Global Value Chains Diagnostic - Annex

Mapping GVCs in the EBRD region[1]

- **EBRD countries are well integrated into global value chains, but heterogeneously across regions, countries and sectors**
- **EU member states and South Eastern European countries show higher GVC integration; particularly in manufacturing**
- **There is a complementary relationship between foreign value-added and higher domestic value-added in GVC exports**
- **GVC linkages are subdued due to high restrictiveness in trade of services**
- **It is key to rethink trade and industrial policies in light of GVCs to identify optimal approaches to increase domestic value-added in the EBRD region.**

Unfolding of GVCs

Over the past decades, the global economy has become increasingly structured around Global Value Chains (GVCs) that account for a significant share of international trade. Nowadays, about 70 per cent of international trade involves a variety of transactions where services, raw materials, parts and components are exchanged in global value chains across countries, before being incorporated into final products that are shipped to consumers all over the world.

As a result of the international fragmentation of production, traditional trade statistics have become increasingly less reliable as a gauge of trade flows and of the value contributed by any particular country. Traditional trade statistics measured in gross terms, which include both intermediate inputs and final products, double count the value of intermediate goods that cross international borders more than once and do not explicitly account for foreign value-added in a final product. In 2017, the 'Exports to GDP' ratio of the EBRD region adds up to 27 per cent, whereas the ratio would be 19 per cent when only taking the domestic value-added component of exports into account *(see BOX 1 for concept and definitions of GVCs).*

In recent years, the fragmentation of international production has been declining and global value chains are under increasingly scrutiny amid global tensions. Despite this slowdown of globalisation, countries across the EBRD region still remain highly integrated into GVCs, thus confirming the need for policy makers to ensure supportive trade policies and promoting opportunities for firms to enhance and upgrade their position in global markets.

GVC integration of EBRD countries

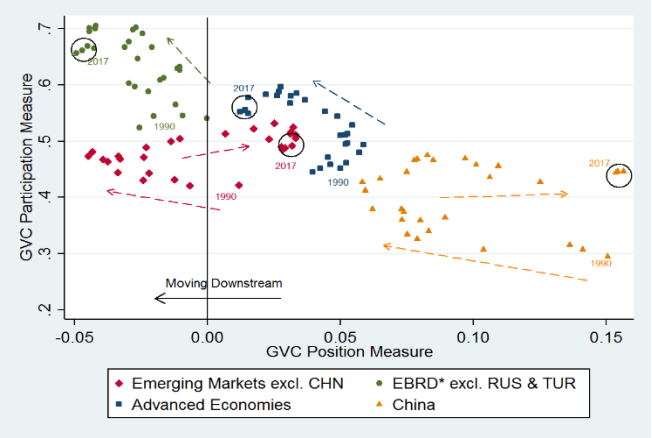
On aggregate, the EBRD region is highly integrated and has a rather downstream position in global value chains, i.e. it sources more foreign inputs for its own exports than it sells domestic inputs to other countries exports. The region shows on average a higher value in the GVC Participation Index (defined as the share of a country's exports that is part of a multi-stage trade process) than eight advanced economies, emerging markets and China in 2017.[2]

[1] This note was produced by Olivia Riera from SEP/EPG and Philipp Paetzold from OCE. The analysis was supported by the *Value Chain Competitiveness Programme*, implemented by the European Bank for Reconstruction and Development and financed by the European Union. The views expressed in this note are those of the authors only and not necessarily those of the EBRD or the EU.

[2] The Advanced economies consist of Canada, the Czech Republic, France, Germany, Japan, Sweden, the United Kingdom and the Unites States of America. Emerging market economies include Argentina, Bangladesh, Brazil, Chile, Columbia, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, South Africa and Thailand.

Moreover, the EBRD region has moved further downstream in GVCs since 1990 (Chart 1). Both observed increases in GVC participation and in the downstream position indicate that the EBRD region has strong backward linkages and sources more foreign inputs from third countries for its exports than it sells to third countries via value chain linkages.

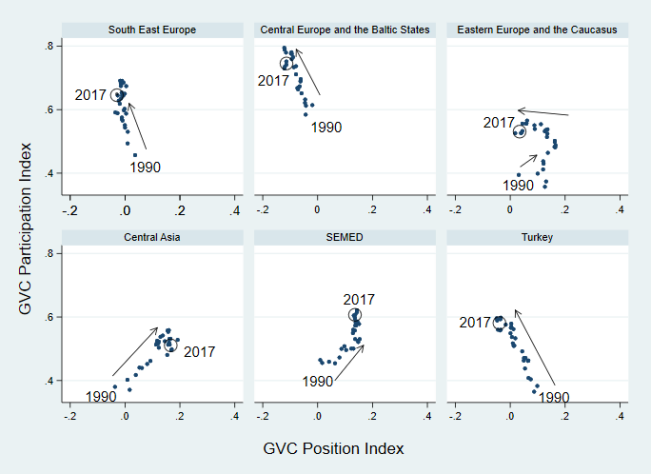
Chart 1: Global GVC Integration over time



Sources: UNCTAD-EORA (2019), and authors calculations

EBRD regions have increased their GVC participation over the last two decades. The Central Eastern European and Baltic States (CEB) show the highest GVC Participation Index value in absolute terms with 74 per cent of all exports either being sourced or sold in GVC linkages, whereas the index value is the lowest with 50 and 53 per cent in Central Asia (CA) and the Eastern European Countries (EEC) in 2017. In relative terms, growth in GVC participation was significantly strong in Turkey and South East Europe (SEE), while other regions such as SEMED, Central Asia and the EEC have only seen minor increases in the GVC Index over the last two decades (Chart 2).

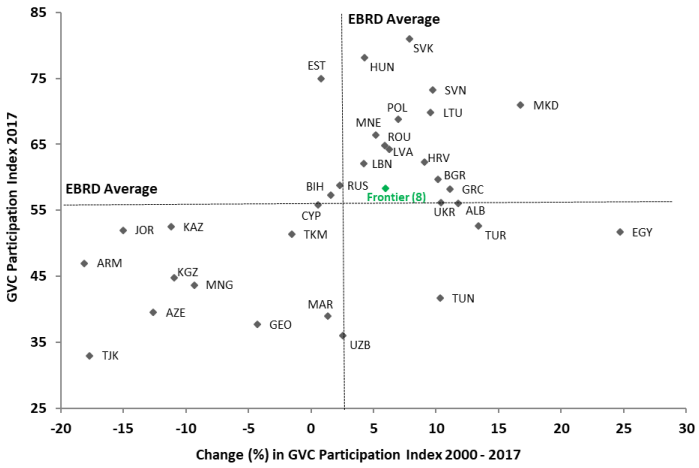
Chart 2: Regional GVC integration



Sources: UNCTAD-EORA (2019), and authors calculations

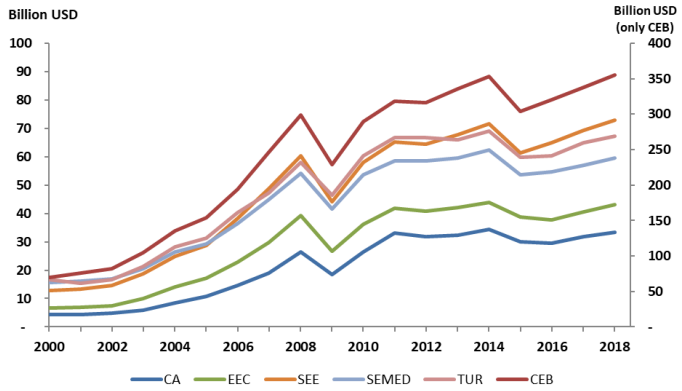
Although the speed of GVC integration of the EBRD countries has slowed down and partly even declined since the financial crisis, the majority of countries are still highly embedded into GVCs. More precisely, 24 EBRD countries have a higher GVC participation in 2017 compared to the year 2000, with the exception of nine EBRD countries mostly located in the CA and EEC regions. EEC and CA countries are the least GVC integrated economies and have even further experienced a decline in GVC participation over time. Nearly all CEB and SEE countries have increased their GVC participation and show a high level of integration in 2017, whereas the development is rather mixed across SEMED countries (Chart 3). Furthermore, the major growth in exports with GVC linkages (measured in nominal USD terms), has been achieved in the period up to the financial crisis, with a general GVC slowdown following the years after across all regions (Chart 4).

Chart 3: Country-level GVC participation since 2000



Sources: UNCTAD-EORA (2019), and authors calculations

Chart 4: Development of GVC linkages[3]



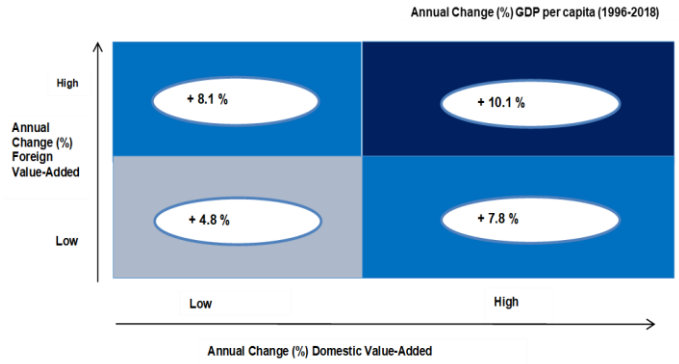
Sources: UNCTAD-EORA (2019), and authors calculations

Upgrading through GVC participation

Upgrading or moving up the value chain is the best long-term strategy for preserving a country's participation in GVCs by capturing more domestic value-added (DVA) and maximising the benefits of GVC participation. The EBRD region experienced on average greater use of foreign value-added (FVA) inputs for their production of exports in the last two decades. At the same time, domestic value-added has also grown in absolute terms, resulting in the region capturing a larger share in global production of DVA. The positive relationship between domestic and foreign value-added of a product indicates a complementary role, in which capturing a smaller domestic share in the total value-added of a product can lead to higher domestic value-added in absolute output terms.

Furthermore, EBRD countries with strong growth in both foreign value-added and domestic value-added volumes have had on average higher GDP per capita growth rates between 1995 and 2018, indicating a positive relationship between growth and GVC participation (Chart 5).

Chart 5: GVC and GDP per capita relationship[4]



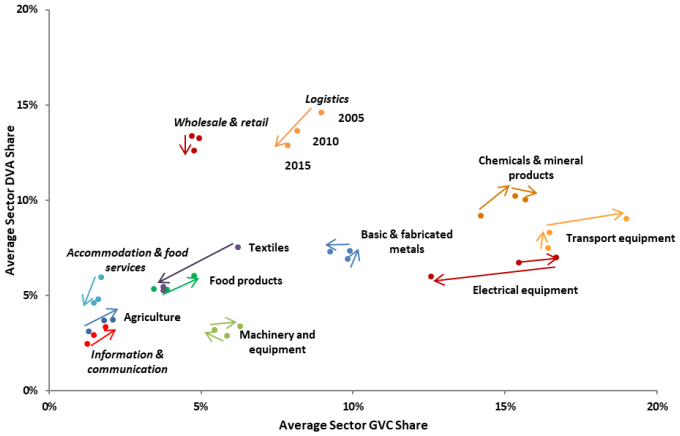
Sources: UNCTAD-EORA (2019), IMF (2018) and authors calculations

The analysis of the integration of EBRD countries at the sector level reveals that the manufacturing sector has been driving GVC integration in the region. On aggregate, both the manufacturing and services sectors account each for around 50 per cent of domestic value added of total exports. But many services industries such as the logistics and retail services activities have experienced a stagnation or even decline in both their DVA and GVC shares of exports in the decade between 2005 and 2015, indicating that their relative importance as export industries have diminished compared to the growing manufacturing industries. In the manufacturing sector, industries producing food, chemicals, plastics, rubber, non-metallic mineral products and transport equipment have grown faster in their exports via GVC linkages and captured a higher share in both DVA and GVC of total exports in the EBRD region (Chart 6).

[3] The chart presents the sum of Foreign Value-Added components in a country's exports (FVA) and Domestic Value-Added exported to third countries for further export (DVA).

[4] Data for 30 EBRD countries (the large commodity exporter countries Russia, Kazakhstan and Azerbaijan are excluded), ranked by the annual change (in %) in foreign value-added and domestic value-added in gross exports between the years 1996 and 2018. High includes the top two quartiles of both rankings, low includes the bottom two. The annual change of GDP per capita reported is the average value of all countries in each quadrant between 1996 and 2018.

Chart 6: Sector level relevance in the EBRD region (as shares of total DVA and GVC volume in the EBRD region)



Sources: OECD (2018)

The role of services

The services sector has become increasingly relevant in terms of GVC.[5] Services and manufacturing industries are becoming more and more intertwined through the so-called 'servicification' of manufacturing. Besides their role as links between different stages of value chains, services are important inputs in the production process of manufacturing goods (e.g. R&D, design, marketing, etc.). Without many services inputs, value chain trade in manufacturing industries would not exist. Improved access to foreign finance, communications, transport and other services is crucial and enhances manufacturing firms' productivity.

While the role of services as an integral element of GVCs has become increasingly evident, this is less pronounced in the EBRD region. Direct services exports as a share of total exports has been stagnating on average at around 30-35 per cent in the EBRD region since 2005, with a strong variation across EBRD countries. Plus, EBRD countries' GVC linkages are found to be significantly higher in the manufacturing sector, which amounts for 75 per cent of total exports via GVCs compared to only 20 per cent in the services sector.

Furthermore, foreign services account on average only for 12 per cent of service value-added in gross exports in the EBRD region in 2016, compared to 20 per cent in the EU-15. This share has only marginally increased since 2005 indicating a stagnating integration of foreign services in the EBRD region. Generally, services are less integrated into GVCs due to a high level of restrictiveness in trade of services across the globe. In 2015, 27 per cent of all direct service exports of the EBRD countries had GVC linkages, whereas the share is higher with 35 per cent in the EU-15.

Conclusions and policy recommendations

EBRD countries are well integrated into global value chains, but heterogeneously across regions, countries and sectors. Particularly, the countries that are part of the European Union or closely connected such as the South East Europe region show a higher degree of GVC integration; mainly in the manufacturing and to a less extent in the services sectors. In line with the observed slowdown in global trade, there has been a stagnation of GVC integration across all EBRD regions since 2011.

The analysis of trends in EBRD countries shows that GVC participation and domestic value-added in exports are complementary. The use of foreign value-added inputs in the production of exports is positively associated with a positive effect on domestic value-added output in the manufacturing sector across EBRD regions, despite reducing the relative share of domestic value added of a product. This highlights that domestic firms can benefit from higher export volumes if they have access to imports of world-class goods and services inputs that enable them to become more productive and competitive on international markets.

The service sector generally exhibits a lower integration into global value chains than the manufacturing sector, but with increasing relevance on both the global and EBRD level through the growing role of the 'servicification' of manufacturing. Enhanced access to foreign services is crucial for a firm's competitiveness as it relies on efficient logistics services to link value chain stages but also on services as inputs to the manufacturing processes such as R&D, marketing and business services.

[5] Based on data from the 17 EBRD countries (EU-12, Morocco, Kazakhstan, Russia, Tunisia and Turkey) included in the OECD 'TiVa' (2018) database which provides services sector data.

However, GVC linkages in services in the EBRD region are still low due to a high level of restrictions and non-tariff trade barriers.

This analysis highlights that in the current GVC world, export competitiveness is inextricably linked to having access to competitively priced intermediate goods and services. Minimum domestic competitiveness is necessary for GVC integration, and well-designed policies can support develop the capacity of domestic firms. Moreover, trade costs such as import tariffs or inefficient customs procedures get amplified with production processes involving multiple border crossings.

It is important to rethink trade and industrial policies in light of GVCs. GVCs provide a key and relevant angle to analyse trade patterns, identify comparative advantage at the country and sector level and discuss and identify optimal policies to increasing domestic value-added.

Further information is available to supplement this factsheet:

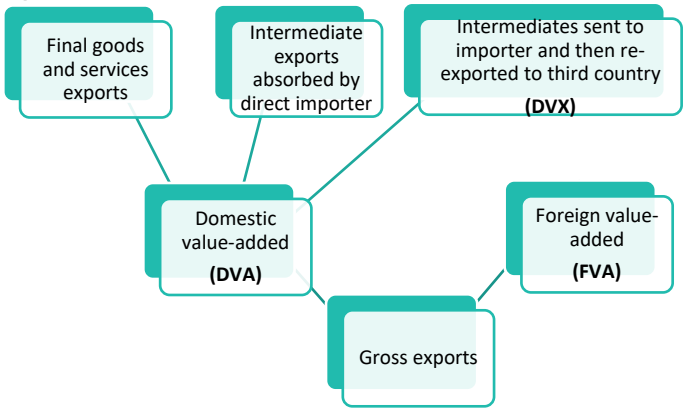
- GVC diagnostic – The Southern and Eastern Mediterranean region
- GVC country diagnostic - Egypt / Jordan / Morocco / Tunisia
- GVC case study: Opportunities from diversification and promotion of resilience in GVCs

BOX 1 – Measuring Participation in Global Value Chains: Concept and Definitions

The flows of goods and services within global production chains are not always best reflected in conventional measures of international trade. The international fragmentation of production has weakened the interpretability of trade data as intermediate goods and services cross borders several times on the way to their final destination. This is referred to as the double (or multiple) counting problem of international trade statistics.

Koopman et al. (2014) developed an analytical framework in which gross exports can be decomposed into domestic (DVA) and foreign (FVA) value-added components.[6] In the next step, a part of the domestic value-added component can be further decomposed into domestic value-added exported to third countries for further exportation (DVX) [Figure B1].

Figure A 1: Decomposition of Value-Added of Exports



Source: Koopman et al. (2014)

Using both FVA and DVX components enables to determine the participation and the position of an economy in GVCs.[7] *GVC Participation* is measured as the share of a country's exports that is part of a multi-stage trade process. It can be calculated by using the sum FVA and DVX divided by gross exports. The larger the ratio, the greater is the intensity of involvement of a particular country in GVCs.

$$GVC_{Participation} = \frac{DVX + FVA}{Gross\ Exports}$$

The *GVC Position Index* defines the overall position for a country on an aggregate level in GVCs. This can be expressed as the log ratio of a country's DVX supply to its FVA use. A positive value indicates that a country contributes more value-added to other countries exports than other countries contribute to its exports (i.e. a country takes an upstream position in GVCs). A negative value indicates that a country sources more foreign value-added inputs for its own exports than it sells domestic inputs to other countries exports (i.e. a country takes a downstream position in GVCs).

$$GVC_{Position} = \ln\left(1 + \frac{DVX}{Gross\ Exports}\right) - \ln\left(1 + \frac{FVA}{Gross\ Exports}\right)$$

It is important to highlight that both upstream and downstream activities can produce high domestic value-added, and both measures should only indicate the relative distance to final demand in GVCs. Countries in an upstream position can both be exporter of raw materials and specialised intermediate inputs that are required at the beginning of a production process. A downstream position can both indicate assembly activities and services like marketing, sales and distribution of a product.

GVC participation can also be described as buyer- and seller-related linkages. *Forward* participation to GVCs corresponds to the indicator DVX and captures the domestic value-added inputs sent to third countries for further processing and export through the value chain. This is the seller perspective in the GVC participation. *Backward* participation refers to FVA and expresses the buyer perspective or sourcing side in the GVC, where an economy imports intermediate inputs to produce exports.

[6] Global inter-country input-output (ICIO) tables are used to derive data on the value added by each country in GVCs. The latest version of the OECD's 'TiVa' (2018) database covers 64 economies and 36 industrial sectors for the years 2005-2015. 17 EBRD countries are covered by this database (EU-12, Morocco, Kazakhstan, Russia, Tunisia, and Turkey). UNCTAD-EORA's (2018) database covers 190 countries for the years 1990-2018, whereas 33 EBRD countries are covered, with the exception of Belarus, Kosovo, Moldova, Serbia and the West Bank.

[7] For an introduction to the calculation of trade in value-added, see also the IMF working paper "Calculating Trade in Value Added" (Aslam et al., 2017) and the OECD paper "Mapping Global Value Chains" (De Backer & Miroudot, 2013).