GLOBAL VALUE CHAINS (GVCs): GERMANY

Participation in GVCs

Countries’ integration in the global economy is nowadays closely linked to their participation in GVCs. One indicator measuring the participation of countries in GVCs shows what percentage of a country’s exports are part of GVCs; either because of upstream links – that is looking back along the value chain and measuring foreign inputs/value added included in a country’s exports – or downstream links – i.e. measuring the domestic inputs/value added of the country contained in the exports of other countries by looking forward along the value chain.

Both upstream and downstream links explain the participation of Germany in GVCs through exports (Figure 1). The use of foreign intermediates in Germany’s exports (i.e. backward participation) is a bit higher than the use of German intermediates in other countries’ exports (forward participation).

Germany participates particularly in manufacturing GVCs for chemicals, basic metals, machinery, electrical and transport equipment through the sourcing of intermediates from abroad (often from Central European countries). In contrast, Germany’s participation in services GVCs is driven by downstream links and the use of German intermediates in the exports of other countries (Figure 2).

Note: 1) This indicator of GVC participation focuses on intermediates which are produced in one country and then included in another country’s exports; it has been introduced by Koopman et al. (2011) ‘Give Credit Where Credit Is Due: Tracing Value Added in Global Production Chains’; see also Miroudot and De Backer (2013) ‘Mapping of GVCs’. GVC participation is influenced by the size of the economy, stock of natural resources, distance to world markets, composition of exports (final versus intermediates), etc.

2) The indicator on the industry level is expressed relative to total country exports (instead of industry exports) in order to take into account the importance of the industry in the total export composition of a country.
Distribution of value added along the value chain (manufacturing and market services)

The ability to participate in GVCs is instrumental for economic integration, but benefiting from GVCs depends on how much value a country creates in GVCs. Similar to the stylised approach applied for individual products (e.g. Apple’s iPhone), the contribution of different industries and countries along the value chain can be calculated at the aggregate level. Final demand in countries (i.e. sales within the domestic market) is made up of value added created by foreign and domestic industries; a further distinction between direct (i.e. within the industry) and indirect (i.e. in upstream industries) domestic value added can be made at the level of individual products.

Figure 3. Domestic and foreign value added in final demand across countries, 2009

- More than 70% of the final demand for manufactured goods and market services in Germany represent value added that has been created domestically. The foreign value added share was about 29% in 2009 (Figure 3).
- Market services show, as expected, the largest domestic value added, especially direct domestic value added. Foreign value added is more important in final demand for manufactured goods sold in Germany, particularly in textiles, chemicals and electrical equipment (Figure 4). Domestic value added (direct and indirect) represents more than half of the final demand for food, wood and paper, basic metals and machinery products.

Figure 4. Domestic and foreign value added in final demand by products, 2009

Note: 3) Timmer et al. (2012) ‘New Measures of European Competitiveness; A Global Value Chain Approach’ calls this measure GVC income.

4) Only manufactured goods and market services are included given the prominence of GVCs in these industries.

5) Since trade and transport margins are grouped together in the wholesale/retail sector, distribution services for final goods are not included in the industry decompositions.
Export shares in GVCs

Countries create (and capture) value added in domestic markets as well as foreign markets (through exports). In an era of GVCs, gross export shares are however less meaningful in measuring the international performance of countries. National economies increasingly specialise in specific activities (assembly, logistics, R&D, etc.) instead of entire industries within GVCs. Because of the international dispersion of productive activities across countries and the uneven distribution of value along the value chain, export shares in value added terms are more accurate indicators of countries’ competitiveness in the global economy.

Figure 5. Export shares\(^6\) across countries, gross and value added terms, 2009

- Germany was the third largest exporter in 2009 in gross terms behind the United States and China. In value added terms, Germany is the second largest exporter on par with China, reflecting the high domestic value added content of German exports (Figure 5).
- A number of manufacturing industries in Germany like machinery and electrical equipment show higher export shares in value added terms than in gross terms. The opposite is true for the transport equipment industry illustrating the higher reliance on foreign inputs in this industry’s exports. Services sectors show roughly equal shares in value added and gross terms (Figure 6).

Figure 6. Export shares by industry, gross and value added terms, 2009

Note: Exports include intermediate, capital as well as final products, hence this indicator provides additional insights into the export activities of countries within GVCs, complementary to the GVC participation index discussed above.
Competitiveness in manufacturing GVCs: the role of services

Manufacturing today involves much more than the pure production of goods and increasingly includes service-related activities both upstream and downstream in the value chain. Manufacturing exports include significant value added from service industries: firms increasingly use logistics, communication services, business services, etc. to facilitate the efficient functioning of GVCs. In addition, services (e.g. design, development, marketing, warranties and after-sales care) help to differentiate, customise and upgrade products, enabling firms to capture more value.

Figure 7. Services value added embodied in manufacturing exports, across countries, 2009

- Almost 40% of the value of German manufacturing exports represents services value added: especially business services and to a lesser extent distribution services, transport and telecommunications and financial services. Services have become significantly more important in manufacturing exports between 1995 and 2009 (Figure 7).

- Exports of different manufacturing industries show a similar distribution across service sectors; business services are the most prevalent category in the exports of each manufacturing industry. (Figure 8). The services value added of exports has particularly increased in the transport equipment industry in Germany.

Figure 8. Services value added embodied in manufacturing exports, by industry, 2009

Note: 7) The results only account for traded services and thus represent a lower bound of the contribution of services to manufacturing exports. R&D services for example are often performed in-house.
8) Distribution services for final goods are not included.