CAREC Institute
Visiting Fellow Program

SERVICES GRAVITY IN CAREC COUNTRIES

Naseem Faraz

December 2021

CAREC INSTITUTE

CAREC Institute

Visiting Fellow Program

Services Gravity in CAREC Countries

Naseem Faraz, PhD
Pakistan Institute of Development Economics

December 2021

Disclaimer

Under the Visiting Fellow Program (VFP), the CAREC Institute has issued research contracts in 2021 to support scholars and researchers to produce targeted knowledge products which would add to the body of knowledge on regional cooperation in CAREC.

Scholars were encouraged to research CAREC integration topics and undertake comparative analysis between (sub)regions to draw lessons for promoting and deepening regional integration among CAREC member countries particularly as anticipated in the CAREC 2030 strategy and stated operational priorities.

This paper is written by Dr. Naseem Faraz from Pakistan Institute of Development Economics, and approved by the CAREC Institute Publication Board consisting of Syed Shakeel Shah (Director), Dr. Ghulam Samad (Publication Board Secretary), Dr. Qaisar Abbas (Chief of Research Division), Dr. Iskandar Abdullaev (Deputy Director Two), and Dr. Hans Holzhacker (Chief Economist). It is released unedited as written by the author.

The views expressed in this paper are the views of the author and do not necessarily reflect the views or policies of CAREC Institute, its funding entities, or its Governing Council. CAREC Institute does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with CAREC Institute official terms.

By making any designation of or reference to a particular territory or geographic area, or by using country names in the report, the author did not intend to make any judgment as to the legal or other status of any territory or area. Boundaries, colors, denominations, or any other information shown on maps do not imply any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

This report is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) https://creativecommons.org/licenses/by/3.0/igo/. By using the content of this publication, you agree to be bound by the terms of this license. This CC license does not apply to other copyright materials in this paper. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. The CAREC Institute cannot be held liable for any claims that arise as a result of your use of the material.

Please contact the author and CAREC Institute for permission to use or otherwise reproduce the content. For additional queries, please contact rd@carecinstitute.org

Table of Content

List of Figures

List of Tables

ABSTRACT

The Services sector is the largest sector in the CAREC countries. It is accounting for 51% of GDP of CAREC countries. The role of domestic and international services is inevitable for export growth, employment and income opportunities. Acknowledging the importance of the role of service, the free trade agreements (FTA) in products (goods) can accelerate trade growth if government also consider FTA in service sector. In the region, the trade agreements in products is prioritized but the services sector is not focused, the knowledge on the margins of trade in services is also limited. This study aims to investigate the gravity of trade in services in the CAREC region. First, we investigate the services' export-import margins at sectoral level for the individual member of the CAREC region. Our finding suggests that there is huge dissimilarity in trade in services across the members. We also find there is strong complementarity in services exports by the member and import of services from Non-CAREC countries. It provides suggestive evidence on great potential of trade in services arrangements between the countries. Secondly, we use modifies Gravity Trade Model to investigate the impact of services flow on the potential bilateral destination-product trade to highlight the effective trade between the member countries. Our results suggest that the higher flow of trade in services increases the products trade positively. In the absence of agreement, although result is not strongly significant but it suggest the positive direction of trade. This evidence on the services gravity in CAREC provides insight on the feasibility of potential bilateral and multilateral free trade agreement in services sector between CAREC countries and highlight the '***Look at central-east policy'***

Keyword: *Trade in services, Free trade agreement, Integration, CAREC countries, Trade Potential*

1. INTRODUCTION

The Services sector is the largest sector in the CAREC countries. It is accounting for 51% of GDP of CAREC countries, services contribute more than 60% of the GDP of Afghanistan, Georgia, Tajikistan while more than 50% in Pakistan, China, and Kyrgyz, among others (see Figure). It also constitutes more than 40% as export value added in the region. This share of services sector is contributed by the domestic services. The contribution of trade in services in total trade viz-a-viz in GDP is very small. The trade in products can never be increased without telecom, internet, finance, accounting, legal services and transportation and logistics services.

The bilateral trade agreements and multilateral trade among CAREC members can be instrumental for exploring the trade potential of Central Asia and its neighboring countries. The FTAs help increase trade through a lowering of tariff and non-tariff barriers among the partner countries. At the same time, other factors that restrict trade in services.

The role of domestic and international services is inevitable for export growth, employment and income opportunities. Acknowledging the importance of the role of service, the free trade agreements (FTA) in products (goods) can become more successful if government also consider service sector agreements with the same countries. The agreement in services can enlarge these opportunities to the mutual benefit of the participating countries. The reduction in tariff-lines perhaps increase the demand-supply in the member countries, however, an accelerated and a multiplier effect can only be observed with FTA in services. This requires in-depth knowledge on bilateral product trade, and trade in services. It also requires knowledge of the networks of the complementarity of the services-goods in the member countries.

Considering the importance of services sector for trade pattern, what trade strategy is needed to change to increase income opportunities for individuals and small and big businesses. The FTA in services sector in CAREC countries is ignored, the dissemination or the margins of trade in services is not known to the member countries. Also, the non-tariff barrier hinders the trade in services in general and particularly in the CAREC countries.

With technology advancements, international services trade has become the new frontier for expanding and diversifying exports, providing significant opportunities for developing and least developed countries. WTO statistics show that the share of developing economy services export increased from 24% in 2005 to 32% in 2015, and the share of low income countries in global services export increased from 0.4% in 2005 to 0.8% in 2015. Increased services export from the low income countries is an important contributor of meeting the sustainable development goals of doubling the export from LDCs by 2020.

This study aims to investigate the Gravity of Trade in Services in CAREC region. First, we investigate the services' export-import margins at sectoral level for the individual member of the CAREC region. These sectors include trade in financial, travel, transport, port, information technology along with facilitation for temporary movement of business people, contractual service supplies, movement of independent professionals in accounting, architecture, engineering, medical and dental services, as well as in nursing and pharma, and management consulting services. Our finding suggests that there is huge dissimilarity in trade in services across the members. For example, the transport sector of Tajikistan and Kazakhstan, Afghanistan, Pakistan, and Azerbaijan shows less than 0.002 values for Export Similarity Index (ESI) which indicates the potential to enhance the export of transport service to other CAREC countries. The finance, telecommunication, construction and manufacturing service also indicates that the trade service of CAREC countries has the lowest similarity across the countries.

Further, we investigate the complementarity in services exports by the member and import of services from Non-CAREC countries. We find there is strong complementarity in services exports by the member and import of services from Non-CAREC countries. This complementarity in services measures the degree to which the export pattern of one country matches the import pattern of a region. Our calculation for the export of transport service shows a match of the import-export pattern of CAREC countries. We find index for Azerbaijan (0.85), Afghanistan (0.86), Pakistan (0.84), and Tajikistan (0.60). Notwithstanding, the financial services, telecommunication, and construction, manufacturing services sectors of CAREC countries strongly matching the pattern of the import-export pattern. It provides suggestive evidence on great potential trade in services arrangements between the countries.

Finally, we use modifies Gravity Trade Model to investigate the impact of services flow on the potential bilateral destination-product trade to highlight the effective trade between the member countries. Our results suggest that the higher flow of trade in services increases the products trade positively. In the absence of agreement, although result is not strongly significant but it suggest the positive direction of trade. This evidence on the services gravity in CAREC provides insight on the feasibility of potential bilateral and multilateral free trade agreement in services sector between CAREC countries. Examining the Gravity of trade in service, this study provides contributory research that must set the stage for potential Bilateral and multilateral FTA in services sector between 11 CAREC countries.

The regional trade agreements in products is prioritized[1] but the services sector in CAREC countries is not focused, the knowledge on the margins of trade in services is also limited. The opening-up opportunities within region may be re-directed and accelerate trade growth in both product and services sector.

2. LITERATURE ON TRADE IN SERVICES AGREEMENTS

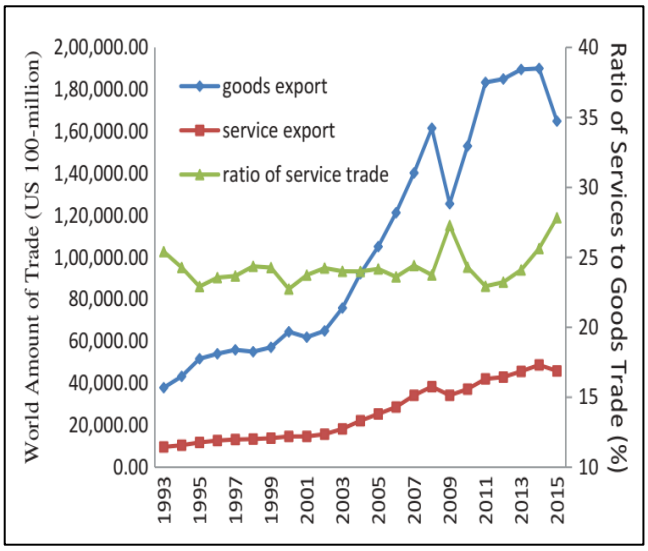
Literature strongly suggests that free trade agreements (FTA) enable countries to liberalize the trade of goods and services across countries. It reduces or eliminate the trade/market barriers for the smooth flow of trade goods and services (Ali and Panhwar, 2017; Edward, 1993). In recent years, the demand for trade in service has increased significantly as the increase in integration of world markets (Yujiang et al, 2019). The review provides the baseline knowledge to examine how the agreement on trade in services influences regional exports, employment and income.

The global service sector accounts for two-thirds of the total Gross Domestic Product (GDP)[2] and over half of the total employment in developed countries (WTO, 2010). The Middle East and North Africa (MENA) in 2010, shared 4.8 percent of global trade service, while 19 percent of the region's GDP in 2009 and service value added accounted for more than 40% of GDP (Karam and Zaki, 2013). Gulf Cooperation Council (GCC) is emerging as a diversify their economies and heavily investing in service to reduce their dependence on oil eastern countries heavily investing in service to reduce. The services sector for the CAREC region accounts for 51 percent of GDP. Services are a crucial input, particularly in the production of goods, that account for 50 percent of global trade. Figure 1 shows the ratio of services trade; in 2015, it was 27.8 percent to goods traded. Yujiang et al, (2019) said, factors that affect services are harder to measure than trade goods and are very vulnerable to regulations and institutional structure.

[1] CAREC countries have more than 50 bilateral and multilateral arrangements for goods trade
[2] https://www.wto.org/english/tratop_e/serv_e/gatsqa_e.htm

Nordas (2010) shows the positive connection of trade goods and trade in services while Celowski (2006) suggests that efforts made to enhance merchandise trade increases demand for trade in services. Although this effect differs across developing and developed countries but the impact is significant. The developing countries like countries in CAREC region experience lesser impact of trade in goods on the trade in services compare to advance countries. This is probably the provision of services in developing countries is not priority. On the contrary, Karmali and Sudarsan (2008) provide evidence that trade in services is an important determined by trade in goods. This set of literature conclude that the success of trade in goods is also determined by the expansion in trade in services between the trading partners.

Figure 1: The Development of Services Trade between 1993 and 2015



Source: Yujiang et al, 2019

The study of Yujiang et al, (2019) added that increase in economic integration of markets causes an increase in the demand for trade in services, while technological advancement has made it much easier to trade at minimum cost via improved infrastructure. Further, Yousefi (2018) discussed that the growth of internet infrastructure has a positive impact on trade in services. Similarly, Deardorff (2001), Ceglowski (2006), Nordas (2010), Lennon (2008), Karmali and Sudarsan (2008) and Egger et al. (2017) also explored the important effect of trade in good on trade in services. Import and export of trade in services has a significant indicator of trade in goods and is strongly persistent, the trade in goods is embodied trade in services such as transport, insurance, and financial services (Egger et al, 2017). Moreover, trade restrictions negatively affect both export and import of trade in services which reduces the competitiveness of export services (Nordas and Rouzet, 2017).

Over the decades, the number of trade agreements has been increased to promote economic growth. Policymakers and economists are urging the Free Trade Agreement (FTA) as a policy tool for trade promotion and economic growth. As a policy tool, bilateral FTAs reduce trade barriers between countries to stimulate trade volume (Baier & Bergstrand, 2007) in the context of mutual trade openness. The bilateral FTA between ASEAN member countries (Thailand, Singapore, Philippines, Malaysia, and Indonesia) was examined by Sudsawasd and Mongsawad (2007) and emphasized to fully liberalize trade in the ASEAN region to achieve larger gain from the FTA. They also confirmed via estimation, considerable economic potential gains from the intra-regional free trade in ASEAN, estimation also revealed that the effect of cooperation could increase trade flows by 182 percent among ASEAN countries. Higher gains for ASEAN from regional tariff removal have been observed in the study because of better resource allocation, less trade diversion, and effective terms of trade among member countries.

China is a major example that has emerged as a major player in the global economy and considers FTAs as an integral part of trade strategy (Zhang, 2010). Indeed, China has recognized the need for intensive development of the services sector as per the 13th Five-Year Plan (OECD, 2016).

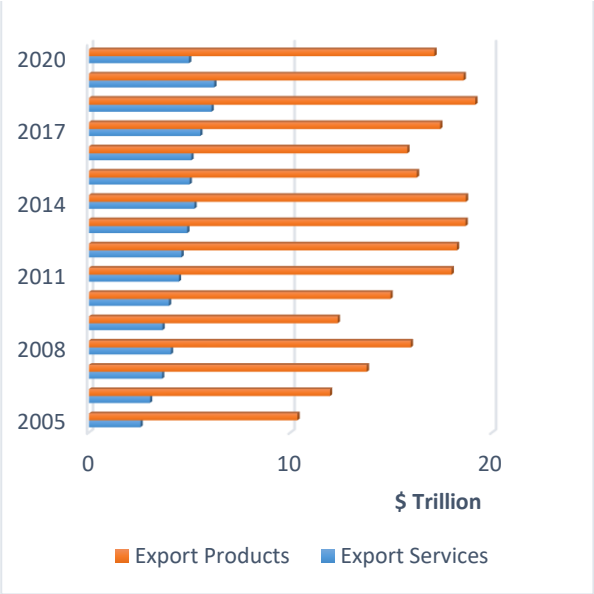
The FTA signed between Japan and Mexico, Korea and other Asian economies has benefited from bilateral trade liberalization (Kawasaki, 2004). A significant impact of FTA on trade balance observed

on Japan's import and export volume. Japan gained 0.03 percent benefits from Mexico and 0.12 percent from Korea in GDP by effective implementation of FTAs. Whereas Park (2019) concluded that FTA between European Union and Japan have the potential to generate 0.76 percent of GDP to European Union and 0.29 percent to Japan per year, it will also create opportunities such as employment for both parties. Walters (2020) noted that US and China needs sign FTA in services such as financial services, and telecommunication to improve the trade ties. It will give an uplift to US economy developing the cooperation in security, availability of work force and energy sector. Finally, Yang, Huang et al. (2020) stated that the China's Belt and Road initiative would upgrade logistic services in transporting the high tech manufacturing products under FTAs.

3. TRADE IN SERVICE IN CAREC REGION

Trade is a critical driver of economic development and growth, governments across the globe supporting trade with various measures to improve their market economy. In this regard, governments facilitate trade via bilateral agreements and multilateral agreements to keep the smooth flow of goods and services. Trade in service is considered a vibrant component of trade and it has emerged as a global drive of domestic and international trade. Countries around the world have replaced their traditional, non-tradable and low-productivity services including informal economy with modern exportable business services for comparative advantages. Trade in role in the growth of an economy is paramount while services support trade via an increase in efficiency, productivity and transparency and leads to economic growth, trade, employment and infrastructure development. The figure shows the value of export goods and services. In 2020, the global export of goods was $ 17.1 trillion and the service sector stood at $ 4.96 trillion. The trade in goods shares nearly 15 percent and trade-in service shares 4.2 percent of global GDP[3]. Worldwide, the increase in service demand due to technology change, increase in income, low transport cost and a decline in the trade barriers that enable trade across the countries. For many economies, the service sector has become an important contributor to GDP and provides indispensable inputs to many products and services.

Figure 2: Global Exports of Goods and Services

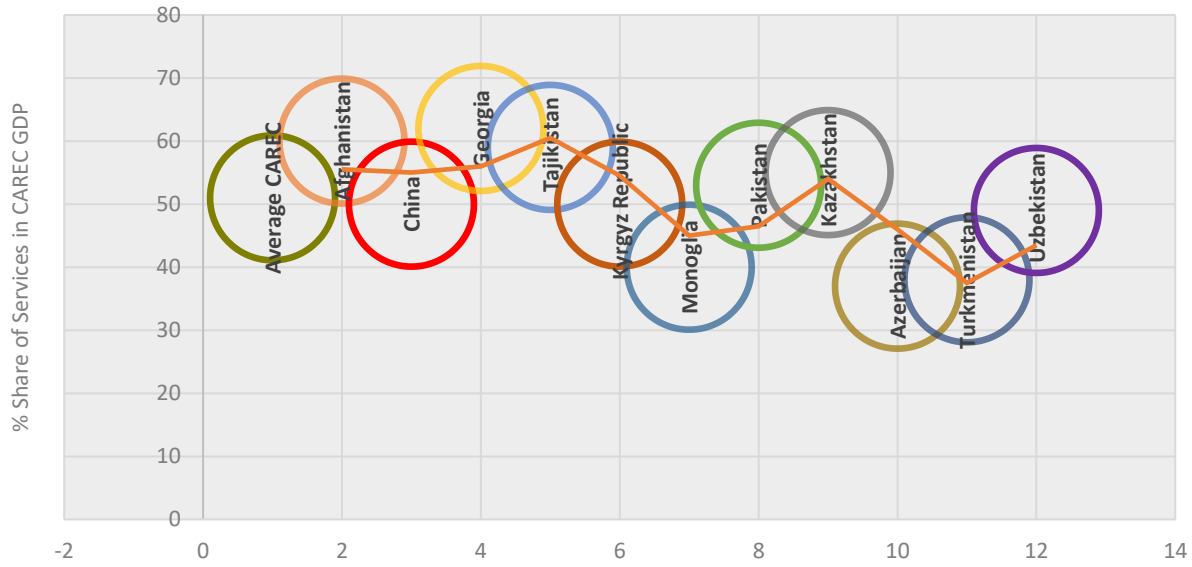


Source: Trade Map, 2020

The service sector is the largest sector in the Central Asia Regional Economic Cooperation (CAREC) countries and producing about 51% of GDP. CAREC countries, Georgia has the most contribution of services in GDP as it shared about 62 percent of national GDP, Georgia is followed by Afghanistan, and Tajikistan about 60 percent. Pakistan, China, Kazakhstan and the Kyrgyz Republic service sector stood at an average rate of 52.79 percent of GDP for 2020. Azerbaijan, Mongolia and Turkmenistan's service sectors are contributing least to GDP in the CAREC region (See Figure 2). It also constitutes more than 40% as export value-added in the region. This share of the services sector is contributed by domestic services.

[3] https://www.statista.com/statistics/268750/global-gross-domestic-product-gdp/

Figure 3: Figure: % Share of Service in CAREC GDP y-axis??

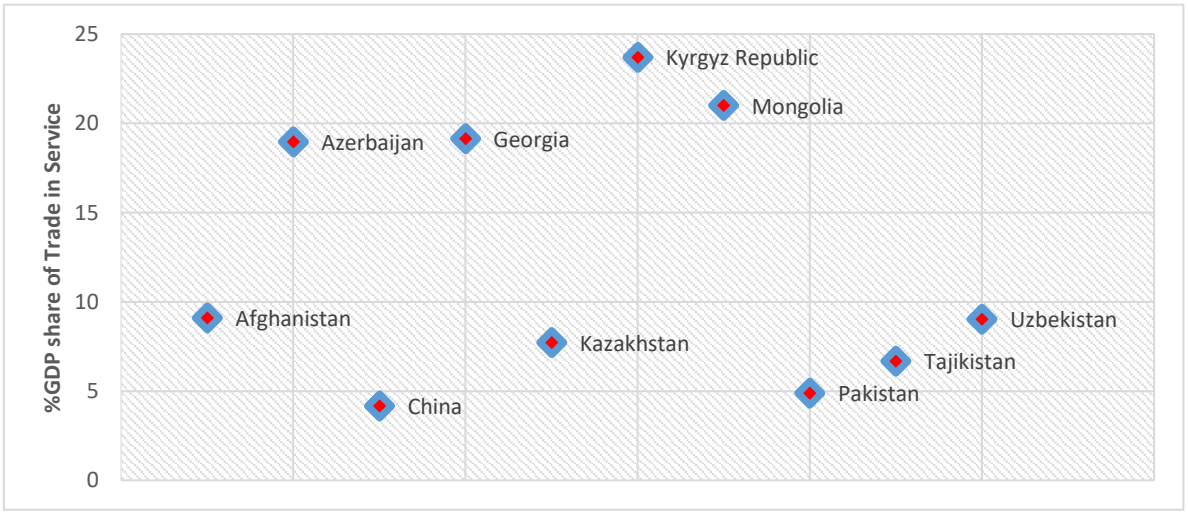


Source: World Development Indicator, 2020

The role of domestic and international services is inevitable for export growth, employment and income opportunities. Trade in services has been steadily increasing, as figure 1 states it increased from $3.6 trillion in 2009 to $6.2 trillion in 2019. Trade in service applies to a diverse array of fields such as financial service, transportation, insurance, construction, communication, and distribution.

Trade in service has a significant role in trade in goods, the figure shows the percent of GDP trade in service for CAREC countries. It shows, Kyrgyz Republic has the highest share of trade in service among CAREC countries that is 24 percent, Kyrgyz Republic is followed by Mongolia, Georgia, and Azerbaijan with a share of 21, 19 and 19 percent respectively. China (4 percent) and Pakistan (5 percent) have

Figure 4: % GDP of Trade in Service



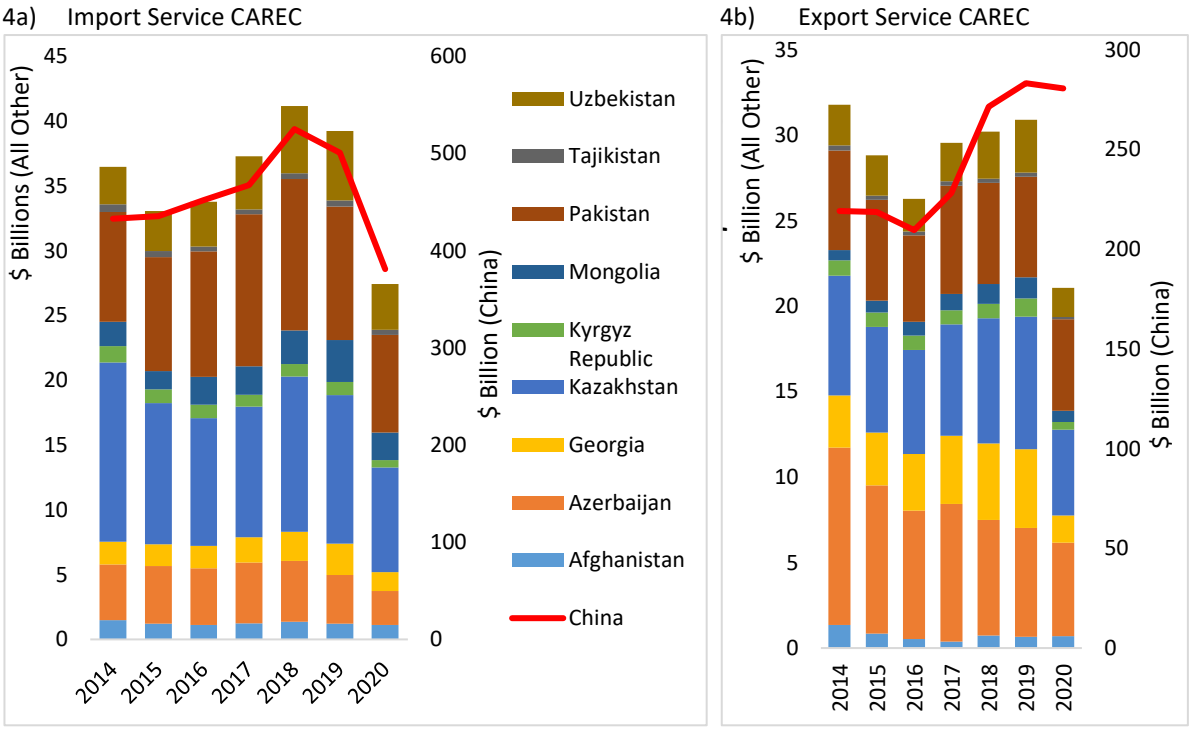
Source: World Development Indicator, 2020

the lowest share GDP in trade in service as per the world bank database (See figure 3). Acknowledging the importance of the role of service, the free trade agreements (FTA) in products (goods) can become more successful if the government also considers service sector agreements with the same countries.

A. SERVICES EXPORT-IMPORT PATTERNS

This study aims study the CAREC region in this context. The volume of trade in services import and export in the CAREC region illustrates in figure 4 (Trade in Service: Export and Import Service CAREC), figure 4a explains that China is heavily depending on imports around the world. China has noted highest import services during 2018 that was $525154 million, in 2020 China's import of services has dropped to $381087 million due to COVID-19 pandemic. China is followed by Pakistan and Kazakhstan with highest level of trade service import in the CAREC region. Uzbekistan and Kyrgyz Republic has the lowest volume of trade service import among the region and no data is available for Turkmenistan. The overall scenario of service shows that, there is a huge declined in the import due to COVID-19 pandemic

Figure 5: Trade in Service: Export and Import CAREC Countries (China on RHS)



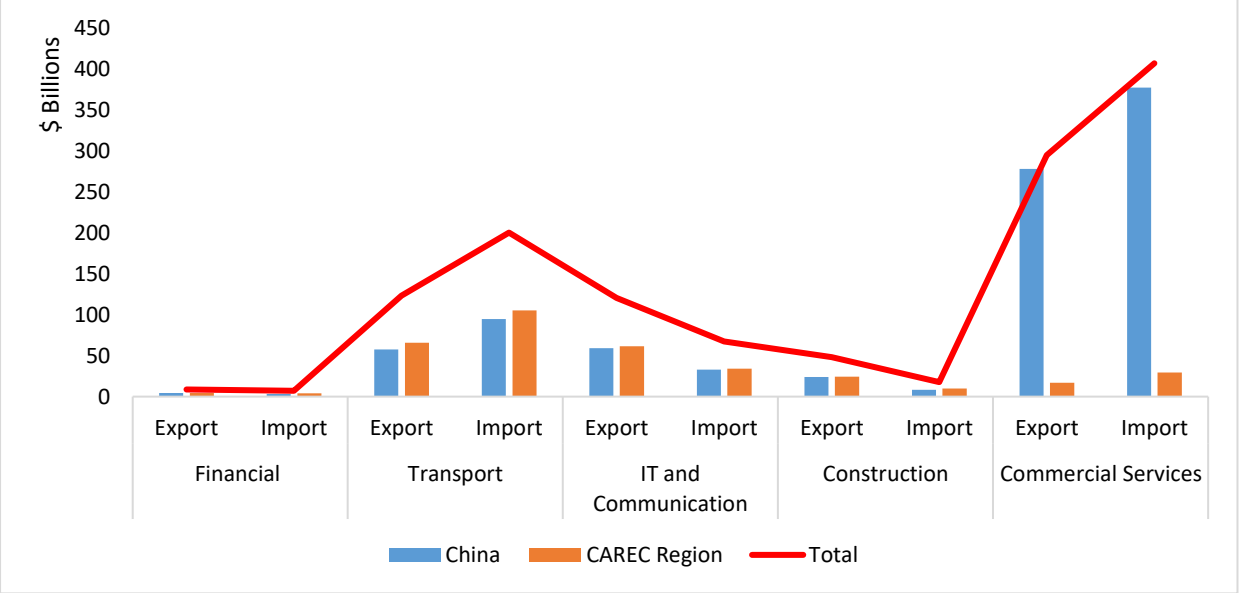
Source: Author Calculation; Trade Map, 2021

China is the biggest exporter of trade services (transport, financial, insurance, construction and Information technology and communication). In 2019, China exported $283.2 billion worldwide as per trade map. China is followed by Kazakhstan, Azerbaijan and Pakistan with the highest volume of export of trade in services in the CAREC region. The COVID-19 pandemic has taken away a big chunk of exports share from all CAREC country except China, where a slight impact of COVID-19 is observed.

B. SECTORAL SERVICES EXPORT-IMPORT

The prominent trade in services are financial services, transport, IT and Communication construction, and Insurance. Figure 5, shows the graphical presentation of subsector of trade in services combined with export and import. It shows that commercial and transport services are heavily dominated sector in trade services, transport includes air transport, freight transport, sea transport, postal and courier services. Whereas, commercial services is the sum of many services such as transport, travel, communication services, construction, financial, insurance, computer and information services, royalties and license fee, other business services, personal cultural and recreational services.

Figure 6: Subsector: Trade in Services 2020



Source: Authors Compile, Trade Map

The total commercial and transport service exported for $294.9 billion and $123.3 billion in the CAREC region respectively while the imports of transport services are $407.2 billion and $200.2 billion in 2020. The commercial and transport sector is followed by IT and Telecommunication with the highest volume of trade for CAREC region. there is a low volume financial services in the CAREC region as shows in Graph however the value of export $8.8 billion and import $7.1 for the year 2020.

Service sector in the CAREC region is significantly contributing the economic transformation. The subsector volume of CAREC region need to be highlighted to identify the potential contributing factor to the economy. table 1 shows that, the volume of China's trade in services much higher in the region for each subsector of trade services. However, China's import of Commercial and transport services, insurance and pension services are higher than export services while financial services, information, computer and telecommunication and construction have positive trade balance for trade services.

Table 1: Share of Subsectors in the Trade in Services by CAREC economy

	Financial		Transport		Telecommunications, computer & information services		Construction	
Countries	**Export**	**Import**	**Export**	**Import**	**Export**	**Import**	**Export**	**Import**
Afghanistan	0.4	0.2	12.4	83.8	7.8	2.1	10.4	0.5
Azerbaijan	0.2	1.1	30.1	49.7	1.2	3.4	0.5	43.6
China	1.5	0.8	20.5	24.8	21.0	8.7	8.5	2.1
Georgia	1.3	1.9	44.0	55.6	7.2	5.5	0.5	0.9
Kazakhstan	2.3	2.6	66.7	26.4	2.8	5.3	1.5	1.5
Kyrgyz Republic	2.5	1.8	35.2	58.0	3.3	3.5	4.0	1.8
Mongolia	1.3	7.3	58.6	28.3	4.9	4.9	5.4	6.3
Pakistan	1.7	4.5	11.3	33.7	32.0	6.2	2.4	0.8
Tajikistan	0.1	0.4	75.7	83.9	4.1	1.4	1.8	7.1
Uzbekistan	1.2	0.4	58.8	52.0	9.8	3.7	2.6	3.1

Source: Author Compile, Trade Map, 2020

China is followed by Kazakhstan and Pakistan with the highest volume of global trade among the CAREC countries. Kazakhstan's transport services trade volume is significantly high among the CAREC

region except China, the export volume is $ 3.35 billion that is 66.7 percent of total export of trade service while import stood at $3.14 billion (26.4 percent) during 2020. Pakistan's major export service is telecommunications, computer & information services that stood at $1.72 billion in 2020 Pakistan which is 32 percent of total trade in services. Whereas, transport service is the highest import for Pakistan is $2.42 billion (33.7 percent). Tajikistan and Afghanistan has the lowest foreign trade in services among the CAREC countries (see table 1)

4. TRADE POTENTIAL IN SERVICES AND PRODUCTS

This section analyzes the trade potentials of the CAREC countries. This analysis will allow us to highlight the possible trade in service bilateral and multilateral trade agreement between partner countries.

4.1 TRADE IN SERVICES INTENSITY

The trade share is defined as the ratio of overall trade between the country in the CAREC region over the total trade of all these countries. This indicator shows the relative importance of trade in the region compared to the total trade. The trade share of region *i* in mathematical form is:

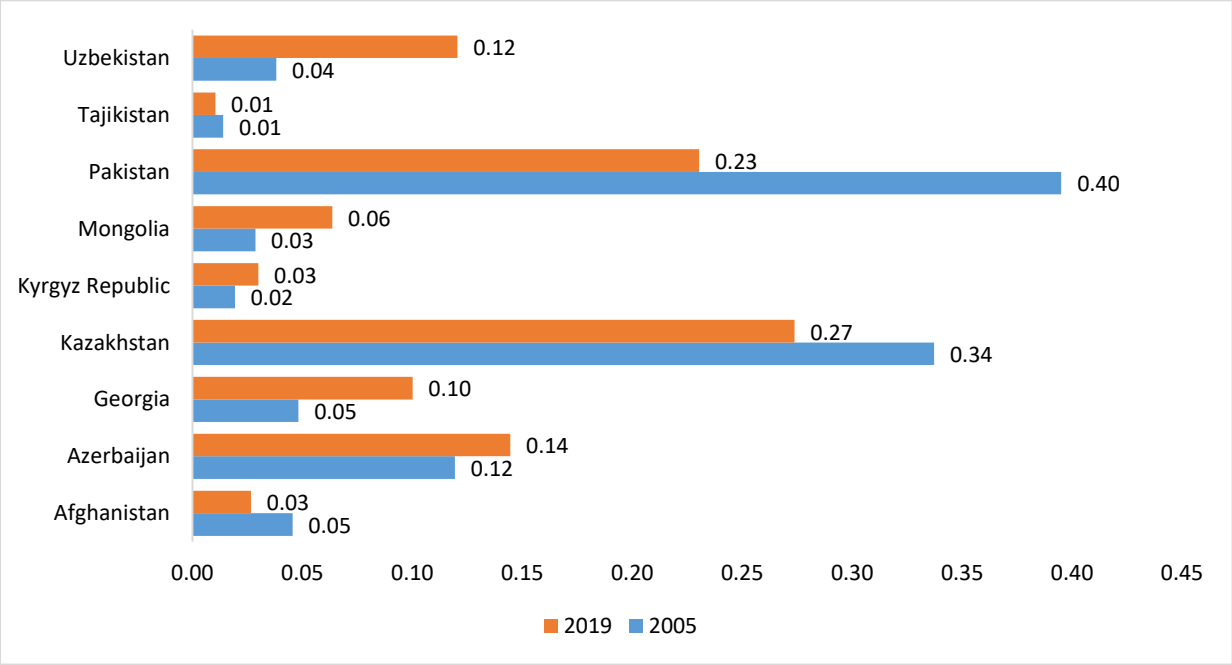
$$\boldsymbol{Trade\ Shares} = \frac{T_{cw}}{T_i} \qquad (1)$$

Where

T_{cw} = Export of Country C to world plus Import of Country w to the world.
T_i = Total Export plus Total Import, *i* Indicates the region that is CAREC.

The trade share (trade in service) index indicates indicating economic integration within the CAREC. However, the current situation of CAREC integration has several issues associated with member countries. The figure shows the trade share index of CAREC countries to the world.

Figure 7: Trade Share – CAREC



Source: author Complication, Trade Map, 2021
*Afghanistan: 2008

Trade share for 2019 accounted for the highest in Kazakhstan and Pakistan that is 27.3 percent and 23.04 percent respectively of CAREC in the world and over time has index has been declined from 33.7 percent and 39.51 percent in 2005. Whereas, Uzbekistan and Georgia have significantly improved their trade services (see figure: Trade Share). But Tajikistan, Afghanistan and Kyrgyz Republic has lowest trade share index of CAREC in the world.

The table shows trends in the CAREC countries: Afghanistan, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan and Uzbekistan. The trade in service trade was used for different years from 2005, 2010, 2015 and 2019 for all CAREC member countries. The figure – 7 shows that the trade share index for Azerbaijan, Georgia, Kyrgyz Republic, and Mongolia has increased during 2005 and 2019. While, Pakistan, Kazakhstan, and Afghanistan's trade share in service has declined since 2005 (see table 2: trade share). It also indicates the potential opportunity of FTA in service among CAREC member countries.

Table 2 Trade Share Including China

Country	2005	2010	2015	2019
Afghanistan	0.007	0.008	0.002	0.003
Azerbaijan	0.018	0.018	0.016	0.011
China	0.851	0.892	0.917	0.932
Georgia	0.007	0.007	0.007	0.004
Kazakhstan	0.050	0.030	0.022	0.018
Kyrgyz Republic	0.003	0.004	0.003	0.001
Mongolia	0.004	0.004	0.004	0.004
Pakistan	0.059	0.026	0.020	0.018
Tajikistan	0.002	0.002	0.001	0.001
Uzbekistan	0.006	0.010	0.007	0.007

4.2 SERVICES SIMILARITY IN CAREC COUNTRIES

This index captures the degree of similarity between the export profiles of one country and other countries in a region. It is defined as the sum over export categories of the smaller export share, comparing the export share of the country with that of other countries in the region. The empirical results of the ESI index are presented for the country as a whole (TOTAL) which covers all trade in service sector of CAREC. We selected five dominant trade in services sectors for analysis. This includes the transport, financial, telecommunication, construction and manufacturing sector.

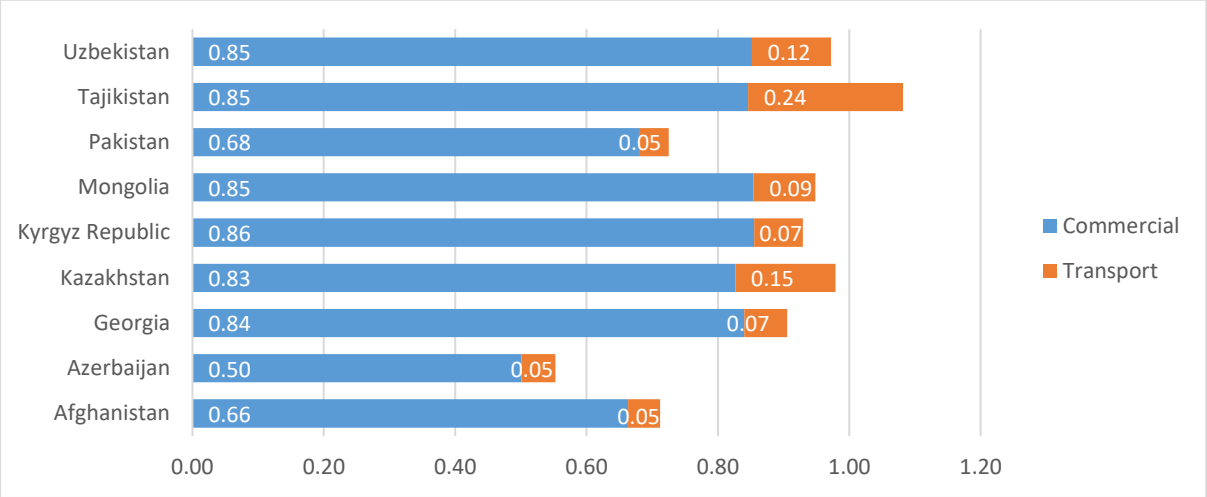
Formula Export Similarity Index:

$$ES = \sum_{\varphi} \min[(\frac{X_{gr}}{X_{r}}), (\frac{X_{gcc}}{X_{c}})]$$

Where X_{gr} is the exports of service by CAREC, X_{r} is the total exports all services of CAREC, X_{gcc} denotes the exports of service g by CAREC country c, and X_{gc} is total exports of all services by CAREC country c such as Afghanistan, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, and Uzbekistan. C denotes country in the region, r is the region (CAREC) while g is the specific service.

Figure export similarity shows the indices for transport and commercial sector of CAREC countries. the calculation based on trade in services to capture the empirical result of trade in service of CAREC member countries. However, the figure shows the maximum value of ESI for the commercial sector of each CAREC country, this indicates a high tendency to trade competitiveness among the CAREC countries. The transport sector shows the maximum value for Tajikistan and Kazakhstan and the lowest ESI value for Afghanistan, Pakistan and Azerbaijan indicates potential to enhance the export of transport trade service to other CAREC countries. These are calculated using subsectors?? (based on subsector).

Figure 8: Export Similarity index



Source: Authors Compilation, Trade Map, 2021

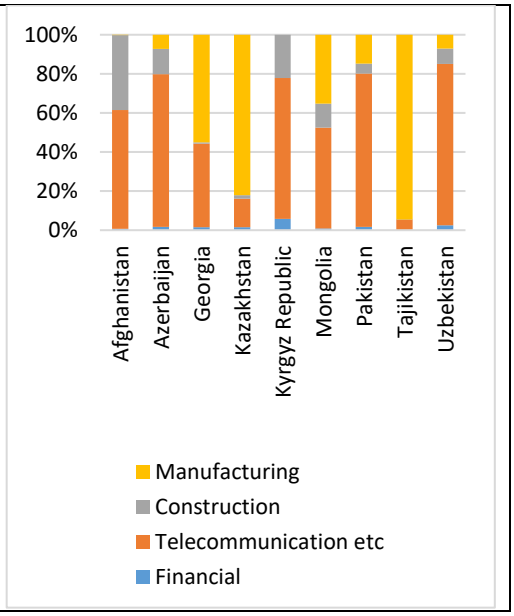
The empirical result of finance, telecommunication, construction and manufacturing service shown in the table below, indicates that the trade service of CAREC countries has the lowest competitiveness with the world. However, Pakistan is showing a higher level of confidence in the telecommunication and manufacturing services among CAREC countries. Tajikistan and Kazakhstan are outperforming in manufacturing services and Afghanistan's construction sector is showing higher value for ESI.

Table 3: ***Export Similarity Index*** **These are calculated using subsectors?? (based on subsector)**

Figure 9: ***Export Similarity Index***

	Financial Services	Tele-communication	Construction Services	Manufacturing Services
Afghanistan	0.00006	0.005	0.0032	0.0000
Azerbaijan	0.00001	0.001	0.0001	0.0001
Georgia	0.00005	0.002	0.0000	0.0019
Kazakhstan	0.00011	0.001	0.0001	0.0058
Kyrgyz Republic	0.00007	0.001	0.0003	0.0000
Mongolia	0.00004	0.002	0.0006	0.0017

Pakistan	0.00029	0.013	0.0009	0.0025
Tajikistan	0.00003	0.002	0.0000	0.0305
Uzbekistan	0.00010	0.003	0.0003	0.0003



Source: Authors Calculation, Trade Map

4.3 COMPLEMENTARITY IN SERVICES IN CAREC COUNTRIES

This index measures the degree to which the export pattern of one country matches the import pattern of a region. It is defined as 1 minus the sum of the absolute value of the difference between the import category shares of the region and the export shares of the country divided in half.

$$IMC = 1 - \{\sum abs \frac{\left[\left(\frac{M_{rg}}{M_r}\right) - \left(\frac{X_{cg}}{X_c}\right)\right]}{2}\}$$

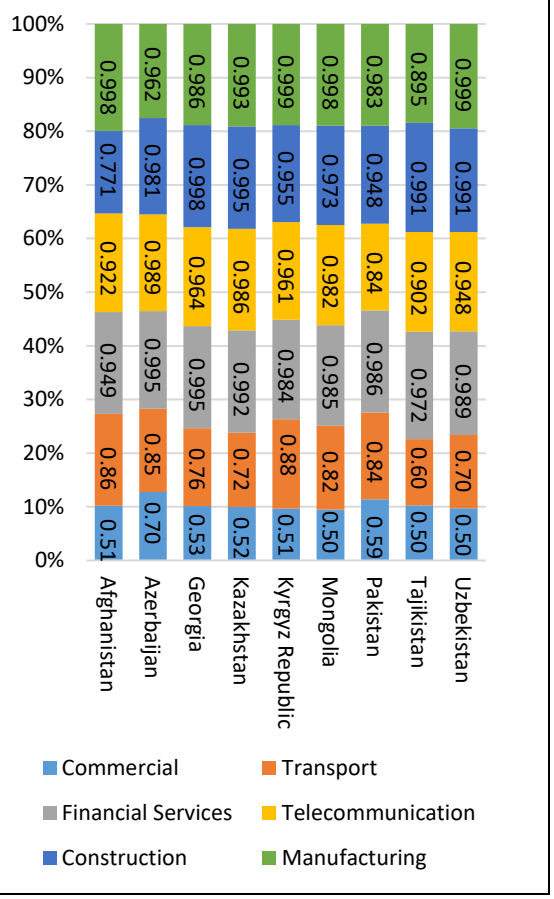
Where $M_{rg}$is the imports of good g by region CAREC, M_r is the total imports of region CAREC. The X_{cg} is the exports of good g by country c and $X_c$is the total exports by country c. The index takes a value between 0 and 1, with 0 indicating no overlap and 1 indicating a perfect match in the import-export pattern. A high degree of complementarity may indicate more favorable prospects for a successful trade arrangement.

The empirical presented in Table: complementarity below a perfect match of the export pattern of CAREC countries for all sectors such as transport, finance, telecommunication, construction and manufacturing service sectors. To illustrate, we will individually compute the complementarity between exports from CAREC countries excluding China from the analysis with CAREC imports in the year 2005 to 2020.

Table 4: ***Complementarity Index***

	Commercial Services	Transport Services	Financial Services Services	Telecommunication Services	Construction Services	Manufacturing Services
Afghanistan	0.51	0.86	0.94	0.92	0.77	0.99
Azerbaijan	0.70	0.85	0.99	0.98	0.98	0.96
Georgia	0.53	0.76	0.99	0.96	0.99	0.98
Kazakhstan	0.52	0.72	0.99	0.98	0.99	0.99
Kyrgyz Republic	0.51	0.88	0.98	0.96	0.95	0.99
Mongolia	0.50	0.82	0.98	0.98	0.97	0.99
Pakistan	0.59	0.84	0.98	0.84	0.94	0.98
Tajikistan	0.50	0.60	0.97	0.90	0.99	0.89
Uzbekistan	0.50	0.70	0.98	0.94	0.99	0.99

Figure 10: Complementarity Index

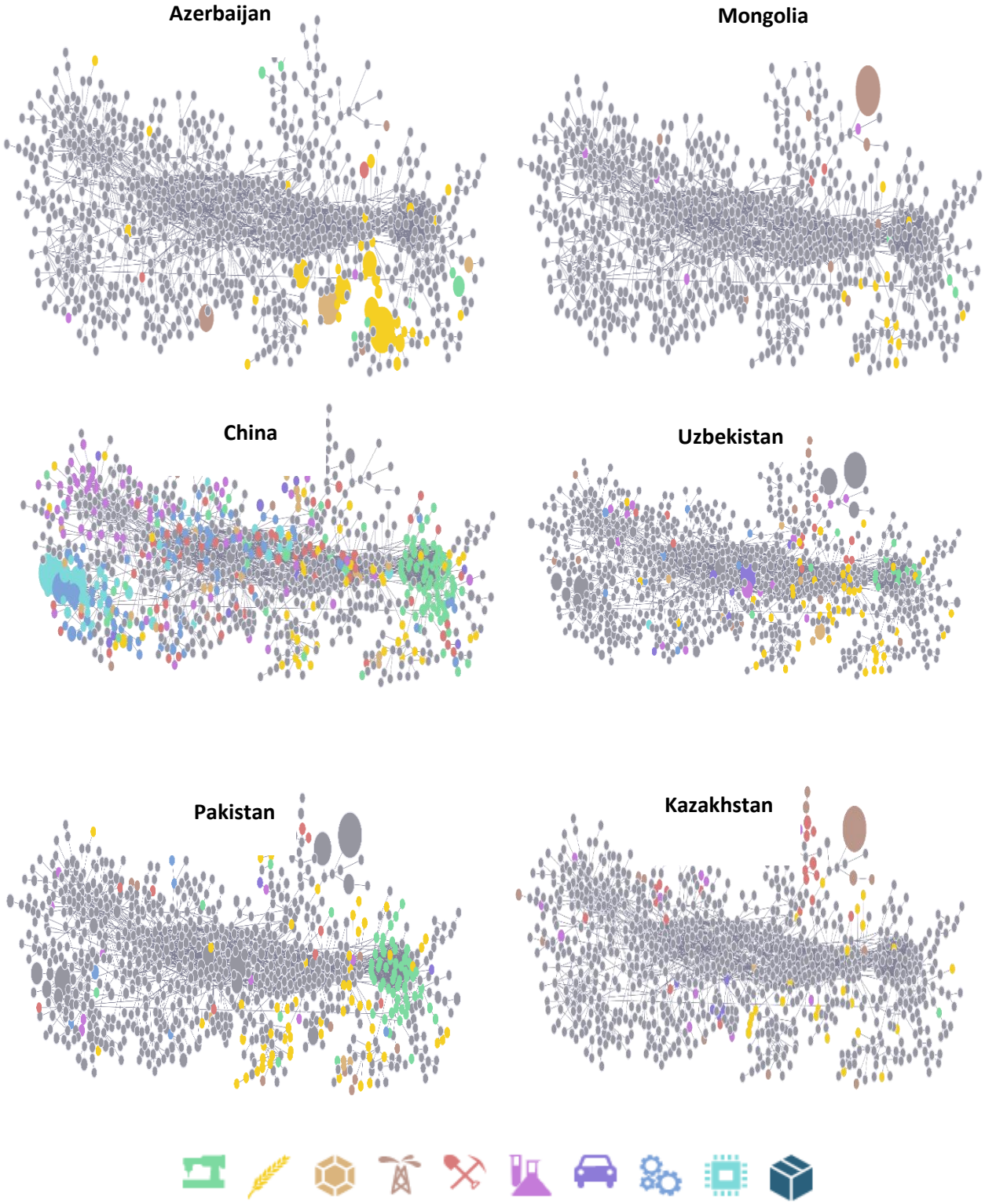


Source: Authors Calculation: Trade Map

The calculated complementarity indices for the transport sector are Azerbaijan (0.85), Afghanistan (0.86), Pakistan (0.84) and Tajikistan (0.60) as per table – 4. Similarly, financial services, telecommunication, construction and manufacturing sectors perfectly match the export pattern (See Table – 4). However, the commercial sector is not perfectly matching with the pattern of other CAREC countries. Whereas, Azerbaijan's index for complementarity index has the highest potential for export of commercial services while Tajikistan and Uzbekistan have a weak complementarity index among CAREC countries. the overall results show that all these countries have exports of trade in services that match perfectly match with the pattern of CAREC imports. We can infer that trade liberalization between the countries with high index values and CAREC partners is likely to create gains as their exports match CAREC's import demand.

4.4 CAREC COUNTRIES PRODUCT COMPARATIVE ADVANTAGES (RCA)

Figure 11: CAREC Reveal Comparative Advantage



The export Reveals Comparative Advantage (RCA) for CAREC countries show in product space (see figure 11). The product includes textile, agriculture, mining, mineral, metal, chemicals, automobiles, machinery, electronics, and others. The total volume of export products for Azerbaijan stood at $20

billion in 2019, the product space shows that Azerbaijan has a comparative advantage in low complexity products, minerals, agriculture products. China products space shows, a total export during 2019 were $ 2.7 trillion. The majority of export destinations for China are the United State of America (USA) with 15.77 percent of total export, Hong Kong (11.33 percent), and Japan (5.93 percent). China's largest comparative advantage is high complexity products such as electronics and machinery.

Mongolian total export volume stood at $8.30 billion and 88.90 percent is exported to China in 2019. It deals with low complexity products. Pakistan also deal in low complexity products and export volume stood at $29.8 billion in 2019. However, the RCA figure shows Pakistan has the potential opportunity to enhance its productivity in textile, chemical, pharmaceutical, and agriculture. Kazakhstan exported $54.4 billion out of which 18.61 percent is exported to China in 2019. Kazakhstan export moderate and low complexity products. While RCA figure shows, Kazakhstan has the potential to enhance its export among CAREC countries in petroleum products, transport, travel, and tourism as already explained in earlier graphs. Uzbekistan's largest goods exports in moderate and low complexity products such as petroleum products, stone products (Gold), transport, tourism, etc.

5. ESTIMATE THE FTA IN SERVICE EFFECTS

This analysis is based on a transformed gravity model estimated with panel data. The pairs of WAEMU member countries are individuals from 1996 to 2013. This section is articulated around two points. The first point looks at the specification of the transformed gravity model. The second point focuses on the data used and the expected signs of estimated coefficients.

5.1 DATA SOURCES

The studyemployed secondary sources for empirical analysis, the study will primarily depend on International Trade Centre's (ITC) database for methodological analysis, the study will also use World Trade Organization (WDI) World Development Indicator (WDI), and Global Competitiveness Index (GCI).

Table 5: Data Description

Variable	Sources	Units
Bilateral Export (Trade in Service) of CAREC member countries	International Trade Centre – Trade Map	$ Billion
Bilateral Import (Trade in Service) of CAREC member countries	International Trade Centre – Trade Map	$ Billion
Global Import and Export	International Trade Centre – Trade Map	$ Trillion
Gross Domestic Products (%)	World Bank - World Development Indicators	Percentage
Regional Trade Agreements	World Trade Organization	Number
% GDP of Trade in Service	World Bank - World Development Indicators	Percentage
Trade Share Index	Authors Calculation	Index
Export Similarity Index	Authors Calculation	Index
Complementarity Index	Authors Calculation	Index

Source: Author's Compile

5.2 MODIFIED GRAVITY MODEL

The original specification of the gravity model based on the physical relationship relates partner country GDP, distance, and a set of control variables. We use modified gravity type of model in which examine the role of services trade impact on the CAREC countries trade in products. In this model we introduce the complementarity in trade in services $\beta Comp\_Services_{jt}$ variable. It measures the degree to which the export pattern of one country matches the import pattern of the CRAEC countries. The variable takes a value between 0 and 1, with 0 indicating no overlap in terms of export of a countries and imports of regions. Whereas 1 indicating a perfect match in the import–export pattern. A high degree of complementarity may indicate more favorable prospects for a successful trade arrangement.

$$Yijt = \partial + \beta Comp\_Services_{jt} + \gamma lnDevelopmentIndexit + \delta lnComplexity\ Indexjt + \theta LLC + \vartheta CB + \mu ijt$$

Where i stands for the partner country, j the destination country, and t the time. A is a scale parameter. $Yijt$ is the bilateral exports and important value form country (i) to country (j) at time t. The $DevelopmentIndexit$ is a holistic measure of the productive capabilities of the country. In particular, the $DevelopmentIndexit$ looks to explain the knowledge accumulated in a population and that is expressed in the economic activities present in the country. This is better measure then simple GDP of the partner countries. $DevelopmentIndexjt$ represent respectively productive activities in the country *(j),* and a set of control variables.

This is a panel data estimation? Fixed effect, random effect?

Table 6. Services trade complementarity effects on product trade

Variables	Log (Trade)	Log(Trade)
Services Complementarity	1.54 (0.682)	1.54 (0.681)
Development Index	0.11*** ().018)	0.12*** ().018)
Complexity Index		0.05*** (0.015)
R^2		.69
No of Obs.	22,849	22,849

Note: *, **, *** represents the level of significant at 1%, 5%, and 10% respectively.

The estimated results are reported in the Table 6. The results show that the complementarity in services structure is positively affect the trade flows to the CAREC countries. This means that the increase in imports of the services sectors which matched to the exports of services sector. The coefficient of the complementarity index is positive but statistically insignificant.

6. CONCLUSION AND POLICY SUGGESTIONS

The contribution of trade in services in total trade viz-a-viz in GDP is very small, however, trade in products can never be increased without trade services such as telecommunication, internet, finance, insurance, legal services, transportation and other logistics services. The bilateral trade agreements among CAREC members can be instrumental for exploring the potential of trade in service in Central Asia and its neighboring countries. We thoroughly investigated via time-series data and relevant research papers for CAREC countries to furnish a shred of evidence that supports the FTA in goods and services. The service sector of the CAREC region is significantly contributing to the economic transformation. The subsector of trade in services of the CAREC region highlighted the potential contributing factor to the economy.

The CAREC region's import and export of trade in service volume illustrating that China heavily capturing the advantages of trade in services via import and export (transport, financial, insurance, construction and Information technology and communication), it recorded a peak at $525154 million for import and $283200 million export. China is followed by Kazakhstan, Azerbaijan and Pakistan with the highest volume of export of trade in services in the CAREC region. Kazakhstan's transport services trade volume is significantly high among the CAREC region after China, the export volume is $ 3.35 billion while and imports stood at $3.14 billion (26.4 percent). Pakistan exported services include telecommunications, computer & information services that stood at $1.72 billion (32 percent of total trade in services). The overall scenario of service shows a huge declined in the import and export due to COVID-19 pandemic.

The study also revealed the importance of the commercial sector particularly transport is a heavily dominated sector for trade in services. Other commercial services include travel, communication services, construction, financial, insurance, computer and information services, royalties and license fees, other business services, personal cultural and recreational services. CAERC recorded the highest export volume for commercial and transport services that is $294.9 billion and $123.3 billion and imports stood at $407.2 billion and $200.2 billion respectively. The significance of ICT cannot be ignored because of globalization, however, ICT is playing important role in trade and comes after the transport sector with the highest volume of trade for CAREC. China is heavily importing ($6500 million) and exporting ($49500 million) ICT services globally, Pakistan exports $1520 million of ICT services globally. ICT services significantly influence the trade in the CAREC region.

It is significantly important to note that, the trade share accounted for the highest in Kazakhstan and Pakistan that is 27.3 percent and 23.04 percent respectively of CAREC region and showed has declined from 33.7 percent and 39.51 percent. Whereas, Uzbekistan and Georgia have significantly improved their trade services. but Tajikistan, Afghanistan and the Kyrgyz Republic has the lowest trade share index of CAREC in the world as mentioned in table 2. The trade in service trade was used for different years from 2005, 2010, 2015 and 2019 for all CAREC member countries and showed that the trade share index for Azerbaijan, Georgia, Kyrgyz Republic, and Mongolia has increased and Pakistan, Kazakhstan, and Afghanistan's trade share in service has declined since 2005. It also indicates the potential opportunity of FTA in service among CAREC member countries.

Export similarity indices captured the empirical result of trade in service of CAREC countries. The transport sector shows the maximum value for Tajikistan and Kazakhstan and the lowest ESI value for Afghanistan, Pakistan and Azerbaijan indicates potential to enhance the export of transport trade service to other CAREC countries. Azerbaijan's index for complementarity index has the highest potential for export of commercial services while Tajikistan and Uzbekistan have a weak complementarity index among CAREC countries. The overall results show that all these countries have exports of trade in services that match perfectly match with the pattern of CAREC imports. We can

infer that trade liberalization between the countries with high index values and CAREC partners is likely to create gains as their exports match CAREC's import demand.

The empirical result of finance, telecommunication, construction and manufacturing service shown in the table below, indicates that the trade service of CAREC countries has the lowest competitiveness with the world. However, Pakistan is showing a higher level of confidence in the telecommunication and manufacturing services among CAREC countries.

Acknowledging the import role of services, the free trade agreements (FTA) in products (goods) can accelerate trade growth if the government also considers FTA in the service sector. The agreement in services can enlarge these opportunities to the mutual benefit of the participating countries.

References

Akın, Ç. (2012). Multiple determinants of business cycle synchronization.

Ali, L., & Panhwar, I. A. (2017). Impact of Trade Liberalization on Economic Development in Pakistan: A Co-Integration Analysis. *Global Management Journal for Academic & Corporate Studies*, *7*(1), 19.

Álvarez, I. C., J. Barbero, A. Rodríguez-Pose, and J. L. Zofío. 2018. "Does Institutional Quality Matter for Trade? Institutional Conditions in a Sectoral Trade Framework." World Development 103: 72–87

Andrenelli, A., C. Cadestin, K. De Backer, S. Miroudot, D. Rigo, and M. Ye. 2018. "Multinational Production and Trade in Services." OECD Trade Policy Papers, No. 212, OECD Publishing, Paris

Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade?. Journal of International Economics, 71(1), 72–95

Breinlich, H., and C. Criscuolo. 2011. "International Trade in Services: A Portrait of Importers and Exporters." Journal of International Economics 84: 188–206.

Ceglowski, J. 2006. "Does Gravity Matter in a Service Economy?" The Review of World Economics 142 (2): 307–328.

Deardorff, A. V. 2001. "International Provision of Trade Services, Trade, and Fragmentation." Review of International Economics 9 (2): 233–248.

Edwards, S. (1993). Openness, trade liberalization, and growth in developing countries. *Journal of economic Literature*, *31*(3), 1358-1393.

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

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

F. Karam & C. Zaki (2013) On the determinants of trade in services: evidence from the MENA region, Applied Economics

Head, K., T. Mayer, and J. Ries. 2009. "How Remote Is the Offshoring Threat?" European Economic Review 53 (4): 429–444

Karmali, D. P., and P. K. Sudarsan. 2008. "Impact of Trade in Goods on Trade in Services: A Country Level Panel Data Analysis." Indian Journal of Economics and Business 7 (1): 145–154

Kawasaki, K. (2004). The impact of free trade agreements in Asia.

Kimura, F., and H. H. Lee. 2006. "The Gravity Equation in International Trade in Services." Review of World Economics 142 (1): 92–121

Lennon, C. 2008. "Trade in Services and Trade in Goods: Differences and Complementarities." PSE Working Papers, 2008-52, PSE.

Mai, Y. H., Adams, P., Dixon, P., & Menon, J. (2010). The Awakening Chinese Economy: Macro and Terms of Trade Impacts on 10 Major Asia-Pacific Countries. ADB Working Paper Series on Regional Economic Integration 66, 1-56.

Nordås, H. K. 2010. "Trade in Goods and Services: Two Sides of the Same Coin?" Economic Modelling 27 (2): 496–506

Nordås, H. K., and D. Rouzet. 2017. "The Impact of Services Trade Restrictiveness on Trade Flows." The World Economy 40 (6): 1155–1183.

OECD. 2016. Enabling China's Transition Towards a KnowledgeBased Economy. Paris: OECD

Park, S. C. (2019). Mega FTA as a Signal Against Trade Protectionism Focused on the EU and Japan FTA. *Przegląd Strategiczny*, *9*(12), 249-270.

Shaikh, F. M., Syed, A. A. S. G., Shah, H., & Shah, A. A. (2012). Observing Impact of SAFTA on Pakistan's Economy by Using CGE Model. *Pakistan Journal of Commerce & Social Sciences*, *6*(1).

Sudsawasd, S. and Mongsawad, P. (2007). Go with the Gang, ASEAN! ASEAN Economic Bulletin, 24 (3), 339-356.

To, T., Thomas, V., Bastos Pinto, R. C., & Krueger, E. (2004). *Impacts of the South Asia Free Trade Agreement* (Doctoral dissertation).

WTO (2010) Measuring trade in services, Annual Report, World Trade Organization, Geneva

Yousefi, A. 2018. “Estimating the Effect of the Internet on International Trade in Services.” Journal of Business Theory and Practice 6 (1): 65.
Yujiang Bi, W. Robert J. Alexander & Zhen Pei (2019) Factors affecting trade in services: evidence from panel data, Applied Economics,
Zhang, Y. 2010. The Impact of Free Trade Agreements on Business Activity: A Survey of Firms in the People's Republic of China. ADBI Working Paper 251. Tokyo: Asian Development Bank Institute
Hussain, C., & Ali Shah, S. Z. (2017). Quantitative assessment of Pakistan and China free trade agreement. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *11*(1), 293–308.
Memon, M. S., Bhatti, N., Shaikh, F. M., & Syed, A. A. S. G. (2016). IMPACT OF PAK-INDIA TRADE ON ECONOMY OF PAKISTAN BY USING COMPUTABLE GENERAL EQUILIBIUM MODEL (CGE). *INTERNATIONAL JOURNAL OF MANAGEMENT & INFORMATION TECHNOLOGY*, *11*(1), 2672–2681.

Zada, N., & Khan, K. (2017). General Equilibrium Analysis of Pakistan’s Free Trade Agreements ‘A Global CGE Approach.’ *33rd AGM, PIDE Islamabad Pakistan*.
Abman, R. and C. Lundberg (2020). "Does free trade increase deforestation? the effects of regional trade agreements." Journal of the Association of Environmental and Resource Economists 7(1): 35-72.
Ades, F., C. Senterre, et al. (2014). "An exploratory analysis of the factors leading to delays in cancer drug reimbursement in the European Union: the trastuzumab case." European journal of cancer 50(18): 3089-3097.
Asner, G. P. and R. Tupayachi (2017). "Accelerated losses of protected forests from gold mining in the Peruvian Amazon." Environmental Research Letters 12(9): 094004.
Baghdadi, L., I. Martinez-Zarzoso, et al. (2013). "Are RTA agreements with environmental provisions reducing emissions?" Journal of International Economics 90(2): 378-390.
Barbier, E. B. (2004). "Explaining agricultural land expansion and deforestation in developing countries." American Journal of Agricultural Economics 86(5): 1347-1353.
Cherniwchan, J. (2017). "Trade liberalization and the environment: Evidence from NAFTA and US manufacturing." Journal of International Economics 105: 130-149.
Organization, W. H. (2017). "Improving access to medicines in the South-East Asia region: progress, challenges, priorities."
Son, K.-B. (2020). "Do free trade agreements matter to drug lag? recent evidence from Korea after the Korea–US free trade agreement." International Journal of Health Services 50(2): 147-155.
Wileman, H. and A. Mishra (2010). "Drug lag and key regulatory barriers in the emerging markets." Perspectives in clinical research 1(2): 51.
Analytica, O. "Brexit will be damaging for UK-EU services trade." Emerald Expert Briefings(oxan-db).

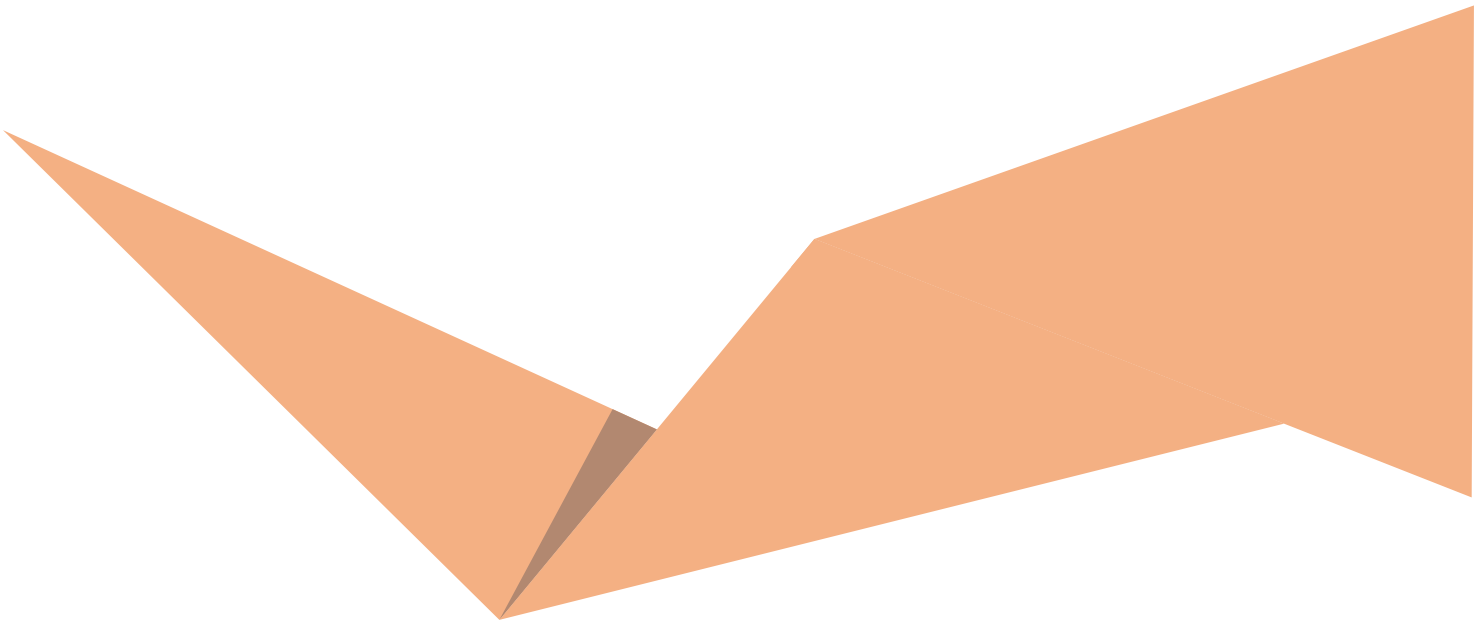
Lu, J., et al. (2020). "Unity versus Collaboration: Construction of China's Belt and Road Free Trade Agreement 2.0 Network." Pacific Economic Review **25**(2): 250-271.
Walters, R. (2020). "A US–Taiwan Free trade agreement in 2020." Режим доступа: https://www. heritage. org/sites/default/files/2020-02/IB5034. pdf.–12.03.
Yang, G., et al. (2020). "Assessment of the effects of infrastructure investment under the belt and road initiative." China Economic Review **60**: 101418.

Appendix – 1: RTA in CAREC Region

Regional trade agreements to the GATT/WTO and in force by country

Country/Territory	Goods notifications (RTAs)	Services notifications (Accessions)	Number of RTAs
Afghanistan	2	0	2
Azerbaijan	5	0	5
China	16	0	16
Georgia	14	0	14
Kazakhstan	10	2	10
Kyrgyz Republic	9	1	9
Mongolia	1	0	1
Pakistan	10	0	10
Tajikistan	2	0	2
Turkmenistan	5	0	5
Uzbekistan	4	0	4

Source: World Trade Organization, 2021



No.376 Nanchang Road,Urumqi
Xinjiang Uygur Autonomous Region
People's Republic of China
f:+86.991.8891151
km@carecinstitute.org
www.carecinstitute.org