Assessing participation of CAREC Countries in Global and Regional Value Chains

Yaroslava Babych, Davit Keshelava, Giorgi Mzhavanadze

4th CAREC Think Tanks Development Forum

Xi'an, PRC

August 27-28, 2019

MOTIVATION

In the modern world countries trade more and more by integrating their production into global value chains.

We see less of "wine-for-cloth" kind of trade, and more trade in intermediate goods and services.

Value Chain (VC) model of trade:

Forward VC Participation: Country A produces intermediate goods domestically, exports to Country B. Country B uses them to produce export goods for other countries.

Backward VC Participation: Country A imports intermediate goods from country B. Country A adds value domestically and exports to other countries.

# BENEFITS FROM PARTICIPATING IN GLOBAL VALUE CHAINS (GVC)

Research finds that both forward and backward linkages in VC participation tend to benefit participating countries, as they

- **increase domestic per capita value-added embodied in exports (gains from trade to domestic factors of production).**
- **increase sophistication of exports (product upgrading)**
- **increase diversification of exports**
- **improve access to markets**
- **facilitate knowledge spillovers and technology transfers**
- **create opportunities for Small and Medium enterprises to participation in and benefit from global production.**

DEGREE OF GVC PARTICIPATION

The degree of GVC participation – different for different countries. Example: OECD countries
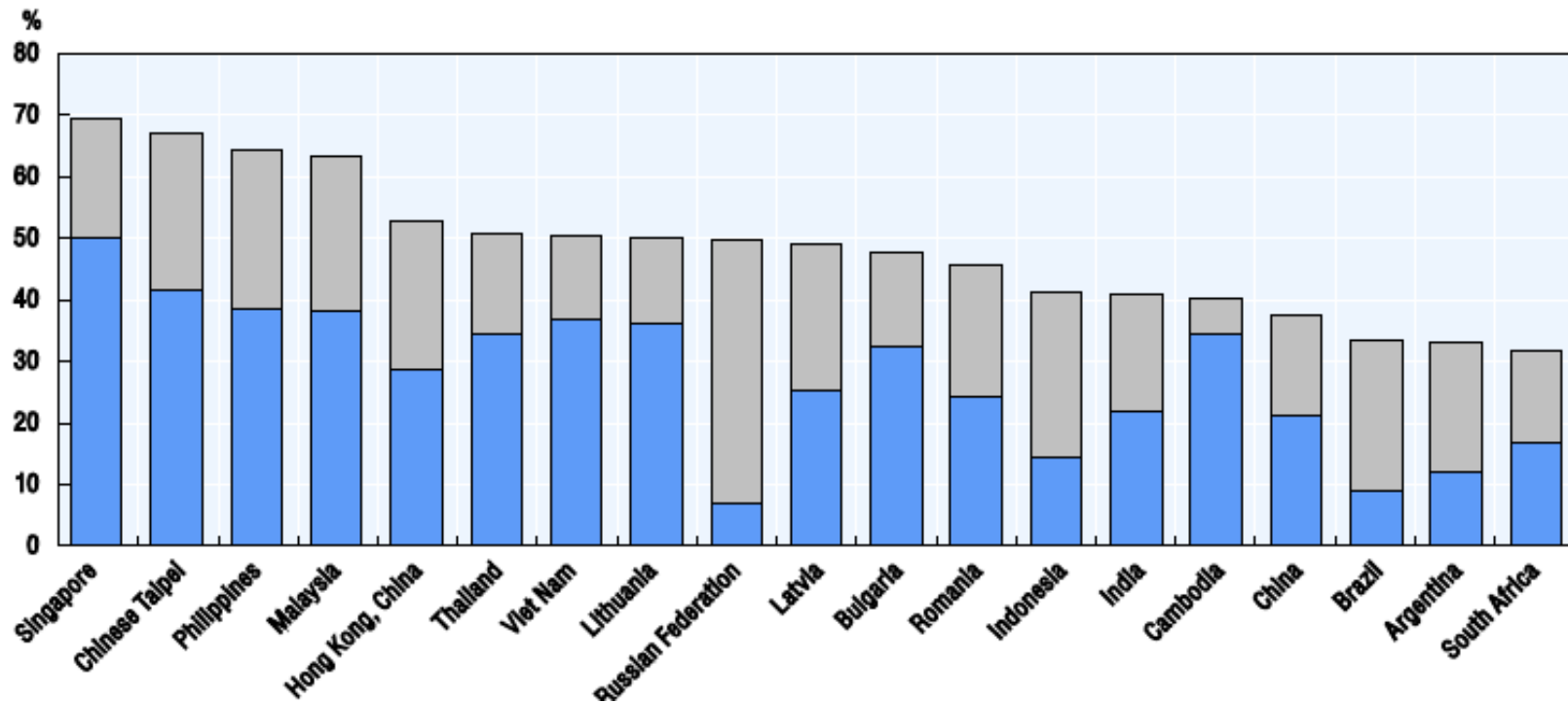
Foreign inputs and domestically produced inputs used in third economies' exports, as a share of gross exports (in %)

OECD countries (above), non-OECD economies (below)

■ **Backward participation**   ▢ **Forward participation**

Source: OECD 2013 report (2009 data)

ISET
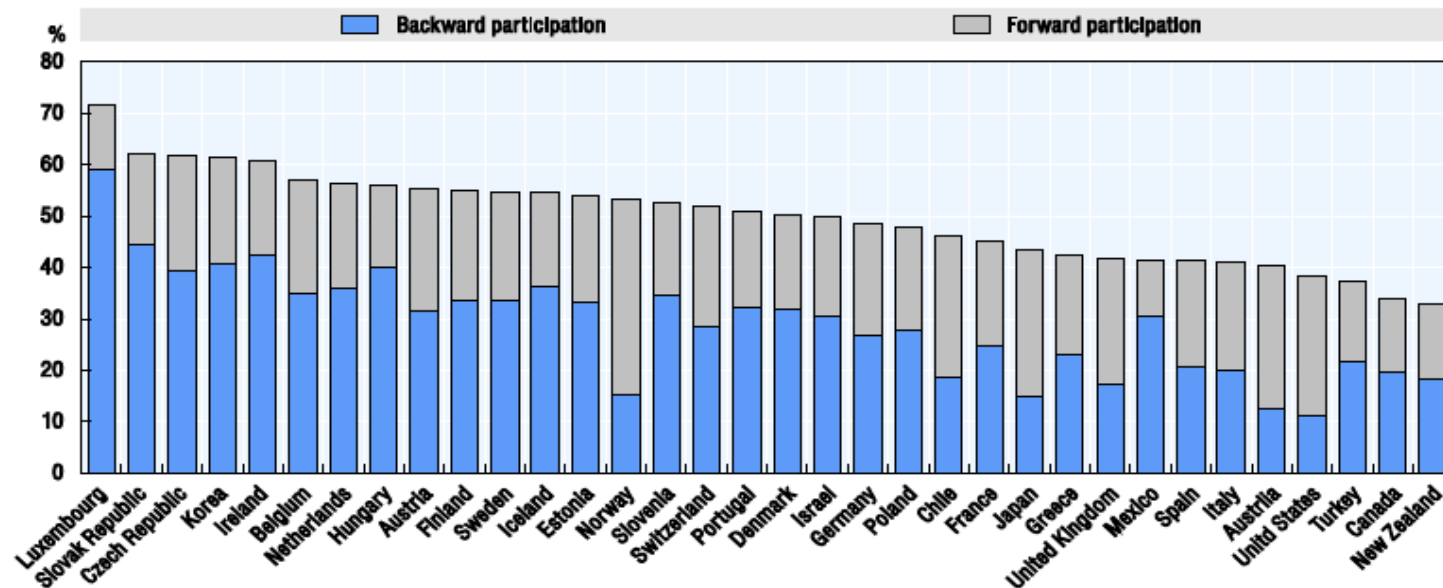
DEGREE OF GVC PARTICIPATION

GVC participation, non-OECD countries

Source: OECD 2013 report (2009 data)

What about developing countries and emerging economies?

Barriers to participating in GVC: infrastructure, weak institutions and contract enforcement, quality of human and physical capital, lack of FDI.

Can countries (such as CAREC members) benefit from participation in Regional Value Chains?

      - RVC participation can be a stepping stone towards greater GVC integration

      - countries can benefit from proximity, access and natural resource endowments of each other

But developing/emerging economies are often very weakly integrated into RVC, and, as our analysis shows, CAREC countries are no exception.

WHAT DOES THIS PAPER DO?

- **Our study is the first one to create comprehensive mapping of the GVCs and RVCs for CAREC region by using the inter-country input-output matrices.**

  - **It aims to contribute to the empirical literature on RVC by assessing the trade linkages between countries in this group**
  - **Empirically identify policy factors that may be associated with RVC participation at the country level.**

MAPPING RVC AND GVC PARTICIPATION FOR CAREC COUNTRIES: METHODOLOGY

		Intermediate use				Final demand		Gross output
		Country A		Country B		Country A	Country B	
		Industry A1	Industry A2	Industry B1	Industry B2	Final Demand	Final Demand	
Country A	Industry A1	Intermediate use of domestic output	Intermediate use by A2 of domestic output from A1	Intermediate use by B1 of exports from A1	Intermediate use by B2 of exports from A1	Final use of domestic output from A1	Final use by B of exports from A1	X_{A1}
	Industry A2	Intermediate use by A1 of domestic output from A2	Intermediate use of domestic output	Intermediate use by B1 of exports from A2	Intermediate use by B2 of exports from A2	Final use of domestic output from A2	Final use by B of exports from A2	X_{A2}
Country B	Industry B1	Intermediate use by A1 of exports from B1	Intermediate use by A2 of exports from B1	Intermediate use of domestic output	Intermediate use by B2 of domestic output from B1	Final use by A of exports from B1	Final use of domestic output from B1	X_{B1}
	Industry B2	Intermediate use by A1 of exports from B2	Intermediate use by A2 of exports from B2	Intermediate use by B1 of domestic output from B2	Intermediate use of domestic output	Final use by A of exports from B2	Final use of domestic output from B2	X_{B2}
Value added		V_{A1}	V_{A2}	V_{B1}	V_{B2}			
Gross input		X_{A1}	X_{A2}	X_{B1}	X_{B2}			

Source: UNCTAD (2013), Yedan (2019)

METHODOLOGY

Table 2. The matrix of the value-added content of trade

t Value Added Exports (DVX) of Country 1

ISET

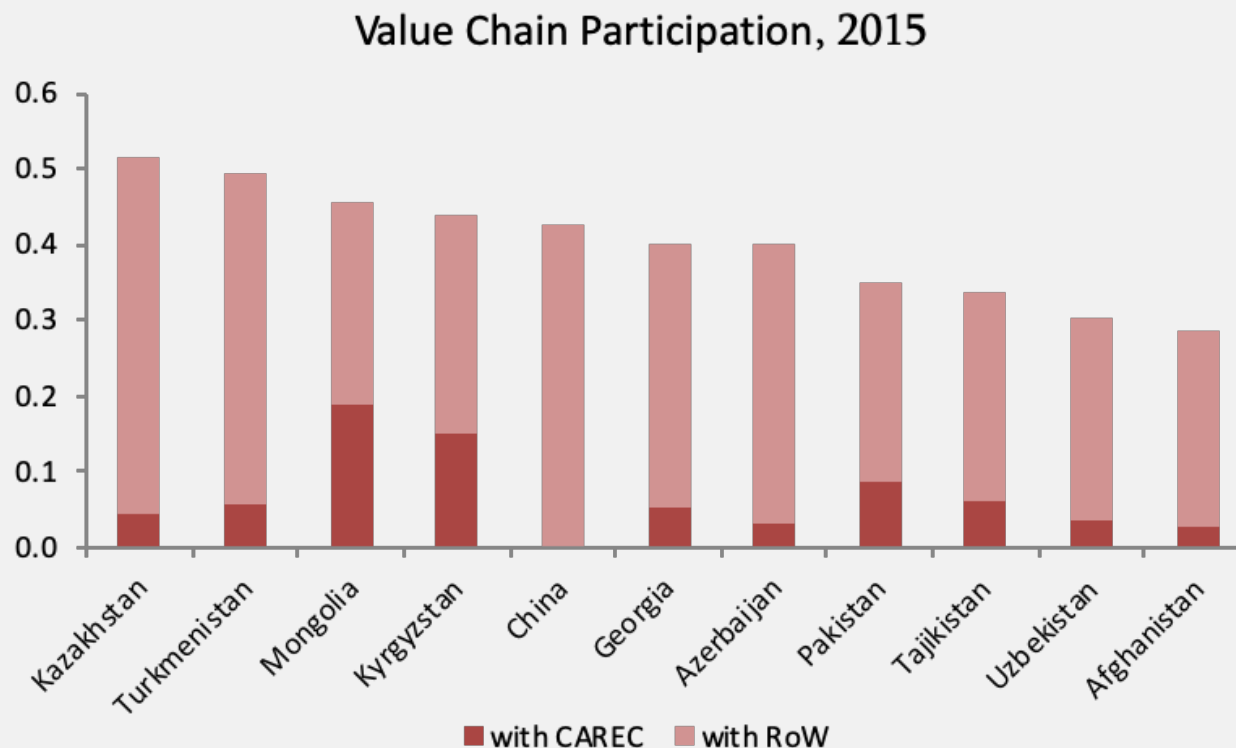The Global Value Chain (GVC) participation index simply adds the FVA and DVX shares for country i and industry k and can be expressed the following way:

$$GVC_{ik} = \frac{FVA_{ik}}{Gross\ Export_{ik}} + \frac{DVX_{ik}}{Gross\ Export_{ik}}$$

RESULTS: GVC AND CAREC-RVC PARTICIPATION INDEX

Value Chain participation index for CAREC countries

Value Chain Participation, 2015

ISET

RESULTS: GVC AND CAREC-RVC PARTICIPATION INDEX

TABLE 3: GVC and RVC Participation Indicies of CAREC Countries

Country	2006			2012			2015		
	RVC	GVC	RVC/GVC	RVC	GVC	RVC/GVC	RVC	GVC	RVC/GVC
Kazakhstan	4.69%	59.44%	**7.89%**	5.23%	55.25%	**9.46%**	4.53%	51.60%	**8.78%**
Turkmenistan	4.93%	52.10%	**9.47%**	6.86%	53.89%	**12.73%**	5.81%	49.60%	**11.72%**
Kyrgyzstan	16.38%	51.85%	**31.60%**	18.27%	50.89%	**35.91%**	15.17%	44.03%	**34.44%**
Mongolia	21.08%	50.76%	**41.52%**	21.05%	50.52%	**41.67%**	18.92%	45.62%	**41.47%**
Azerbaijan	2.85%	46.29%	**6.17%**	0.33%	46.62%	**0.70%**	3.27%	39.96%	**8.19%**
China	0.24%	44.47%	**0.53%**	6.21%	44.41%	**13.98%**	0.25%	42.73%	**0.59%**
Georgia	3.87%	41.80%	**9.25%**	3.47%	43.07%	**8.05%**	5.13%	40.01%	**12.83%**
Pakistan	7.38%	37.02%	**19.94%**	7.37%	38.48%	**19.16%**	8.81%	35.04%	**25.15%**
Tajikistan	5.22%	36.53%	**14.30%**	10.01%	38.27%	**26.16%**	6.00%	33.77%	**17.75%**
Afghanistan	2.74%	36.00%	**7.62%**	3.73%	33.43%	**11.17%**	2.75%	28.54%	**9.65%**
Uzbekistan	3.25%	35.89%	**9.05%**	3.09%	30.99%	**9.96%**	3.33%	30.39%	**10.96%**
Average for CAREC	6.60%	44.74%	**14.30%**	7.78%	44.17%	**17.18%**	6.73%	40.12%	**16.50%**

ISET

RESULTS: HOW DID PARTICIPATION CHANGE OVER TIME?

Changes in RVC and GVC participation (percentage points)						
Country	2006-2015		2006-2012		2012-2015	
	RVC	GVC	RVC	GVC	RVC	GVC
Pakistan	1.43	-1.99	-0.01	1.46	1.44	-3.44
Georgia	1.26	-1.79	-0.40	1.27	1.66	-3.06
Turkmenistan	0.88	-2.50	1.92	1.78	-1.05	-4.29
Tajikistan	0.77	-2.76	4.79	1.75	-4.02	-4.50
Azerbaijan	0.42	-6.34	-2.53	0.33	2.95	-6.67
Uzbekistan	0.08	-5.50	-0.16	-4.90	0.25	-0.60
China	0.01	-1.74	5.97	-0.06	-5.96	-1.68
Afghanistan	0.01	-7.45	0.99	-2.57	-0.98	-4.89
Kazakhstan	-0.16	-7.84	0.54	-4.19	-0.70	-3.65
Kyrgyzstan	-1.22	-7.82	1.89	-0.97	-3.10	-6.85
Mongolia	-2.16	-5.14	-0.02	-0.24	-2.14	-4.90
Average	0.0012	-0.0462	0.0118	-0.0058	-0.0106	-0.0405

ISET

RESULTS: CASE OF GEORGIA

Table 4: Bilateral Value Chain (CVC) Participation Indicies for Georgia and top VC partner countries

Country	2006			2012			2015		
	CVC	Forward	Backward	CVC	Forward	Backward	CVC	Forward	Backward
Russia	6.59%	3.79%	2.81%	8.42%	3.83%	4.59%	7.80%	3.64%	4.16%
Germany	4.76%	3.47%	1.28%	4.96%	3.28%	1.68%	3.83%	2.73%	1.10%
Italy	3.55%	3.03%	0.52%	3.37%	2.72%	0.65%	3.08%	2.58%	0.50%
France	3.44%	3.07%	0.37%	3.12%	2.65%	0.46%	2.94%	2.59%	0.34%
Turkey	3.05%	1.46%	1.59%	3.46%	1.43%	2.02%	2.93%	1.31%	1.62%
Azerbaijan	1.91%	0.32%	1.59%	3.54%	0.30%	3.24%	2.80%	0.26%	2.54%
Ukraine	1.49%	0.71%	0.78%	1.78%	0.80%	0.97%	1.53%	0.74%	0.78%
USA	1.49%	0.65%	0.84%	1.64%	0.60%	1.04%	1.34%	0.53%	0.80%
Netherlands	1.39%	1.15%	0.24%	1.38%	1.07%	0.31%	1.26%	1.01%	0.25%
UK	1.42%	0.81%	0.61%	1.36%	0.74%	0.62%	1.12%	0.59%	0.53%
China	0.84%	0.57%	0.27%	1.25%	0.75%	0.50%	1.07%	0.61%	0.46%
Iran	0.82%	0.52%	0.30%	0.89%	0.45%	0.43%	0.98%	0.59%	0.39%
Belgium	1.01%	0.83%	0.18%	0.94%	0.72%	0.23%	0.85%	0.67%	0.17%
Spain	0.76%	0.59%	0.17%	0.73%	0.50%	0.23%	0.65%	0.48%	0.17%
South Korea	0.48%	0.40%	0.08%	0.64%	0.53%	0.11%	0.59%	0.51%	0.09%
Japan	0.73%	0.47%	0.26%	0.72%	0.40%	0.32%	0.57%	0.37%	0.20%
Singapore	0.56%	0.52%	0.04%	0.57%	0.51%	0.06%	0.56%	0.51%	0.05%
Kazakhstan	0.54%	0.33%	0.22%	0.64%	0.33%	0.30%	0.53%	0.29%	0.24%

FURTHER ANALYSIS

Analyze Domestic value added (DVA) and Foreign value added (FVA) associated with forward and backward value-chain exports for Georgia and other CAREC countries by industry and country.

Forward CVC linkages of Georgia, 2015 (domestic value-added used in foreign exports)

Georgia	Russia	Germany	Italy	France	Turkey	Azerbaijan	Ukraine	USA	Netherland	UK
Wholesale trade and commission trade, except of motor vehicles and motorcycles	14537.39	6827	17854	8277	1934	868	1313	1294	3555	1730
Manufacture of basic metals and fabricated metal products	10370.39	3879	4098	6934	4622	505	467	1477	1051	691
Retail trade of motor fuel	9231.199	1646	1978	1097	376	92	445	377	742	529
Mining and quarrying	9070.286	4052	3818	6845	4291	710	1463	1439	1529	839
Retail trade, including trade of motor vehicles and motorcycles	7392.577	3704	2854	3468	1694	343	923	756	1449	838
Manufacture of coke, refined petroleum products and nuclear fuel; manufacture of chemicals, chem	5398.026	4096	3311	10330	2077	1334	1032	1624	3953	843
Real estate, renting and business activities	4671.894	5882	6048	5066	1926	449	947	933	2489	1602
Cargo handling and storage	4290.459	3464	3497	3494	1809	367	818	678	1281	817
Other land transport; sea and coastal water transport	3893.878	2602	1403	1575	3006	296	781	361	805	450
Growing of fruit, nuts, beverage and spice crops	3632.188	5679	1442	619	265	35	1966	225	570	252
Financial intermediation	3409.643	3212	2629	2937	2864	182	355	610	833	769
Other supporting transport activities	3388.402	4050	4321	4363	1433	417	718	707	1511	825

FURTHER ANALYSIS

Backward CVC linkages of Georgia, 2015 (foreign value-added used in domestic exports)										
Georgia	Russia	Germany	Italy	France	Turkey	Azerbaijan	Ukraine	USA	Netherland	UK
Chemicals, chemical products and man-made fibres	18991.93	2713	1327	973	4881	4198	1496	1210	573	1203
Basic metals and fabricated metal products	13630.66	3033	1337	895	4777	7195	2807	2263	569	1568
Office machinery and computers; machinery, equipment and apparatus n.e.c.	10434.7	3102	1346	883	4440	4662	2213	2332	580	1467
Fruit, nuts, beverage and spice crops	8190.279	1727	765	617	2523	4518	1016	1006	585	785
Alcoholic beverages	6717.127	2726	1154	949	3088	2985	1065	1418	834	1132
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	5039.526	1731	767	488	2836	7445	1794	1653	346	873
Other land transportation services; water transport services	4028.804	922	393	268	1393	8035	1328	855	189	519
Transport equipment	3416.664	988	428	283	1366	1384	641	638	182	459
Coke, refined petroleum products and nuclear fuels; industrial gases	2974.923	434	211	155	773	657	245	212	92	197
Retail trade services of motor fuel	2711.03	289	137	106	398	3936	590	412	76	264
Mineral waters and soft drinks	2536.002	1247	558	414	1967	976	397	624	253	516
Reexport/reimport	2487.179	822	352	220	1543	92	1038	1580	172	444
Other food products	2429.618	514	240	154	723	622	214	264	181	155
Public administration and defence services; compulsory social security services	1982.251	420	226	122	816	2938	428	232	107	168
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	1695.981	798	451	251	1406	1011	316	374	165	341
Collected and purified water; distribution services of water	1687.426	56	23	17	53	125	52	52	11	31
Air transport services	1610.521	836	323	213	911	3888	696	609	147	415

NEXT STEPS

- **Taking the stock of forward and backward linkages between Georgia and other CAREC countries at the industry level. This exercise will reveal the opportunities for further trade cooperation and will serve as a backdrop for in-depth interviews with industry representatives. We will also do the same exercise for a number of select CAREC countries.**

- **Look at the industry by industry VC participation index for CAREC countries. This would reveal how particular industries are integrated on the regional level and in global value chains. It would be instrumental for understanding which industries may have the highest potential for intra-regional integration.**