Employment and value added using FIGARO data - view into the automotive industry

Statistics Explained

Data extracted in July 2025
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Highlights

At EU level, the domestic value added in exports for the car industry is on the increase since 2020, reaching € 196 billion in 2023.In 2023, the value added by non-EU countries in the production of vehicles for export by the EU automotive sector slightly decreased compared to 2022, suggesting a halt in the growing dependence on external providers.In 2023, the value added generated in the Chinese automotive industry due to the EU final use amounted to € 4.0 billion, up from € 1.2 billion in 2010.In 2023, Germany and Poland recorded the largest number of jobs in the EU automotive industry driven by foreign final use,
with 274 000 and 109 000 people, respectively. However, these jobs constitute only 0.6% of their overall employment.

This article delves into gross value added and employment in the EU associated with the global value chains (GVCs) in the automotive industry that serves as a classic example of GVCs in Europe. The Draghi Report dedicates a comprehensive chapter to the history, relevance, current status, and challenges faced by the European Union (EU) in this arena.

The data analysis focuses on NACE industry C29, encompassing motor vehicles, trailers, and semi-trailers (hereafter referred to as motor vehicles). For simplicity, the terms “vehicles”, "cars", and “automotive,” as well as “industry” and “sector,” are used interchangeably throughout.

This article explores the macroeconomic globalisation indicators derived from the FIGARO tables – full international and global accounts for research in input-output analysis – and which use the Leontief input-output model (Miller and Blair, 2022). Indeed, GVCs are often not immediately visible in conventional trade statistics, which typically report the total value of a product at the point of trade.

What are global value chains

The production of goods and services relies on inputs, which can be sourced locally or globally. The final value of a product reflects the value that has been added in the different stages of the production chain, through the combination of factors of production, including employment . Gross value added may be generated, and employment may be located, in multiple countries. This phenomenon is commonly referred to as global value chains (GVCs), which have significantly transformed international trade over the past few decades. GVCs have driven economic growth, innovation, and shaped global production networks, fostering a complex and interconnected world.

By fragmenting production across borders, GVCs have capitalised on lower transportation costs and digital infrastructure. However, recent geopolitical events have disrupted the value chains, reshaping the global landscape. In response, countries are adopting policy measures, such as tariffs and export controls, to safeguard their economic security. Under the political guidelines 2024-2029 of the European Commission’s President von der Leyen , resilient and strategically managed GVCs will become increasingly crucial for navigating global trade and maintaining economic stability.

Value added in trade

In 2023, the automotive industry accounted for 1.8% (€ 273 billion) of the EU's total gross value added (€ 15 545 billion). Germany was the largest contributor, with a value added of € 160 billion (4.2% of the country's total gross value added), followed by Italy (€ 17.5 billion, 0.9%), France (€ 15.4 billion, 0.6%), Spain (€ 14.3 billion, 1.0%), Czechia (€ 12.4 billion, 4.3%), Sweden (€ 10.9 billion, 2.2%), and Poland (€ 9.3 billion, 1.4%).

The automotive industry's value added is generated to supply domestic consumption and exports. In 2023, EU exports of automotive products to non-EU countries reached € 254.7 billion, representing 6.9% of the EU's total exports (€ 3 688 billion). Meanwhile, EU imports of products of the automotive industry amounted to € 113.2 billion, resulting in a trade surplus of € 124.5 billion.

A more detailed analysis of value added in trade reveals that EU exports of automotive products to non-EU countries contained € 196 billion of **domestic** value added in 2023 (see Figure 1). This indicator, calculated from an EU perspective, represents the gross value added generated in the EU economy by its exports to non-EU economies, and includes value added from different EU countries and industries (spillover effects) within the EU, reflecting the industry's complex supply chains.

In contrast, **foreign** value added in EU automotive exports to non-EU countries (i.e. gross value added generated outside of the EU by the exports of the EU economy to non-EU economies) generated € 50.1 billion of gross value added outside the EU in 2023. Between 2020 and 2022, the EU's automotive industry relied increasingly on foreign suppliers for materials, parts, and intermediate goods. This trend, known as vertical specialisation or backward linkage, may be driven by increases in prices, volumes, or both. However, in 2023, the foreign value added in EU exports slightly decreased, indicating a pause in the previously growing trend.

Figure 1: Domestic and foreign value added embodied in EU automotive exports, EU, 2010-2023 Source: Eurostat (naio_10_fgde) and (naio_10_fgfeie)

Figures 2 and 3 illustrate the involvement of the EU main trading partners in EU vehicles exports over time. Regarding the value added generated **in the EU** by EU exports (Figure 2), the United Kingdom held the largest share in 2023 (17.6%), closely followed by the United States (17.0%) and China (15.5%). The significance of EU exports to China, in terms of EU domestic value added for the automotive sector, increased substantially from 2010 to 2021 (from 8.6% to 19.3%) but then decreased in 2022 (18.6%) and 2023 (15.5%). Conversely, the share of EU domestic value added in exports to the United Kingdom declined from 22.6% to 16.2% between 2015 and 2021 but then rose in 2022 (16.4%) and 2023 (17.6%). Türkiye and Switzerland also represent significant players for the EU domestic value added in automotive sector exports, with shares of 6.7% and 5.0%, respectively, in 2023.

The United Kingdom was also the largest player in terms of value added generated **outside the EU** by EU exports in 2023, accounting for 18.6% of the total value added in non-EU countries from EU automotive exports (Figure 3). Although the share for this country fell from 24.0% in 2015 to 16.5% in 2021, it rebounded to 17.4% in 2022 and 18.6% in 2023, still not reaching its earlier peak. The United States was the second-largest player for the foreign value added in EU automotive exports in 2023, with a share of 16.5%. The share of value added generated in this country recorded the same trend, with a decrease from 17.7% in 2015 to 14.1% in 2021, followed by increases to 16.1% in 2022 and 16.5% in 2023. China, ranking third in 2023 with a share of 14.9%, displayed a different pattern, reaching its highest share of 18.8% in 2021. In this case also, Türkiye and Switzerland were significant players, with shares for the foreign value added in EU exports of 7.0% and 4.8%, respectively, in 2023.

Analysing the domestic (Figure 2) and foreign (Figure 3) value added in EU automotive exports reveals that the United Kingdom, the United States and China are the key players in the automotive industry, not only as significant importers of EU vehicles but also as a crucial suppliers of inputs required by the EU automotive sector for its exports.

Figure 2Figure 3

Value added in final use

This section explores the value added contribution of the EU automotive industry (domestic value added) to the final use of goods and services in non-EU countries. It also analyses how much value added is generated in the automotive industries of non-EU countries (foreign value added) due to the final use of goods and services of the EU. This approach differs from the one presented in the previous section, which examined the value added contribution of the entire EU economy in the EU exports of the automotive industry to non-EU countries.

Figure 4 illustrates the changes in the EU **domestic** automotive industry value added due to non-EU final use from 2010 to 2023. This indicator shows an upward trend, increasing from € 52.7 billion in 2010 to € 85.3 billion in 2017, before declining to € 63.8 billion in 2020, and then rising again to a peak of € 91.6 billion in 2023. The **foreign** automotive industry value added from EU final use displays a comparable, though less pronounced, trend. It rose from € 14.9 billion in 2010 to € 30.9 billion in 2019, experienced a brief dip to € 26.0 billion in 2020, and then climbed again to € 34.4 billion in 2023.

Figure 4: Domestic and foreign value added in final use, EU, 2010-2023 Source: Eurostat (naio_10_fgdf)

A detailed evolution of the **domestic** value added of the EU automotive industry resulting from non-EU final use, broken by partner country, is provided in the interactive Figure 5. In 2023, the United States represented 20.0% of the total EU automotive industry domestic value added ending up in the final use of non-EU consumers, making that country the largest contributor to the EU value added for the automotive industry. China was the second-largest contributor in 2023; its share increased from 9.1% in 2010 to 19.6% in 2021, before reverting to 16.2% in 2023. The third-largest contributor to the EU automotive value added in 2023 was the United Kingdom, with 14.6% of the EU automotive's domestic value added generated for the non-EU final use. Together, the United States, China, and the United Kingdom accounted for more than half of the value added generated in the EU automotive industry due to the foreign final use of goods and services in 2023. Türkiye and Switzerland, ranking fourth and fifth respectively, are also important market for the EU automotive industry.

The **foreign** value added generated in non-EU automotive industries by EU final use reached € 34.4 billion in 2023. This reflects an increase in nominal terms of 130% since 2010 (€ 14.9 billion), and 6% compared with 2022 (€ 32.3 billion). Figure 6 illustrates the role of EU final use as a driver of non-EU value added generation, highlighting the contribution from each non-EU country for the period 2010 to 2023. In 2023, Japan accounted for the largest share of value added in the non-EU automotive industry due to EU final use, at 14.2%. The United Kingdom followed with a share of 12.4%. Both countries have experienced significant decreases in their shares in recent years, Japan recording its highest share in 2010 (22.5%) and the United Kingdom in 2014 (21.1%). Chinese automotive producers ranked third in 2023 in terms of EU foreign value added generated by EU final use, with a share of 11.6%, after having peaked at 12.6% in 2022. Collectively, China, Japan, and the United Kingdom accounted for more than one third (38%) of the total EU foreign automotive value added due to EU final use in 2023. Other important countries that generate value added in their automotive industry due to EU final use include Türkiye, Mexico, South Korea, and the United States, with shares of 9.9%, 8.5%, 7.3%, and 6.3%, respectively, in 2023.

Figure 5Figure 6

Exposure to trade disruptions

The EU automotive industry has strong bilateral relationships with the United States and China. Two angles have been addressed previously: the value added in trade (EU value added in exports), and the value added in final use (EU value added in foreign final use). When appropriately combined, these 2 approaches become an indication of the overall exposure to trade disruptions. This exposure indicator provides a comprehensive view of all linkages between the EU and a target country. For instance, in 2023, the EU exposure towards the United States in the automotive industry reached a peak of € 19.1 billion (see Figure 7). This figure represents the sum of the EU value added in various categories, including:

1. final exports

2. intermediate exports to the United States ending up in its final use, or in a third country's final use
3. intermediate exports to a third country ending up in the United States.

Also, relations with China have been increasing throughout the last decade, from € 5.2 billion in 2010 to € 15.9 billion in 2023. In 2022, the exposure the EU had with China was very close to the one with the United States (17.2% versus 17.5%).

EU relationships with both the United States and China in the automotive sector are primarily characterised by greater growth in the EU exposure to these two countries rather than in their exposure to the EU (see Figure 7). From the EU perspective, automotive industry of China has become more exposed to the EU final use of goods and services in recent years, increasing from € 1.3 billion in 2010 to € 4.6 billion in 2023. This growth reflects the rapid integration of the Chinese automotive industry not only into EU final use but also into third-country final use through EU production and into third-country production for EU final use. The exposure of the United States towards the EU also increased over the last decade, though to a lesser extent, rising from € 1.4 billion in 2010 to € 2.5 billion in 2023.

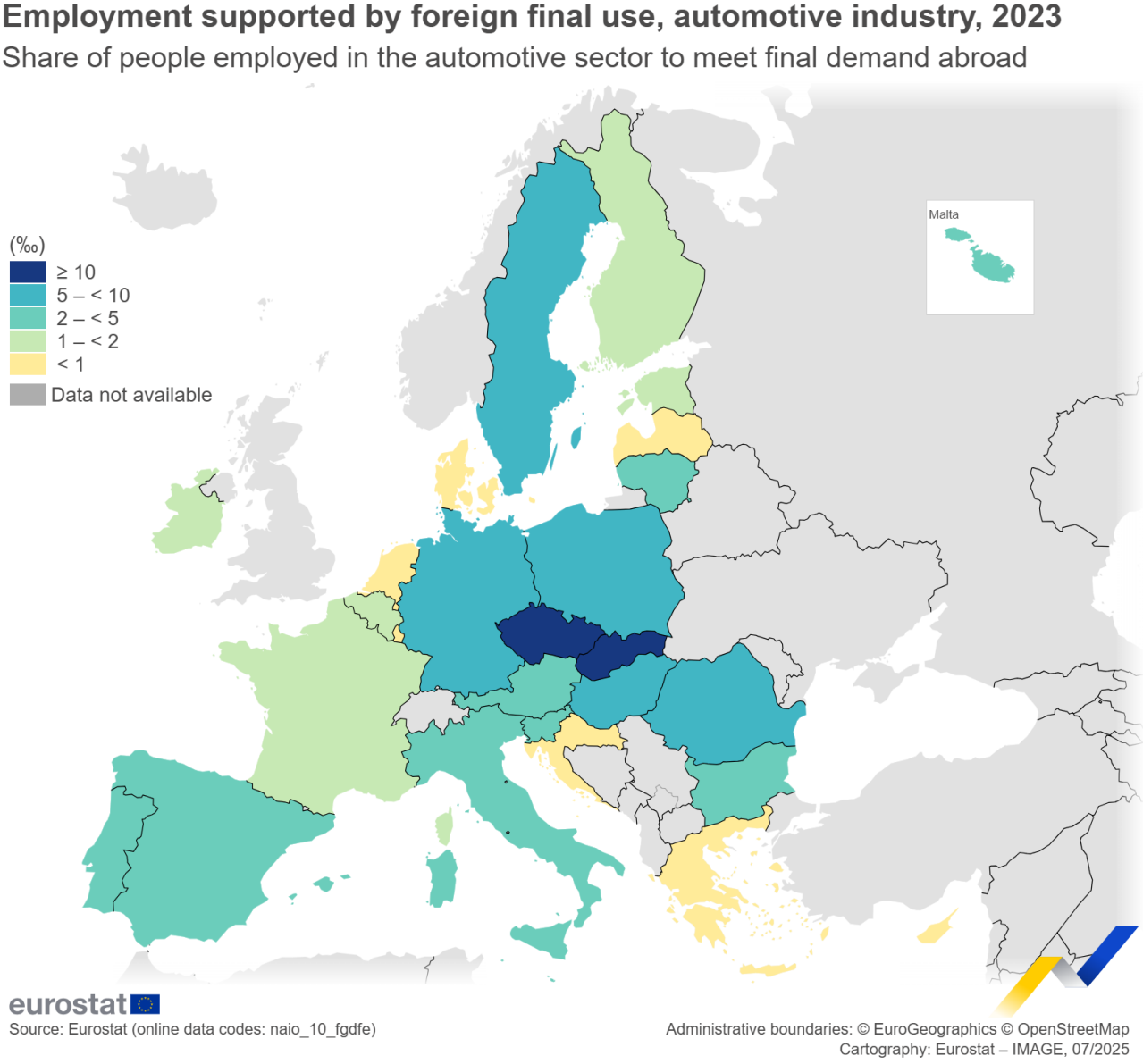
Figure 7: Exposure of the EU towards the United States and China, and of the United States and China towards the EU, automotive industry, 2010-2023 Source: Eurostat (naio_10_fgtex)

Employment in the automotive sector

Examining EU employment triggered by foreign final use provides another lens through which to understand the impact of global value chains on European lives. In 2023, approximately 851 000 workers in the EU automotive industry were employed to meet final demand abroad. Although this represents a decline of 81 000 jobs from the peak in 2015, it remains a significant portion of the automotive industry's workforce (i.e. 35% of the 2.47 million people working in the EU automotive industry).

Among the EU countries, Germany recorded the largest number of workers in the automotive sector employed to satisfy EU foreign final use, with 274 000 workers in 2023. Poland, Czechia, Romania, and Italy followed with 109 000, 66 000, 62 000 and 58 000 workers, respectively. In contrast, Cyprus and Luxembourg have very few workers employed in the automotive sector to meet EU foreign final use. However, these numbers are in line with the size of the countries.

Map 1 offers a representation of the EU countries categorised according to the share of people employed in the automotive industry whose job is linked to the foreign final use of goods and services compared to the total employment of the country, expressed as ratio per thousand of people. In 2023, Slovakia (18%) and Czechia (12%) had the highest shares of people employed in the automotive sector whose job was supported by the foreign final use. Hungary (9%), Romania (7%) as well as Germany, Poland and Sweden (all three 6%) also recorded high percentages. In line with the EU average, the shares for Austria and Slovenia each reached 4%. All the other EU countries reported figures below the EU average.



Map 1: Employment supported by foreign final use, automotive industry, 2023 (%) Source: Eurostat (naio_10_fgdfe)

Source data for tables and graphs

- Download Excel file

All FIGARO data, for inter-country supply, use, input-out tables and macroeconomic globalisation indicators, including value added and employment, are also available from Circabc .

Data sources

Concept and definitions

Macroeconomic globalisation indicators presented in this article are computed using the FIGARO tables, through the application of the Leontief input-output model. This model relies on the interdependencies between industries

and countries, represented mathematically in the form of technical coefficient matrices. The Leontief inverse matrix is derived, which captures the total direct and indirect effects of changes in final use across countries and industries.

The FIGARO tables are a statistical product of the integrated global accounts for economic modelling. They are constructed by combining multiple data sources, including National Accounts Main Aggregates (NAMA), Supply and Use Tables (SUTs), Input-Output Tables (IOTs), and trade statistics for goods and services. Meeting standards from the European system of national and regional accounts (ESA 2010) , the methodology ensures alignment with National Accounts concepts, and integrates adjustments for trade asymmetries and valuation differences.

The FIGARO tables link national accounts and data on business, trade and employment for tor the 27 EU Member States (Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, and Sweden), 5 EU candidate countries (Albania, Montenegro, North Macedonia, Serbia, and Türkiye), and 17 main EU trading partners (Argentina, Australia, Brazil, Canada, China, India, Indonesia, Japan, Norway, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Switzerland, the United Kingdom, and the United States). A 'rest of the world' region completes the FIGARO tables.

The FIGARO tables present the relationship between economies at a detailed level of 64 industries and 64 products, following the NACE and CPA classifications, as defined in the ESA 2010 national accounts transmission programme .

Key steps in the FIGARO process involve harmonising classifications, estimating trade margins, and balancing bilateral trade flows between countries, aligned with National Accounts. This process generates inter-country supply, use and input-output tables that detail the flows of goods and services across industries and countries, enabling comprehensive analysis of global value chains, production, and environmental impacts.

The following main applications are produced based on the FIGARO tables:

- macroeconomic globalisation indicators,
- greenhouse gas footprints linked to final consumption and investment in the EU.

Indicators

The following macroeconomic globalisation indicators are calculated:

- **Imports by industry** = the total imports (intra- and extra-EU) of goods and services for the intermediate and final uses of the EU. The values are measured in basic prices and differ from the international trade statistics, which are measured in CIF values and do not follow the national accounts concepts. They measured in million euros.

- **Exports by industry** = the total exports (intra- and extra-EU) of goods and services for intermediate and final uses. The values are measured in basic prices and differ from the international trade statistics, which are measured in FOB values and do not follow the national accounts concepts. They are measured in million euros.

- **Domestic value added in exports - EU perspective** = the gross value added generated in the EU by its exports to non-EU economies. It reflects the value added generated in the EU economy, by the direct and indirect production of products for export. It is measured in thousand euros and as percentage of EU exports.

- **Domestic value added in exports - country perspective** = the gross value added generated in a EU country by its exports to other countries (EU and non-EU ones). It reflects the value added generated in the EU country, by the direct and indirect production of products for export. It is measured in thousand euros and as percentage of the EU country's exports.

- **Foreign value added in exports - EU perspective** = the gross value added generated outside the EU by its exports to non-EU economies. It refers to the value added generated in non-EU economies by the imports of goods and services used by the EU economy to produce other goods and services for export. It is measured in thousand euros and as percentage of EU exports.

- **Foreign value added in exports - country perspective** = the gross value added generated outside the EU country by its exports to other countries (EU and non-EU ones). It refers to the value added generated in the other countries by the imports of goods and services used by the EU country to produce other goods and services for export. It is measured in thousand euros and as percentage of EU country's exports.

- **Domestic value added in foreign final use** = the gross value added generated in a EU economy (in the EU as a whole or in a specific EU country) by the final use abroad (outside the EU or -outside the specific EU country, respectively). It captures the value added created in the EU as a whole or in the specific EU country along the value chain of goods and services that are used by final consumers abroad. It is measured in thousand euros.

- **Foreign value added in domestic final use** = the gross value added generated abroad by the domestic final use of the EU as a whole or of a specific EU country. It reflects the foreign value added incorporated into the domestic final use of products of the EU economy, highlighting how industries abroad are connected to the final consumers in the EU as a whole or in the specific EU country. It is measured in thousand euros.

- **Global value chain participation - EU perspective** = the sum of backward and forward participation from the EU perspective. The backward participation is calculated as a share of foreign (non-EU) value added in EU exports. The forward participation is calculated as the domestic value added generated in the EU by non-EU economies' exports. It is also measured as a share of EU exports.

- **Global value chain participation - country perspective** = the sum of backward and forward participation from the country perspective. The backward participation is calculated as a share of foreign (EU and non-EU) value added in a EU country's exports. The forward participation is calculated as the domestic value added generated in a EU country by other countries' exports. It is also measured as a share of the EU country's total exports.

- **Trading partner exposure** = the domestic gross value added generated by the exports of an economy to a trade partner directly and indirectly through third countries. This indicator is built up on domestic value added in exports and domestic value added in foreign final use, and enables a more comprehensive assessment of the dependencies and potential vulnerabilities between the EU and its trade partners. It is measured in thousand euros.

- **Domestic employment in exports - EU perspective** = the employment in the EU supported by its exports (extra-EU). It reflects the employment supported in the EU by the production in the EU economy of products for export. It is measured in number of persons and as a percentage of the total EU employment.

- **Domestic employment in exports - country perspective** = the employment in an EU country supported by its exports (intra and extra-EU). It reflects the employment supported in the country by the production in its own economy of products for export. It is measured in number of persons and as a percentage of the total EU country's employment.

- **Domestic employment in foreign final use** = the employment in a EU economy (in the EU as a whole or in a specific EU country) supported by the final use abroad (outside the EU or outside the specific EU country, respectively). It captures the employment supported in the EU as a whole or in the specific EU country along the value chain of goods and services that are used by final consumers abroad. It is measured in number of persons and as a percentage of the total employment in the EU or in the EU country.

More information on the indicators, their definition and use can be found in the Statistical Working Paper Macroeconomic globalisation indicators based on FIGARO. Insights into the measurement of value added and employment in the EU .

It is worth mentioning that the macroeconomic globalisation indicators provide results in values (not differentiating between prices and volumes). Hence, results and conclusions about dependence in global value chains must be carefully considered.

Frequency and availability

The FIGARO tables and applications, including the macroeconomic globalisation indicators, are produced and updated annually. In 2025, the time series **from 2010 to 2023** has been published (period T +24 months, T being the year of release). The time series is in line with the latest macroeconomic aggregates.

More information

For more information, please refer to the thematic section for the supply, use, input-output and FIGARO tables .

Context

Partners

The FIGARO tables are the result of a long-term collaboration between Eurostat and the European Commission's Joint Research Centre . Both partners also collaborate within the GIANT initiative (Global Input-Output Accounts), which is an global inter-agency network comprising the Asian Development Bank (ADB), the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC), the United Nations Economic Commission for Africa (UN-ECA), and the World Trade Organisation (WTO), which aims to explore synergies and common action among the various initiatives on the compilation of multi-country (extended) supply, use, and input-output tables.

Purpose

The FIGARO tables provide the first official inter-country supply, use and input-output data for the EU. They are a tool for analysing the social, economic and environmental effects of globalisation. These may be analysed through studies on competitiveness, growth, productivity, employment, environmental footprint and international trade (for example, analyses of global value chains).

The tables are used to evaluate EU policies and assess the economic interdependencies of the EU (or the euro area or individual EU countries) in a globalised world.

Explore further

Other articles

- Employment and value added in EU exports - an analysis with FIGARO data
- Economic globalisation indicators
- Supply and use tables for the European Union and the euro area
- Supply and use tables for individual countries
- Building the System of National Accounts , see
  - Building the System of National Accounts – supply and use tables
- National accounts and GDP
- Globalisation patterns in EU trade and investment - online publication

Database

- Data can be accessed through the thematic section and are stored in Circabc . Files containing the macroeconomic globalisation indicators are released in parquet file format.

- Data are also available from the Eurostat dissemination database in the folder "Macroeconomic globalisation indicators based on FIGARO (naio_10_fg)".

Thematic section

- Supply, use and input-output tables (SUIOTs) and FIGARO tables

Publications

- Macroeconomic globalisation indicators based on FIGARO. Insights into the measurement of value added and employment in the EU
- EURONA 1/2019 – The employment content of EU exports: an application of FIGARO tables – see Chapter 3
- EU inter-country supply, use and input-output tables – Full international and global accounts for research in input-output analysis (FIGARO)

Methodology

- Macroeconomic globalisation indicators based on FIGARO. Insights into the measurement of value added and employment in the EU
- Figaro project methodological note
- Additional methodological note – May 2021

External links

- Joint Research Centre – Input-output economics
- OECD – Trade in value added
- European Commission - Globalisation
- The 2023 EU Industrial R&D Investment Scoreboard

Visualisation

- Eurostat globalisation dashboard