

Assessing the Determinants of Services Exports of Pakistan: An Application of Extended Gravity Model

 **Asif Javed**¹ (Corresponding Author)

School of Economics
Quaid-i-Azam University, Islamabad – Pakistan

 **Farzana Naheed Khan (PhD)**²

School of Economics
Quaid-i-Azam University, Islamabad – Pakistan

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Abstract

The services sector plays a crucial role in Pakistan's economy based on its contribution to GDP and the engagement of most of the labour force with this sector. Services exports provide valuable foreign exchange earnings, and the focus on promoting services exports can resolve the balance of trade issue. Hence, this study investigates the key determinants influencing Pakistan's services exports with its major trading partners. The study employed an extended gravity model through fixed effect, random effect and Poisson-Pseudo Maximum Likelihood (PPML) methods by using data from 2000-2022 and found out that the GDP of the partner country, FDI, employment in services, logistics performance index (LPI), and services trade restrictiveness index (STRI) are important determinants of services exports in Pakistan. Pakistan is the most restrictive economy in the South Asian region which has higher STRI, resultantly the restrictions are negatively affecting the services trade and exports of the country. Moreover, the study evaluated that the USA, UAE, China, and UK are major export markets for export services of Pakistan. Based on these findings, the study suggests that Pakistan should improve its logistics infrastructure and reduce service trade restrictions to boost services exports.

Keywords

Extended gravity model
Information & communication technology
Service trade restrictiveness index
Services exports
Services trade

INTRODUCTION

The services sector has become a key factor for global economic growth, particularly for the developing countries. The services sector is a major contributor towards global GDP having a share of 61.7% in 2022 (World Bank, 2022). This demonstrates the importance of this sector for the global economy and its development. The service sectors are also playing an important role in modern global value chains. Advanced logistics and data analytics are significantly improving productivity of agriculture and manufacturing sectors (Kirov, 2017). Digital platforms facilitate innovation and collaboration based on which it is possible to overcome the geographical barriers (Miroudot & Cadestin, 2017). Services trade has expanded considerably, and the tradability of services becomes possible due to changes in technology and regulatory reforms (Sáez et al., 2015). The countries have realized the importance of the services sector and are aiming to boost the scale and exports of services by taking appropriate measures and enforcing policies to support the services trade in their respective countries. Skills training programs of India and Philippines to develop highly skilled workforce, measures to develop ICT related infrastructure by South Korea, regulatory reforms by Singapore to encourage businesses in services, digitalization of financial services by Ireland are some of the prime examples to promote services trade and exports in respective countries.

Pakistan is focusing on improving trade and related infrastructure to improve its competitiveness. Digital Pakistan Policy intends to establish software technology parks, and promote IT enabled logistic systems of logistic operators. This will help to improve Logistics Performance Index (LPI) of Pakistan. Countries around the world are implementing laws, policies, procedures, and processes that help in the smooth flow of goods and services trade. 'Pakistan Single Window' is a prime example of implementation of e-governance in Pakistan that helped in improving the efficiency of cross-border trade and reducing the related challenges and regulatory barriers. For a detailed understanding of the flow of trade in services between Pakistan and its major trading partners, the study examined the factors that affect services exports of Pakistan. Although a lot of research has been carried out to explore the determinants of trade of Pakistan, but the focus remains more specific to trade in goods. Despite the increasing importance of services sector and services trade, there has been a dearth of literature that examined determinants of services exports and its trade in case of Pakistan. Some of the studies that examined determinants

of the services sector do so by using old methodologies and limited number of variables. These gaps in literature provided the motivation for this study.

Research objective

To explore the determinants of services exports of Pakistan with its major trading partners.

Research questions

The study explored the following research questions:

- What are the key determinants of services exports of Pakistan with its top trading partners?
- What implications do these findings about services trade determinants have for trade policy and measures for Pakistan to improve services exports.
- What is the impact of services trade restrictions imposed by Pakistan and its trading partners on services exports of the country.

The study explored the determinants that impact the services export flows of Pakistan with its major trading partners by using gravity model approach with suitable estimation techniques i.e. Fixed Effect Model (FEM), Random Effect Model (REM) and Pseudo Maximum Likelihood (PPML). The study hypothesized that the economic size of Pakistan and its trading partners positively influences services exports of Pakistan. Furthermore, services trade restrictions are expected to have a negative impact on services exports. These hypotheses provided guidance in the empirical analysis and helped explore the relationships between services trade, policy barriers, and export performance. The contribution and significance of this study is that it focuses on services exports of Pakistan and used extended gravity model with more relevant variables. The study used panel dataset for top 20 trading partners of Pakistan in services exports which are having 82.5% share in total services exports of Pakistan.

LITERATURE REVIEW

An extensive number of studies have covered various aspects of international trade in services including the significance of services trade for economic growth of a country and the major determinants that impact the trade flows between the countries and regions. Francois and Hoekman (2010) emphasized that services are vital for export growth, and they play a key role in improving competitiveness of all firms. Van der Marel (2012) stated that determinants of services trade are different from goods and services trade. On the other hand, Breinlich and Criscuolo (2011) emphasized that there existed many common things between goods and services trade. Higher GDP reflects a more substantial economic scale and greater capacity to produce and export services. Eichengreen and Gupta (2013) pointed out that per capita income of exporter country, and market size are important determinants of services exports. Visús and Zayas (2003) referred to foreign income as a major determinant of services exports flows. Distance reflects transportation and communication costs and various studies such as Boulatoff et al., (2022) and Kimura and Lee (2006) referred distance as key determinant of services exports. An educated and skilled workforce is fundamental for the provision of high-quality services. Higher literacy and education levels ensure that workers have the basic skills and expertise to meet global standards in different services industries. Skilled labor force provides comparative advantage in services trade (Van der Marel, 2012). Nyahoho (2010) pointed out that human capital is an important factor for enhancing exports of computer and information services whereas research and development intensity significantly impact on the construction services computer and information services, and royalties and license fees. Studies such as Nasir and Kalirajan (2013) emphasized that modern services exports rely heavily on skilled workforce and ICT related infrastructure (Sahoo & Dash, 2014) which have positive relationship with services exports.

The Service Trade Restrictiveness Index (STRI) reflects the existence of regulatory barriers to international trade which negatively affects the exports and imports of services (Nordås & Rouzet,

2017). Barriers to service trade are applied in the form of restricted mobility of individuals, barriers to foreign entry and ownership, policies that favor local over foreign producers and consumers, and general restrictions on competition. Van der Marel and Shepherd (2013) also highlighted the negative relation between restiveness index of World Bank and cross-border trade in financial services and transport. Trade barriers negatively affect the services trade and foreign affiliate sales in the importing country. Andrenelli et al., (2018) found that policies restricting trade in services resulted in decreasing the output of multinational enterprises' foreign affiliates in both manufacturing and services sectors. Regional Trade Agreements help in decreasing trade barriers in services between member countries. RTAs provide market access and allow traders to increase their access to potential customers. Shepherd and Van Der Marel (2010) pointed out that regional trade agreements are important determinants of service trade. Lin and Lin (2023) examined the positive and significant impact of RTAs on service trade and services exports.

Ajmair et al., (2016) applied ARDL method of estimation to examine the determinants of services sector growth in Pakistan. The study analyzed that foreign trade, government expenditures, market size and population growth are major determinants of services sector output growth in the long run. Foreign trade and personal remittances are important determinants of services sector growth in the short run. Mujahid and Alam (2014) examined that population, FDI, consumption and investment are major determinants of service sector growth in Pakistan. Although literature on services sector of Pakistan exist, however there is a lack of in-depth analysis of services trade and exports. Most of the existing studies provided an overview of the services sector while neglecting the significance of services trade and services exports. Then, the existing literature on Pakistan's services sector briefly examines the determinants of services sector and do not discuss determinants of services exports in detail. The literature gap also existed in exploring the impact of service trade restriction on services exports of Pakistan.

Trends and Patterns of Services Trade of Pakistan

Global services are showing a dynamic transformation as digitalization has revolutionized cross-border delivery and consumption of services. Firms can now reach out to potential customers and suppliers globally due to new data networks, digital tools, and platforms (Arshad & Mukhtar, 2019). The composition of services exports of Pakistan is progressing, with a special attention by the government on knowledge-intensive services such as Information Technology (IT), professional services and telecommunications. The major portion of total population of Pakistan is based on youth which have promising digital skills and expertise based on which a significant growth in services sector exists for Pakistan.

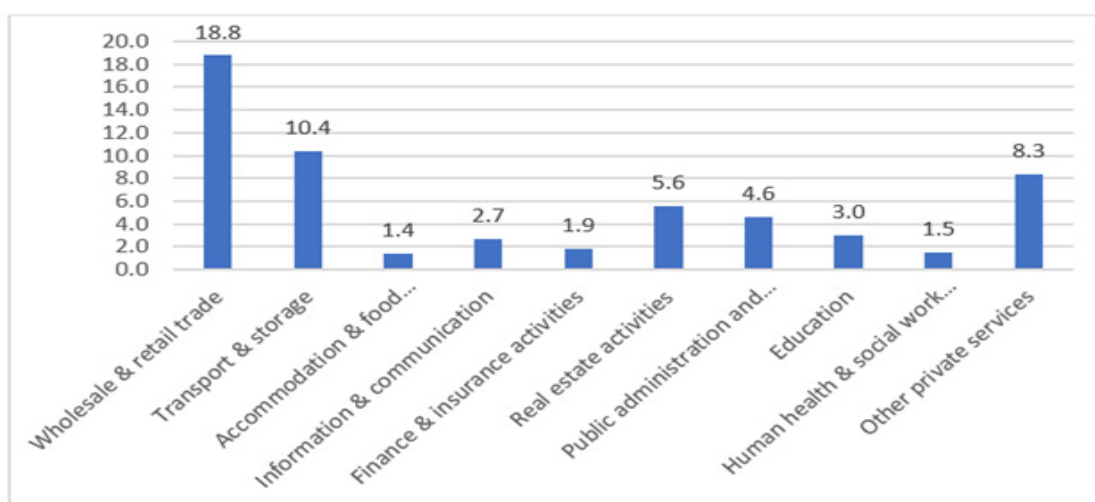


Fig. 1. Share of services sector in GDP of Pakistan (2022)

Source: State Bank of Pakistan (2023)

Within services sectors, wholesale and retail trade has a major contribution towards GDP of Pakistan (Figure 1). According to Pakistan Bureau of Statistics (2020-21), 14.3% of total employment is engaged

in wholesale and retail trade sector. Transport and storage are another major subgroup within services sector which has a significant share in GDP of Pakistan. The study by Manzoor et al., (2019) emphasized that growth of Pakistan is heavily reliant on the development of its transport networks.

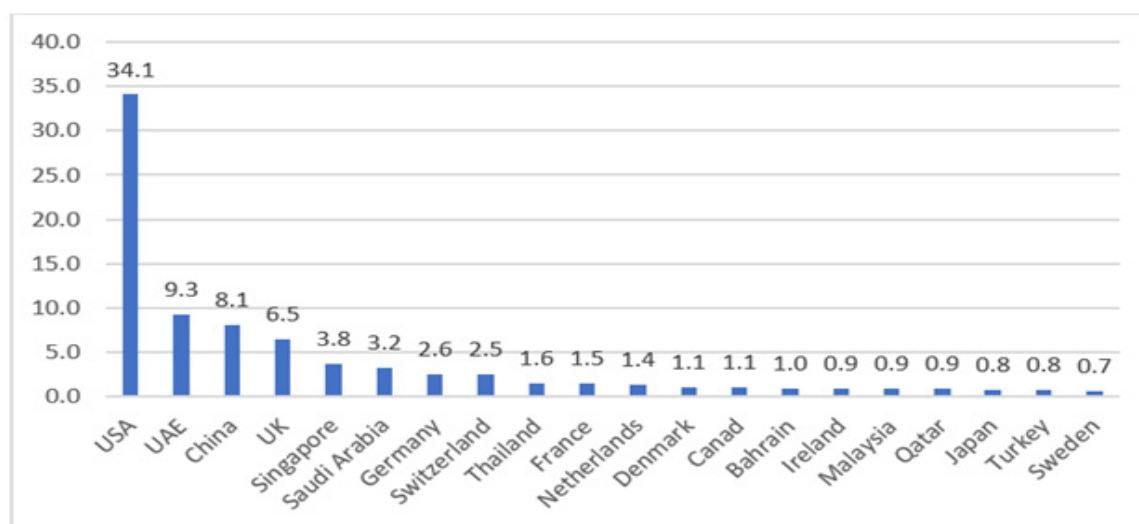


Fig. 2. Major trading partners of Pakistan in services exports (2018-2022)

Source: State Bank of Pakistan (2023)

USA is leading export destination for services as Pakistan exported 34.1% of its total services between 2018-2022 towards USA. UAE and China are other major export destinations (Figure 2). The major services exports to USA include IT exports whereas business services are major services exports towards China. Pak-China Free Trade Agreement in Services provided more business prospects and helped in promoting trade integration between two countries.

Table 1

Exports of services (USD Million)

Description	2018	2019	2020	2021	2022
Total services	5933	5,870	5,393	6,544	7,494
Telecommunication, computer and information services	1,127	1,292	1,716	2,451	2,651
Other business	1,479	1,478	1,345	1,542	1,743
Government	1,238	1,214	977	1,031	1,117
Transport	895	891	605	611	873
Travel	390	494	439	559	738
Financial services	135	162	113	153	249
Insurance and pension services	51	42	46	46	52
Construction	597	277	131	120	43
Personal/cultural and recreational	11	11	7	12	15
Intellectual property	7	-	11	13	13
Maintenance	3	9	2	6	-

Source: State Bank of Pakistan (2023)

Total services exports of Pakistan increased from \$ 5,870 million in 2019 to \$ 7,499 million in 2023 showing growth of 27.8% during the period. Telecommunication, computer and information services have the major share in total exports as the exports of this sub-sector were \$ 2,717 million in 2023. The growth in exports of ICT sector is largely due to increase in exports of computer services such as IT exports (State Bank of Pakistan, 2023). The study by Javed (2020) also examined that ICT sector is providing valuable export earnings to Pakistan. State Bank of Pakistan provided relaxation in retention limit by increasing it from 35% to 50% for IT exporters and freelancers which played a key role in boosting confidence of firms

in the government policies and enhancing trading activities.

Table 2
Comparison of services exporters in Asia (\$ Million)

Exporters	2018	2019	2020	2021	2022
China	271,451	283,192	280,629	392,198	424,056
India	204,956	214,762	203,145	240,510	309,374
Singapore	207,494	219,792	214,093	266,532	291,256
Malaysia	40,231	41,089	22,155	21,246	31,683
Bangladesh	5,446	6,214	6,020	7,475	8,270
Pakistan	5,933	5,870	5,393	6,544	7,494
Sri Lanka	8,374	7,474	3,035	2,475	3,062

Source: Nasir and Kalirajan (2016)

Table 2 highlights the level of service exports by countries in Asia. It can be observed that China is the leading exporter of services while India is the second country in terms of services exports. Despite of growth in total services exports, the level of exports of Pakistan is still lower as compared to other Asian countries.

METHODOLOGY

The gravity model is more suitable for services trade as compared to goods trade, as physical proximity among the producer and consumer is crucial for certain types of services (Dao Ngoc et al., 2014). The study applied the gravity model to explore the determinants of services exports of Pakistan. The classical gravity model rests on the notion that the trade flow among two countries is proportional to the product of economic mass of each country normally measured through GDP while taking into the account the distance between the countries (Christie, 2002).

$$\log Export_{ijt} = \beta_0 + \beta_1 \log GDP_{it} + \beta_2 \log GDP_{jt} + \beta_3 \log Dist_{ij} + \varepsilon_{ij} \quad \text{equation (1)}$$

The dependent variable is the services exports of Pakistan. A gravity model is applied to determine the factors that impact Pakistan's services exports where GDP and geographical distance are included as the basic independent variables. The subscript *i* represents Pakistan and *j* represents trading partners of Pakistan. The gravity models can be classified as classical or extended gravity model according to the definition of trade costs. In the classical model, trade costs are measured by the physical remoteness among the trading partners. Whereas, in the extended gravity model, trade costs include bilateral as well as unilateral cost factors. Therefore, our study has employed an extended gravity model where additional variables are added to represent unilateral costs following Anderson and Wincoop (2003). Other independent variables include population, mobile subscriptions, exchange rate, Foreign Direct Investment (FDI), services imports of trading partners, employment in services sector of Pakistan, economic complexity index, trade as percentage of GDP, logistics performance index, Regional Trade Agreement (RTA), and Services Trade Restrictiveness Index (STRI).

Specified equation to estimate the model is as follow:

$$\begin{aligned} \log ser exp_{it} = & \log gdp_{it} + \log gdp_{jt} + \log dist_{it} + \log pop_{it} + \log pop_{jt} + \log mob_{it} + \log mob_{jt} + \\ & literacy\ rate_{it} + \log exchange\ rate_{it} + \log fdi_{it} + \log service\ imports_{jt} + employment\ in\ services_{it} + \\ & economic\ complexity\ index_{it} + logistics\ performance\ index_{it} + STRI_{it} + STRI_{jt} + RTA \end{aligned} \quad (1)$$

The study used panel data framework to estimate the determinants of services exports of Pakistan and used data from 2000–2022. Panel estimation has various advantages as compared to cross section

data and time series data as panel estimation controls individual heterogeneity. Besides, more degree of freedom decreases the collinearity between explanatory variables and enhances the efficiency of econometric findings. Baltagi and Baltagi (2008) pointed out another advantage of panel data that it also measures effects that are not detectable in cross sections and time series data. Three models have been used in the literature which are termed as appropriate for panel data, this includes pooled OLS, fixed effects model and random effects model. The pooled OLS assumes that all countries and periods are homogeneous (Wooldridge, 2010). The fixed effects model should be used if the effect variables are correlated, while the random effects model is preferable when there is no such correlation. Silva and Tenreyro (2006) emphasized that poisson pseudo maximum likelihood (PPML) should be used when there involve zero trade flows, hence it is the best fit for estimating the gravity models. Studies such as Mulabdic and Yasar (2021) estimated the gravity model through PPML method.

Data Sources

The data for the time period of 2000-2022 is taken from various sources including State Bank of Pakistan (SBP), International Trade Centre (ITC), Economic Survey of Pakistan, the World Bank database and OECD. The study incorporated 20 trading partners of Pakistan in services sector, reflecting 82.5% share in total services exports. The selection of countries is based on the performance of the service export of Pakistan with each trading partner (measured in terms of the share of service export to trading partner with respect to the total services exports of Pakistan) as well as on the availability of data.

Description of the Variables

Services exports are the total value of service sector exports of Pakistan. The variable shows the services exports with respect to each trading partner of Pakistan. The data on services exports is taken from State Bank of Pakistan. The GDP of trading partners is an important factor that impacts on the demand for export of services as it indicates the external demand. A higher level of GDP indicates higher external demand, thus higher exports of services. The inclusion of GDP as an independent variable reflects the size of the country and income effects (Freund & Wienhold 2002). Distance can be regarded as a proxy for more than just transport costs (Leamer, 2007) while it also indicates cultural, linguistic, legal differences and differences in time zones. Distance between the two countries is generally expected to exert a negative impact on goods trade, In the case of services the impact of distance on services is not clear from the literature, as services do not have to be physically transported from one location to another. Some services require the presence of people while others can be done virtually. Hence, the significance of distance in services trade is low. Population indicates the market size and the sign of the coefficient can take both positive and negative value. Signs of the population coefficient can also take positive or negative value based on whether the country is developing or developed (Giorgio 2004).

FDI has an integral part in international trade and many developing countries rely on FDI inflows for their growth. This study took FDI inflows from partner countries in Pakistan. The impact of FDI on exports and trade is mixed as studies such as Santos-Paulino (2005) pointed out the positive impact of FDI on exports. Communication facilities are important determinants of services trade as countries consider the host country's communication facilities such as internet speed and the mobile phone network while doing services trade. The improvement in communication facilities helps in accessing the global markets (Majeed et al., 2006). This study used mobile cellular subscriptions as a measure of communication facilities and expected a positive link between communication facilities and services exports. The performance of the services sector relies heavily on availability of human capital. A skilled and educated workforce effectively contributes to productivity and competitiveness which increases services exports. Hence, high human capital stock is positively associated with exports which is shown through literacy rate (adult, % of people aged 15 and above). Exchange rate is the relative price of the currencies of two nations and this study takes an average period exchange rate with each trading partner. The logistics performance index shows the importance of trade facilitation in export flows and has a positive impact on exports. The index pointed out the overview of customs procedures, logistics costs and the quality of the infrastructure required for land and sea transport. Hence, improvements in the components of the

Table 3
 Description of Variables

Variable/symbol	Definition	Unit of measurement	Source
Services exports of Pakistan (ser_exp_{it})	Services exports are the total value of service sector exports of Pakistan	Thousand \$	State Bank of Pakistan.
GDP (gdp_{it}, dp_{it})	Gross Domestic Product current \$	Thousand \$	World Development Indicators
Distance ($dist_{it}$)	Distance from capital of Pakistan to capital of partner country	Miles	CEPII
Population (pop_{it}, pop_{jt})	Population, total	Number in thousand	World Development Indicators
Mobile subscriptions (mob_{it}, mob_{jt})	Mobile cellular subscriptions	Number in thousand	World Development Indicators
Literacy rate ($literacy_rate_{it}$)	Literacy rate, adult total (% of people ages 15 and above) of Pakistan	Percentage	World Development Indicators
Exchange rate ($exchange_rate_{it}$)	Exchange rate	Official exchange rate of Pakistan (LCU per US\$, period average)	State Bank of Pakistan
FDI (fdi_{it})	Foreign Direct Investment by partner country in Pakistan	Thousand \$	State Bank of Pakistan
Service imports ($service_imports_{jt}$)	Service imports by partner countries (current \$)	Thousand \$	World Development Indicators
Employment in services ($employment_in_service_{it}$)	Employment in services (% of total employment)	Percentage	World Development Indicators
Economic Complexity Index ($economic_complexity_index_{it}$)	The Economic Complexity Index is a ranking of countries based on the diversity and complexity of their export basket	Ranking	Harvard Growth Lab
Logistics Performance Indicator ($logistics_performance_index_{it}$)	Logistics performance index: Overall (1=low to 5=high)	Index	World Development Indicators
Service Trade Restrictiveness Index (STR_{it}, STR_{jt})	The indices quantify the identified restrictions across five standard policy categories, with values between zero and one	Index	The World Bank-OECD
Regional Trade Agreement (RTA_{it})	Regional Trade Agreement in Services	Number	World Trade Organization

index indicate that the country can increase its trade volume (Martí et al., 2014).

Services imports show the demand for services from trading partners and more imports by partner countries means that there exist more prospects for exports. Hence, the coefficient of services imports is expected to take positive value indicating that with increase in services imports by partner countries, exports of services of Pakistan are expected to increase. Employment in services shows the percentage of labor force that is engaged in services sector of Pakistan. Higher percentage of employment indicates that more labor force is working in the sector reflecting the higher demand for their services. Thus, employment in services is expected to have a positive relation with services exports. Countries that have higher trade as a percentage of GDP indicate that they are more engaged in trade. Thus, a positive relation between trade as percentage of GDP and services exports is expected. Previous studies such as Gul and Yasin (2011) used trade as a percentage of GDP to examine its impact on bilateral trade volume. The Service Trade Restrictiveness Index (STRI) shows how restrictive an economy is for service trade. The higher restrictions resulted in lower services trade which impacted the trade flow. Hence, a negative relation existed between STRI and services exports. The study used both data sources including World Bank and OECD to explore STRI. The Economic Complexity Index (ECI) indicates the composition of a productive output of a country and shows the structure that emerges to hold and combine knowledge. A higher value for ECI suggests that a country has the capacity to produce and export a wide range of services, signifying a sophisticated economy with advanced skills and technology. Thus, a positive relation between ECI and services exports is expected. The Regional Trade Agreement helps in increasing the trade flows between member nations. Pant and Paul (2018) pointed out that RTAs promote intra-regional trade volume and welfare of member countries. However, benefits related to RTA depend upon the structure of cost in partner countries as compared with the cost structure in non-member countries. Hence, both positive and negative values can be taken by the RTA coefficient.

Results & Discussion

Table 4 presents the results from the gravity equation where services exports of Pakistan is taken as the dependent variable. Column 1 defines the independent variables whereas other columns contain results from fixed effect model, random effect model and PPML.

Table 4

Determinants of services exports of Pakistan

Variables	FEM	REM	PPML
Constant	-10.64689***	-14.87371	-1.335284
Log GDP _i	0.518868***	0.714671*	0.104364
Log GDP _j	0.093625**	0.445495**	0.225692***
Log Distance	-	0.836283*	-0.093591
Log Pop _i	1.472720***	0.753485	-0.209647
Log Pop _j	-1.201691***	-0.183048	0.021100
Log Mob sub _i	0.094145***	0.121590*	0.025558
Log Mob sub _j	0.157939***	0.039222	-0.013886
Literacy rate _i	-0.004616**	-0.011904	-0.002178
Log Exchange rate _i	-0.011134**	-0.010281	0.047173***
Log FDI _i	0.052974***	0.072084***	0.023934***
Log Service imports _j	0.283337***	-0.157274	-0.027947*
Employment in services _i	0.078315***	0.075145***	0.022009***
Economic complexity index _i	0.010076***	0.009783***	0.003141*
Trade % of GDP _j	0.000421***	0.001372*	0.000996***

Logistics performance index_i	0.285986***	0.298090**	0.091231*
STRI_i	-0.021731***	-0.020649**	-0.004428
STRI_j	0.006160***	0.006719***	0.003614***
RTA	-	0.116781	-0.156335***
Diagnostic Test			
R-square	0.998774	0.379287	0.523439
Adjusted R-square	0.998672	0.353952	0.503988
S.E of regression	1.029946	0.389091	0.520274
F-statistics	9866.498	14.97074	-

Significance level at 1% (***) , 5% (**), and 10% (*)

The estimation results presented in table 3 indicate that most of the variables are significant and their coefficients take the sign as explained in the literature on standard gravity model. In fixed effect model, all variables except GDP of partner countries, exchange rate, and literacy rate (which are significant at 5 percent) are significant at 1% level. However, only the sign of literacy rate turned out to be contradictory as it shows a negative coefficient value. This indicates an inverse relationship between literacy rates and service exports, which needs further research. In random effect model, FDI, employment in services, economic complexity index and STRI of partner countries are significant at 1 percent of significance. In PPML, variables such as GDP of Pakistan, exchange rate, FDI, trade as percentage of GDP and STRI index are significant at 1 percent level of significance. STRI coefficient reinforces the adverse effects of regulatory barriers on services trade flows.

The results under fixed effect model indicates that if GDP of partner countries increase by one percent, services exports of Pakistan increase by 0.93 percent. This shows that the economic growth of trading partners significantly enhances demand for Pakistan's service offerings. The number of mobile cellular subscriptions in both Pakistan and partner countries positively impact the services exports. The results are like studies such as Majeed et al., (2006) and Freund and Weinhold (2002) who indicated that communication facilities have a positive impact on services exports. Recent advancements in mobile cellular teledensity and broadband penetration in Pakistan, as highlighted by Javed (2020), underscores the critical role of improved connectivity in promoting trade relationships and export performance.

A 1% increase in FDI from partner countries results in a 0.05% increase in Pakistan's services exports. This finding is consistent with the literature, such as Wong et al., (2009), which examined the positive and significant relation between FDI and services exports. Services imports of partner countries are positively related with services exports of Pakistan as 1% increase in services imports by partner countries tend to increase services exports of Pakistan by 0.28 percent. This suggests that increased demand for services in partner countries creates opportunities for Pakistan to expand its exports. Besides, employment in services sector of Pakistan, economic complexity index of Pakistan, trade as percentage of GDP of partner countries, and logistics performance index are all positively related with services exports of Pakistan.

The results of random effect model indicates that 1% increase in the GDP of Pakistan's trading partners results in a 0.44% increase in services exports. This indicates that economic growth in partner countries positive impacts their demand for Pakistan's services. FDI positively affects services exports and 1% increase in FDI in Pakistan increases services exports by 0.07 percent. Improvement in logistics performance index can promote services exports of Pakistan while its coefficient is significant at 1% level. An improved LPI score reflects a better logistics environment, which enhances trade competitiveness and economic performance. This finding aligns with Töngür et al., (2020), who examined a similar relationship between LPI and export flows. The Services Trade Restrictiveness Index (STRI) of Pakistan has a negative and significant impact on services exports. Higher restrictions lead to lower export volumes, highlighting the detrimental effects of restrictive trade policies. Banik and Bhaumik (2014) identified Pakistan as one of the most restrictive economies in South Asia in terms of STRI. Similarly, Javed (2020) emphasized that

high service trade restrictions contribute to low trade volumes between Pakistan and South Asia across various service sectors.

The findings from PPML method show that a 1% increase in the GDP of Pakistan's trading partners results in a 0.22% increase in services exports, with the coefficient significant at the 1% level. A higher GDP reflects more demand for service export from trading partners. This result is consistent with studies such as Guisan and Cancelo (2002) which pointed out positive and significant impact of GDP of trading partners on services exports of home country. Exchange rate and FDI also positively influence the services exports of Pakistan. Ahmadzadeh et al., (2012) found a similar relationship between FDI and services exports and suggested that FDI promotes services exports growth. A 1% increase in employment in Pakistan's services sector is associated with a 0.02% increase in services exports. This demonstrates the importance of a skilled and available workforce in enhancing export capacity. Higher trade openness, as indicated by trade as percentage of GDP, is positively associated with Pakistan's services exports. This highlights the role of open trade policies in driving export growth.

Higher economic complexity shows a competitive advantage in exports of high-value, knowledge intensive services including ICT and finance. These services require specialized skills and expertise, which often exist in more economically complex nations. The findings indicate that there is positive and significant relationship between ECI and services exports of Pakistan. Economically complex countries are more resilient to economic shocks and changes in global demand. ICT exports of Pakistan show significant growth amid the Coronavirus (Covid-19) shock as demand of digital services increased during the Covid-19 period and afterwards (State Bank of Pakistan, 2023). Better economic complexity also attracts foreign investment into the services sector as investors intend to explore countries having advanced capabilities. More than \$ 500 million investment in IT, telecom, and related sectors has been secured during a tech expo 2024. Better logistics performance improves the accessibility of a country towards global markets. Based on efficient logistics networks, it has become easier for service providers to reach global customers and increase their market presence. This study observed positive impact of LPI on services exports of Pakistan. High LPI score helps in encouraging investment in the various sub-sectors of the services. The global e-commerce giant 'Alibaba' has acquired Pakistan's leading e-commerce platform 'Daraz' for an estimated \$200 million investment. LPI also covers the quality of trade and transport infrastructure for which Pakistan has cooperated with China under the China-Pakistan Economic Corridor (CPEC) through which significant digital investments have been made to improve digital infrastructure including construction of fiber optics and facilitating high-speed internet connectivity for major cities of Pakistan. Besides, data centers have also been established to fulfill the increasing demand for cloud computing and data storage services in Pakistan.

STRI covers trade restrictions across various services sectors and existing challenges. The study examined that STRI of Pakistan is negatively impacting its services exports. Pakistan is identified as most restrictive economy which have higher STRI as compared to other South Asia nations. Visa process for tourists in Pakistan is a lengthy and complicated process whereas people visiting Pakistan for religious tourism also faced many restrictions. This affected the growth of services exports of Pakistan in travel and tourism sector. The temporary movement of persons is restricted which is affecting the growth of IT related services exporters in Pakistan as due to restrictive visa regime and security risk perception, foreigners are reluctant to travel to Pakistan. Hence, enterprises of Pakistan find it difficult to attract businesses from abroad. IT related businesses have also identified regulatory restrictions as major impediments which are affecting exports of the IT sector (World Bank, 2022). Besides, regulations also affect payment mechanisms in Pakistan making it difficult for businesses to receive and send online payments. As per the Foreign Exchange Regulation Act 1947, foreign investment in digital space is restricted. There are barriers to foreign exchange regime which create challenges for foreign firms while transferring the working capital, profits, and fixed investment (Javed, 2020).

CONCLUSION

The services sector has become a crucial driver of global economic growth, especially for developing countries. The contribution of services sector towards global GDP indicates the significance of this sector for the global economy and development. Besides, it also provides support to other sectors such as agriculture and manufacturing sectors which help in increasing their productivity and growth. The advancements in the form of digital technologies are helping in overcoming the geographical barriers. The impact of digital services extends beyond trade as they are also assisting in achieving healthcare education, and agriculture related SDGs. Various sub-sectors within the services such as ICT and financial services are playing a key role in economic development through the provision of innovative products and services.

Services sector is important for Pakistan's economy based on its contribution to GDP and share of labor force employed within different services sectors. Services exports are providing valuable foreign exchange earnings, and it can also help in reducing the trade deficit through appropriate measures. The government of Pakistan has taken various policies and measures through which it intended to develop services sectors and exports. The study examined the determinants of services exports of Pakistan with respect to its major trading partners. The data was taken for the time period of 2000-2022 and the gravity model is applied through fixed effects, random effects and PPML method. Besides, the study also examined the service trade flows of Pakistan. It was observed that exports of services have increased considerably over the last few years whereas imports have decreased slightly. The major markets for services exports of Pakistan include USA, UAE, China and UK. The findings from gravity model indicated that GDP of partner countries is significant determinant of services exports of Pakistan, and both have positive relationship. FDI by partner countries in Pakistan is also important determinant having positive and significant relationship with services exports. Employment in the services sector has a positive relationship with services exports as more labor force indicates the sector is experiencing growth. The logistics performance index also has a positive relationship with services exports as improvement in infrastructure shows that the trade competitiveness of a country is improving. STRI has a negative relationship with services exports as restrictions affect the trade flow.

The government is focusing on improving trade and related infrastructure which will help in better LPI score. Establishing software technology parks and promoting IT-enabled logistics systems of logistics operators are some of the measures that will help in facilitating businesses in the services sector. The study observed a positive and significant relationship between LPI, and services exports and the implementation of digital solutions will help in improving efficiency and reliability of service delivery. The role of economic complexity is also important, and the government can increase services exports through investing in education, training, and infrastructure that support complex services. Service trade restrictions in the form of constrained visa regimes and barriers to temporary movement of people are affecting business activities and exports of services sector. Higher STRI score of Pakistan in comparison of other South Asian countries is an indication that services sector is facing challenges which are affecting growth of services exports. Besides, regulatory restrictions also act as major barriers which impact exports of services, specifically the IT sector which is a major sector for services exports.

Policy Recommendations

For reducing service trade barriers, government of Pakistan should simplify regulations for business and develop payment gateways and ease payment related restriction. A decrease in restrictions on foreign investment and streamlining the administrative procedures will also help in promoting trading activities in services, which will ultimately increase services exports.

Competing Interest

The authors reported no potential conflict of interest.

Authors' Biography

¹ **Asif Javed** is a PhD Research Scholar at the School of Economics, Quaid-i-Azam University in Islamabad – Pakistan and an Associate Research Fellow at Sustainable Development Policy Institute (SDPI). He received his Doctorate Degree in Economics from Quaid-i-Azam University in Islamabad – Pakistan.

² **Farzana Naheed Khan (PhD)** is an Assistant Professor at the School of Economics, Quaid-i-Azam University in Islamabad – Pakistan. She obtained her Doctorate Degree in Economics from Quaid-i-Azam University in Islamabad – Pakistan.

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