2013), 'Causal Links between Foreign Direct Investments and Trade: A Comparative Study of India and China', *Eurasian Journal of Business and Economics*, Vol. 6, No. 11, pp. 75-91.
- Shingal, A. 2010. How much do agreements matter for services trade? Available at SSRN 1586839.

- Srinivasan, T.N (1998), 'India's Export Performance: A Comparative Analysis'. In I.J. Ahluwalia and I.M.D. Little (eds.) *India's Economic Reforms and Development: Essays for Manmohan Singh*, Delhi: OUP.
- Thomas, M (2015), *Estimation of the key Economic Determinants of Services trade: Evidence from India*, The Institute for Social and Economic Change, Working Paper No. 348.
- UNCTAD. (2005). *World investment report*. Geneva: United Nations Conference on Trade and Development.
- Urata, S. and K. Kiyota (2003), 'Services Trade in East Asia', in (ed.) Itto, T. and Krueger, A.O. *Trade in Services in the Asia Pacific Region*, University of Chicago Press
- Westerlund, J. Testing for Error Correction in Panel Data, *Oxford Bulletin of Economic and Statistics*, 2007, 69(6), 709-748.
- Global Business Coalition for Education (2019), *The 2030 Skills Scorecard Bridging business, education, and the future of work*, South Asia Edition, New York.



The Asia-Pacific Research and Training Network on Trade - ARTNeT - is an open network of research and academic institutions and think-tanks in the Asia-Pacific region. Since its inception, ARTNeT aims to increase the amount of high quality, topical and applied research in the region by harnessing existent research capacity and developing new capacities. ARTNeT also focuses on communicating these research outputs for policymaking in the region including through the ARTNeT Working Paper Series which provide new and policy-relevant research on topics related to trade, investment and development. The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations and ARTNeT secretariat or ARTNeT members.

Readers are encouraged to quote or reproduce material from ARTNeT Working Papers for their own publications, but as the copyright holder, ARTNeT requests due acknowledgement and a copy of the publication.

This and other ARTNeT publications are available from artnet.unescap.org



ARTNeT Secretariat, United Nations ESCAP
Rajadamnern Nok Avenue
Bangkok 10200, Thailand
Tel: +66(0) 22881425
Fax: +66(0) 22881027

ARTNeT Secretariat, United Nations ESCAP