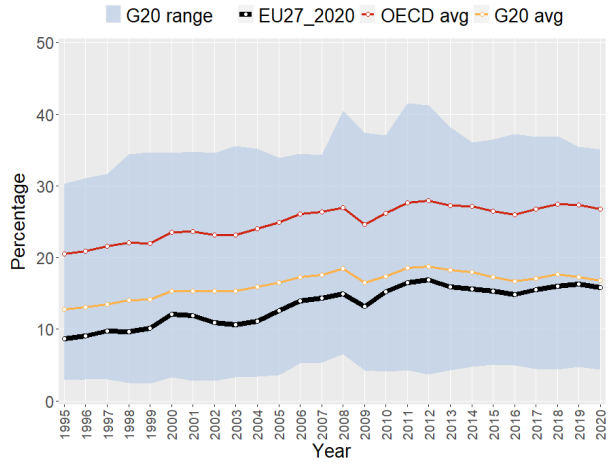
ICIO-TIVA HIGHLIGHTS: GVC INDICATORS FOR **THE EUROPEAN UNION**

OECD's Inter-Country Input-Output (ICIO) tables have been supporting analysis of global and regional inter-dependencies for over 10 years. Notably, ICIO-based **Trade in Value Added** (TiVA) indicators offer new insights into the commercial relations among economies and provide a broad view of where value is created along **global value chains (GVCs)**. Compared to gross trade statistics, the TiVA approach better reflects the contribution to trade made by services, the role of imports in export performance, and the true nature of economic interdependencies through indicators based on the value-added origins (both country and industry) of exports, imports and final demand. ICIO tables are also used to generate indicators of **Trade in Employment** (TiM), revealing the impact of GVCs on jobs, and **Greenhouse Gas Footprints**, providing insights into how final demand in a country drives emissions abroad. A further extension of the ICIO tables, the **Analytical AMNE** database examines the role of multinational enterprises in global production networks. The 2023 versions of these databases cover up to 76 economies and 45 industrial sectors, for the years 1995 to 2020. A new dataset introduces two novel indicators to assess the importance of direct and indirect gross output linkages along GVCs. This note highlights a selection of GVC-related indicators for **the European Union**, that can help inform analysis in a range of policy areas including environment, industry, innovation, investment and trade. A **glossary** is provided for further information on how these indicators can be harnessed for analysis.

Figure 1. Foreign value-added content of gross exports
As a percentage of total gross exports, 1995 to 2020



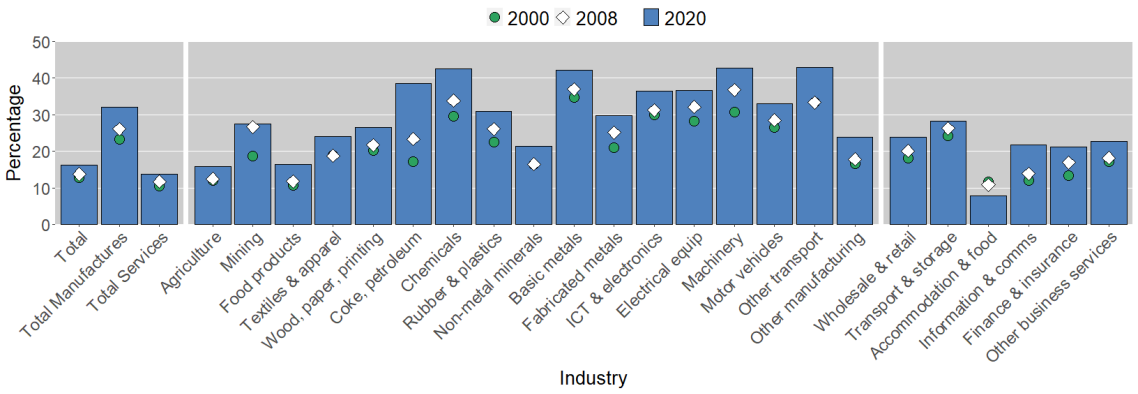
A standard way to evaluate globalisation through trade in intermediate inputs is to consider the foreign value-added content of gross exports. This reflects "backward participation" in GVCs. At the global level, the new TiVA indicators confirm that there has been a slowdown in GVC integration since the Financial Crisis in 2008-09 (Figure 1). In general, foreign value added in trade has remained relatively stable over the last decade.

Between 2008 and 2020, the foreign content of EU exports is estimated to have increased from 15% to 15.8% - significantly below the OECD average of 26.7%.

The role of foreign final demand in domestic production

An alternative approach to evaluate participation in GVCs is to adopt a forward-looking perspective, such as the share of domestic value added driven by foreign demand (Figure 2). Overall, in 2020, 16.3% of EU domestic value added was driven by foreign final demand, up from 13.7% in 2008 and significantly below the OECD average of 29.8% in 2020. By industry, the shares ranged from *Other transport equipment (including Shipbuilding, Air and spacecraft and Railroad equipment)* (43%) and *Machinery and equipment* (42.8%) at the higher end to *Accommodation and food services* (7.9%) at the lower end.

Figure 2. European Union - domestic value added in foreign final demand
As a percentage of value added, by industry, 2000, 2008 and 2020



The importance of imports for exports

The industries with the most foreign value-added contents in their exports (Figure 3a) were *Coke and refined petroleum products* (49.9%), *Financial and insurance* (26%) and *Basic metals* (24.2%). *Wholesale and retail trade* generated the greatest source of domestic value-added content of total exports in 2020, accounting for 13.6% of total gross exports (Figure 3b), followed by *Chemicals and pharmaceuticals* (7.7%) and *Other business services* (7.6%). The most foreign content in total exports came from *Chemicals and pharmaceuticals* (1.8%).

Figure 3a. European Union - foreign value-added content of gross exports
As a percentage of gross exports, by industry, 2000, 2008 and 2020

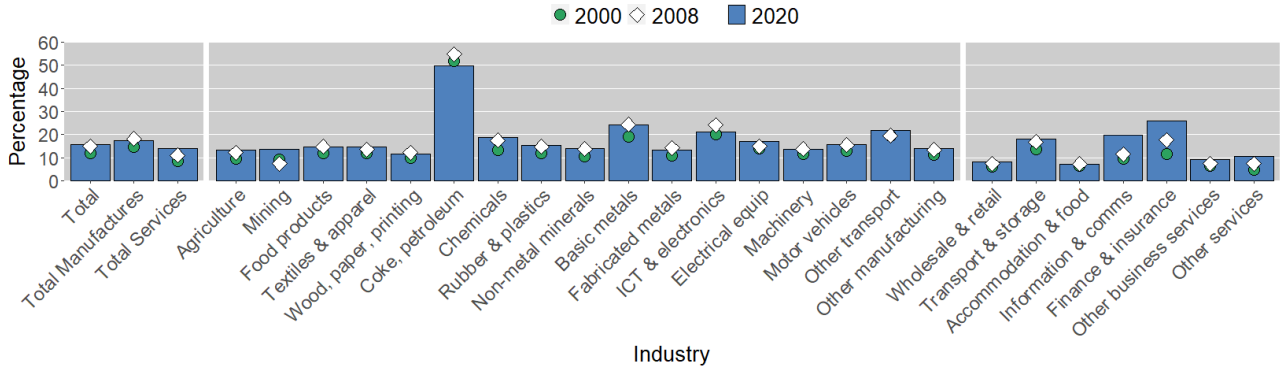
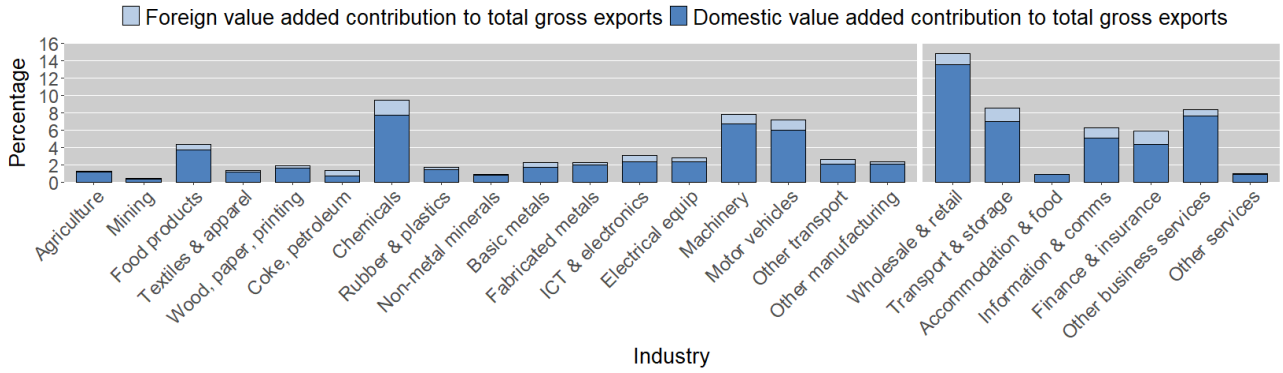
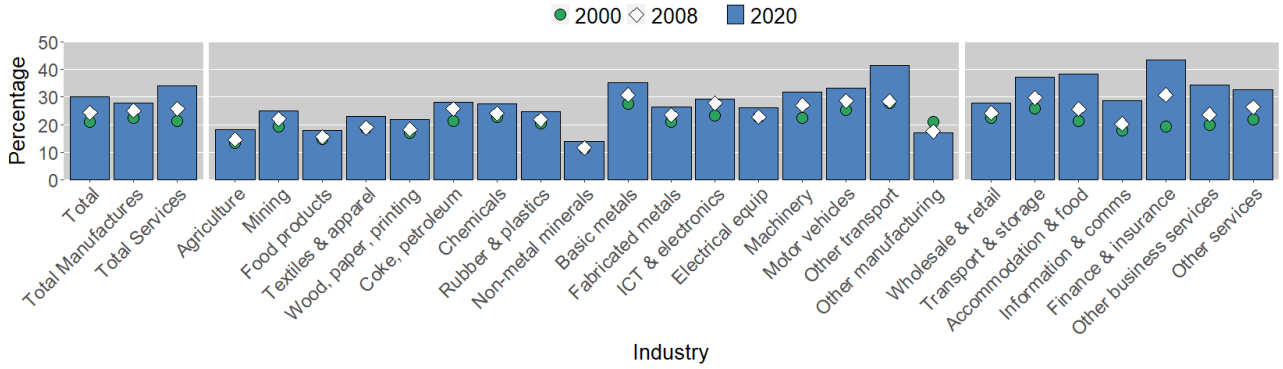


Figure 3b. European Union - industry share of domestic and foreign value-added content of gross exports
As a percentage of total gross exports, 2020



In 2020, 30.2% out of the total value of EU imports of intermediate goods and services was subsequently embodied in exports (Figure 4), significantly below the OECD average of 44.5%, and above the share in 2008 (24.3%). The originating industries with the highest shares of intermediate imports used in EU exports were *Financial and insurance* (43.4%), *Other transport equipment* (41.5%) and *Accommodation and food services* (38.3%).

Figure 4. European Union - imported intermediate inputs used for exports, by industry-origin of imports
As a percentage of intermediate imports, 2000, 2008 and 2020

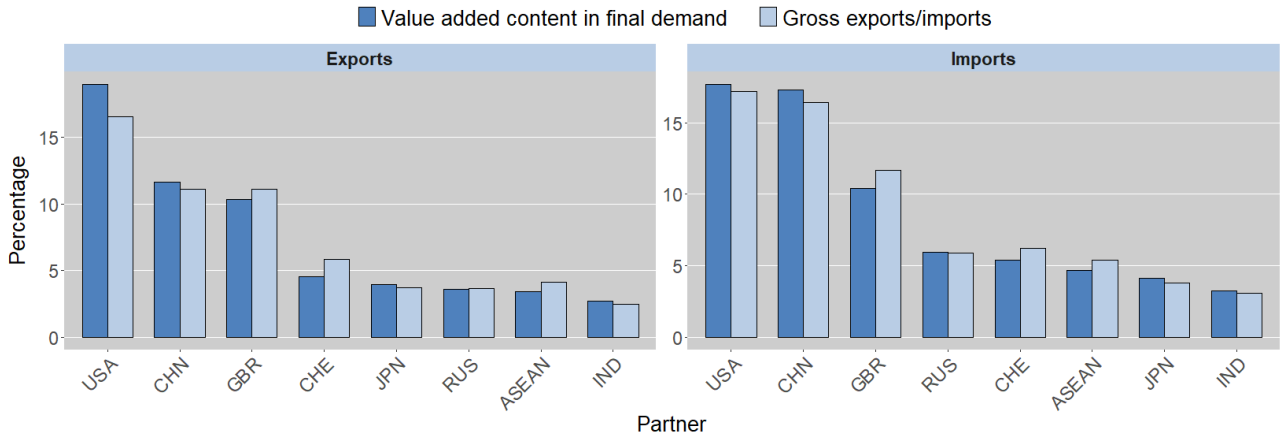


International flows of goods and services: main players

In gross terms, the United States (16.6%), China (11.1%) and the United Kingdom (11.1%) were the three most important EU export market destinations in 2020 (Figure 5). The top three final destinations for EU value added were also the United States (19%), China (11.6%) and the United Kingdom (10.3%).

These same three economies also constituted EU top three partners in 2020 for imports in gross terms - the United States (17.2%), China (16.4%) and the United Kingdom (11.7%) -, as well as in value-added terms - the United States (17.7%), China (17.3%) and the United Kingdom (10.4%).

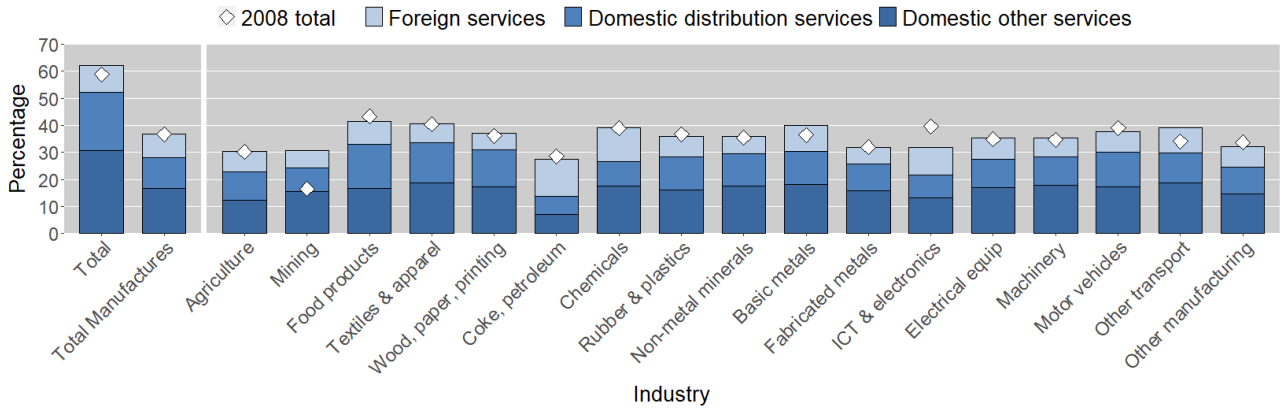
Figure 5. European Union - main trade partners
As a percentage of total gross and value-added exports and imports, 2020



The importance of services in international trade

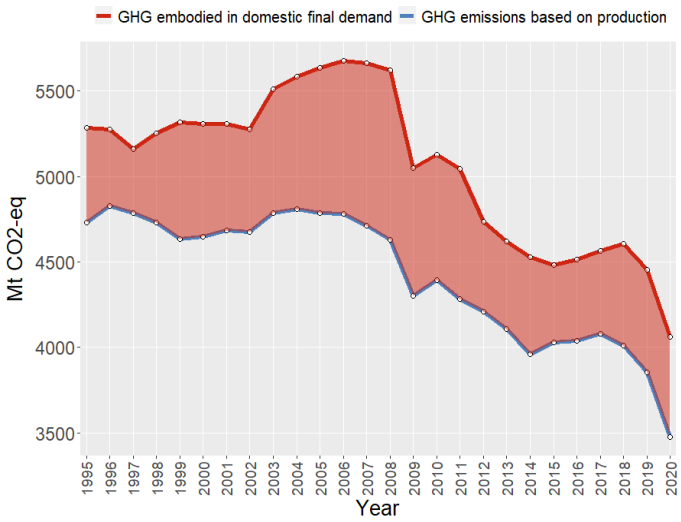
Services are a major contributor to the EU economy, accounting for 62.1% of EU gross exports in 2020 (Figure 6) - above the OECD average of 58.9%. Foreign services contributed 9.8% to the value of total gross exports. For manufactures, services value-added content was 36.8% of gross exports, with the highest shares in *Food and beverages* (41.5%), *Textiles and apparel* (40.4%) and *Basic metals* (40.1%).

Figure 6. European Union - services content of gross exports
As a percentage of gross exports by industry, 2020



Environment and trade - embodied emissions

Figure 7. European Union - production-based and demand-based greenhouse gas (GHG) emissions
1995 to 2020, Million tonnes of CO2 equivalent (Mt CO2-eq)



The underlying ICIO tables, used to generate TiVA indicators, also enable the estimation of other indicators related to globalisation. For example, estimates of GHG emissions embodied in final demand provide an alternative perspective to measures of emissions from domestic production. Figure 7. highlights the difference between production-based and demand-based carbon emissions.

Between 2000 and 2019, EU GHG emissions from domestic production fell by 17.1% (to 3854 Mt). Over the same period, emissions embodied in EU final demand for goods and services also fell, by 16% (to 4454 Mt). In 2019, the European Union was a net importer of GHG emissions, with consumption being 600 Mt greater than production of emissions.

Further information is available to supplement this country note:

- Access the data at: http://oe.cd/tiva
- TiVA indicators are based on the 2023 version of ICIO tables: http://oe.cd/icio
- Related indicators of Trade in Employment (TiM): http://oe.cd/io-emp; and Greenhouse Gas Footprints: http://oe.cd/io-ghg
- Analytical AMNE database: http://oe.cd/gvc-mne/
- Trade policy implications of global value chains: https://www.oecd.org/trade/resilient-supply-chains/

Note: This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

COUNTRY NOTE GLOSSARY

Note:

For all data presented in this country note, the European Union is being considered as a single economy. This means that exports and foreign final demand only take into account non-EU countries, while intra-region flows of value added are considered as domestic.

1. Foreign value-added content of gross exports (TiVA: EXGR_FVASH)

Estimates the contribution to the total value of exports originating from foreign suppliers. It is often considered as a measure of 'backward linkages' in analyses of GVCs. Gross exports in TiVA exclude re-exported imports, i.e. imports that enter and exit a country without any further transformation.

2. Domestic value added in foreign final demand, by industry (TiVA: VALU_FFDDVA)

Presents, for a given country, the value added originating from that country's manufacturing and service industries that is embodied (via exporting activities) in foreign final demand - as a share of the total domestic value added generated by that industry. It can be considered as a measure of industry 'export orientation', as it shows the share of an industry's value added that ultimately meets foreign final demand (whether as a direct export or as an indirect export i.e. embodied in exports by other, downstream industries and countries).

3. Foreign value-added content of gross exports by industry (3a), and industry share of domestic and foreign value content of gross exports (3b) (TiVA: EXGR_FVASH, EXGR_TDVAIND, EXGR_TFVAIND)

Shows the foreign content share of gross exports by industries (3a) and a decomposition of total gross exports into the domestic and foreign value-added content exported by each industry (3b).

4. Imported intermediate inputs used for exports, by industry-origin of imports (TiVA: IMGRINT_REII)

Presents, for a given country, the share of intermediate imports from partners' industries that are used domestically in producing goods and services for export, as a percentage of total intermediate imports from partners' industries. The indicator provides a measure of the importance of intermediate imports to produce goods and services for export and their role as a source of international competitiveness.

5. Exports to and imports from main partner countries (TiVA: EXGRPSH, IMGRPSH, FFD_DVAPSH, DFD_FVAPSH)

Presents, for a given country, the share of total exports to, or total imports from, main partners as a percent of total export or imports in value-added and gross terms. Export figures do not include re-exports.

6. Services content of gross exports (TiVA: EXGR_SERV_DVASH, EXGR_SERV_FVASH)

Presents, for a given country, the contribution made by domestic and foreign services to exporting activities, at the total economy level and for specific goods-producing industries. It reveals the extent to which manufacturing industries, for example, rely on services as intermediate inputs into the production and export of goods.

7. Emissions embodied in domestic and foreign final demand (FD_CO2E, PROD_CO2E)

Production-based Greenhouse Gas (GHG) emissions are estimated by allocating the emissions, measured in carbon dioxide equivalent (referred as CO2-eq and sometimes as CDE), to the 45 target resident industries in OECD ICIO and to household final consumption of fuels. Demand-based GHG emissions are calculated by multiplying the intensities of the production-based emissions with the global Leontief inverse and domestic final demand matrices from OECD ICIO. Thus, net emissions are defined as the difference between production-based emissions and domestic and foreign emissions embodied in domestic final demand.