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Trade-SCAN v2: A user-friendly tool for global value chain analysis

User Guide

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Contents

Foreword

This document is an illustrated User Guide for the Trade-SCAN v2 (Trade Supply Chain Analysis) tool developed by the European Commission's Joint Research Centre (JRC) to help users understand how international trade flows affect employment, income and environmental variables such as CO_2 emissions.

The three data sources are three global multiregional input-output databases: OECD 2018[1], EXIOBASE3.4[2] and WIOD 2016 Release[3]. Each of these databases has a different geographical and temporal coverage, as well as a different industry breakdown. Other complementary sources of information are EU KLEMS[4], the International Labour Organization[5], and the WIOD Environmental Accounts produced by the JRC and published in a report downloadable at: https://ec.europa.eu/jrc/en/publication/world-input-output-database-environmental-accounts. We have grouped the data sources into two official statistics databases (OECD and FIGARO) and two project-based databases (WIOD and EXIOBASE3.4). However, the Eurostat-FIGARO multiregional input-output database will not be available until 2021 so it has not been included in this version yet.

Trade-SCAN v2 offers three different modules. Firstly, the "**Trade-SCAN-Ad-hoc**" module simplifies the calculation of the foreign/domestic factor contents of the final demand of countries and regions: value added components, employment and CO_2 emissions, by sector, skill, gender, age group, etc. In addition, Trade-SCAN v2 provides a full decomposition of bilateral gross trade (from a country perspective) into foreign, domestic and double-counting components, facilitating the calculation of bilateral gross exports in value added terms as well as the employment and CO_2 emissions embodied in the bilateral gross exports of countries. The user can create ad-hoc queries very easily by just choosing the desired parameters (e.g. countries, sectors, skill levels, regions).

Secondly, the **"Trade-SCAN-Pocketbook"** module offers the possibility to download the tables and charts from five reports published by the JRC and DG TRADE using this tool (Arto et al., 2018a, 2018b, 2020a, 2020b, 2020c). This User Guide explains how to obtain some of the indicators contained in these five reports. We have obtained these indicators using WIOD 2016 Release. They illustrate in detail the relationship between trade and final demand with income, employment and CO_2 emissions for the EU as a whole and for each EU Member State.

Thirdly, the **"Trade-SCAN-Dashboard"** module includes eight indicators calculated with WIOD 2016 Release data, e.g. a breakdown of gross exports into domestic, foreign and double-counting terms; or bilateral trade balances both in gross and in value added terms, among others.

This manual describes all the functionalities of the tool and provides illustrative examples. In addition, it contains screenshots of the tool to support the explanations.

This tool is intended to be free and publicly available upon request by writing to JRC-TRADE-SCAN@ec.europa.eu. Users outside the European Commission will receive the database and the executable files to install the tool locally. Note that the Trade-SCAN Ad-hoc module requires a GAMS licence to be installed locally to work. Annex 1 describes the installation process. In the future, we expect the tool to be available via the website of the Joint Research Centre of the European Commission so that anyone can run it remotely without the GAMS requirement.

The authors are pleased to share their work and hope users find this tool helpful for their analyses of the economic, environmental and social consequences of global value chains.

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1 http://oe.cd/i-o
2 For a detailed description see Wood et al. (2015).
3 Documented in Timmer et al. (2015, 2016).
4 Described in Stehrer et al. (2019).
5 https://ilostat.ilo.org/data/

Acknowledgements

The authors are grateful to Iñaki Arto, Erik Dietzenbacher, Ignacio Cazcarro and Miguel Sánchez for their efforts, advice and support in the development of the Trade-SCAN v2 tool.

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Abstract

This document is an illustrated User Guide for the Trade-SCAN v2 (Trade Supply Chain Analysis) tool developed by the European Commission's Joint Research Centre (JRC) to help users understand how international trade flows affect employment, income and environmental variables such as CO_2 emissions.

1 Introduction

The European Commission's Joint Research Centre (JRC) and the Basque Centre for Climate Change (BC3) have jointly developed Trade-SCAN v2 (Trade Supply Chain Analysis), a user-friendly tool for global value chains analysis, in support of the European Commission's Directorate General for Trade's (DG TRADE) policymaking.

As in many policy and academic areas, international trade is at the core of Trade-SCAN v2. Exports (encompassing both intermediate and final product exports) and final demand constitute the object of analysis of this tool. Both exports and the demand for final products generate a series of effects across all industries and countries participating upstream and downstream of the supply chains.

Recent research into global value chains, together with the availability of global multiregional input-output databases, has made it possible to trace the origin of the value added incorporated in traded goods depending on their use and destination.

Trade-SCAN v2 implements a novel mathematical framework for the decomposition of bilateral gross exports developed by Arto et al. (2019). The approach is based on the foundations of input-output economics and matrix algebra. This framework allows the decomposition of a country's bilateral gross exports, measured at the border, into a single expression. Trade-SCAN v2 provides a full decomposition of bilateral gross trade (from a country perspective) into foreign, domestic and double-counting components, facilitating the calculation of bilateral gross exports in value added terms as well as the employment and CO_2 emissions embodied in the bilateral gross exports of countries. Furthermore, it includes the calculation of the foreign/domestic factor contents of the final demand of countries and regions: value added components, employment and CO_2 emissions, by sector, skill, gender, age group, etc.

For value added, for instance, Trade-SCAN v2 allows the identification of the country and industry where the value added is generated, the exporting country and industry, the importing country and industry, the country and industry producing the final goods and the country whose final demand is ultimately driving the exports.

Trade-SCAN v2 allows the possibility to choose between three different global multiregional input-output tables: the OECD 2018 Inter-Country Input-Output Tables (oe.cd/icio), the European Commission-funded World Input-Output Database (www.wiod.org), and EXIOBASE3.4 (www.exiobase.eu). The Eurostat-FIGARO (https://ec.europa.eu/eurostat/web/experimental-statistics/figaro) database will be added in 2021.

The design of this tool facilitates global value chain analysis. Therefore, the intended audience of Trade-SCAN v2 tool is mainly policy-makers, but it can also be useful for academic, educational or informational purposes.

This document shows how to use the three modules of Trade-SCAN, the ad-hoc queries, the pocketbook and the dashboard. It also demonstrates the potential of the ad-hoc queries module with a series of examples extracted from five reports published by the JRC and DG TRADE (Arto et al., 2018a, 2018b, 2020a, 2020b, 2020c).

2 Trade-SCAN-Ad-hoc module

This module enables the user to choose the parameters of the decomposition of the factor content of exports or final demand to answer a specific question (i.e. create ad-hoc queries). To create a new query, the user has to make three initial choices: 1) Select DATABASE; 2) Select CONCEPT; 3) Select TYPE OF DECOMPOSITION.

Figure 1. Trade-SCAN-Ad-hoc home page

Source: Own elaboration

Select database

For the database, there are currently three choices available[6] (see Annex 2 for details on the countries, industries and variables of each database).

The **OECD 2018 Inter-Country Input-Output Tables** (oe.cd/icio) cover the period from 2005 to 2015, and include 36 industries in 64 countries, and a Rest of the World region[7]. This database enables the computation of effects in terms of total primary inputs (distinguishing value added and taxes less subsidies on products).

The European Commission-funded **World Input-Output Database** (www.wiod.org) 2016 Release (Timmer et al., 2015, 2016) consists of a series of World Input-Output Tables. They cover the period from 2000 to 2014, for 43 countries (27 EU Member States, United Kingdom, Australia, Brazil, Canada, China, India, Indonesia, Japan, Mexico, Norway, Russia, South Korea, Switzerland, Turkey, Taiwan, the United States of America, and an aggregate "Rest of the World" region) and 56 industries (in NACE Rev.2 classification). This database enables the estimation of effects in terms of employment and total primary inputs (distinguishing value added as the sum of labour compensation and capital compensation, taxes less subsidies on products and international trade and transport margins). This database has been complemented with other sources, like EU KLEMS and the International Labour Organization, to allow the computation of

[6] FIGARO is the first project to compile official inter-country Supply, Use and Input-Output Tables at the EU level (https://ec.europa.eu/eurostat/web/experimental-statistics/figaro). Trade-SCAN will incorporate the FIGARO tables in future versions of this tool.

[7] China-Export processing activities and Mexico-Global Manufacturing activities have been merged with their respective regular activities.

employment and labour compensation effects by age, skill level and gender (however, these data are only available from 2008 onwards). Moreover, we complement the database with data on CO_2 emissions from the WIOD Environmental Accounts produced by the JRC (Corsatea et al., 2019) in order to have estimations of impacts in terms of CO_2 emissions (footprints).

EXIOBASE3.4 (www.exiobase.eu) covers the period from 1995 to 2011 and includes 166 industries in 43 countries, and 5 Rest of the World regions (Wood et al., 2015). This database enables the calculation of effects in terms of total primary inputs (distinguishing value added, taxes less subsidies on products, compensation of employees, gross operating surplus and other net taxes on production), employment (jobs and hours worked) and seven types of emissions to air. Compensation of employees is also available by skill level and employment by skill and/or gender.

Select concept

For the concept, Trade-SCAN v2 allows the selection of two different "domestic" concepts:

— **Countries** (left icon): the "domestic" concept is the country itself.

— **Regions** (right icon): the "domestic" concept is a specific region (i.e. EU28, USMCA, etc.), including intra-regional linkages.

The country-level analysis breaks down the factor content of the exports of a country with respect to other countries, while the region-level analysis considers the exports of a group of countries (e.g. EU) to countries outside that region (e.g. non-EU). The region-level analysis includes intra-region spillovers (e.g. intra-EU), which are not considered in the country-level analysis. In other words, for instance, jobs in Poland supported by French intermediate goods embodied in the German exports to non-EU countries are not captured with the country-level analysis. This level of analysis would only cover Polish jobs linked to Polish intermediates embodied in German exports to non-EU countries.

Select type of decomposition

For the type of decomposition, there are two options:

- **Decomposition of factors embodied in exports**: this refers to the amount of value added, employment, emissions, etc. embodied in one country's gross exports. These effects are within the reference country (domestic) and elsewhere in the world (foreign), with an additional element of double-counting components (Arto et al., 2019). For value added, this concept is equivalent to value added in exports (VAiX)[8].
- **Decomposition of factors embodied in final demand (footprint)**: this refers to the amount of value added, employment, emissions, etc. embodied in one country's domestic final demand (consumption and investment). These effects are within the reference country (domestic) and elsewhere in the world (foreign). In the case of emissions, the footprint contains the domestic content, the foreign content and the direct household contribution. For value added, the foreign content is equivalent to trade in value added (TiVA).

After making these three choices, click on "Continue to step 1" to continue.

Alternatively, the user also has the option of loading a pre-saved query using the "Load pre-saved queries" button. Users can save their queries and reload them later on. This can be useful to save time modifying previously defined queries, to share them with other Trade-SCAN users and to ease scientific traceability, reproducibility and transparency.

[8] We have implemented Trade-SCAN v2 based on exports. Therefore, if the user is interested in the value added / employment embodied in the imports of country A from country B, this must be calculated as the value added / employment embodied in the (mirror) exports of country B to country A.

2.1 Example 1. Decomposition of exports by country

Assume the following research question:

> *In 2014, how many jobs in the Polish basic metals industry were supported by the German exports of motor vehicles to the United States?*

To answer this question we will use the WIOD, for example. Choose the option "Countries" and "decomposition of factor content in exports". In the next step, select the year "2014" and variable "total employment". Note that there are other years/variables available, and "select all" / "clear all" buttons. After selecting the year(s) and variable(s), click on "Continue to step 2".

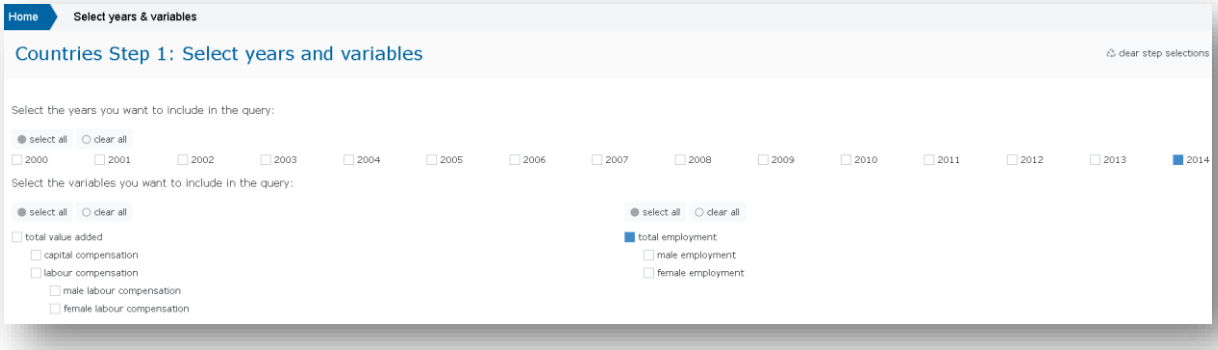


Figure 2. Countries step 1

Source: Own elaboration

Note that certain indicators are only available from 2008 onwards. A message pops up at the bottom of the screen when selecting them for a year earlier than 2008.

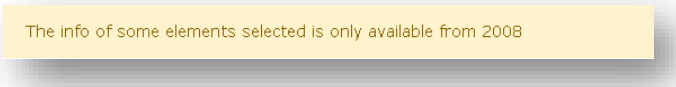


Figure 3. Indicator unavailability warning

Source: Own elaboration

In Step 2, select the components of the decomposition and the corresponding countries and industries. In our example, since the question is focused on the effects in Poland of the German exports of motor vehicles (both for intermediate and final use), select "foreign effects of final exports" and "foreign effects of intermediate exports".

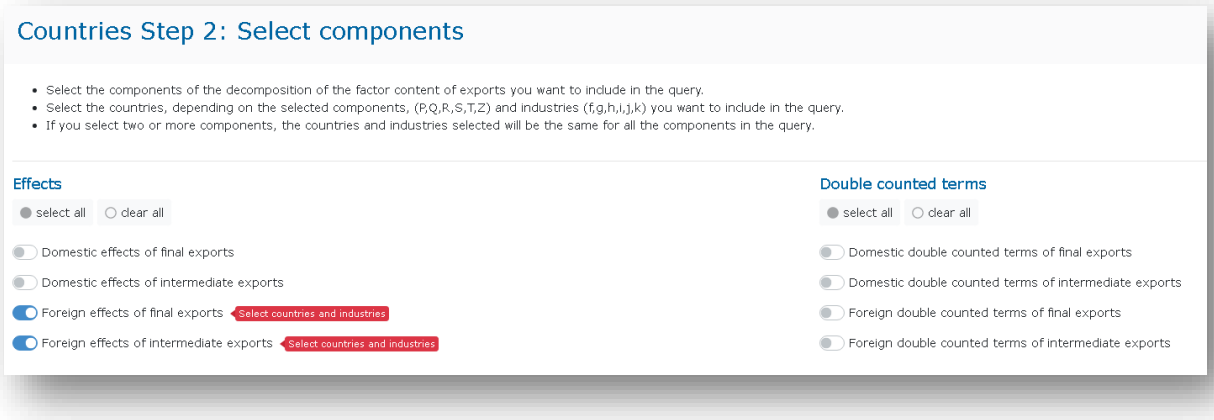


Figure 4. Countries step 2: select components

Source: Own elaboration

Next, "select countries and industries", as indicated in the two red call-outs in the upper left part of Figure 4. By clicking on any of those red call-outs, a diagram of red boxes appears at the bottom of the screen. This diagram displays the countries and industries involved in the computation of the corresponding effect. See the diagram corresponding to "Foreign effects of final exports".

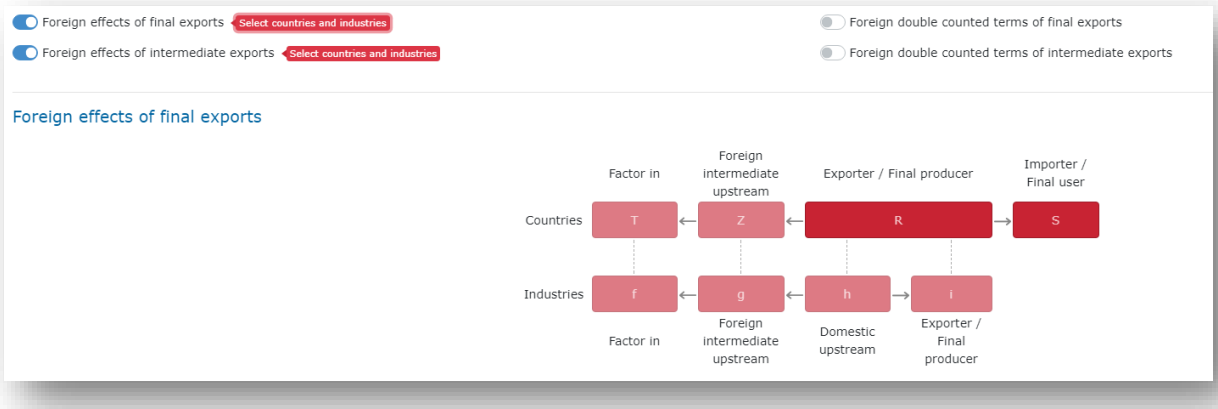


Figure 5. Countries step 2: display diagram

Source: Own elaboration

In the example[9], the "Factor in" country, T, is Poland, the "Exporter/Final producer", R, is Germany, the "Importer/Final user", S, is the United States, the "Factor in" industry, f, is the "Manufacture of basic metals", and the "Exporter/Final producer" industry, i, stands for "Manufacture of motor vehicles, trailers and semi-trailers". For all other boxes, there is no need to select a specific country or industry so you should use the "select all" button and activate the summation option in each of the corresponding boxes (g, Z and h).

[9] The letters shown in all flow charts correspond to the mathematical notation of the equations in Arto et al. (2019).

To select Poland, click on T; a new window pops up (Figure 6), then click on "Poland" in the list of countries on the left. Selected countries will move to the column on the right. Next, by clicking on the green button "Add selection", the window closes and the selection for this dimension is saved.

Note that the selection window contains two tabs: one for individual countries ("Countries") and another for country groups ("C. Groups"). The latter only avoids selecting the countries of a region one by one (e.g. selecting the 27 EU Member States). The results would not change in any case: by selecting country groups, the results are the same for each country, unless the user activates the summation option. If the user activates this option, Trade-SCAN v2 will aggregate the results of all the selected countries (e.g. 27 EU Member States).

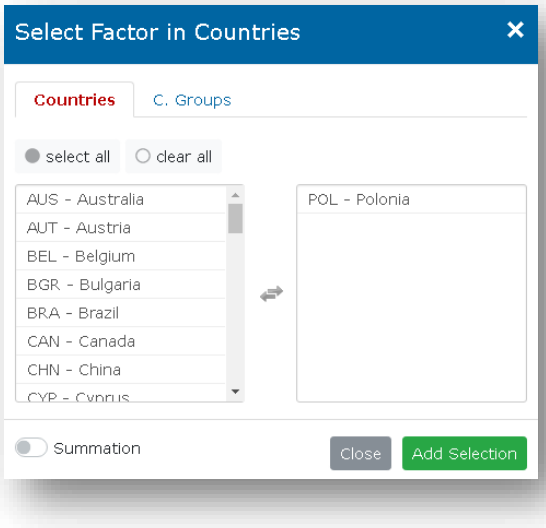


Figure 6. Countries step 2: selection of Poland

Source: Own elaboration

The T box in the diagram should have turned green, indicating that the selection is complete for this dimension (see Figure 7).

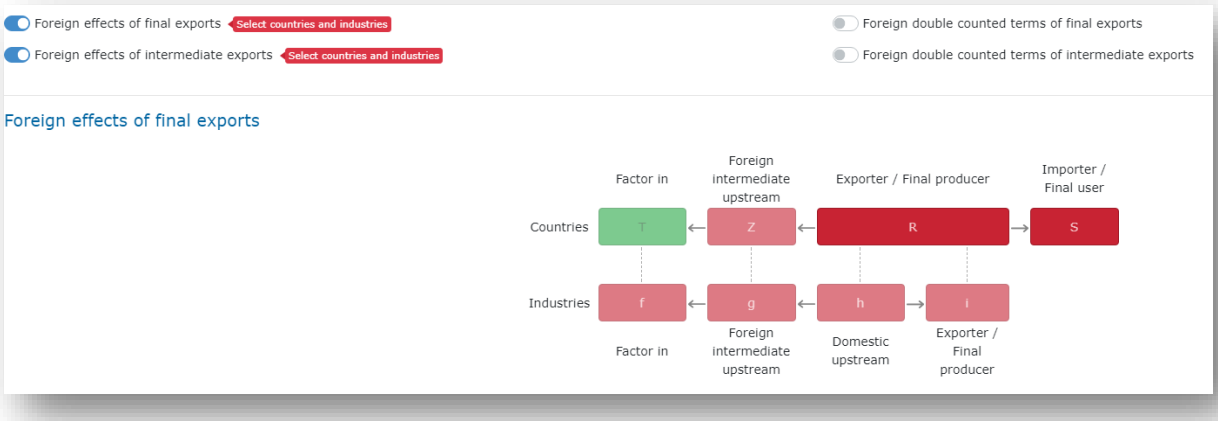


Figure 7. Countries step 2: countries selection confirmation

Source: Own elaboration

The next element is Z, i.e. "Foreign intermediate upstream". In this example, we focus on all jobs in Poland supported by German exports regardless of which country is supplying inputs to Germany to produce such exports. Therefore, click on the Z box and click on the "select all" countries button at the top and activate the "Summation" option at the bottom of the window to aggregate the results across all the countries in this dimension.

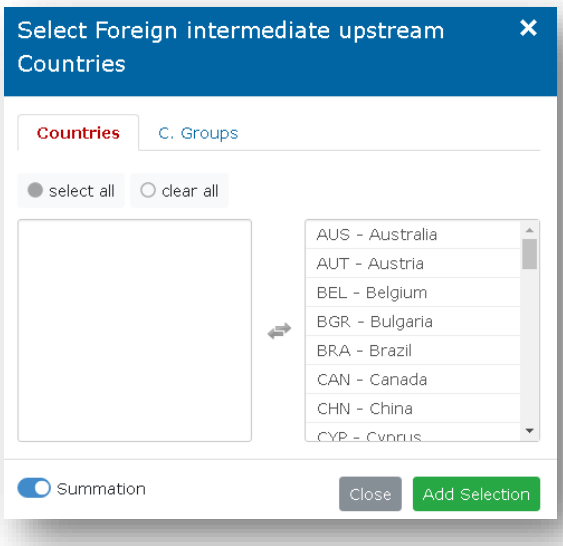


Figure 8. Countries step 2: summation

Source: Own elaboration

A Greek summation symbol will appear at the bottom right corner of the selected boxes where this option is activated (see Figure 9).

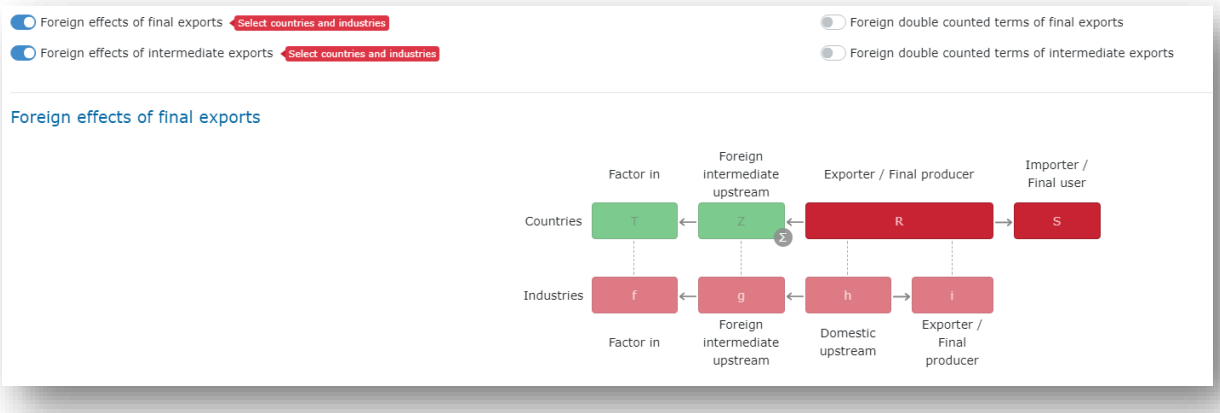


Figure 9. Countries step 2: summation confirmation

Source: Own elaboration

Continue with the selection of the other boxes referring to exporters and final users. For R, select Germany as shown in Figure 6 for Poland and for S, United States. The result is shown in Figure 10.

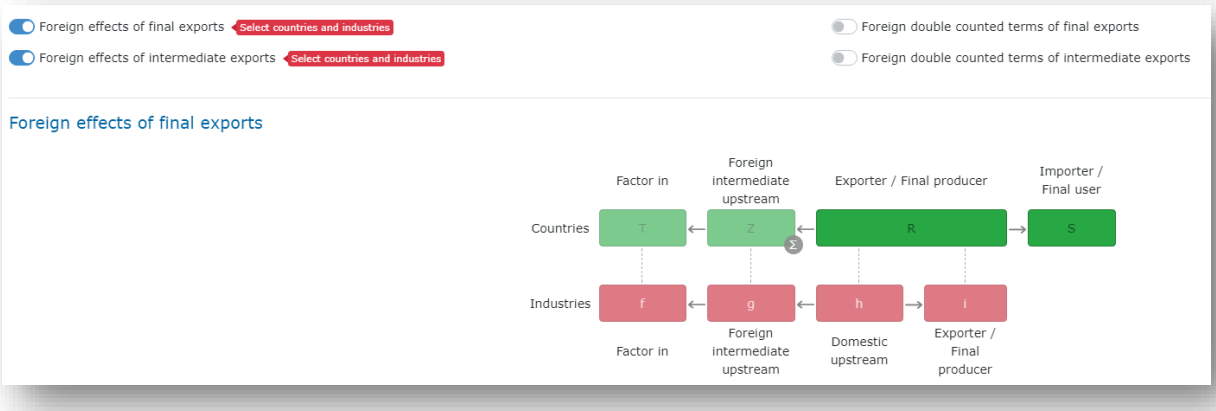


Figure 10. Countries step 2: summation of countries

Source: Own elaboration

For industries, similar to Z, sum across all industries for domestic (h) and foreign intermediate upstream effects (g) since the focus is on the industry where the jobs are located (f, basic metals) and the exporter industry (i, motor vehicles). For instance, by clicking on the g box, a window pops up as shown in Figure 11. Then, use the "select all" button at the top and the "Summation" button in the bottom left corner of the window.

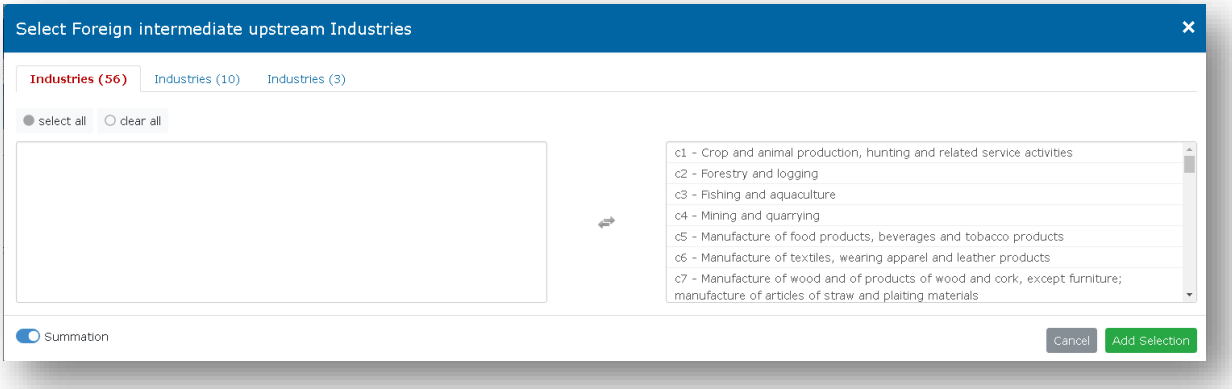


Figure 11. Countries step 2: industries

Source: Own elaboration

Do the same for the h box and the resulting diagram should look like Figure 12.

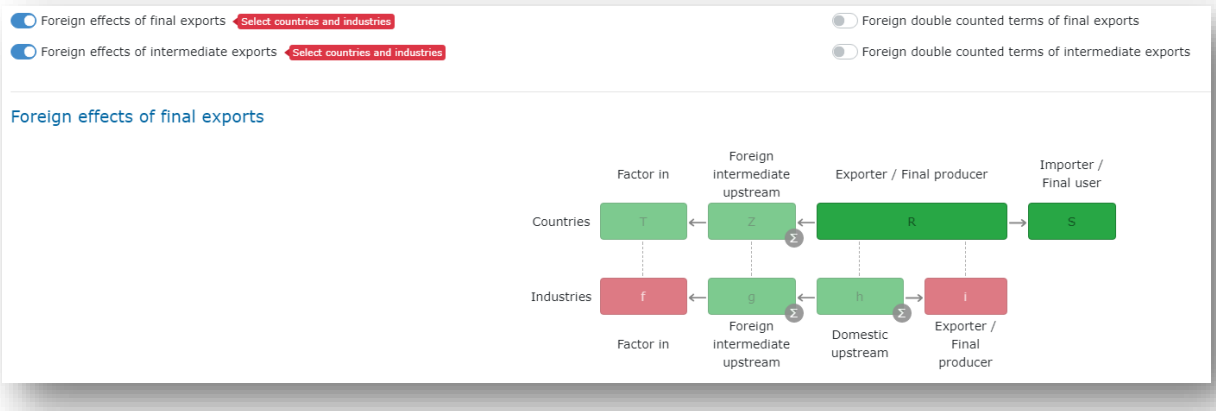


Figure 12. Countries step 2: summation of industries

Source: Own elaboration

To select "basic metals", click on the red box f; a new window pops up (Figure 13), then click on "c15 – Manufacture of basic metals" in the list of industries on the left. Selected industries will move to the column on the right. Note that this window contains two additional tabs with aggregations to 10 and 3 industries, respectively. Next, by clicking on the green button "Add selection", the window closes and the selection for that industry is saved.

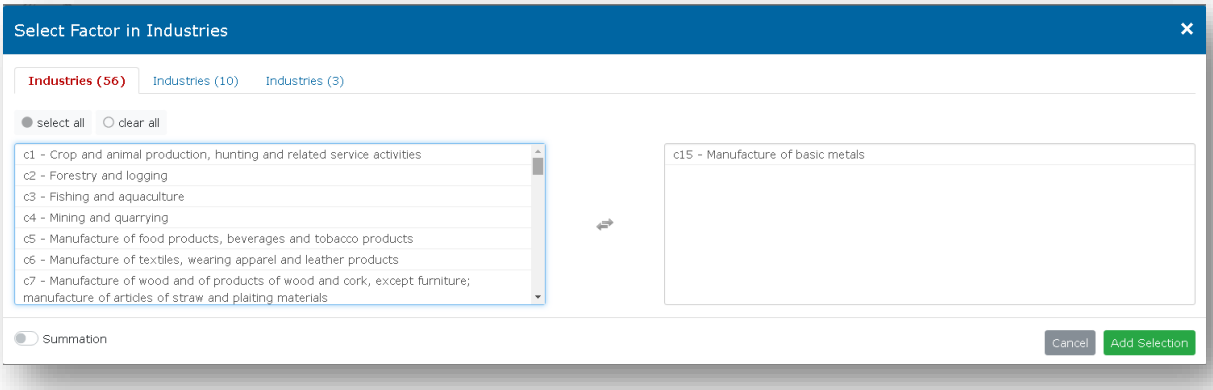


Figure 13. Countries step 2: selection of industries

Source: Own elaboration

The f box in the diagram should have turned green, indicating that the selection is complete for this dimension.

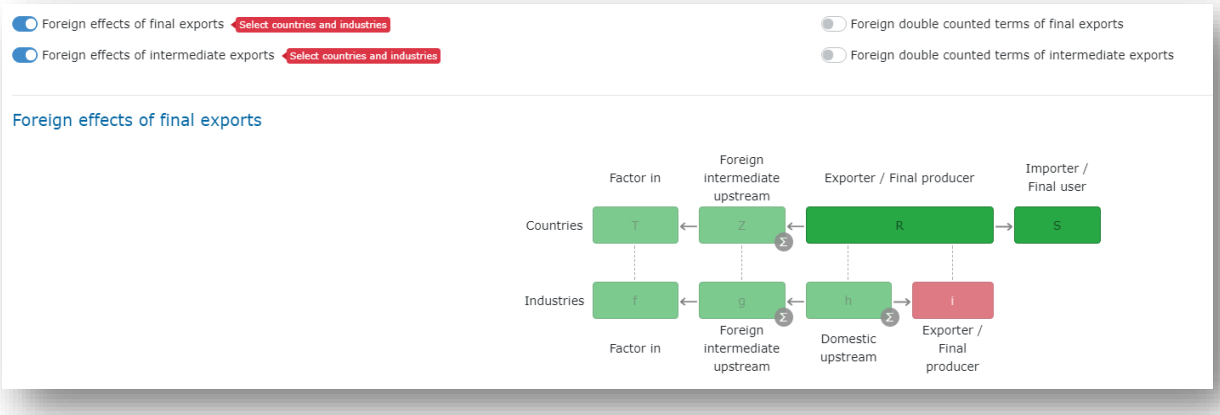


Figure 14. Countries step 2: selection of basic metals

Source: Own elaboration

The next element is i, i.e. "Exporter/final producer". In this example, we focus on all jobs in Poland supported by German exports of motor vehicles. Therefore, click on the i box and select "c20 – Manufacture of motor vehicles, trailers and semi-trailers" as shown in Figure 15.

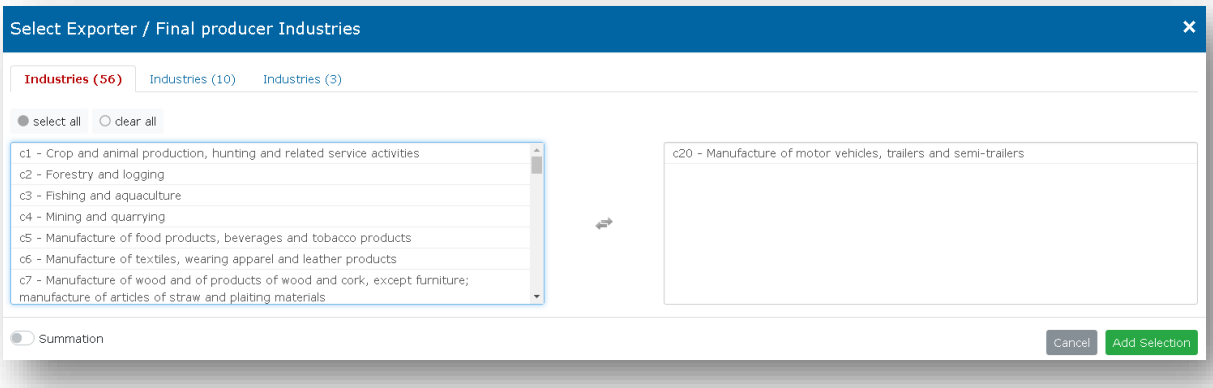


Figure 15. Countries step 2: selection of motor vehicles

Source: Own elaboration

Once the user completes all boxes (when all of them are green) in the diagram, the red call-out next to "Foreign effects of final exports" will turn green. Now, click on the red call-out below next to "Foreign effects of intermediate exports". The diagram now becomes longer[10] with new elements to select.

[10] Once the user becomes familiar with the tool, it would be advisable to start with this option and fill in all boxes. This would automatically fill in all other cases with shorter diagrams.

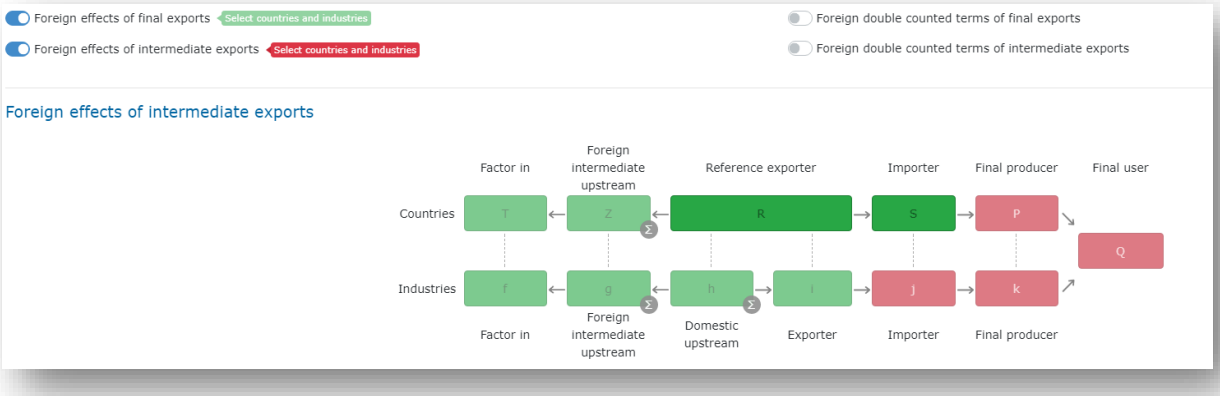


Figure 16. Countries step 2: complete diagram

Source: Own elaboration

Our example does not require further details on specific final producers and final users of the goods exported by Germany so, for instance, follow the same procedure described above for boxes Z (for countries) and g (for industries) to complete the rest of the boxes of the diagram still in red (see Figure 16). Once all these boxes are green, then the red call-out will also become green (see Figure 17). Then click on "Continue to step 3" to proceed.

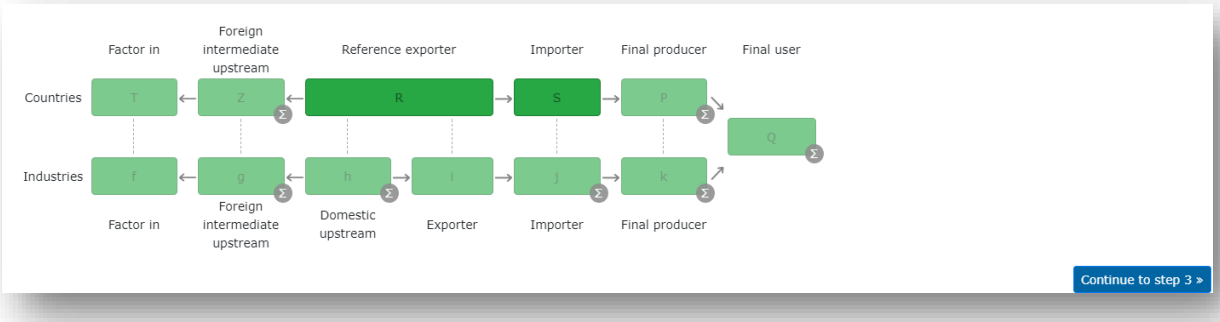


Figure 17. Countries step 2: continue to step 3

Source: Own elaboration

In "Step 3", the top part of the screen summarises the information of the query: years, variables and components. Below, the summary of the selected regions and industries is presented collapsed unless the user clicks on "show". The reverse operation can be done by clicking on "hide". Notice also that the "top" link allows the user to jump to the top of the page in one click, despite generally long lists.

The screen of this step also informs the user of the number of records and the size of the results in the top right corner. If the number of records is too large to fit in MS Excel, a warning message appears. Note that, despite the warning, you will be able to proceed, but the results will be available only as a GDX file and not in MS Excel. Note that given the size of the query, calculations may take a long time (see Section 2.4 below for some tips on strategies to optimise the computation power).

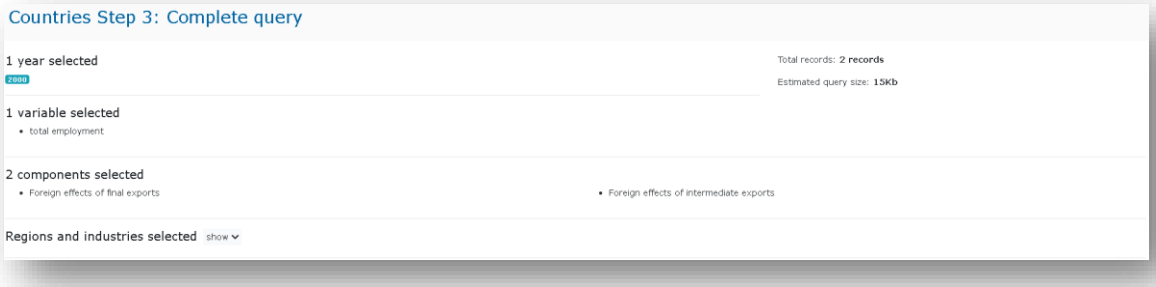


Figure 18. Countries step 3

Source: Own elaboration

At the bottom right corner of the screen, type the name of the query and the folder where the results must be saved. Enter the name[11] of the query and a description (optional) and click on the blue icon "Save + Export to GAMS" to execute the query and save both the query and the results in the desired folder. Note that there are two additional buttons: a blue icon button with a folder, to explore the folder where queries are saved by default[12], and the "Save Query" button, which saves the query but does not execute it[13].

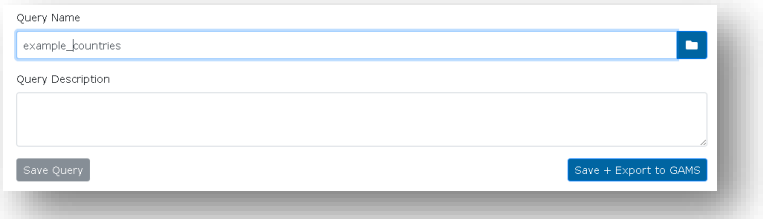


Figure 19. Countries step 3: save and execute queries

Source: Own elaboration

Once the user specifies the name, the (optional) description and the folder location of the query, they can click "Save + Export to GAMS" and a new window pops up asking for a file name (by default, it is the query name given before) with the extension ".tscan".

[11] The query name must be up to 35 characters. Do not use blank spaces or special characters. Example of a valid name: Query_2018-04-30_01_EMP_VA_2000-2014_USA_EU28.

[12] In case you need to see the names of existing queries, etc.

[13] You may want to prepare a query to be run later or to be sent to another user that would run it using the "Load pre-saved queries" feature.

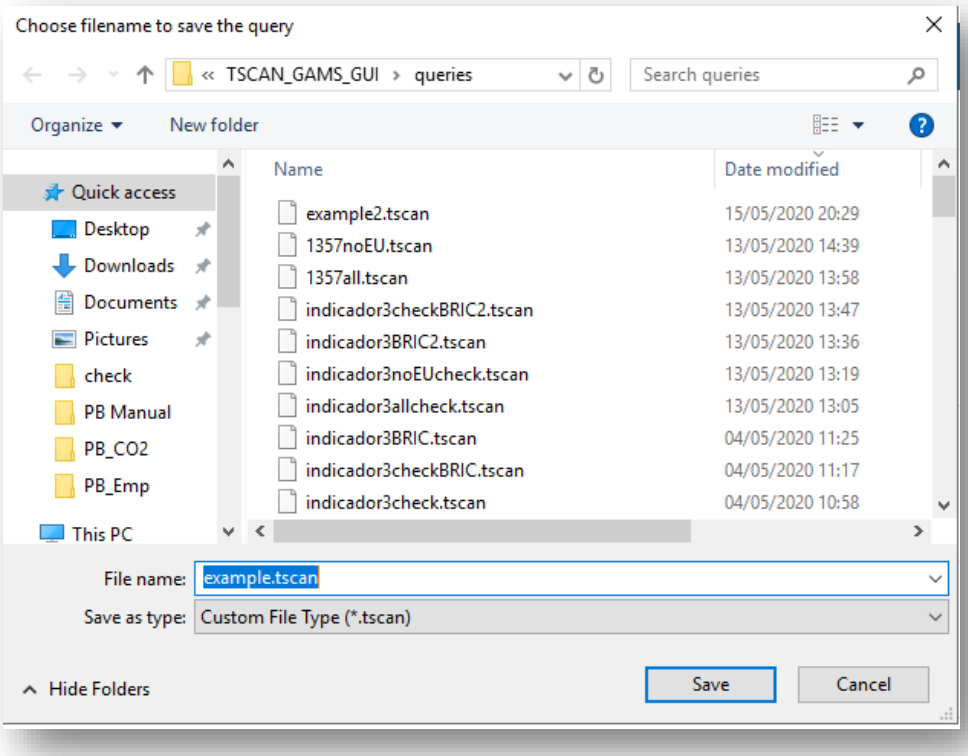


Figure 20. Countries: Save query

Source: Own elaboration

By clicking on "Save", the graphical user interface launches GAMS and a system command prompt window pops up showing the GAMS processes running.

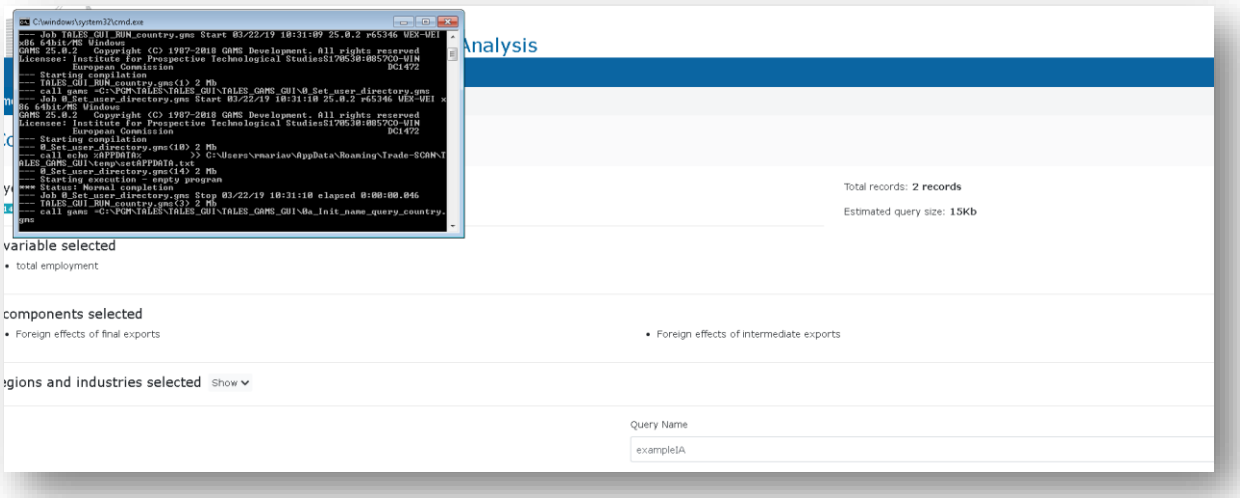


Figure 21. Countries: GAMS

Source: Own elaboration

Once the GAMS process is finished, a GDX[14] file (GAMS Data eXchange) and a MS Excel Macro-Enabled workbook file (.xlsm) are saved in the same folder as the query file.

The xlsm file contains the following sheets:

- Info: index of the file, contact information and the citation details.
- Codes: codes, descriptions and units of measurement.
- Industry groups: industry groups' codes and descriptions.
- Country groups: country groups' codes and descriptions.
- Pivot: instructions to create a pivot table with the information from the different sheets using a tailored VBA code available in the xlsm file. Note that, in principle, MS Excel 2010 does not allow the creation of pivot tables combining data from different sheets but you can do it using this VBA code. Although MS Excel 2013 allows the creation of pivot tables from multiple sheets using model data features, using our VBA code might be preferable, for better file compatibility across users with different versions of MS Excel and because it is simpler than using data model features.
- Summary: information about the query description, and the selections made in the query.
- Exports final: country R's total exports of goods and services for final use of industry i, depending on the query made.
- Exports intermediate: country R's total exports of goods and services for intermediate use of industry i, depending on the query made.

Furthermore, the Excel workbook includes one sheet for each of the components of the decomposition selected in the query. Our example includes two additional sheets with the results of the query, indicating foreign final and foreign intermediate effects, respectively.

Each sheet contains data on the "factor" (e.g. "EMP" - employment), the "year" (e.g. "2014"), the countries and industries selected at each stage of the value chain (SUM for the dimensions where the option "Summation" was activated) and the "Value". See below.

Table 1. Foreign final

Factor	Year	T	F	Z	g	R	H	i	S	j	P	k	Q	Value
EMP	2014	POL	c15	SUM	SUM	DEU	SUM	c20	USA					0.618122

Source: Trade-SCAN

Table 2. Foreign intermediate

Factor	Year	T	F	Z	g	R	H	i	S	j	P	k	Q	Value
EMP	2014	POL	c15	SUM	SUM	DEU	SUM	c20	USA	SUM	SUM	SUM	SUM	0.191203

Source: Trade-SCAN

With this information, in 2014, around 809 jobs in the *Polish basic metals industry were supported by the German exports of motor vehicles to the United States.* Note that the unit of employment is thousands of persons employed, as indicated in the codes sheet of the MS Excel workbook. The total intermediate and final gross exports by country and product (as specified in the query) are in the last sheets of the resulting Excel file with other results for comparison purposes.

[14] The GDX file is a platform-independent binary file that can contain information regarding sets, parameters, variables and equations. GDX files resulting from queries contain one parameter symbol for each component requested in the query. Users can manage it using GAMS or other languages such as R, Python, etc.

2.2 Example 2. Decomposition of final demand by regions

Assume the following research question:

> *In 2014, how many jobs were supported in each EU-28 country by the final demand for motor vehicles of each EU-28 country?*

To answer this question we will use again the WIOD. This time choose the option "Regions" and "decomposition of factor content in final demand". In the next step, select the year "2014" and variable "total employment" and click on "Continue to step 2", as in the previous example.

In "Step 2", since the question is focused on the domestic effects of the European final demand, select "domestic factor content in final demand".

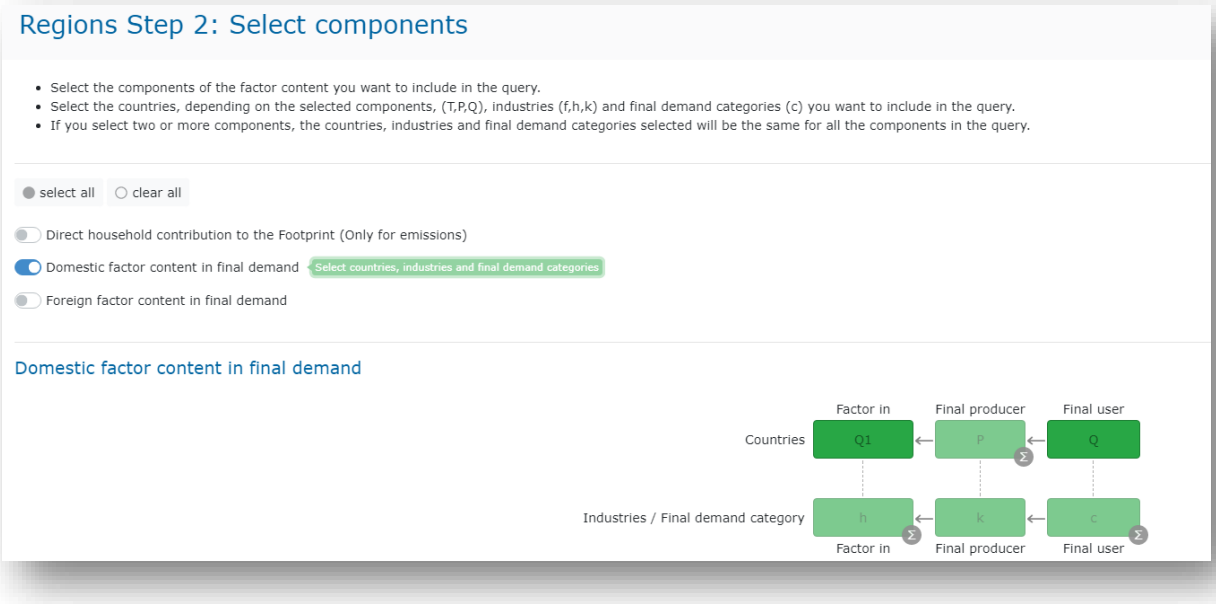


Figure 22. Regions step 2: select components

Source: Own elaboration

Next, select countries and industries in the diagram. In the example, for Q (final user country) and Q1 (factor in country) select EU-28 without clicking on "Summation", since we want to distinguish the final user countries and the employment in countries supporting the final users' demand. Otherwise, we would obtain an aggregate for the EU-28. For k, select "c20 - Manufacture of motor vehicles, trailers and semi-trailers". For all other boxes, there is no need to select a specific country, industry or component of final demand, so, select all and activate the "Summation" option in each of the corresponding boxes (P, h and c).

Notice that by definition in the selection window for Q and Q1 there is no option available for selecting individual countries as in the country level of analysis (Figure 23); however, for all other boxes individual countries or groups of countries can be selected.

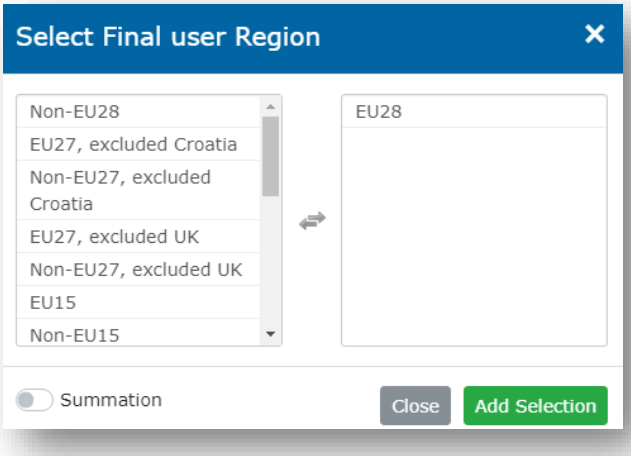


Figure 23. Regions step 2: regions selection

Source: Own elaboration

This time the MS Excel file contains a sheet for Final Demand instead of Exports. This sheet contains country Q's final demand for goods and services of industry k, depending on the query made. It is easy to visualise the results using the instructions given in the Pivot sheet of the resulting MS Excel workbook (see Figure 24).

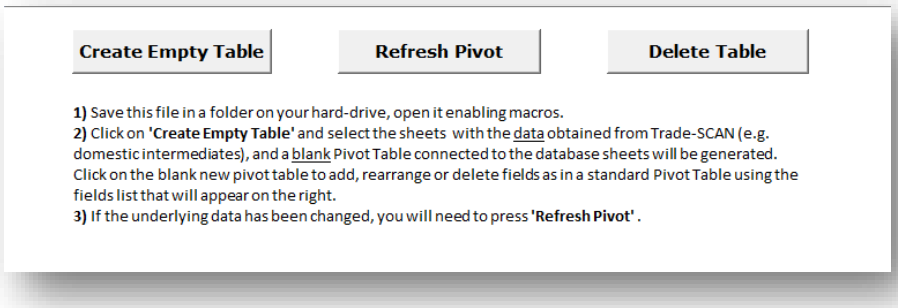
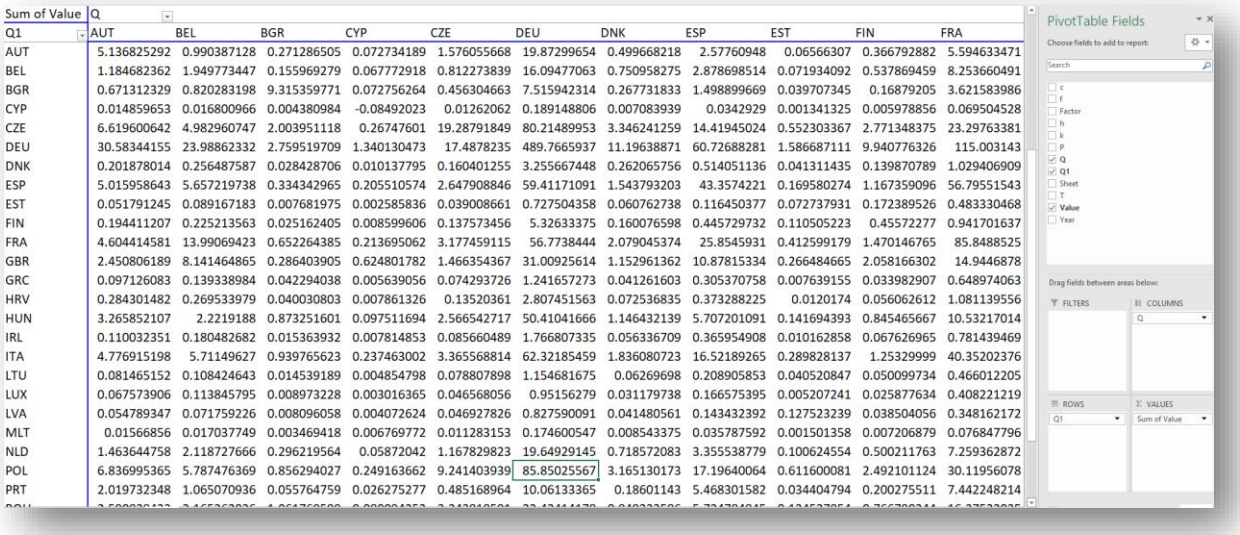


Figure 24. Create empty table

Source: Own elaboration

Select Q1 as "Rows", Q as "Columns" and "Value" in the box Values. As shown in Figure 25, the resulting double-entry table displays the amount of jobs in each EU country (row) that are supported by the final demand of vehicles in each EU country (columns).



Sum of Value	Q										
Q1	AUT	BEL	BGR	CYP	CZE	DEU	DNK	ESP	EST	FIN	FRA
AUT	5.136825292	0.990387128	0.271286505	0.072734189	1.576055668	19.87299654	0.499668218	2.57760948	0.06566307	0.366792882	5.594633471
BEL	1.184682362	1.949773447	0.155969279	0.067772918	0.812273839	16.09477063	0.750958275	2.878698514	0.071934092	0.537869459	8.253660491
BGR	0.671312329	0.820283198	9.315359771	0.072756264	0.456304663	7.515942314	0.267731833	1.498899669	0.039707345	0.16879205	3.621583986
CYP	0.014859653	0.016800966	0.004380984	-0.08492023	0.01262062	0.189148806	0.007083939	0.0342929	0.001341325	0.005978856	0.069504528
CZE	6.619600642	4.982960747	2.003951118	0.26747601	19.28791849	80.21489953	3.346241259	14.41945024	0.552303367	2.771348375	23.29763381
DEU	30.58344155	23.98862332	2.759519709	1.340130473	17.4878235	489.7665937	11.19638871	60.72688281	1.586687111	9.940776326	115.003143
DNK	0.201878014	0.256487587	0.028428706	0.010137795	0.160401255	3.255667448	0.262065756	0.514051136	0.041311435	0.139870789	1.029406909
ESP	5.015958643	5.657219738	0.334342965	0.205510574	2.647908846	59.41171091	1.543793203	43.3574221	0.169580274	1.167359096	56.79551543
EST	0.051791245	0.089167183	0.007681975	0.002585836	0.039008661	0.727504358	0.060762738	0.116450377	0.072737931	0.172389526	0.483330468
FIN	0.194411207	0.225213563	0.025162405	0.008599606	0.137573456	5.32633375	0.160076598	0.445729732	0.110505223	0.45572277	0.941701637
FRA	4.604414581	13.99069423	0.652264385	0.213695062	3.177459115	56.7738444	2.079045374	25.8545931	0.412599179	1.470146765	85.8488525
GBR	2.450806189	8.141464865	0.286403905	0.624801782	1.466354367	31.00925614	1.152961362	10.87815334	0.266484665	2.058166302	14.9446878
GRC	0.097126083	0.139338984	0.042294038	0.005639056	0.074293726	1.241657273	0.041261603	0.305370758	0.007639155	0.033982907	0.648974063
HRV	0.284301482	0.269533979	0.040030803	0.007861326	0.13520361	2.807451563	0.072536835	0.373288225	0.0120174	0.056062612	1.081139556
HUN	3.265852107	2.2219188	0.873251601	0.097511694	2.566542717	50.41041666	1.146432139	5.707201091	0.141694393	0.845465667	10.53217014
IRL	0.110032351	0.180482682	0.015363932	0.007814853	0.085660489	1.766807335	0.056336709	0.365954908	0.010162858	0.067626965	0.781439469
ITA	4.776915198	5.71149627	0.939765623	0.237463002	3.365568814	62.32185459	1.836080723	16.52189265	0.289828137	1.25329999	40.35202376
LTU	0.081465152	0.108424643	0.014539189	0.004854798	0.078807898	1.154681675	0.06269698	0.208905853	0.040520847	0.050099734	0.466012205
LUX	0.067573906	0.113845795	0.008973228	0.003016365	0.046568056	0.95156279	0.031179738	0.166575395	0.005207241	0.025877634	0.408221219
LVA	0.054789347	0.071759226	0.008096058	0.004072624	0.046927826	0.827590091	0.041480561	0.143432392	0.127523239	0.038504056	0.348162172
MLT	0.01566856	0.017037749	0.003469418	0.006769772	0.011283153	0.174600547	0.008543375	0.035787592	0.001501358	0.007206879	0.076847796
NLD	1.463644758	2.118727666	0.296219564	0.05872042	1.167829823	19.64929145	0.718572083	3.355538779	0.100624554	0.500211763	7.259362872
POL	6.836995365	5.787476369	0.856294027	0.249163662	9.241403939	85.85025567	3.165130173	17.19640064	0.611600081	2.492101124	30.11956078
PRT	2.019732348	1.065070936	0.055764759	0.026275277	0.485168964	10.06133365	0.18601143	5.468301582	0.034404794	0.200275511	7.442248214

Figure 25. Result of the pivot table

Source: Own elaboration

2.3 Load pre-saved queries

This function enables the user to load a previously saved query. When clicking the "Load Pre-Saved Query" button, a window pops up displaying the folder where queries are saved by default. Select the desired query file (.tscan) and click on "Open" to load it. The Step 3 screen will show the summary of the loaded query. From this screen, it is possible to go back and forth making any desired modifications to the original query before exporting it to GAMS.

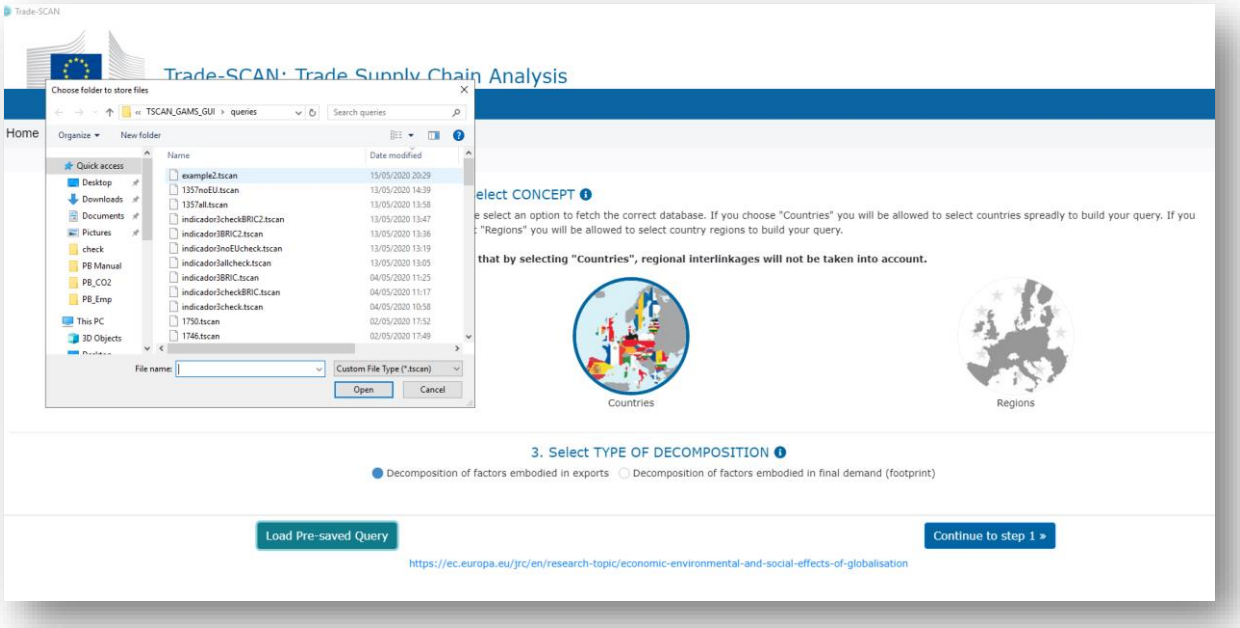


Figure 26. Load pre-saved query

Source: Own elaboration

2.4 Recommendations

a) Size of queries: Bear in mind that workbooks of MS Excel 2010 or later versions can accommodate a maximum of 1 048 576 rows per worksheet. Therefore, the number of records shown on the screen divided by the number of selected components (components are exported to separate sheets) should not exceed 1 048 576 rows. Note that a query with so many rows is very large and its computation time would be very long. Moreover, the MS Excel workbook would be huge and very difficult to handle. Therefore, it is advisable to fine-tune the query as much as possible or to make separate queries, if necessary.

b) Computing performance: The code architecture makes the most of the available computing power, especially the RAM. However, note that including extra components such as countries or years increases the computing time exponentially. Adding extra variables also increases the computing time but to a lesser extent. Instead, increasing the sectoral resolution does not have a significant impact on the speed since the calculations use the maximum level of resolution (to avoid aggregation biases) and generate the aggregates at the end of the process. However, queries related to the factor decomposition of gross exports using EXIOBASE might take longer and eventually fail if you include more than one reference country (R) and several countries in the other dimensions.

3 Trade-SCAN-Pocketbook module

This module gives access to the tables and figures contained in Arto et al. (2018a, 2018b, 2020a, 2020b, 2020c), which were obtained using the WIOD 2016 Release database. Note that for several indicators, this electronic version contains more data than the printed and online pdf versions (i.e. extra years). The structure of this section is as follows: first, we show the content of these pocketbooks; then, we explain the functioning of this module; and third, we show how to calculate some of their indicators using the aforementioned Ad-hoc module.

3.1 Pocketbooks contents

3.1.1 EU exports to the world: effects on employment and income

Trade policy is a core component of the European Union's 2020 Strategy. With the objective of providing comprehensive, reliable and comparable information on trade effects on the EU, the JRC and DG TRADE collaborated to produce two publications on the effects of EU exports to the world: one on employment and the other on income (Arto et. al., 2018a, 2018b).

These reports are the follow-up of a previous publication (Arto et al., 2015) and include a series of indicators related to the EU exports to the rest of the world. These indicators cover different aspects of the relationship between trade, employment and income for the EU as a whole and for each EU Member State.

Figures 27 and 28 provide the overview of all the interlinkages across indicators of employment and income effects, respectively. All indicators pivot around Tables A5 and B2 in the publications. These two indicators show where the effects take place (rows) and the country whose exports generate the effects (columns). The other indicators split these results by industry, skill, gender and age.

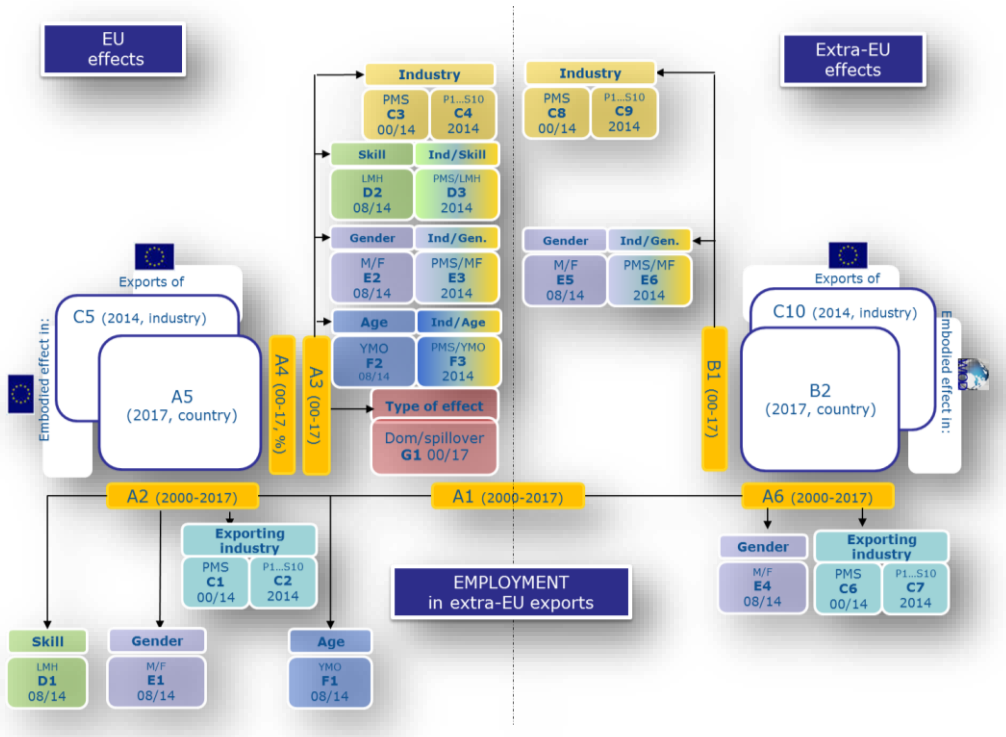


Figure 27. Overview of indicators of the effects of exports on employment

Source: Arto et al. 2018a

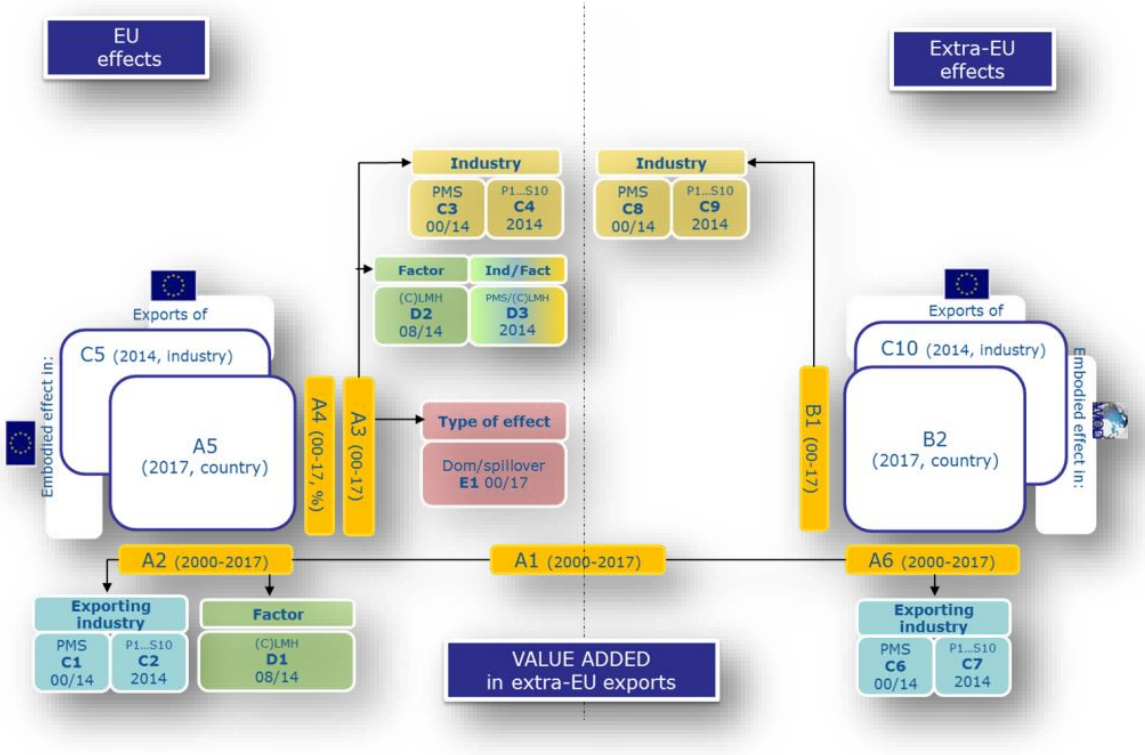


Figure 28. Overview of indicators of the effects of exports on income

Source: Arto et al. 2018b

3.1.2 EU trade in employment, income and CO_2 emissions

The fast-changing global economy, characterised by the dynamic creation of business opportunities and increasingly complex production chains, means that it is now even more important to fully understand global value chains. With the objective of providing comprehensive, reliable and comparable information on the effects of global value chains on the EU, the JRC produced three additional publications: on trade in employment, trade in income and trade in CO_2 emissions (Arto et al., 2020a, 2020b, 2020c).

These reports are the follow-up of previous publications (Arto et al., 2015, 2018a, 2018b, 2018c) and include a series of indicators related to the EU interdependence with the rest of the world. These indicators cover different aspects of this relationship for the EU as a whole and for each EU Member State.

Figures 29 to 34 provide an overview of all the interlinkages across indicators of trade in employment, income and CO_2 emissions. Separate figures represent indicators related to EU final demand and non-EU final demand. Those referring to the EU final demand pivot around Tables A4 and B2. These two indicators show where the effects take place (rows) and the country whose final demand generates the effects (columns). The other indicators of the figure split these results by industry, skill and gender. The other set of indicators related to non-EU final demand pivots around Tables C13 and C16. Similarly, these two indicators show the industries where the effects take place (rows) and the industry whose final products generate the effects (columns).

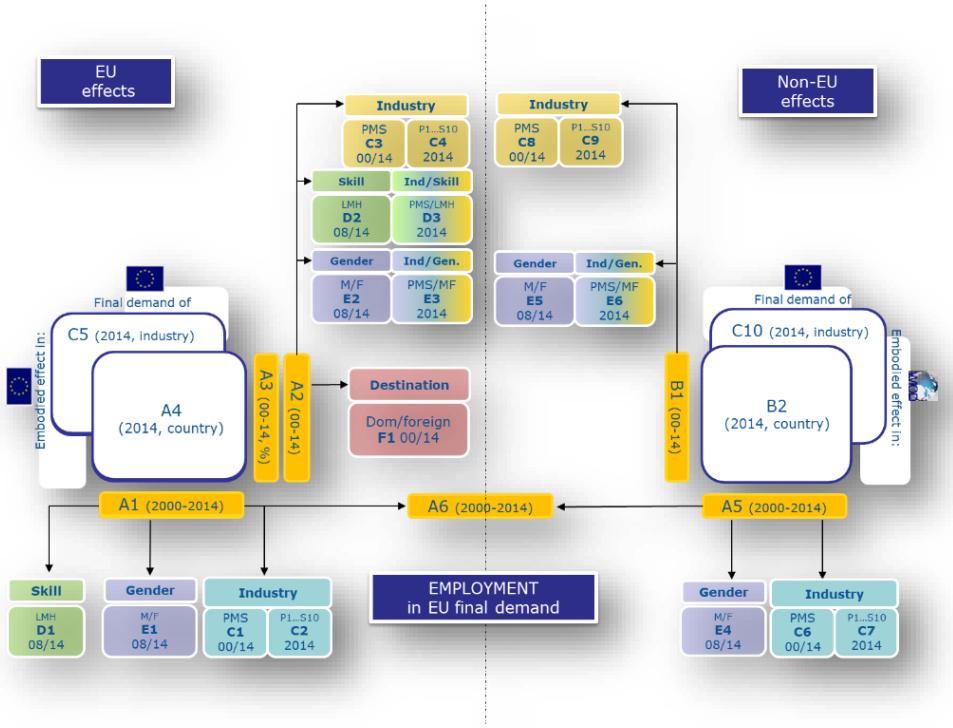


Figure 29. Overview of indicators of employment in EU final demand

Source: Arto et al. 2020a

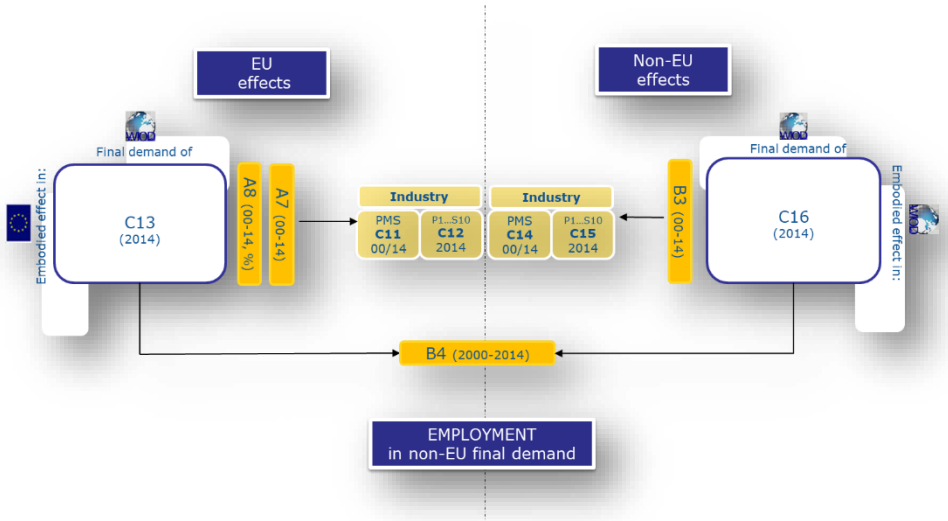


Figure 30. Overview of indicators on employment in non-EU final demand

Source: Arto et al. 2020a

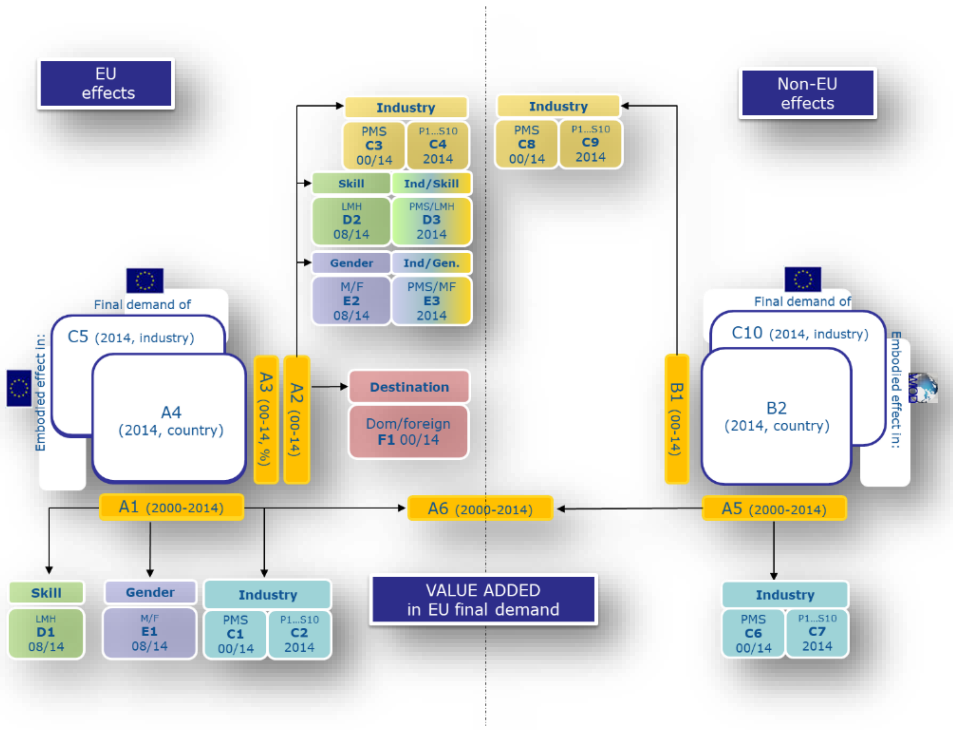


Figure 31. Overview of indicators on value added in EU final demand

Source: Arto et al. 2020b

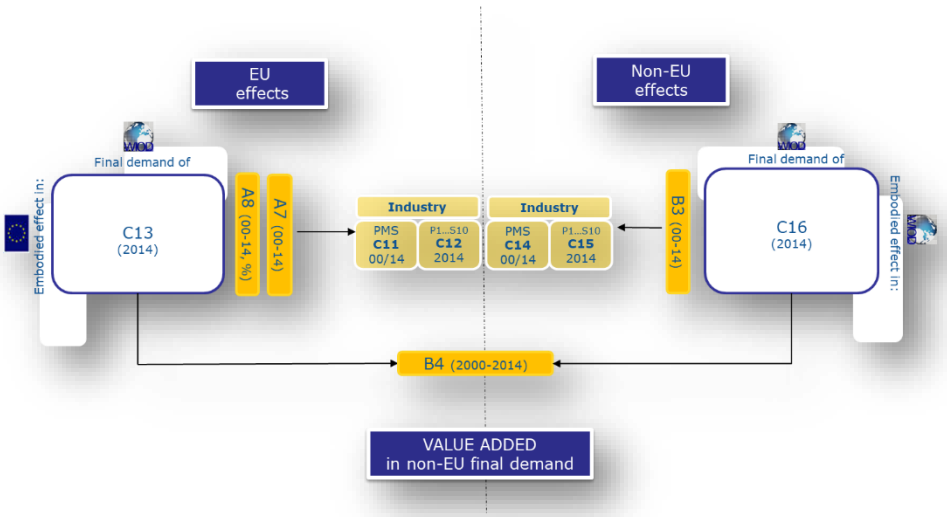


Figure 32. Overview of indicators on value added in non-EU final demand

Source: Arto et al. 2020b

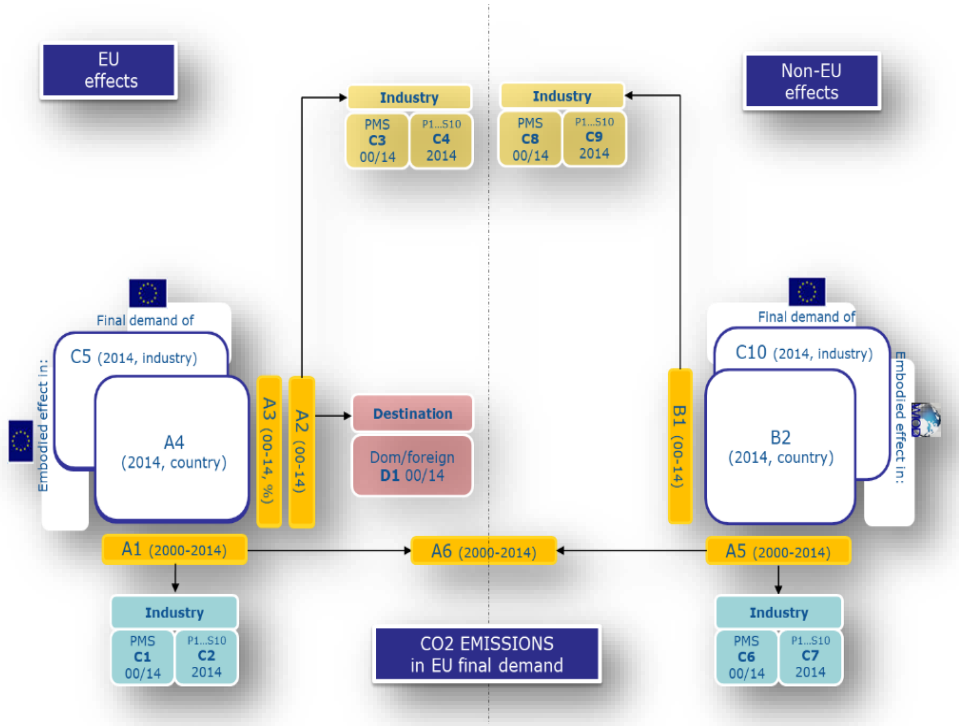


Figure 33. Overview of indicators on CO_2 emissions in EU final demand

Source: Arto et al. 2020c

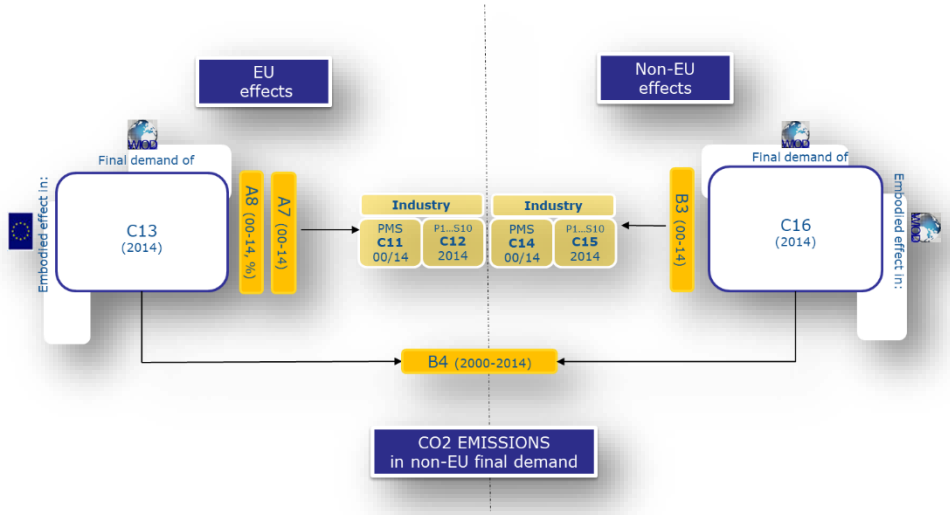


Figure 34. Overview of indicators on CO_2 emissions in non-EU final demand

Source: Arto et al. 2020c

Note that several indicators are given in percentage terms in the published reports to facilitate their interpretation although in this User Guide they are obtained only in absolute values. We believe the user can subsequently calculate the corresponding shares with respect to totals. In addition, in the reports, industries in certain indicators

are grouped into 3 sectors or 10 industries to facilitate the display of the results. This User Guide explains how to obtain these indicators for 56 industries (NACE Rev.2).

3.2 Module structure

Next, we explain the functionalities of the Trade-SCAN-Pocketbook module. This module is organised in two parts: to the left, there is the list of indicators and the search box; to the right, the tool displays the selected indicators, either in table format or in charts.

3.2.1 Left-hand side

At the top of this part of the screen is a search box that admits two types of entries: table codes or keywords. Table codes refer to the codes used in the title of the sections of the pocketbooks. See in the example below that if we introduce "a1" in the search box, we get access to tables/figures coded A1 in the pocketbooks (e.g. "Total (European Union and rest of the world) employment in the exports of each Member State"). Note that the search engine is not case-sensitive.

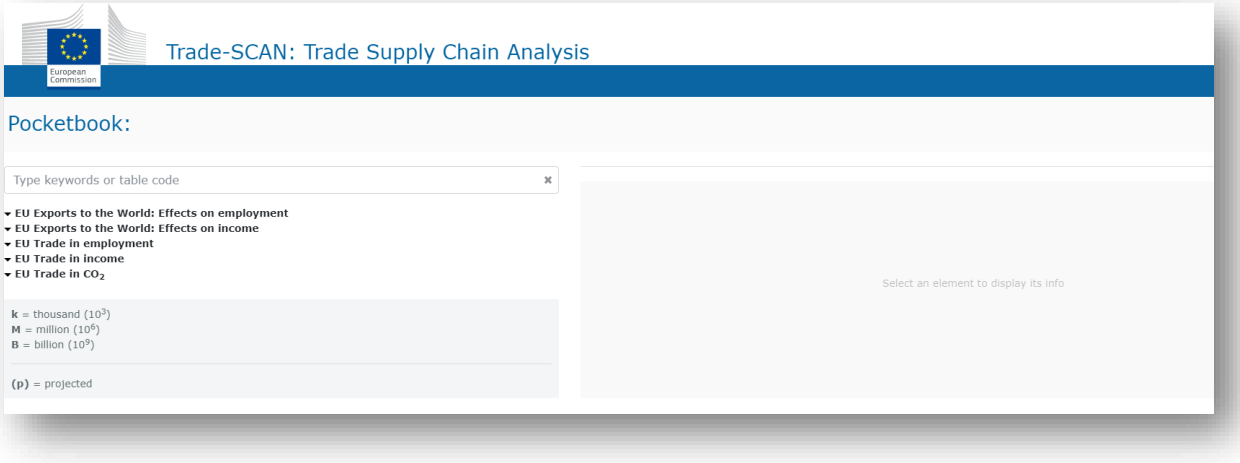


Figure 35. Search pocketbook indicators: table codes

Source: Own elaboration

Alternatively, you can search by keyword, for example "skill". The search will yield six elements for the effects on employment. The user can search by every keyword contained in the title of the pocketbooks' indicators (Figure 36).

The user can also access the pocketbook indicators through a tree menu. Figure 37 shows how to access, for example, indicator G1. By clicking on the name of the indicator, the tool displays the corresponding figure on the right-hand side of the page.

3.2.2 Right-hand side

This side displays the selected indicators, both in the form of a graph and a table (Figure 38). When hovering over the charts, a tooltip shows the specific value and label of the data pointed to at each moment. A "Download" button enables the user to save the underlying data on their own computer (as .jpg for graphs and as .xlsx for tables).

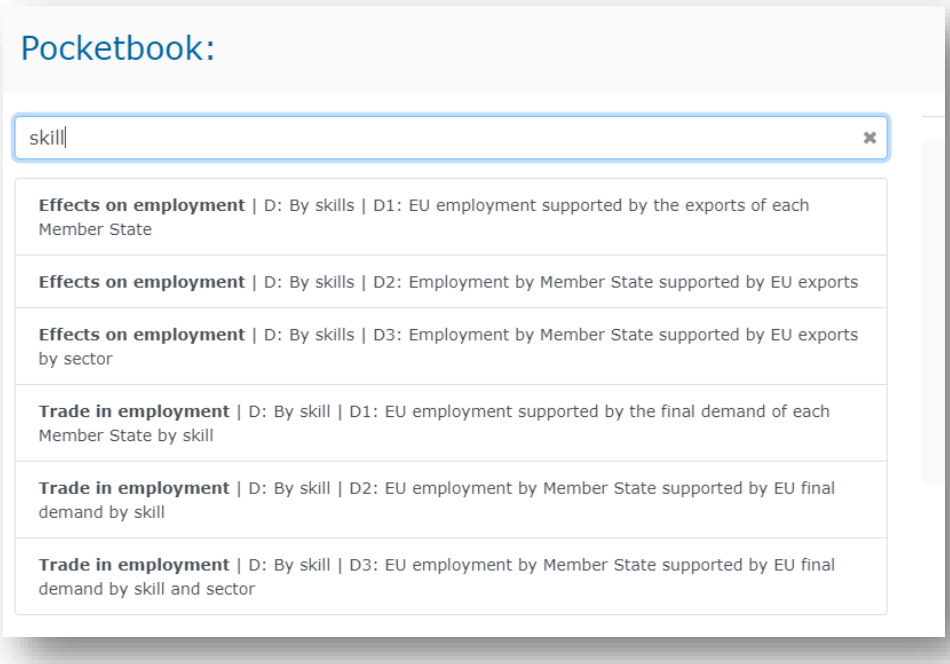


Figure 36. Search pocketbook indicators: keywords

Source: Own elaboration

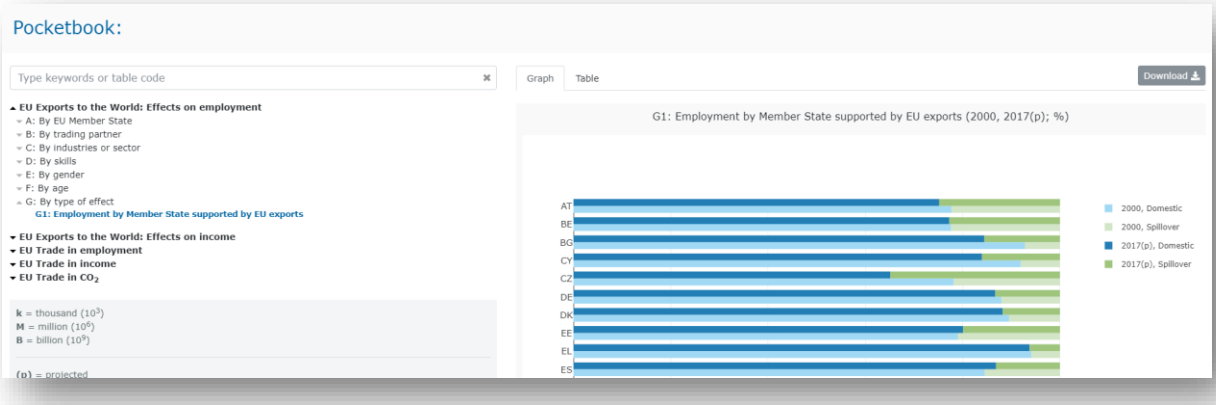
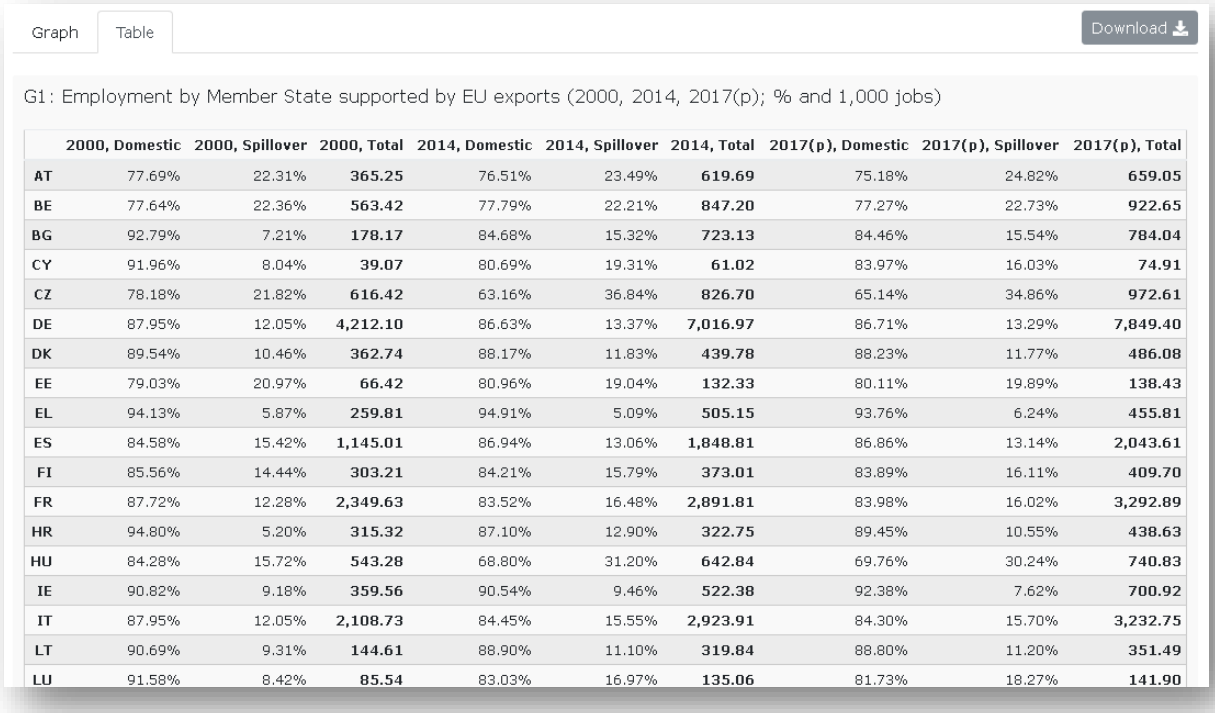


Figure 37. Access pocketbook indicators: tree menu

Source: Own elaboration



	2000, Domestic	2000, Spillover	2000, Total	2014, Domestic	2014, Spillover	2014, Total	2017(p), Domestic	2017(p), Spillover	2017(p), Total
AT	77.69%	22.31%	**365.25**	76.51%	23.49%	**619.69**	75.18%	24.82%	**659.05**
BE	77.64%	22.36%	**563.42**	77.79%	22.21%	**847.20**	77.27%	22.73%	**922.65**
BG	92.79%	7.21%	**178.17**	84.68%	15.32%	**723.13**	84.46%	15.54%	**784.04**
CY	91.96%	8.04%	**39.07**	80.69%	19.31%	**61.02**	83.97%	16.03%	**74.91**
CZ	78.18%	21.82%	**616.42**	63.16%	36.84%	**826.70**	65.14%	34.86%	**972.61**
DE	87.95%	12.05%	**4,212.10**	86.63%	13.37%	**7,016.97**	86.71%	13.29%	**7,849.40**
DK	89.54%	10.46%	**362.74**	88.17%	11.83%	**439.78**	88.23%	11.77%	**486.08**
EE	79.03%	20.97%	**66.42**	80.96%	19.04%	**132.33**	80.11%	19.89%	**138.43**
EL	94.13%	5.87%	**259.81**	94.91%	5.09%	**505.15**	93.76%	6.24%	**455.81**
ES	84.58%	15.42%	**1,145.01**	86.94%	13.06%	**1,848.81**	86.86%	13.14%	**2,043.61**
FI	85.56%	14.44%	**303.21**	84.21%	15.79%	**373.01**	83.89%	16.11%	**409.70**
FR	87.72%	12.28%	**2,349.63**	83.52%	16.48%	**2,891.81**	83.98%	16.02%	**3,292.89**
HR	94.80%	5.20%	**315.32**	87.10%	12.90%	**322.75**	89.45%	10.55%	**438.63**
HU	84.28%	15.72%	**543.28**	68.80%	31.20%	**642.84**	69.76%	30.24%	**740.83**
IE	90.82%	9.18%	**359.56**	90.54%	9.46%	**522.38**	92.38%	7.62%	**700.92**
IT	87.95%	12.05%	**2,108.73**	84.45%	15.55%	**2,923.91**	84.30%	15.70%	**3,232.75**
LT	90.69%	9.31%	**144.61**	88.90%	11.10%	**319.84**	88.80%	11.20%	**351.49**
LU	91.58%	8.42%	**85.54**	83.03%	16.97%	**135.06**	81.73%	18.27%	**141.90**

Figure 38. Display of pocketbook indicators

Source: Own elaboration

When the indicator consists of more than one file, a message like the following one pops up.

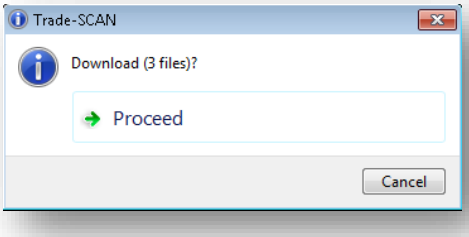


Figure 39. Download multiple-file pocketbook indicators

Source: Own elaboration

Once the user clicks "Proceed", a new window opens to allow the user to save each of the three files in the desired folder.

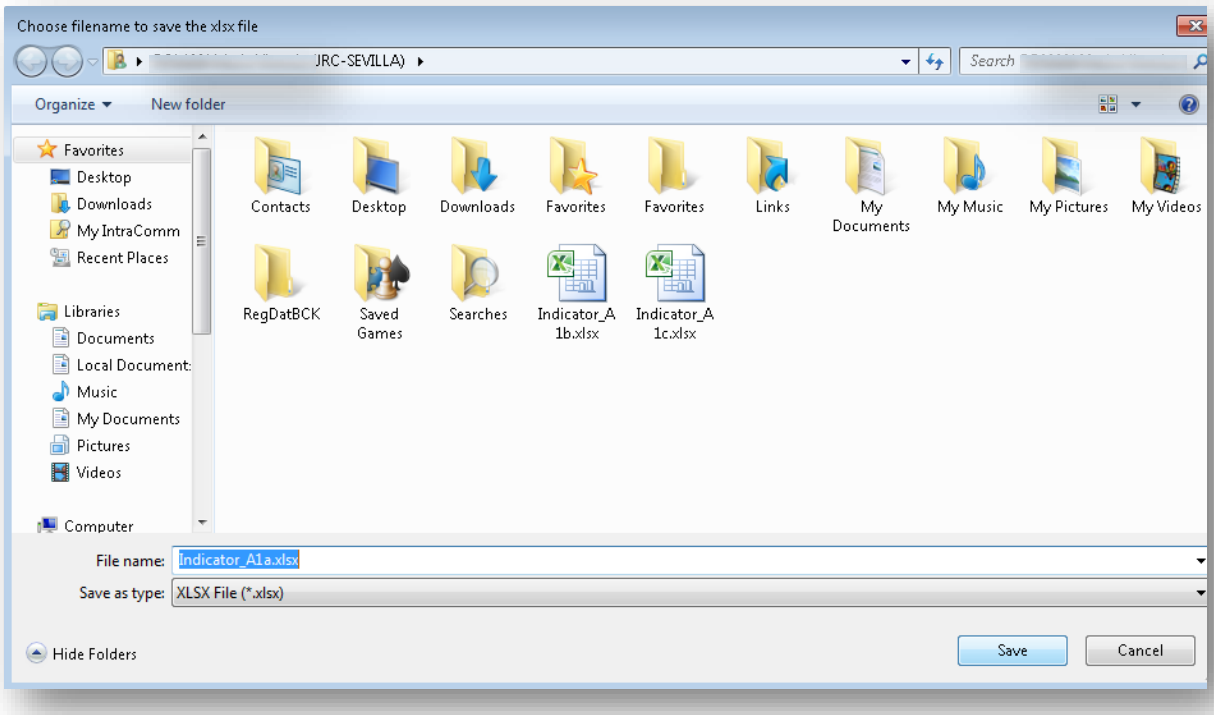


Figure 40. Download pocketbook indicators

Source: Own elaboration

3.3 Calculation with the Trade-SCAN-Ad-hoc module

3.3.1 Indicators of effects of EU exports to the world

3.3.1.1 Indicator A1. Total (EU and rest of the world) value added / employment supported by the exports of each EU Member State

- Enter the Trade-SCAN-Ad-hoc module by double-clicking on the corresponding icon.
- Select the WIOD.
- Select the concept by clicking on the "Regions" map icon. The selection of the "Regions" option implies that the domestic concept applies to the region(s) and enables the accounting of intra-regional linkages.
- Select the type of decomposition: "decomposition of factors embodied in exports" (already selected by default).
- Click on the "Continue to step 1" button.

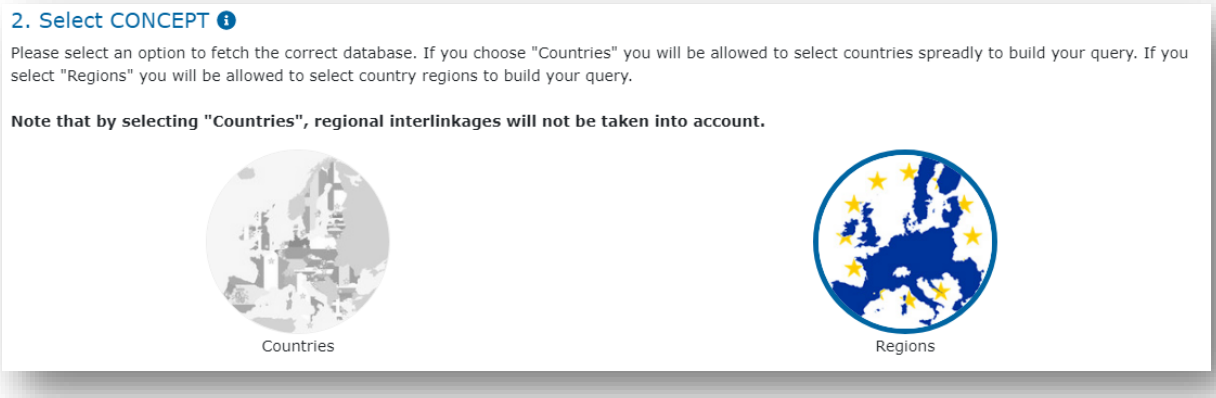


Figure 41. A1. Decomposition of exports. Step 0

Source: Own elaboration

— Step 1: select years "2000", "2007" and "2014"; and variables "value added" and "total employment".

Figure 42. A1. Decomposition of exports. Step 1

Source: Own elaboration

— Step 2: select the four left-hand side effects and click on the fourth call-out (i.e. with the longer diagram – see footnote 4). For T, Z, P and Q, select all countries and activate the "Summation" option. For f, g, h, i, j, k, select all industries and activate the "Summation" option too. For R1, select EU28 and click on "Summation", while for R, select EU28 with the "Summation" option off. For S, select non-EU28 and activate "Summation". Note that the only element with the "Summation" option off is R, the "exporter country", which is the one whose effects we would like to report on.

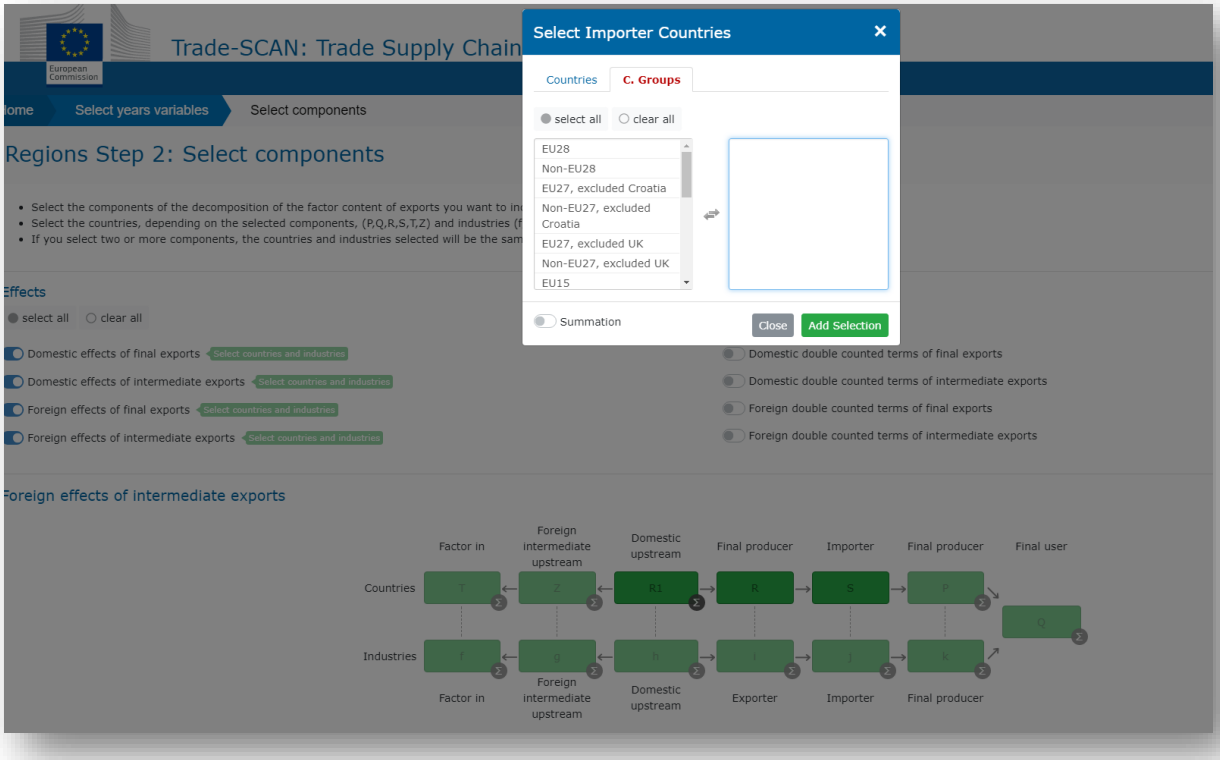


Figure 43. A1. Decomposition of exports. Step 2

Source: Own elaboration

— Step 3: give the query a name and (optionally) a description and click the button "Save + Export to GAMS".

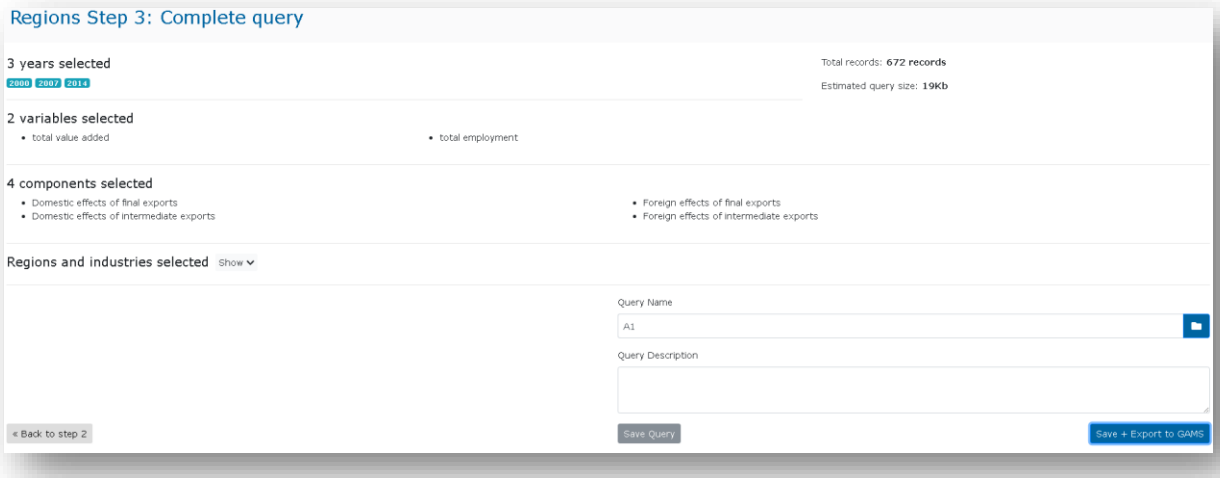


Figure 44. A1. Decomposition of exports. Step 3

Source: Own elaboration

— Create a pivot table in the resulting MS Excel file by selecting the sheet "Pivot" and clicking on the button "Create Empty Table". Then, select the following sheets in the pop-up window: "Domestic_final", "Foreign_final", "Domestic_intermediate" and "Foreign_intermediate".

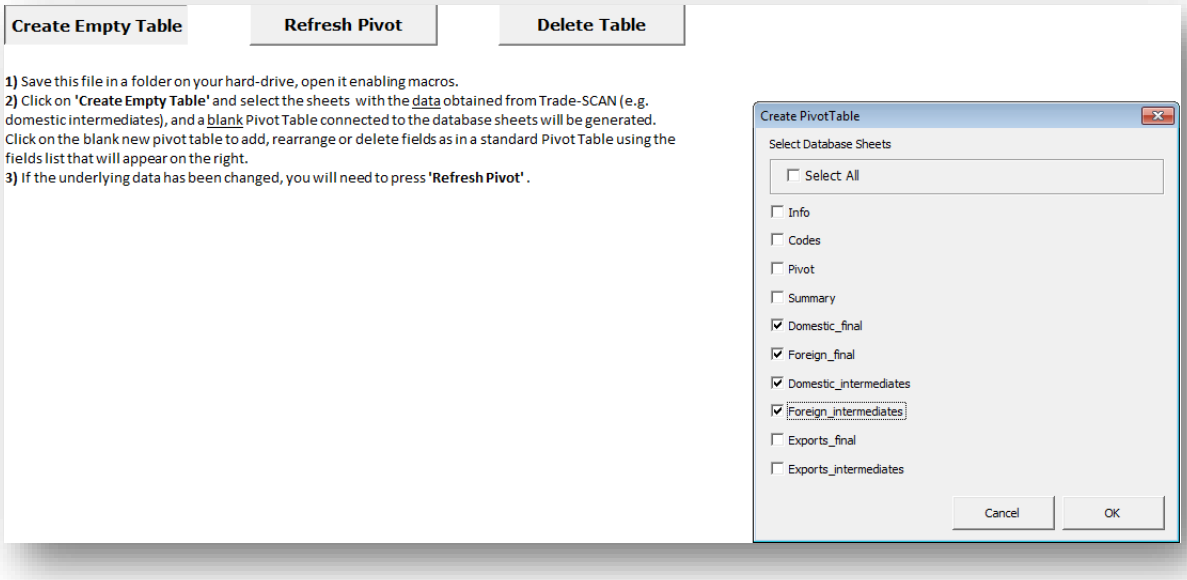


Figure 45. A1. Decomposition of exports. Create pivot table

Source: Own elaboration

— Pivot table field list: select "Factor" for "Filters", "Year" for "Columns", R for "Rows" and "Value" for "Values", summarised as a sum, not as a count (usual default of pivot tables).

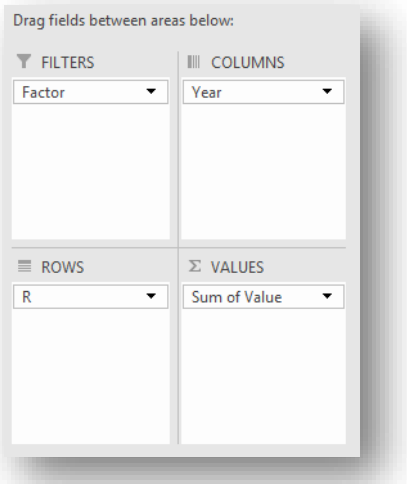


Figure 46. A1. Decomposition of exports. Pivot table field list

Source: Own elaboration

— Select "EMP" or "VA" from the "Factor" list in the "Filters" section to display the effects on employment (EMP) and value added (VA). Alternatively, the user can move

"Factor" to the "Columns"/"Rows" above the existing dimension (e.g. R), producing a long table with a first block for "EMP" and another subsequent one for "VA"[15].

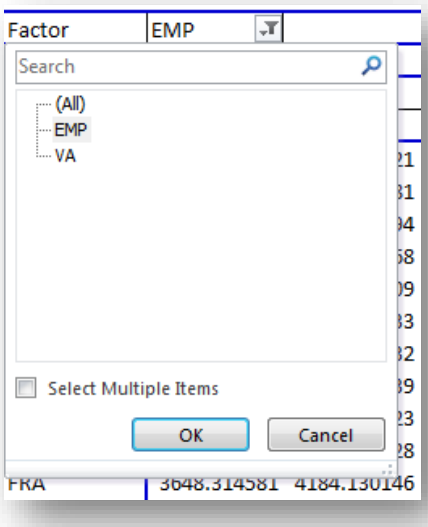


Figure 47. A1. Decomposition of exports. Selection of variable

Source: Own elaboration

3.3.1.2 Indicator A2. EU value added / employment supported by the exports of each EU Member State

Load the query saved for Indicator A1 and make the following changes:

— Step 2: deselect the two foreign effects.

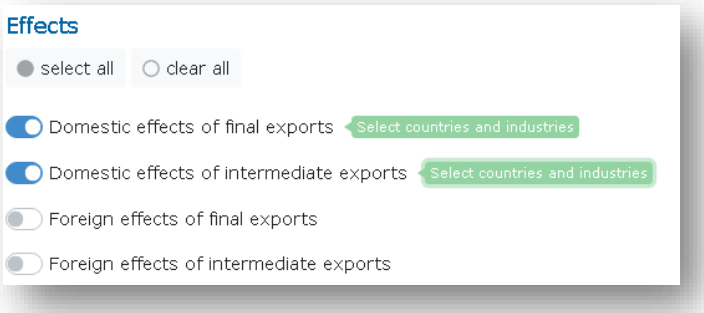


Figure 48. A2. Step 2

Source: Own elaboration

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A1. The user should note that there would be only two sheets with results accounting for the domestic effects due to intermediate and due to final exports: "Domestic_final" and "Domestic_intermediate".

[15] In this case, remember to deactivate Grand Totals, as it would not make sense to sum EMP with VA.

3.3.1.3 Indicator A6. Extra-EU value added / employment supported by the exports of each EU Member State

Load the query saved for Indicator A1 and make the following changes:

— Step 2: deselect the two domestic effects.

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A1. In this case, there would be only two sheets with results, i.e. "Foreign_final" and "Foreign_intermediate".

3.3.1.4 Indicator A3. Value added / Employment by Member State supported by EU exports

Load the query saved for Indicator A2 and make the following changes:

— Step 2: deactivate the "Summation" option for R1 ("factor in country") and activate it for R ("exporter country"). Note that now only R1 has the "Summation" option off because we are interested in analysing the effects by "factor in country", or, in other words, in the countries where the effects take place.

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A2 but selecting R1 for "Rows" instead of R.

3.3.1.5 Indicator A5. Value added / Employment by Member State supported by the exports of each Member State

Load the query saved for Indicator A3 and make the following changes:

— Step 1: deselect years "2000" and "2007".

— Step 2: deactivate "Summation" for R (exporter country). Note that now two elements have the summation deactivated, R1 and R, because we want to analyse the effects by "factor in" and "exporter country" separately.

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A3 but selecting R for "Columns" instead of "Years".

3.3.1.6 Indicator C3. Value added / Employment by Member State supported by EU exports by sector/industry

Load the query saved for Indicator A3 and make the following changes:

— Step 1: deselect year "2007".

— Step 2: deactivate "Summation" for h ("factor in industry"). Note that now two elements have the summation deactivated, R1 and h, because we want to analyse the effects by "factor in country" and "factor in industry".

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A3 but including h in "Columns" below the element "Years".

— Calculate the shares along the rows from the results of the pivot table.

3.3.1.7 Indicator D2. Value added / Employment by Member State supported by EU exports by skill

Load the query saved for Indicator A3 and make the following changes:

— Step 1: deselect years "2000" and "2007", and select year "2008"; deselect total "value added" and "total employment", and select "capital compensation", "high/medium/low skill labour compensation" and "high/medium/low employment".

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A3 but moving "Factor" from the "Filters" section to the "Columns" section below the element "Years".

— Select from the "Factor" list the variables to display in the "Columns": employment (EMPHS, EMPLS, and EMPMS) or value added (CAP, LABHS, LABLS, LABMS).

— Calculate the shares along the rows from the results of the pivot table.

3.3.1.8 Indicator D3. Value added / Employment by Member State supported by EU exports by skill and sector

Load the query saved for Indicator D2 and make the following changes:

— Step 1: deselect year "2008"; deselect "total value added" and "total employment", and select "capital compensation", "high/medium/low skill labour compensation" and "high/medium/low employment".

— Create a pivot table in the new MS Excel file using the same structure as in Indicator D2 but moving "Years" from the "Columns" to the "Filters" and including h in the "Columns" section above "Factor".

— Select from the "Factor" list the variables to display in the "Columns": employment (EMPHS, EMPLS, and EMPMS) or value added (CAP, LABHS, LABLS, LABMS).

— Calculate the shares along the rows from the results of the pivot table.

3.3.1.9 Indicator B2. Extra-EU value added / employment by country supported by the exports of each Member State

Load the query saved for Indicator A6 and make the following changes:

— Step 1: deselect years "2000" and "2007".

— Step 2: deactivate "Summation" for T (factor in country). Note that now two elements have the summation deactivated, T and R, because we want to analyse the effects by "factor in" and "exporter country".

— Create a pivot table in the new MS Excel file and select "Factor" for "Filters", R for "Columns", T for "Rows" and "Value" for "Values".

3.3.1.10 Indicator E5. Extra-EU employment by country supported by EU exports by gender

Load the query saved for indicator A6 and make the following changes:

— Step 1: deselect years "2000" and "2007", and select year "2008"; deselect "total value added" and "total employment", and select "male" and "female employment".

— Step 2: deactivate "Summation" for T (factor in country) and activate "Summation" for R. Note that now only one element has the "Summation" deactivated, T, because we want to analyse the effects by "factor in country".

— Create a pivot table in the new MS Excel file using the same structure as in Indicator A6 but selecting T for "Rows" instead of R and moving "Factor" from the "Filters" to the "Columns" below the element "Year".

— Calculate the shares along the rows from the results of the pivot table.

3.3.1.11 Indicator E6. Extra-EU employment by country supported by EU exports by gender and sector

Load the query saved for indicator E5 and make the following changes:

— Step 1: deselect year "2008".

— Step 2: deactivate "Summation" for f (factor in industry). Note that now two elements have the "Summation" deactivated, T and f, because we want to analyse the effects by "factor in country" and by "factor in industry".

— Create a pivot table in the new MS Excel file using the same structure as in Indicator E5 but removing "Year" from the "Columns" and including f in the "Columns" above the element "Factor".

— Calculate the shares along the rows from the results of the pivot table.

3.3.2 Indicators of EU trade in factors

3.3.2.1 Indicator A1. EU employment / value added / CO_2 emissions associated with the final demand of each Member State

— Enter the Trade-SCAN-Ad-hoc module by double-clicking on the corresponding icon.

— Select the WIOD.

— Select the concept by clicking on the "Regions" map icon. The selection of the "Regions" option implies that the domestic concept applies to the region(s) and enables the accounting of intra-regional linkages.

— Select the type of decomposition: "decomposition of factors embodied in final demand (footprint)".

— Click on the "Continue to step 1" button.

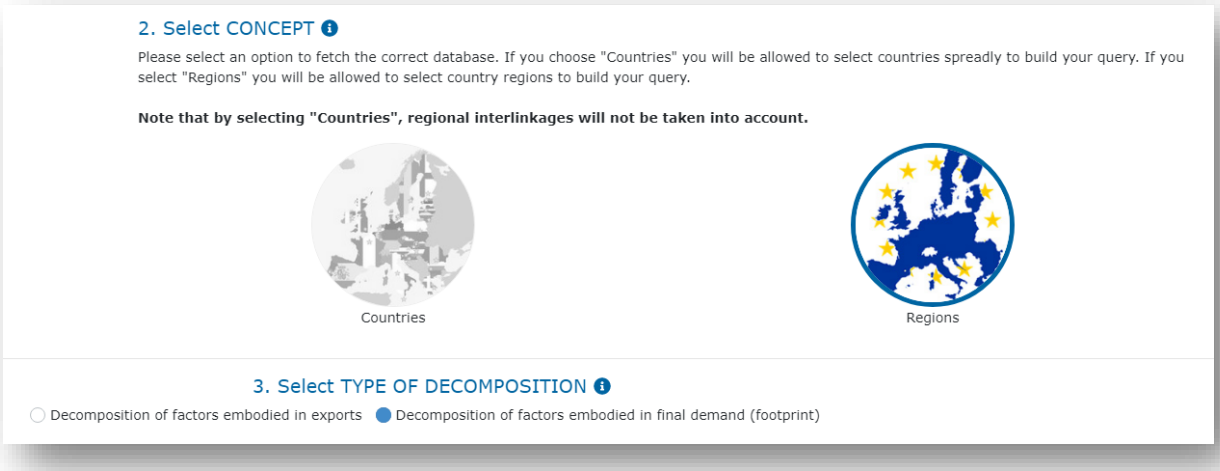


Figure 49. A1. Decomposition of final demand. Step 0

Source: Own elaboration

— Step 1: select years "2000", "2007" and "2014"; and variables "value added", "total employment" and "CO2".

Figure 50. A1. Decomposition of final demand. Step 1

Source: Own elaboration

— Step 2: select the "Domestic factor content in final demand" component and the "Direct household contribution to the footprint" component (only meaningful for emissions). For P, select all countries and activate "Summation". For h and k, select all industries and activate "Summation" too. For c, select all components of final demand and activate "Summation". For Q1, select EU28 and activate "Summation". For Q, select EU28 and do not activate "Summation". Note that the only element with "Summation" deactivated is Q, the final user country, because we want to analyse the effects by final user country or "country of final demand".

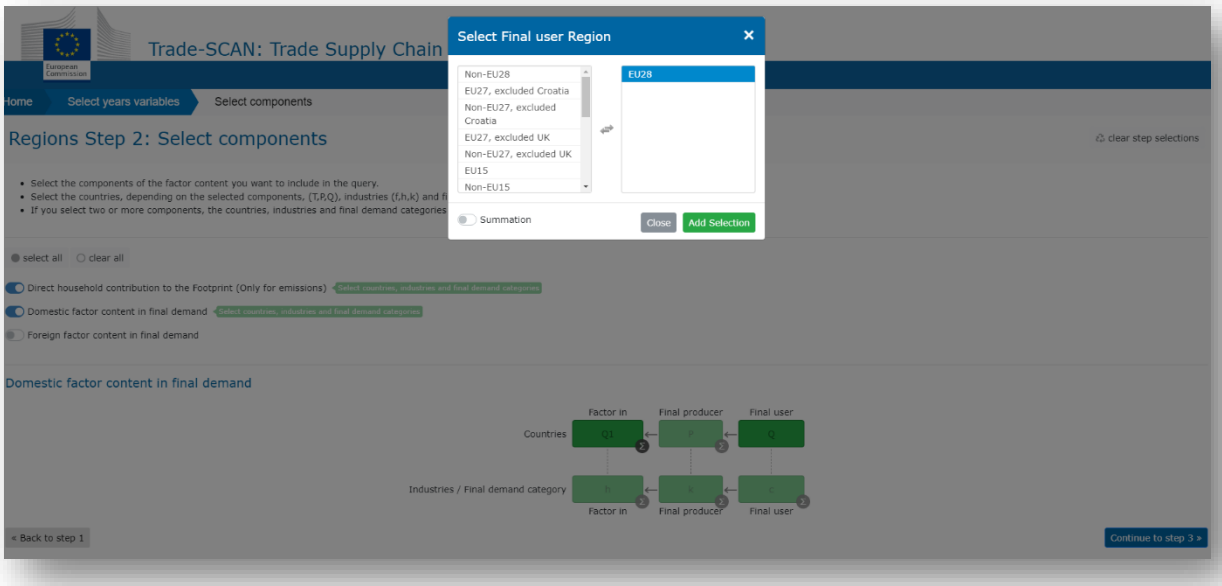


Figure 51. A1. Decomposition of final demand. Step 2

Source: Own elaboration

— Step 3: give the query a name and (optionally) a description and click the button "Save + Export to GAMS".

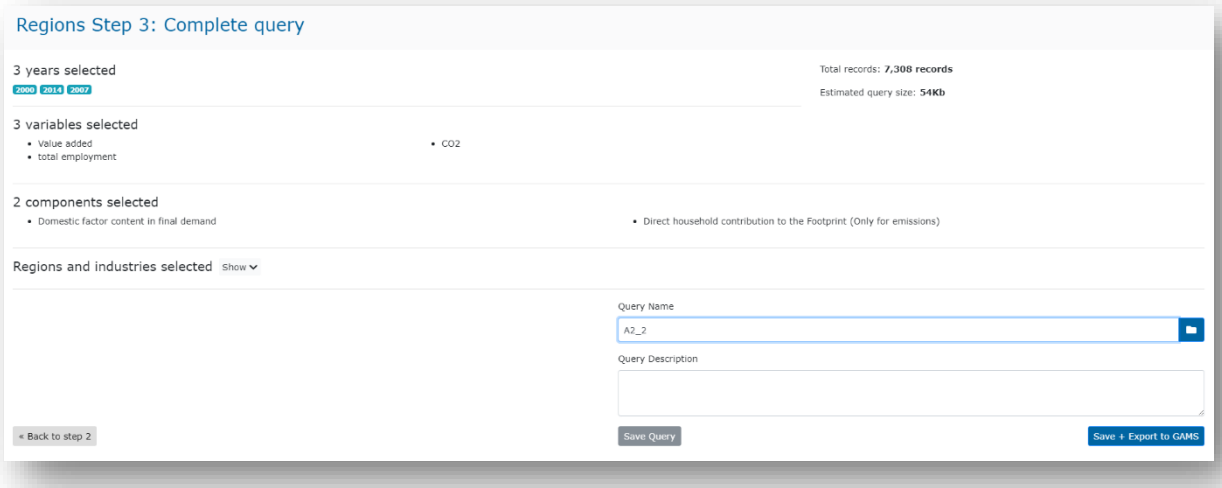


Figure 52. A1. Decomposition of final demand. Step 3

Source: Own elaboration

— Create a pivot table in the new MS Excel file by selecting the sheet "Pivot" and clicking on the button "Create Empty Table". Then, select the following sheets in the pop-up window: "Domestic_factor_content" and "Direct_household_contribution" (which only contains data for emissions).

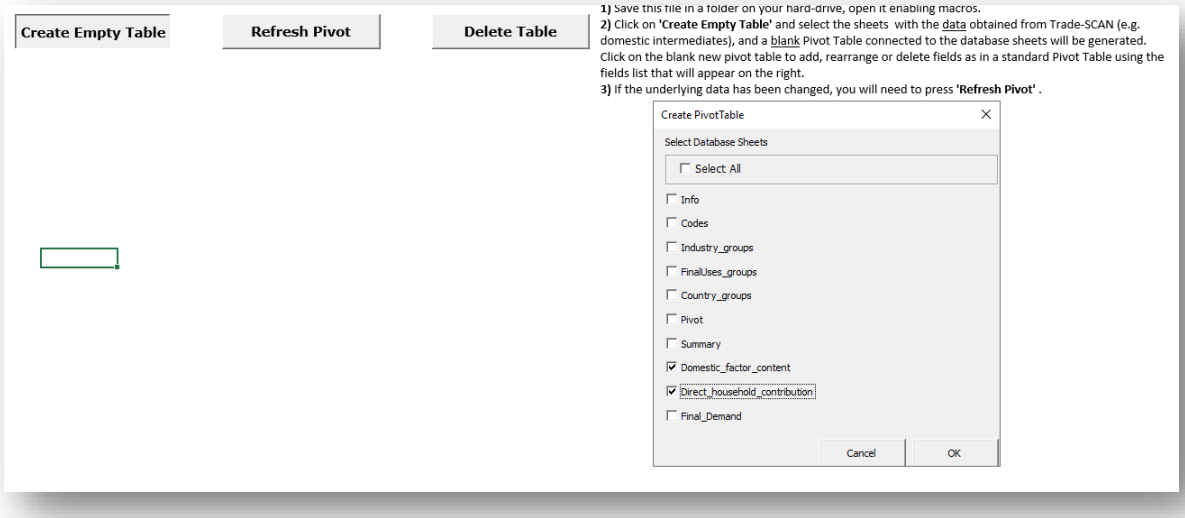


Figure 53. A1. Decomposition of final demand. Create pivot table

Source: Own elaboration

— Pivot table field list: select "Factor" for "Filters", "Year" for "Columns", Q for "Rows" and "Value" for "Values", summarised as a sum, not as a count (usual default of pivot tables).

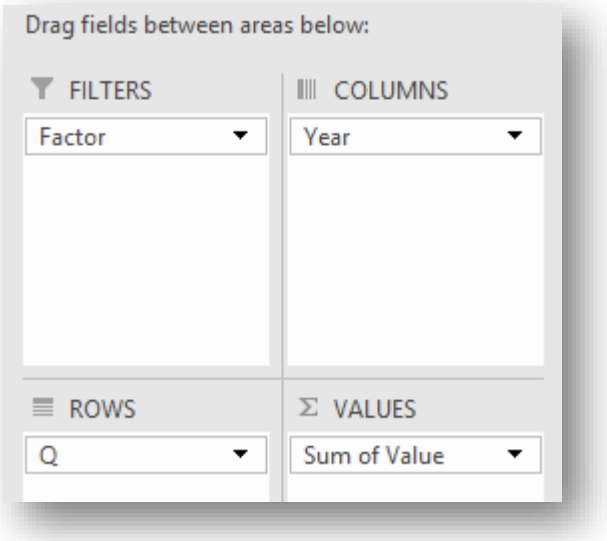


Figure 54. A1. Decomposition of final demand. Pivot table field list

Source: Own elaboration

— Select "EMP", "VA" or "CO2" from the "Factor" list in the "Filters" to display the effects on employment (EMP), value added (VA) or CO_2 emissions (CO2). Alternatively, the user can move "Factor" to the "Column"/"Rows" above the existing dimension (e.g. Q), producing a long table with a block for each variable[16].

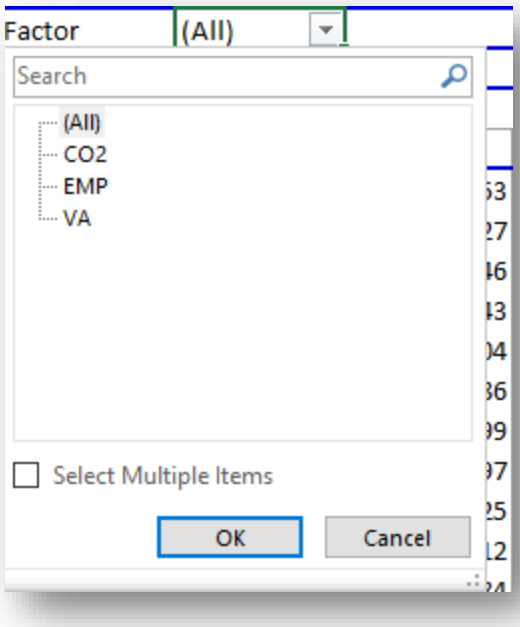


Figure 55. A1. Decomposition of final demand. Selection of variable

Source: Own elaboration

[16] In this case, remember to deactivate Grand Totals, as it would not make sense to sum "EMP", "VA" and "CO2".

3.3.2.2 Indicator A2. EU employment / value added / CO_2 emissions by Member State associated with EU final demand

Load the query saved for Indicator A1 and make the following changes:

- Step 2: deactivate "Summation" for Q1 ("factor in country") and activate "Summation" for Q ("final user country"). Note that now only one element has the "Summation" option deactivated, Q1, because we want to analyse the effects by "factor in country". For the direct household contribution to the CO_2 emission footprint by Member State, the user needs to deactivate the "Summation" option for Q.
- Create a pivot table in the new MS Excel file using the same structure as in Indicator A1 but selecting Q1 for "Rows" instead of Q. The user needs to create two pivot tables in the case of CO_2 emissions. The first one with Q1 in "Rows" and selecting "Domestic_factor_content" in the "Filter" section. The second with Q in "Rows" and selecting "Direct_household_contribution" in the "Filter" section. The sum of these two tables would make the total CO_2 emissions per country.

3.3.2.3 Indicator A4. EU employment / value added by Member State associated with the final demand of each Member State

Load the query saved for Indicator A2 and make the following changes:

- Step 1: deselect years "2000" and "2007".
- Create a pivot table in the new MS Excel file using the same structure as in Indicator A2 but selecting Q for "Columns" instead of "Years". For CO_2 emissions, select Q1 in "Rows" and Q in "Columns" in the pivot table for "Domestic_factor_content". In the pivot table for "Direct_household_contribution", select Q in "Rows" and leave the "Columns" section empty. The sum of these emissions and the main diagonal elements of the former pivot table makes the total emissions per country.

3.3.2.4 Indicator A5. Non-EU employment / value added / CO_2 emissions associated with the final demand of each Member State

Load the query saved for Indicator A1 and make the following changes:

- Step 2: deselect the "Domestic factor content of final demand" and the "Direct household contribution to the footprint", and select the "Foreign factor content of final demand". For T, select the country group "non-EU28" and activate "Summation", and for f, select all industries and activate "Summation" too. Note that the only element with deactivated "Summation" is Q, the "final user country", because we want to analyse the effects by final user country or "country of final demand".
- Create a pivot table in the new MS Excel file using the same structure as in Indicator A1 but note that now the only sheet available is "Foreign_factor_content".

3.3.2.5 Indicator B2. Non-EU employment / value added / CO_2 emissions by country associated with the final demand of each Member State

Load the query saved for Indicator A5 and make the following changes:

- Step 1: deselect years "2000" and "2007".
- Step 2: deactivate "Summation" for T ("factor in country"). Note that now two elements have the "Summation" option deactivated, T and Q, because we want to analyse the effects by "factor in" and "final user country".
- Create a pivot table in the new MS Excel file and select "Factor" for "Filters", Q for "Columns", T for "Rows" and "Value" for "Values".

3.3.2.6 *Indicator A6. Total employment / value added / CO_2 emissions effect of the final demand of each Member State*

— Select the concept by clicking on the "Countries" map icon. The selection of the "Countries" option implies that the domestic concept applies to each country.

— Select the type of decomposition: "decomposition of factors embodied in final demand (footprint)".

— Click on the "Continue to step 1" button.

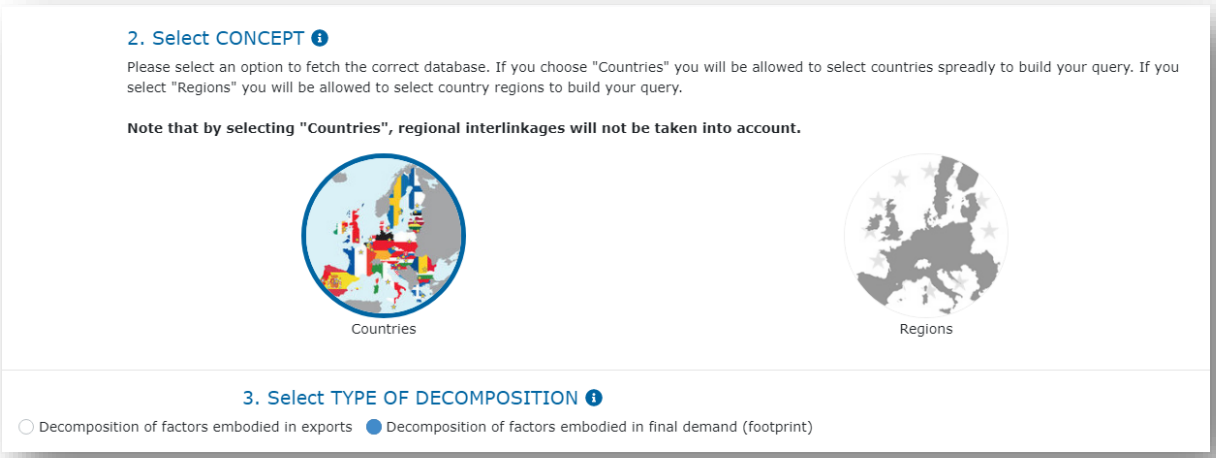


Figure 56. A6. Step 0

Source: Own elaboration

— Step 1: select years "2000" and "2014"; and variables "value added", "total employment" and "CO2".

Figure 57. A6. Step 1

Source: Own elaboration

— Step 2: select the three components of the decomposition. As usual, the "Direct household contribution to the footprint" component only reports data on emissions. For T and P, select all countries and activate "Summation". For f, h and k, select all industries and activate "Summation". For c, select all components of "final demand" and activate "Summation". For Q1 and Q, select EU28 and deactivate "Summation". Note that the only elements with deactivated "Summation" are Q1 and Q, because we

want to analyse the domestic effects by final user country or "country of final demand".

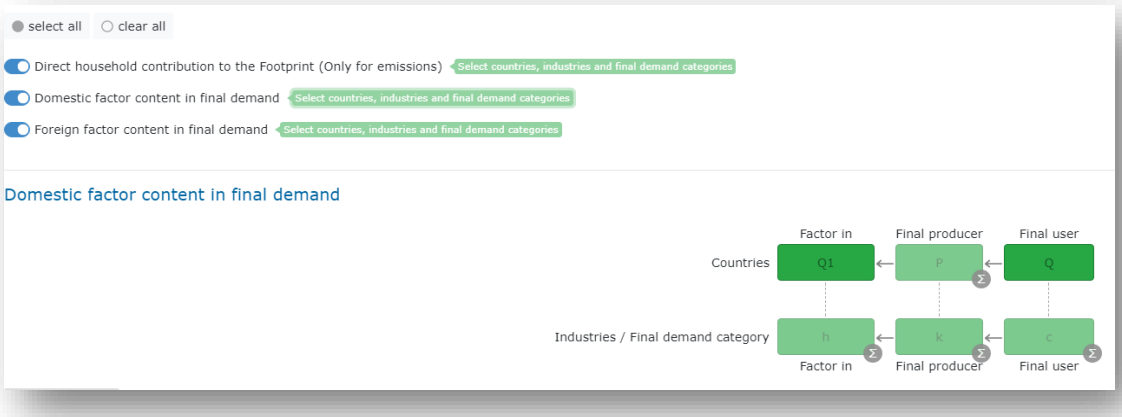


Figure 58. A6. Step 2

Source: Own elaboration

— Step 3: give the query a name and (optionally) a description and click the button "Save + Export to GAMS".

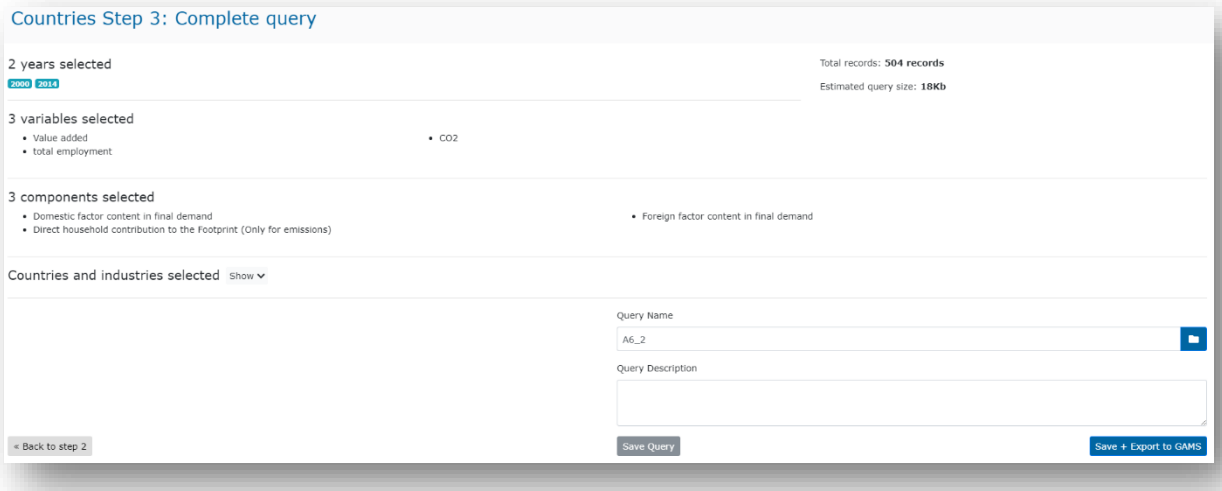


Figure 59. A6. Step 3

Source: Own elaboration

— Create a pivot table in the new MS Excel file by selecting the sheet "Pivot" and clicking on the button "Create Empty Table". Then, select the following sheets in the pop-up window: "Domestic_factor_content", "Foreign_factor_content" and "Direct_household_contribution" (which only contains data for emissions).

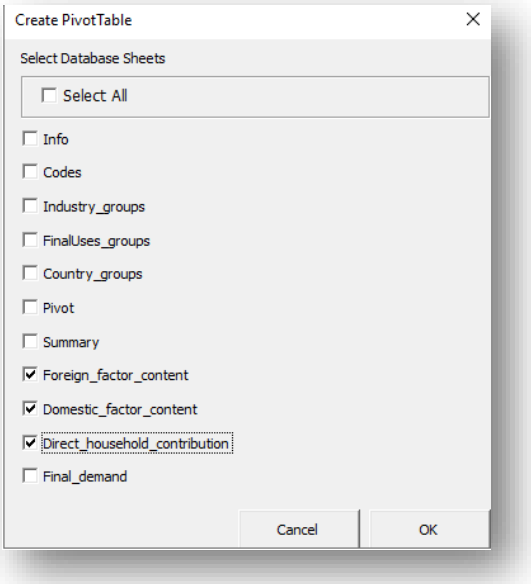


Figure 60. A6. Create pivot table

Source: Own elaboration

— Pivot table field list: select "Factor" for "Filters", "Year" (above) and "Sheet" (below) for "Columns", Q for "Rows" and "Value" for "Values". Note that "Value" should be the summarised as "% of Parent Column Total", not as the count of elements (usual default of pivot tables).

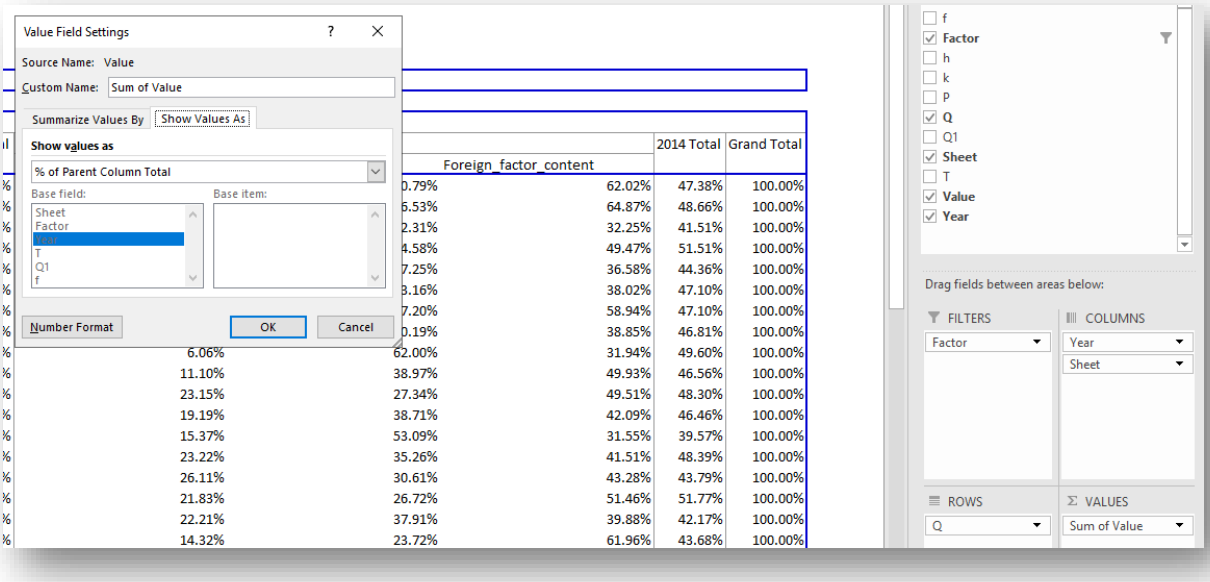


Figure 61. A6. Pivot table field list

Source: Own elaboration

— Select "EMP", "VA" or "CO2" from the "Factor" list in the "Filters" to display the effects on employment (EMP), value added (VA) or CO_2 emissions (CO2). Alternatively, the

user can move "Factor" to the "Columns"/"Rows" above the existing dimensions, producing a table with different blocks for each variable[17]. Note that for CO_2 emissions, the domestic share is the sum of the "Domestic_factor_content" and "Direct_household_contribution".

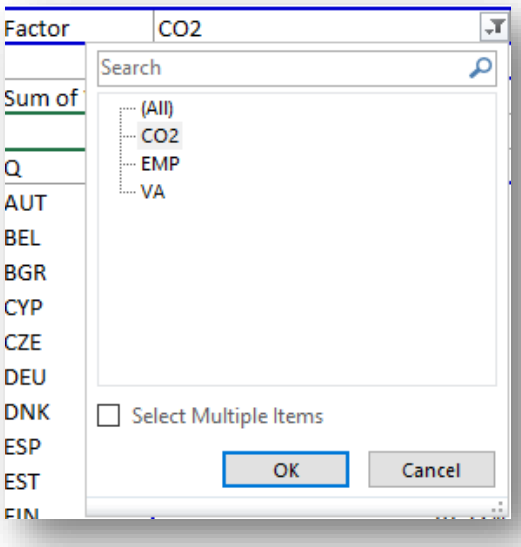


Figure 62. A6. Selection of variable

Source: Own elaboration

3.3.2.7 Indicator F1 (D1 for CO_2 emissions). EU employment / value added / CO_2 emissions by Member State associated with final demand by destination

Load the query saved for Indicator A6 and make the following changes:

- Step 2: select only EU Member States for T ("factor in country") and deactivate "Summation". For Q1 select all countries ("factor in country") and deactivate "Summation" too. Activate "Summation" in Q ("final user country"). Note that now two elements have "Summation" deactivated, T and Q1, because we want to analyse the effects by "factor in countries", either "domestic effects" (Q1) or "foreign effects" (T). In the case of CO_2 emissions, deactivate "Summation" for Q as well. This enables the user to obtain the direct household contribution to the footprint by Member State.
- Create two pivot tables in the new MS Excel file: for the domestic effects, select "Factor" and "Sheet" for "Filters", "Years" for "Columns", Q1 for "Rows" and "Value" for "Values". Then, select the desired "Factor" and the sheet "Domestic_factor_content" in the "Filters". Subsequently, create a copy of the sheet "Pivot". In this second pivot table, substitute Q1 with T in the "Rows" section and select "Foreign_factor_content" in "Filters". Calculate the percentages of the effect due to the domestic and foreign final demand of each country by rows using both pivot tables. For CO_2 emissions, create an additional pivot table with "Domestic_household_contribution" selected in "Filters", and Q in "Rows". These emissions are part of the domestic share.

[17] In this case, remember to deactivate Grand Totals, as it would not make sense to sum "EMP", "VA" and "CO2".

3.3.2.8 Indicator A7. EU employment / value added / CO_2 emissions by Member State associated with non-EU final demand

Load the query saved for Indicator A6 and make the following changes:

- Step 1: select year "2007".
- Step 2: deactivate the components "Direct household contribution to the footprint" and "Domestic factor content in final demand"; select only EU Member States for T ("factor in country") and activate "Summation". For Q ("final user country"), select only non-EU28 and activate "Summation". Note that only one element has "Summation" deactivated, T, because we want to analyse the effects by "factor in countries".
- Create a pivot table in the MS Excel file by selecting only the sheet "Foreign factor content".
- Pivot table field list: select "Factor" for "Filters", "Year" for "Columns", T for "Rows" and "Value" for "Values" summarised as a sum, not as a count of elements (usual default of pivot tables).
- Select "EMP", "VA" or "CO2" from the "Factor" list in the "Filters" to display the effects on employment (EMP), value added (VA) or CO_2 emissions (CO2). Alternatively, the user can move "Factor" to the "Columns"/"Rows" section above the existing dimensions, producing a table with blocks for each variable[18].

3.3.2.9 Indicator C11. EU employment / value added / CO_2 emissions by Member State associated with non-EU final demand by sector/industry

Load the query saved for Indicator A7 and make the following changes:

- Step 1: deselect year "2007".
- Step 2: deactivate "Summation" for f (factor in industry). Note that now two elements have "Summation" deactivated, T and f, because we want to analyse the effects by "factor in countries" and "factor in industries".
- Create a pivot table in the new MS Excel file using the same structure as in Indicator A7 but including f in the "Columns" section below the element "Years".
- Calculate the shares along the rows or choose to show the values as a percentage of the row total in "Value Field Settings".

3.3.2.10 Indicator C13. EU employment / value added / CO_2 emissions supported by non-EU final demand: inter-industry linkages

Load the query saved for Indicator C11 and make the following changes:

- Step 2: deactivate "Summation" for k ("final producer industry") and activate "Summation" for T ("factor in country"). Note that two elements have "Summation" deactivated, f and k, because we want to analyse the effects by "factor in" and "final producer industries".
- Create a pivot table in the new MS Excel file by selecting "Factor" and "Year" in "Filters"; f in "Rows" and k in "Columns". For every factor and year, the pivot table provides the effect caused by the demand of each industry in columns on each other industry, in rows.

[18] In this case, remember to deactivate Grand Totals, as it would not make sense to sum "EMP", "VA" and "CO2".

4 Trade-SCAN-Dashboard module

This module produces downloadable graphical representations of different indicators obtained using the WIOD 2016 Release. Click on "Add module" and choose one of the options from the drop-down menu.

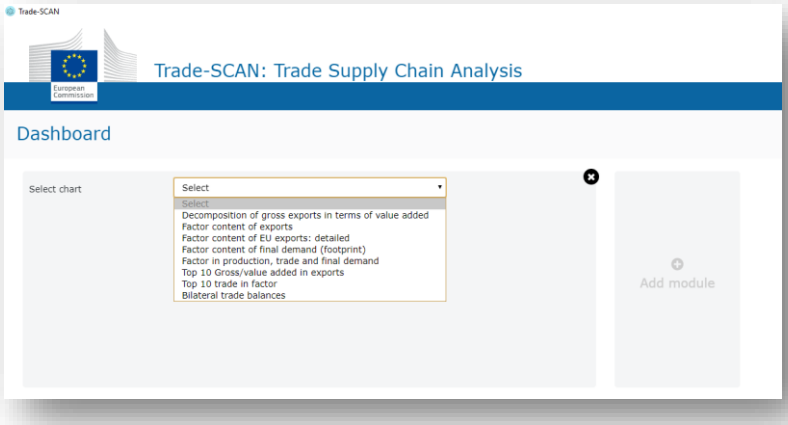


Figure 63. Dashboard: select chart

Source: Own elaboration

To show additional modules side by side (up to eight), click on "Add module"; modules can also be deleted by clicking on the white encircled cross.

4.1 Example 1. Breakdown of gross exports

This option enables the user to visualise the decomposition of gross exports in three components: domestic value added, foreign value added and the double-counted term (see Arto et al., 2019 for further details). Select this option and choose the desired country from the drop-down menu.

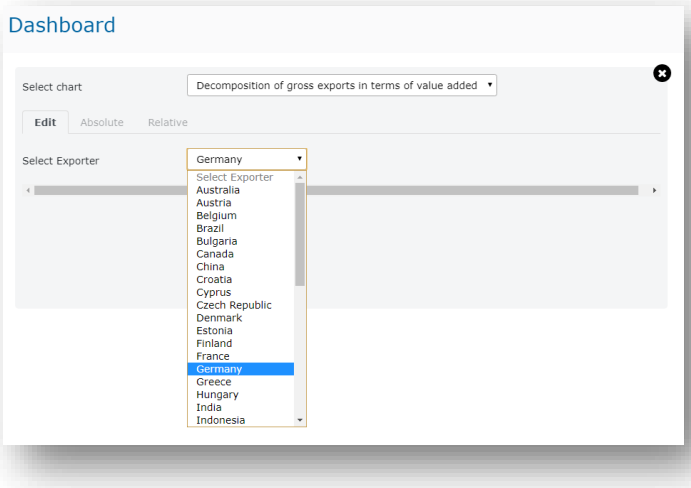


Figure 64. Dashboard: edit decomposition

Source: Own elaboration

This results in two charts with values in absolute and in relative terms. Switch between the corresponding tabs to visualise them. A "Download" button enables the user to save the graphs on their own computer (as a .jpg file). To change the country selected, return to the "Edit" tab.

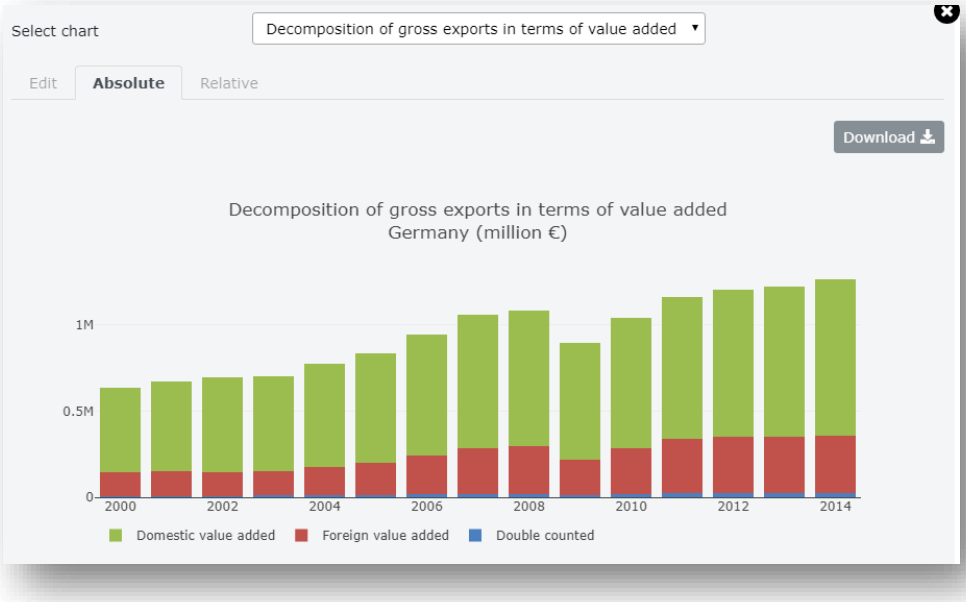


Figure 65. Dashboard: decomposition charts

Source: Own elaboration

4.2 Example 2. Factor content in final demand (footprint)

This indicator shows the factor content of the final demand of one specific country. This is a footprint type of indicator. The user has to select the country of final demand and the factor (CO_2 emissions, employment or value added). To change the country and the factor selection, return to the "Edit" tab.

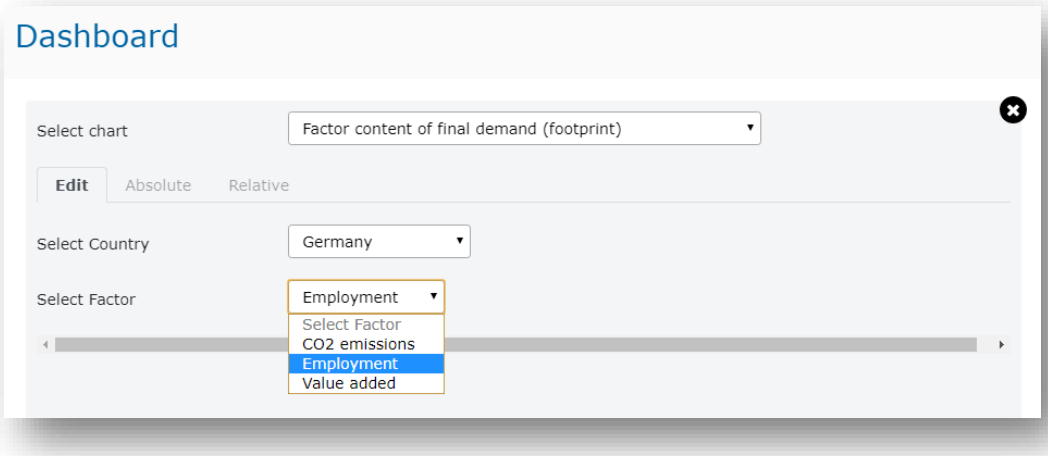


Figure 66. Dashboard: edit factor content of final demand

Source: Own elaboration

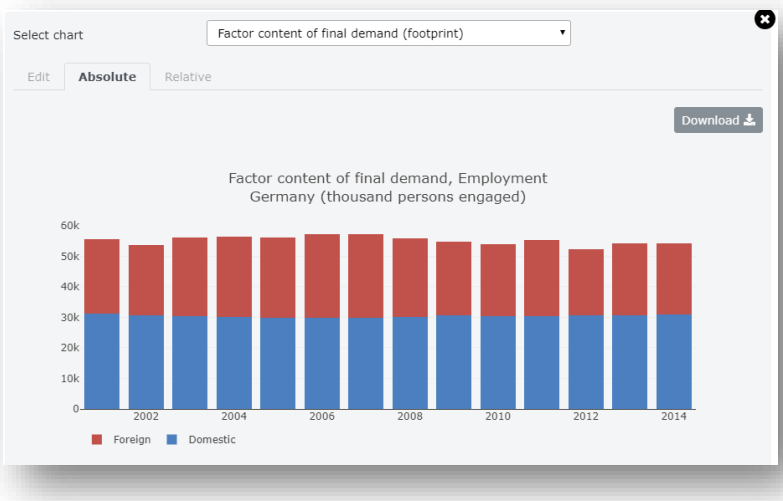


Figure 67. Dashboard: factor content in final demand chart

Source: Own elaboration

4.3 Other indicators

There are six other indicators available in the dashboard and these are detailed below.

4.3.1 Factor content of exports

This option enables the user to visualise the factor content of one specific country's exports. The employment content of exports can be domestic or foreign as well as for value added (capital and labour compensation), primary inputs (international transport and trade margins, taxes less subsidies on products and value added) and CO_2 emissions. Once this option is selected, choose the desired country and factor from the drop-down menu. As a result, two charts are produced with the values in absolute and in relative terms. They can be visualised by switching the corresponding tab.

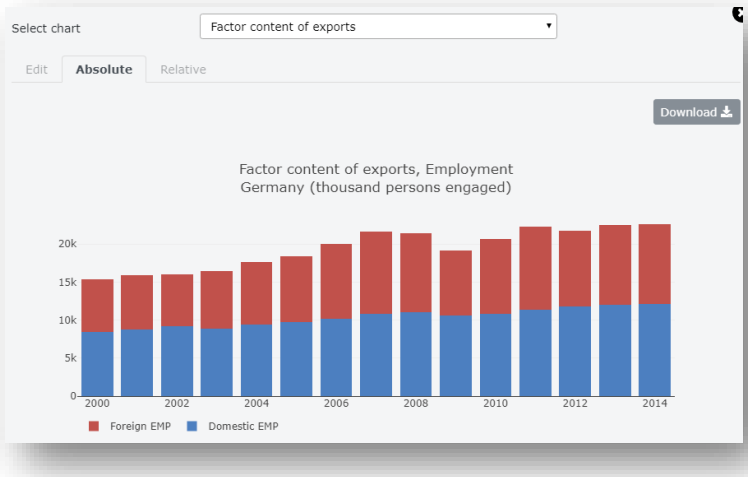


Figure 68. Dashboard: factor content of exports chart

Source: Own elaboration

4.3.2 Factor content of EU exports: detailed

This indicator is available for the EU countries and provides details on the employment content of exports by skill, gender and age group; and labour compensation by skill and gender.

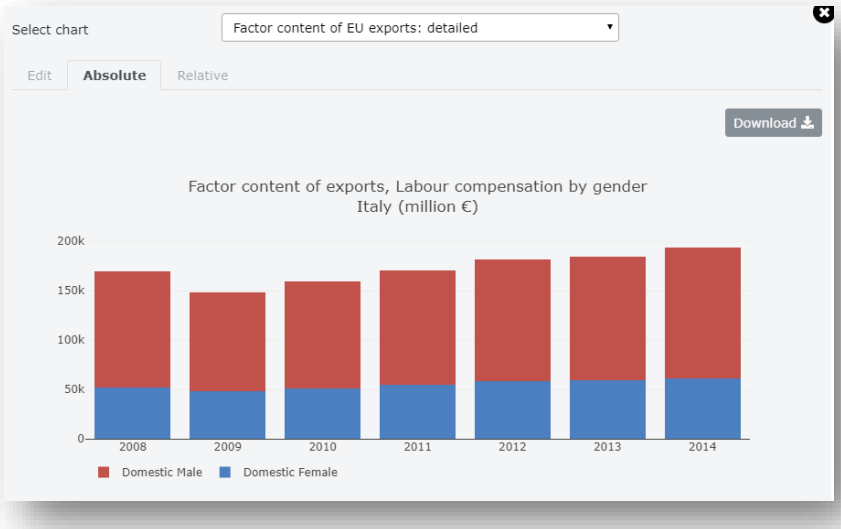


Figure 69. Dashboard: factor content of exports: detailed chart

Source: Own elaboration

4.3.3 Factor content in production, trade and final demand

This indicator shows how the factor content of one country's final demand for one specific year is the result of the factor content in domestic production less the corresponding factor content in exports plus the factor content elsewhere due to imports. This indicator becomes very clear in terms of CO_2 emissions.

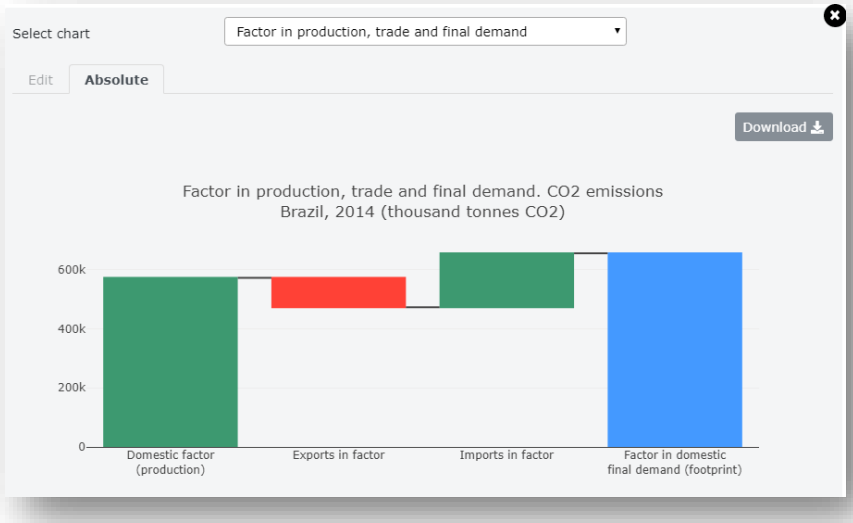


Figure 70. Dashboard: factor in production, trade and final demand chart

Source: Own elaboration

The carbon footprint of one specific country is the result of departing from the amount of CO_2 emitted in the country, then excluding those emissions driven by exports, and finally, summing CO_2 emitted elsewhere due to imports. Three factors are available for this indicator: employment, value added and CO_2 emissions

4.3.4 Top 10 gross/value added in exports

This indicator shows, for the exports of one country and one specific year, which are the 10 most relevant commodities and/or destination countries. The user can choose whether to obtain the ranking accounting for exports in gross or value added terms.

Figure 71. Dashboard: top 10 gross/value added in exports chart

Source: Own elaboration

4.3.5 Top 10 trade in factors

This indicator shows, for one specific country and year, the 10 most relevant origin/destination countries of the factors traded. In other words, the (top 10) countries whose final demand absorbs one specific country's factor (factor exports) the most and the (top 10) countries contributing the most to a country's final demand (factor imports).

Figure 72. Dashboard: top 10 trade in factor chart

Source: Own elaboration

4.3.6 Bilateral trade balances

This indicator shows bilateral trade balances in gross and value added terms. It also provides trade balances of employment and CO_2 emissions.

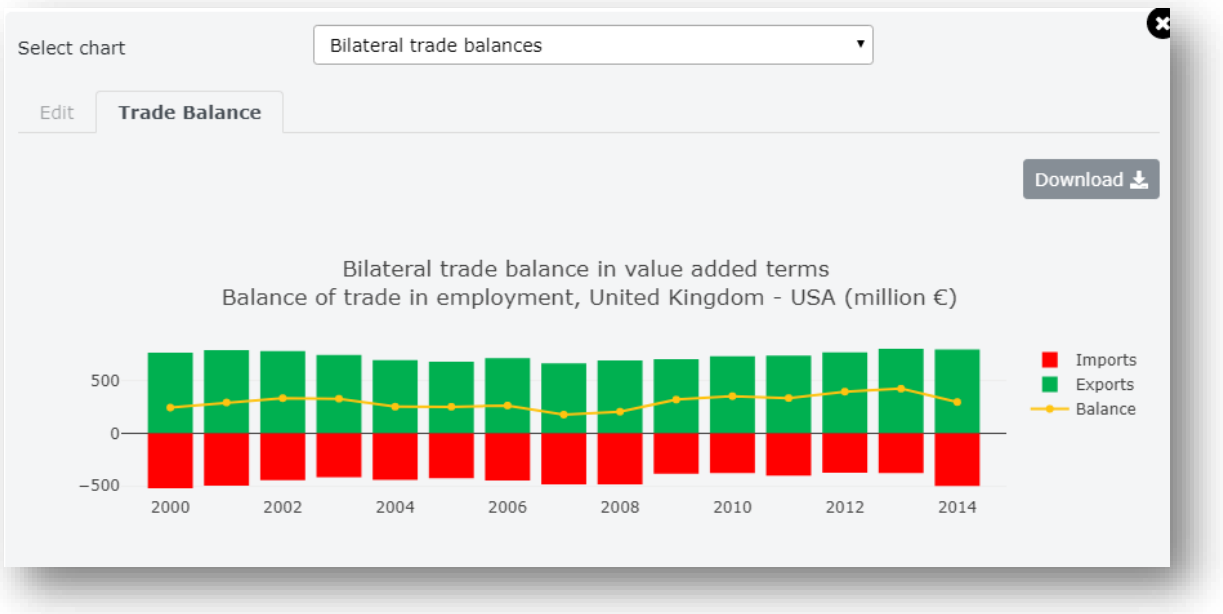


Figure 73. Dashboard: bilateral trade balances chart

Source: Own elaboration

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Annexes

Annex 1. Software installation procedure

The three modules comprising Trade-SCAN (ad-hoc, pocketbook and dashboard) are installed separately; therefore, users might want to install only some of them. For instance, if the user does not have a GAMS licence, they can only use the pocketbook and dashboard modules.

Table A1.1. Trade-SCAN system requirements

Operating System	Windows 7 or superior	**Processor**	2 GHz
Feature \ Module	**Ad-hoc**	**Pocketbook**	**Dashboard**
RAM	16[19]	16	16
Disk Space	GUI: 323 Mb Database: 572 Gb OECD: 44 Gb WIOD: 46 Gb EXIOBASE: 482 Gb	GUI: 459 Mb	GUI: 442 Mb
GAMS	24 or superior[20]	n.a.	n.a.

Source: Own elaboration

Download the installation files and the database from the JRC website and extract the software using any compression software like WinZip, 7zip, etc.

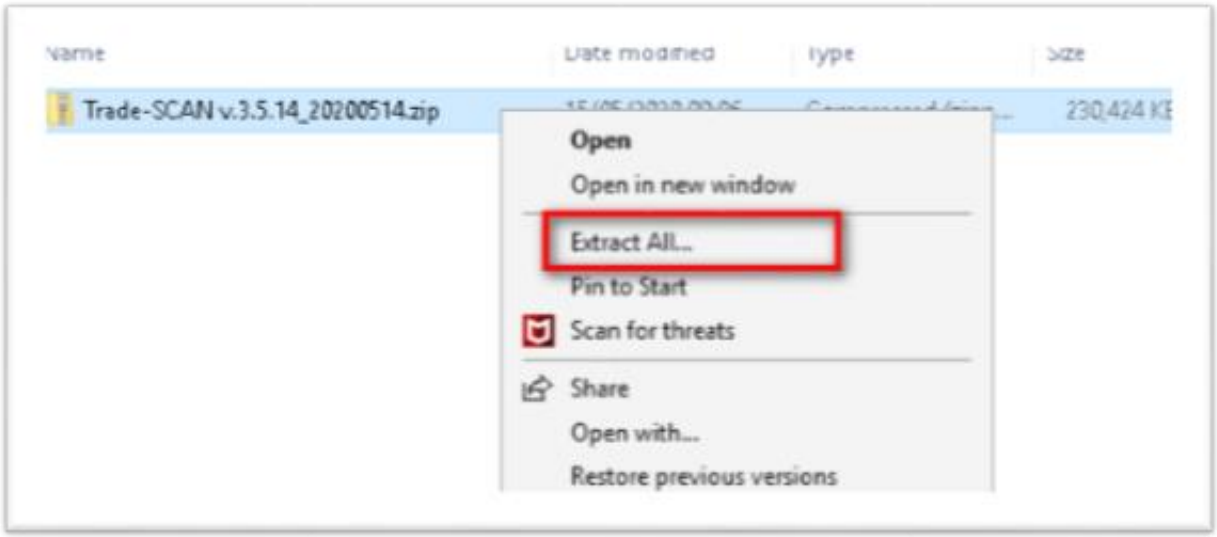

Figure A1.1. Installation step 1

Source: Own elaboration

[19] The size of the queries that the user will be able to run is highly dependent on the RAM. To be able to manage queries on the decomposition of factors in exports using EXIOBASE, a RAM of at least 64 Gb is recommended.

[20] Trade-SCAN might work with older versions. This is the oldest version tested.

The zip file will extract the following content.

Figure A1.2. Installation step 2

Source: Own elaboration

Installation of the Ad-hoc module

To run queries in the Ad-hoc module, the user must have a licensed GAMS (the demo version is not enough) already installed locally. Without it, the user would only be able to save them. If you have a licensed GAMS, you need to create a new system variable called "GAMS" and update the Path variable before running the installer of the Trade-SCAN-Ad-hoc module.

Adding GAMS to the Path variable

Right-click on "This PC" / "Properties" and select the "Change settings" option.

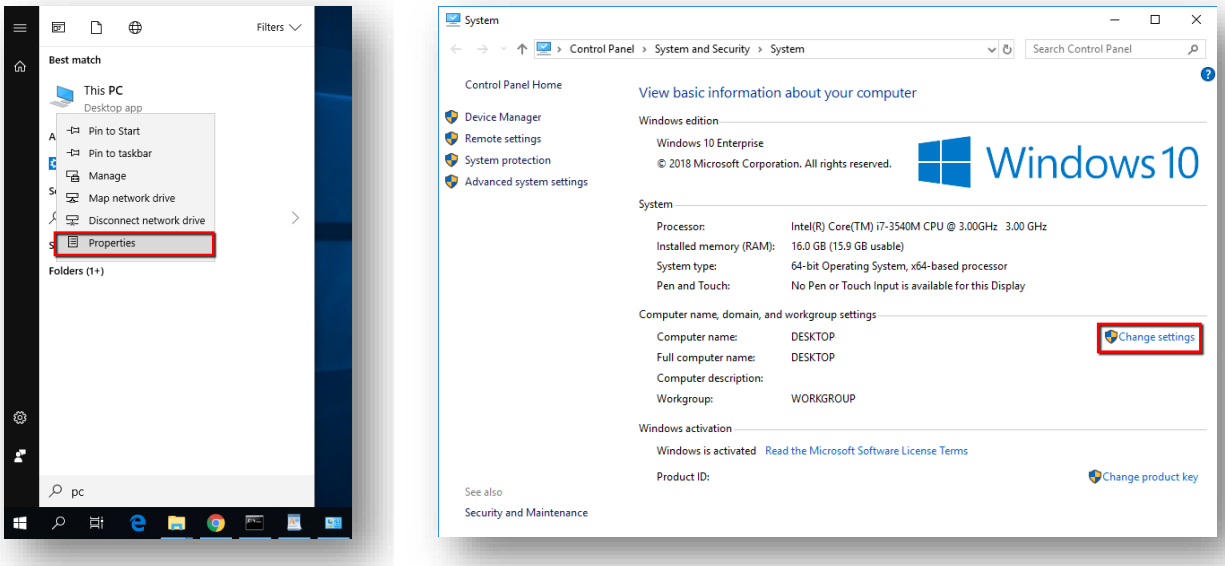

Figure A1.3. Installation step 3

Source: Own elaboration

Select the "Advanced" tab and then click on "Environment Variables…".

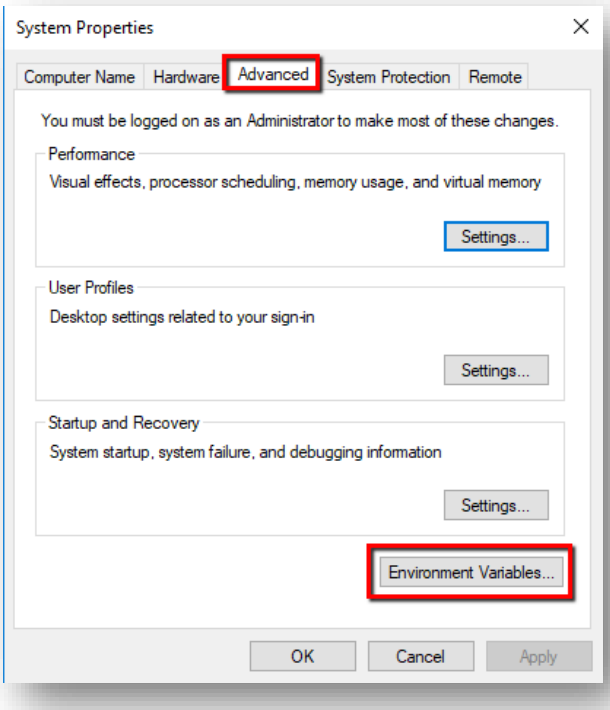

Figure A1.4. Installation step 4

Source: Own elaboration

Click on "New…" and create a new variable named GAMS, pointing to your GAMS installation folder and click the "OK" button. Usually GAMS is installed under C:\GAMS\win64\<RELEASE_NUMBER>

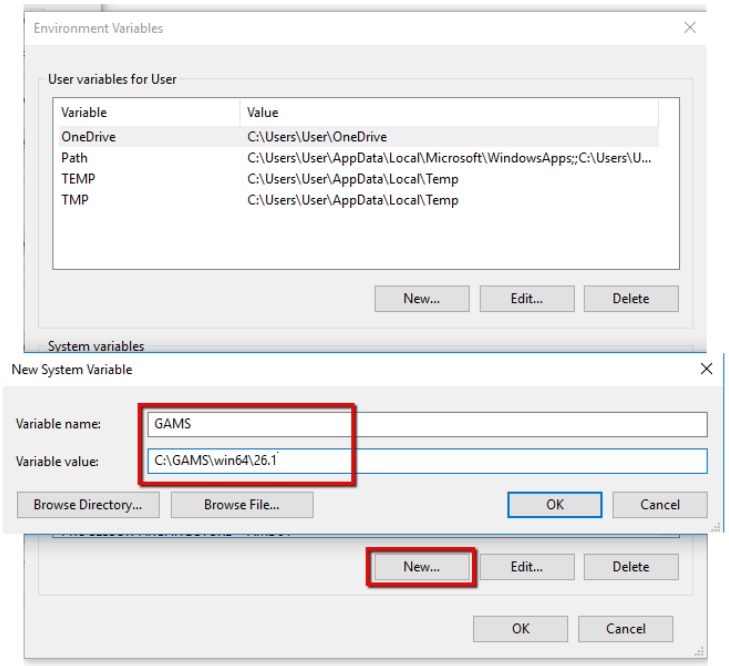

Figure A1.5. Installation step 5

Source: Own elaboration

Now search for the "Path" system variable and click on "Edit…".

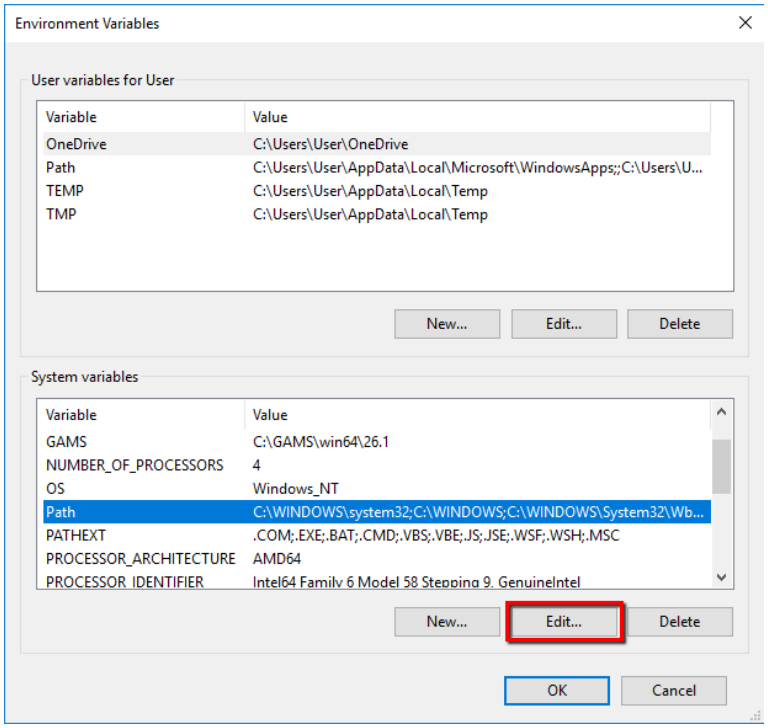

Figure A1.6. Installation step 6

Source: Own elaboration

Click on "New" and add the following two new lines replacing your <RELEASE_NUMBER> and click "OK":

%GAMS%

C:\GAMS\win64\<RELEASE_NUMBER>

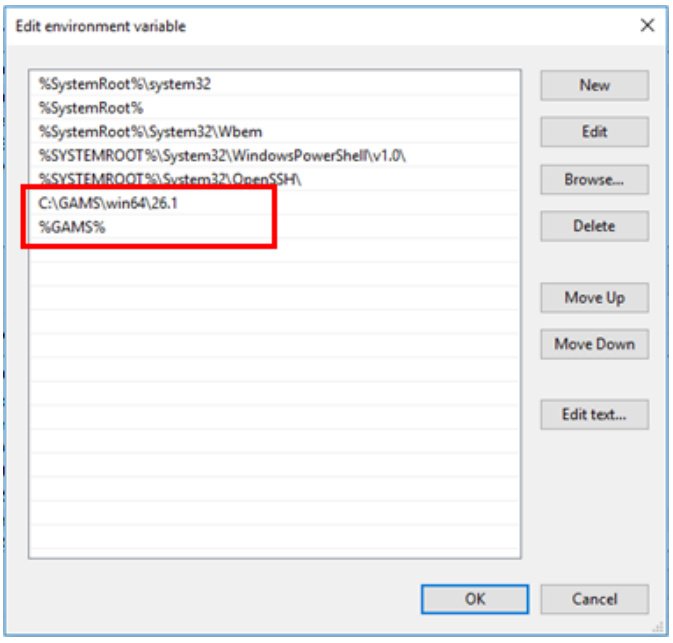

Figure A1.7. Installation step 7

Source: Own elaboration

Run the installer

Now, you can execute the "**TScan Ad-hoc Setup.exe"** installer.

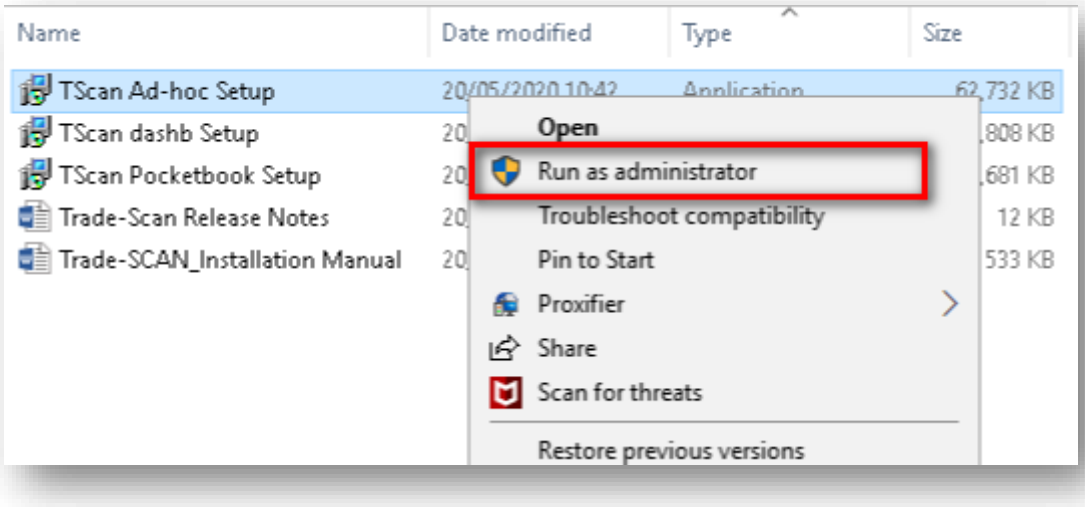

Figure A1.8. Installation step 8

Source: Own elaboration

Click "Next".

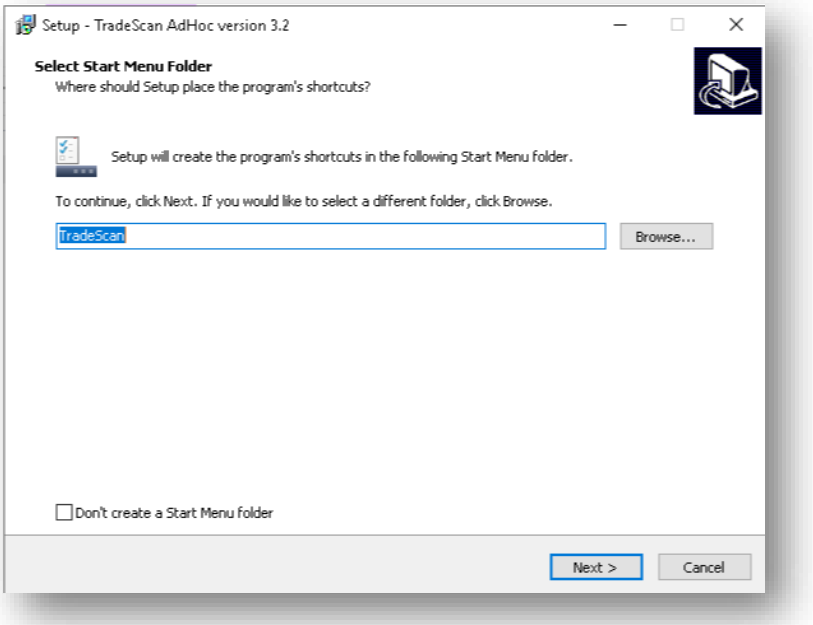

Figure A1.9. Installation step 9

Source: Own elaboration

Then, click on "Install".

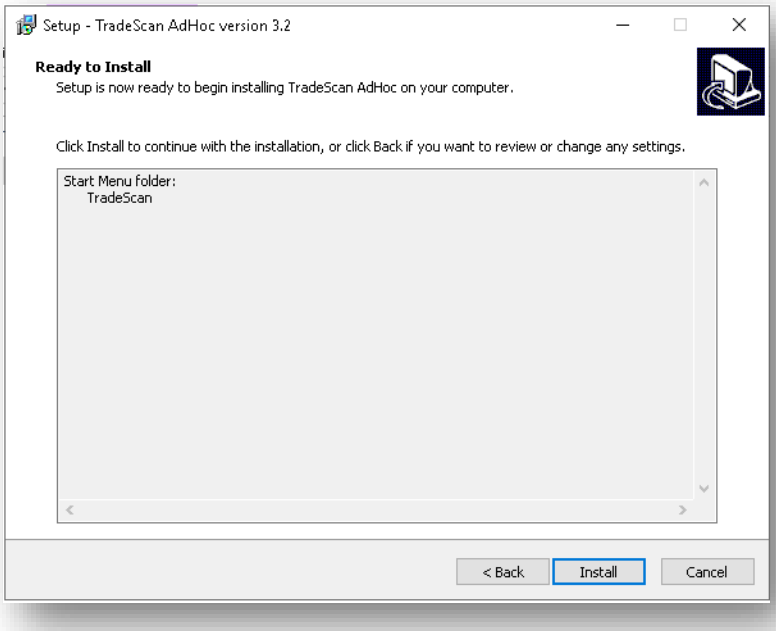

Figure A1.10. Installation step 10

Source: Own elaboration

Subsequently, the installation process will start creating the required files in: "C:\Program Files\TradeScan\TSCAN_GUI"

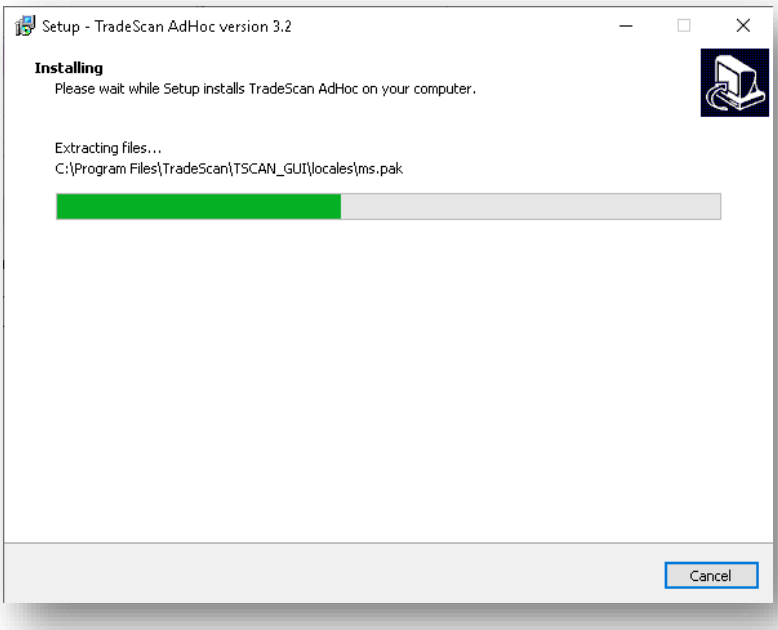

Figure A1.11. Installation step 11

Source: Own elaboration

Wait until the installation is complete and click on "Finish".

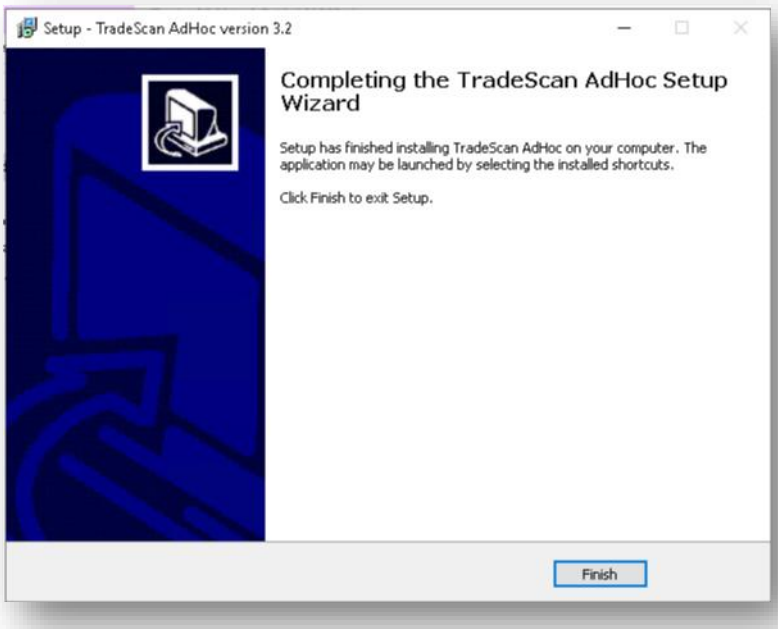

Figure A1.12. Installation step 12

Source: Own elaboration

Database location (single installation)

By default, the database files are located under the following folder:

"C:\Program Files\TradeScan\TSCAN_GUI\TSCAN_GAMS_GUI\Database"

This folder is empty after the installation and it is necessary to copy there all the GDX files and folders that comprise the database. Download them from the JRC website. Alternatively, users might also want to download, install and use only one of the databases because of limited disk space.

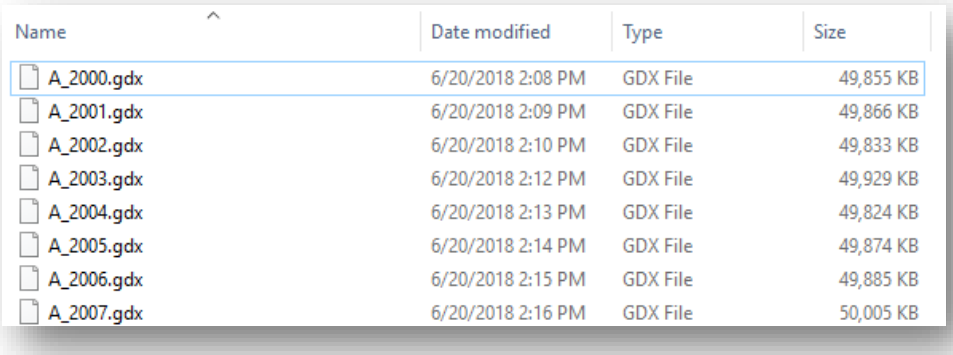

Figure A1.13. Installation step 13

Source: Own elaboration

Database location (shared installation)

Optionally, in the case of deploying several Trade-SCAN installations, it is possible to share the access to a single shared database in order to avoid duplicating it for each individual installation. Since Trade-SCAN works with the database in read-only mode, there are no conflicts for allowing concurrent access to those files by several Trade-SCAN clients simultaneously (shown as hosts in the image below).

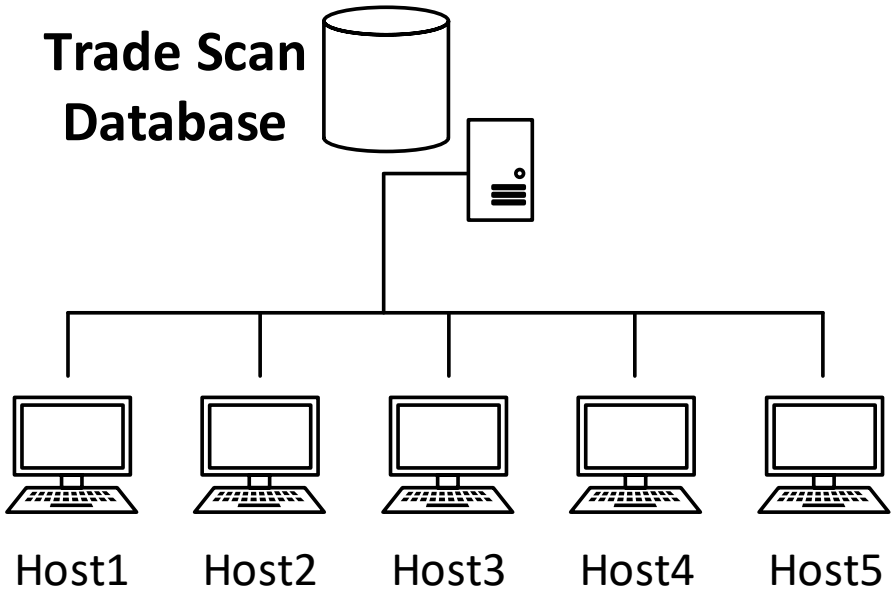

Figure A1.14. Illustration of shared installation

Source: Own elaboration

To implement this solution, it is necessary to place the database folders on a shared disk (from a central storage server) and then run the following command with Administrator rights for each Trade-SCAN client (hosts):

mklink /d "C:\Program Files\TradeScan\TSCAN_GUI\TSCAN_GAMS_GUI\Database" "\\sharedserver\Database"

Installation of the Pocketbook module

Execute the "**TScan Pocketbook Setup.exe"** installer.

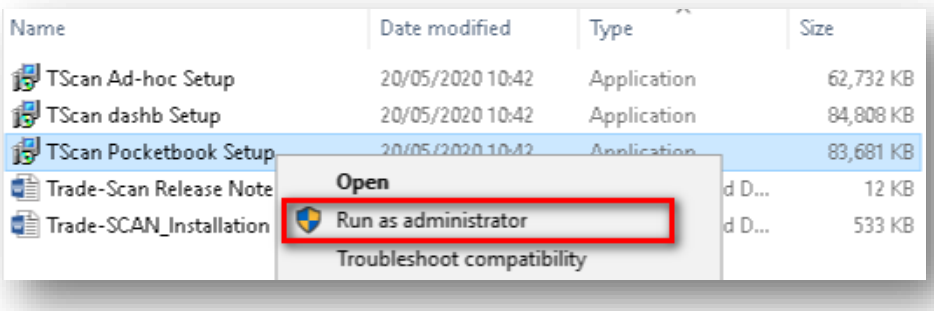

Figure A1.15. Installation step 14

Source: Own elaboration

Click on “Install”.

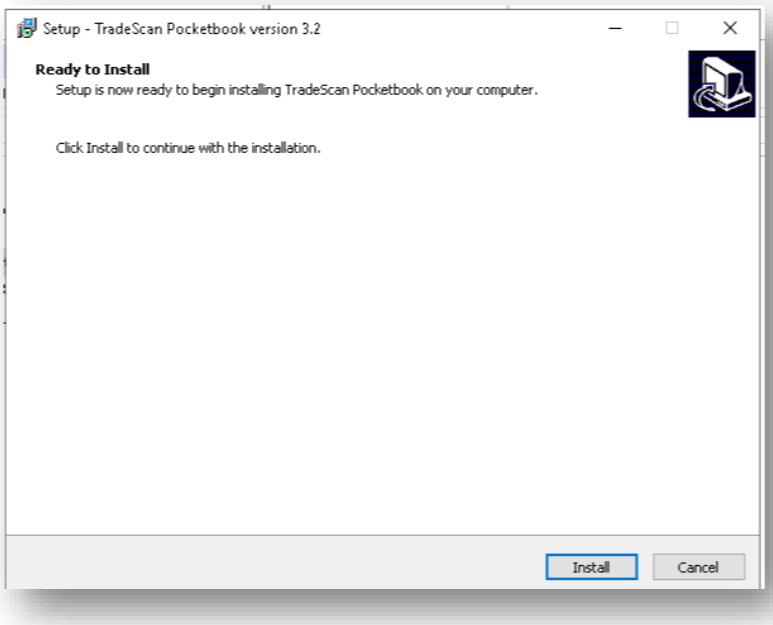

Figure A1.16. Installation step 15

Source: Own elaboration

The installation process will start creating the required files in:

“C:\Program Files\TradeScan\TSCAN_POCKETBOOK”

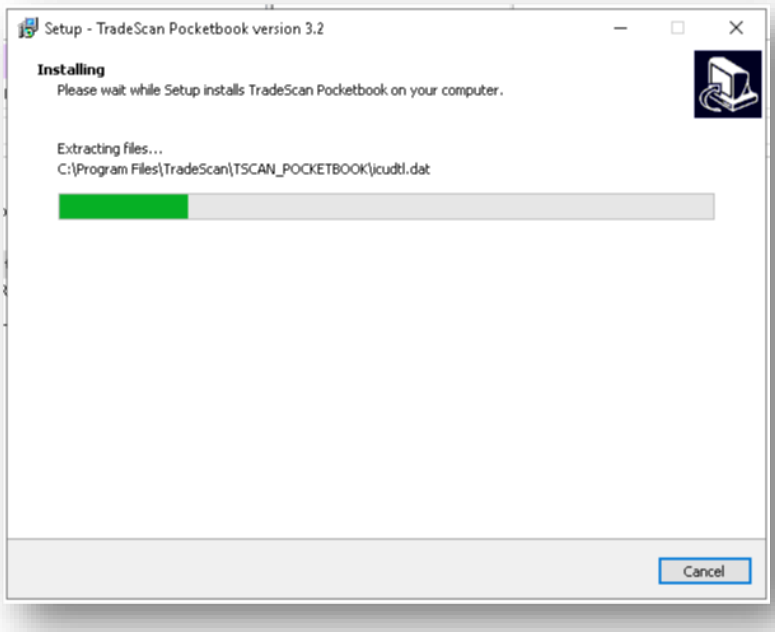

Figure A1.17. Installation step 16

Source: Own elaboration

Wait until the installation is complete and click on "Finish".

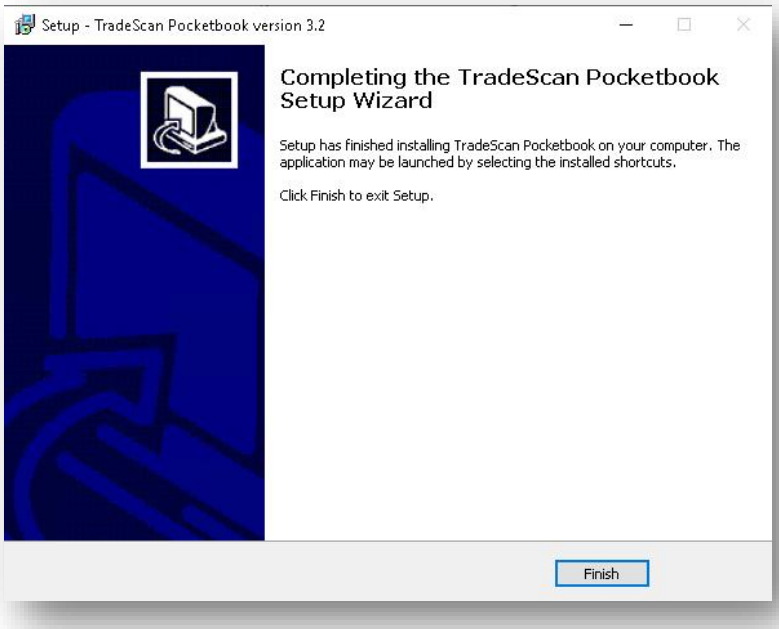

Figure A1.18. Installation step 17

Source: Own elaboration

Installation of the Dashboard module

Execute the "**TScan dashb Setup.exe"** installer.

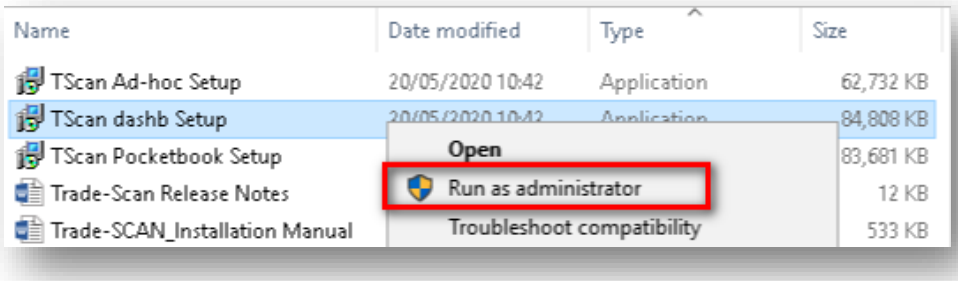

Figure A1.19. Installation step 18

Source: Own elaboration

Click on "Install".

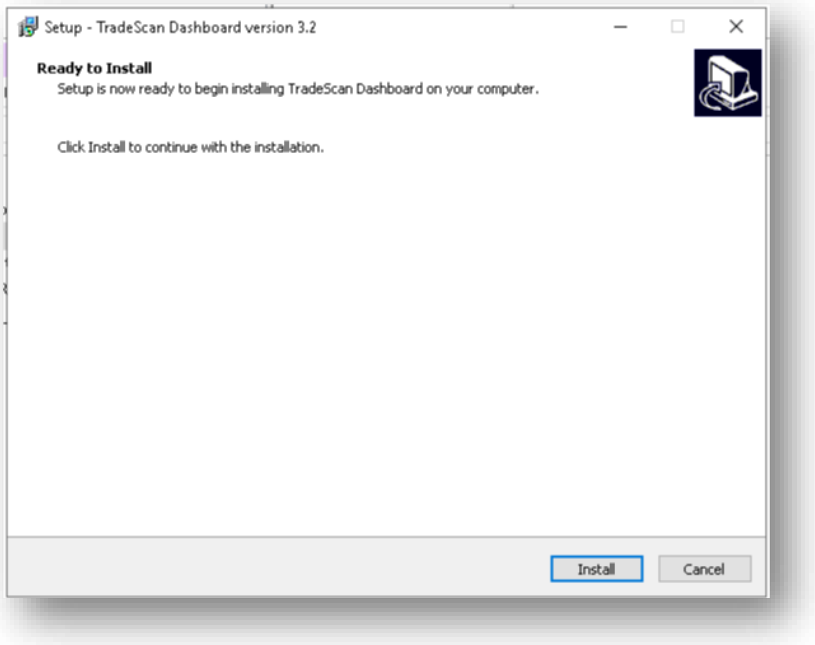

Figure A1.20. Installation step 19

Source: Own elaboration

The installation process will start creating the required files in:

"C:\Program Files\TradeScan\TSCAN_DASHB"

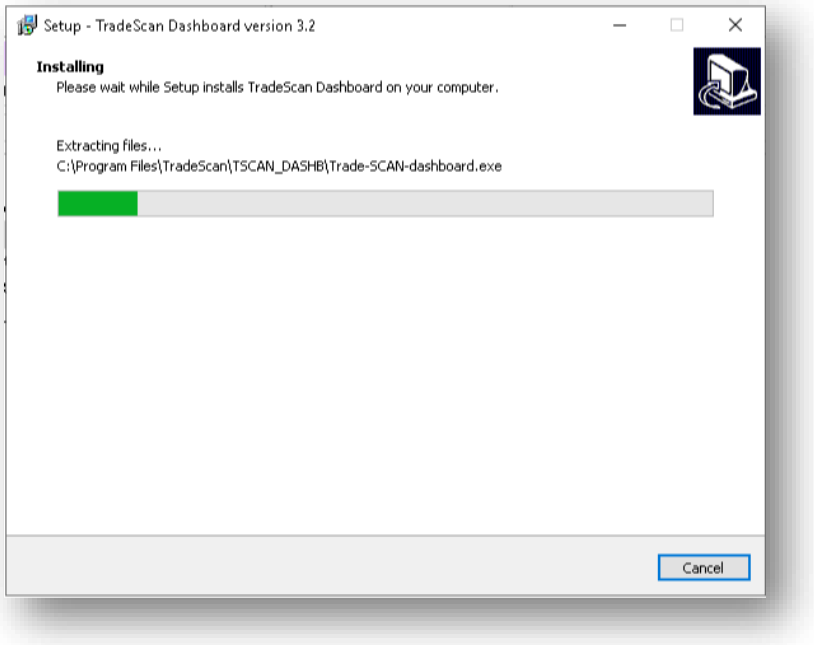

Figure A1.21. Installation step 20

Source: Own elaboration

Wait until the installation is complete and click on "Finish".

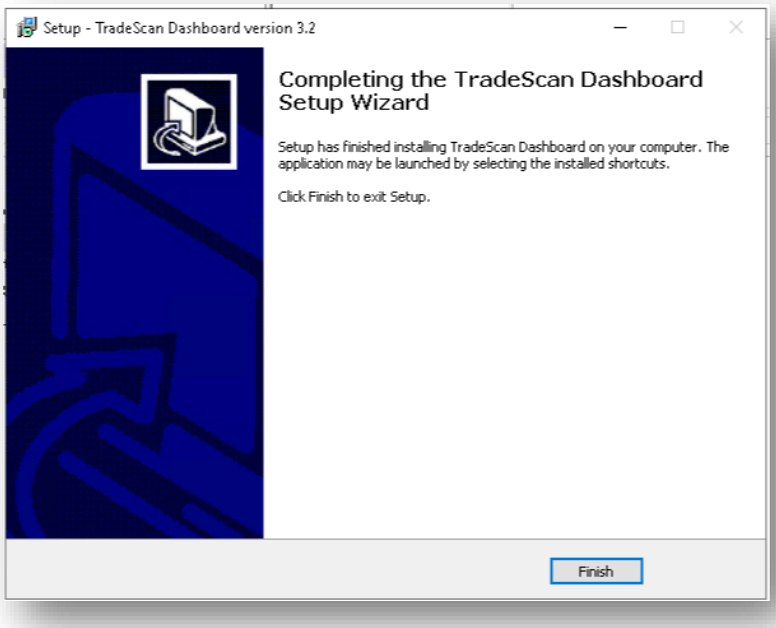

Figure A1.22. Installation step 21

Source: Own elaboration

Launching Trade-SCAN

A new shortcut will be created for each module on the desktop. Click on them to open the corresponding Trade-SCAN module. Loading can take longer the first time you open the modules.

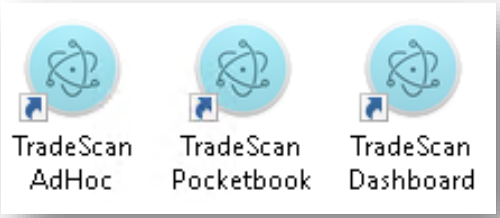

Figure A1.23. Installation step 22

Source: Own elaboration

Uninstalling Trade-SCAN

To uninstall the software, enter each folder and search for "unins000.exe", and open it with Administrator rights:

- **Ad-hoc**: C:\Program Files\TradeScan\TSCAN_GUI\unins000.exe
- **Pocketbook**: C:\Program Files\TradeScan\TSCAN_POCKETBOOK\unins000.exe
- **Dashboard**: C:\Program Files\TradeScan\TSCAN_DASHB\unins000.exe

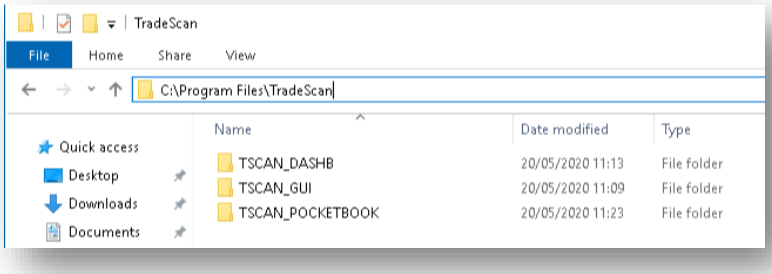

Figure A1.24. Deinstallation step 1

Source: Own elaboration

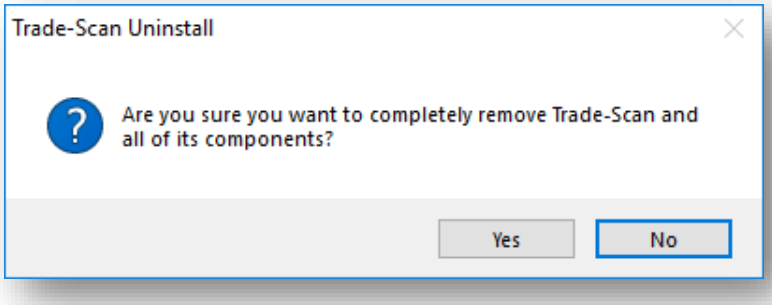

Figure A1.25. Deinstallation step 2

Source: Own elaboration

Wait for the process to finish.

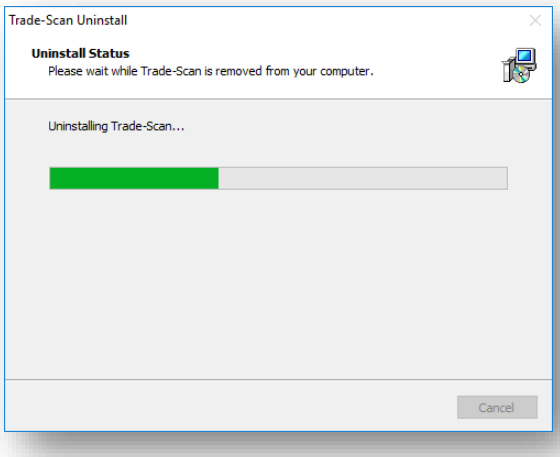

Figure A1.26. Deinstallation step 3

Source: Own elaboration

This will remove Trade-SCAN from your PC. Please note that any user-saved queries and database files will remain and should be manually deleted if they are no longer needed.

Queries location

By default, user queries are saved by the Ad-hoc module in the following location:

"C:\Users\<USERNAME>\AppData\Roaming\Trade-SCAN\TSCAN_GAMS_GUI\queries"

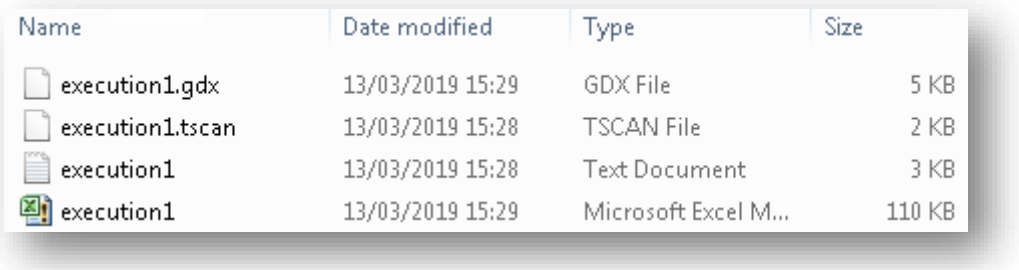

Figure A1.27. Queries location

Source: Own elaboration

Annex 2. Dictionaries

Geographical entities

Countries

		Databases												
Code	**Name**	**OECD**	**WIOD**	**EXIOBASE**	**EU28**[21]	**EU27**	**EU27_ExcUK**	**EU15**	**EU13**	**EUROZONE**	**BRIC**	**USMCA**	**EASTASIA**	**CCTR**
ARG	Argentina	√												
AUS	Australia	√	√	√										√
AUT	Austria	√	√	√	√	√	√	√		√				√
BEL	Belgium	√	√	√	√	√	√	√		√				√
BGR	Bulgaria	√	√	√	√	√	√		√					√
BRA	Brazil	√	√	√							√			√
BRN	Brunei Darussalam	√												
CAN	Canada	√	√	√								√		√
CHE	Switzerland	√	√	√										√
CHL	Chile	√												
CHN	China	√	√	√							√			√
COL	Colombia	√												
CRI	Costa Rica	√												
CYP	Cyprus	√	√	√	√	√	√		√	√				√
CZE	Czechia	√	√	√	√	√	√		√					√
DEU	Germany	√	√	√	√	√	√	√		√				√
DNK	Denmark	√	√	√	√	√	√	√						√
ESP	Spain	√	√	√	√	√	√	√		√				√
EST	Estonia	√	√	√	√	√	√		√	√				√
FIN	Finland	√	√	√	√	√	√	√		√				√
FRA	France	√	√	√	√	√	√	√		√				√
GBR	United Kingdom	√	√	√	√	√		√						√
GRC	Greece	√	√	√	√	√	√	√		√				√
HKG	Hong Kong, China	√												√
HRV	Croatia	√	√	√	√		√		√					√
HUN	Hungary	√	√	√	√	√	√		√					√
IDN	Indonesia	√	√	√									√	√
IND	India	√	√	√							√			√
IRL	Ireland	√	√	√	√	√	√	√		√				√
ISL	Iceland	√												
ISR	Israel	√												
ITA	Italy	√	√	√	√	√	√	√		√				√

[21] Trade-SCAN v2 also includes the complementary country groups: non-EU28, non-EU27, non-EU27ExcUK, non-EU15, non-EU13, non-EUROZONE, non-BRIC, non-USMCA, non-EASTASIA and non-CCTR.

		Databases												
Code	**Name**	**OECD**	**WIOD**	**EXIOBASE**	**EU28[21]**	**EU27**	**EU27_ExcUK**	**EU15**	**EU13**	**EUROZONE**	**BRIC**	**USMCA**	**EASTASIA**	**CCTR**
JPN	Japan	√	√	√									√	√
KAZ	Kazakhstan	√												
KHM	Cambodia	√												
KOR	Korea, Republic of	√	√	√									√	√
LTU	Lithuania	√	√	√	√	√	√		√	√				√
LUX	Luxembourg	√	√	√	√	√	√	√		√				√
LVA	Latvia	√	√	√	√	√	√		√	√				√
MAR	Morocco	√												
MEX	Mexico	√	√	√								√		√
MLT	Malta	√	√	√	√	√	√		√	√				√
MYS	Malaysia	√												
NLD	Netherlands	√	√	√	√	√	√	√		√				√
NOR	Norway	√	√	√										√
NZL	New Zealand	√												
PER	Peru	√												
PHL	Philippines	√												
POL	Poland	√	√	√	√	√	√		√					√
PRT	Portugal	√	√	√	√	√	√	√		√				√
ROU[22]	Romania	√	√	√	√	√	√		√					√
ROW	Rest of the World	√	√											
RUS	Russia	√	√	√							√			√
SAU	Saudi Arabia	√												
SGP	Singapore	√												
SVK	Slovakia	√	√	√	√	√	√		√	√				√
SVN	Slovenia	√	√	√	√	√	√		√	√				√
SWE	Sweden	√	√	√	√	√	√	√						√
THA	Thailand	√												
TUN	Tunisia	√												
TUR	Turkey	√	√	√										√
TWN	Taiwan	√	√	√									√	√
USA	United States of America	√	√	√								√		√
VNM	Viet Nam	√												
WWA	Rest of Asia			√										
WWE	Rest of Africa			√										
WWF	Rest of Latin America and the Caribbean			√										
WWL	Rest of Europe			√										
WWM	Middle East			√										
ZAF	South Africa	√		√										

[22] Note that the code for Romania in EXIOBASE is ROM.

Regions

Code	EU28	Non_EU28	EU27	Non_EU27
Description	**EU28**	**Non-EU28**	**EU27, Croatia excluded**	**Non-EU27, Croatia excluded**
Countries	AUT	AUS	AUT	AUS
	BEL	BRA	BEL	BRA
	BGR	CAN	BGR	CAN
	CYP	CHE	CYP	CHE
	CZE	CHN	CZE	CHN
	DEU	IDN	DEU	HRV
	DNK	IND	DNK	IDN
	ESP	JPN	ESP	IND
	EST	KOR	EST	JPN
	FIN	MEX	FIN	KOR
	FRA	NOR	FRA	MEX
	GBR	RUS	GBR	NOR
	GRC	TUR	GRC	RUS
	HRV	USA	HUN	TUR
	HUN	WWA	IRL	USA
	IRL	WWE	ITA	WWA
	ITA	WWF	LTU	WWE
	LTU	WWL	LUX	WWF
	LUX	WWM	LVA	WWL
	LVA	ZAF	MLT	WWM
	MLT	CHL	NLD	ZAF
	NLD	ISL	POL	CHL
	POL	ISR	PRT	ISL
	PRT	NZL	ROU	ISR
	ROU	ARG	SVK	NZL
	SVK	BRN	SVN	ARG
	SVN	KHM	SWE	BRN
	SWE	COL		KHM
		CRI		COL
		HKG		CRI
		KAZ		HKG
		MYS		KAZ
		MAR		MYS
		PER		MAR
		PHL		PER
		SAU		PHL
		SGP		SAU
		TWN		SGP
		THA		TWN
		TUN		THA
		VNM		TUN
		ROW		VNM
				ROW

Code	EU27_ExcUK	Non_EU27_ExcUK	EU15	Non_EU15	EU13	Non_EU13
Description	**EU27, UK excluded**	**Non-EU27, UK excluded**	**EU15**	**Non-EU15**	**EU13**	**Non-EU13**
Countries	AUT	AUS	AUT	AUS	BGR	AUS
	BEL	BRA	BEL	BGR	CZE	AUT
	BGR	CAN	DEU	BRA	EST	BEL
	CYP	CHE	DNK	CAN	CYP	BRA
	CZE	CHN	ESP	CHE	LVA	CAN
	DEU	GBR	FIN	CHN	LTU	CHE
	DNK	IDN	FRA	CYP	HUN	CHN
	ESP	IND	GBR	CZE	MLT	DEU
	EST	JPN	GRC	EST	POL	DNK
	FIN	KOR	IRL	HRV	ROU	ESP
	FRA	MEX	ITA	HUN	SVN	FIN
	GRC	NOR	LUX	IDN	SVK	FRA
	HRV	RUS	NLD	IND	HRV	GBR
	HUN	TUR	PRT	JPN		GRC
	IRL	USA	SWE	KOR		IDN
	ITA	WWA		LTU		IND
	LTU	WWE		LVA		IRL
	LUX	WWF		MEX		ITA
	LVA	WWL		MLT		JPN
	MLT	WWM		NOR		KOR
	NLD	ZAF		POL		LUX
	POL	CHL		ROU		MEX
	PRT	ISL		RUS		NLD
	ROU	ISR		SVK		NOR
	SVK	NZL		SVN		PRT
	SVN	ARG		TUR		RUS
	SWE	BRN		USA		SWE
		KHM		ZAF		TUR
		COL		WWA		USA
		CRI		WWE		ZAF
		HKG		WWF		WWA
		KAZ		WWL		WWE
		MYS		WWM		WWF
		MAR		CHL		WWL
		PER		ISL		WWM
		PHL		ISR		CHL
		SAU		NZL		ISL
		SGP		ARG		ISR
		TWN		BRN		NZL
		THA		KHM		ARG
		TUN		COL		BRN
		VNM		CRI		KHM
		ROW		HKG		COL
				KAZ		CRI
				MYS		HKG
				MAR		KAZ
				PER		MYS
				PHL		MAR
				SAU		PER
				SGP		PHL
				TWN		SAU
				THA		SGP
				TUN		TWN
				VNM		THA
				ROW		TUN
						VNM
						ROW

Code	EUROZONE	Non_EUROZONE	BRIC	Non_BRIC	USMCA	Non_USMCA
Description	Eurozone	Non-Eurozone	BRIC	Non-BRIC	USMCA	Non-USMCA
Countries	AUT	AUS	BRA	AUS	CAN	AUS
	BEL	BGR	RUS	AUT	MEX	AUT
	CYP	BRA	IND	BEL	USA	BEL
	DEU	CAN	CHN	BGR		BGR
	ESP	CHE		CAN		BRA
	EST	CHN		CHE		CHE
	FIN	CZE		CYP		CHN
	FRA	DNK		CZE		CYP
	GRC	GBR		DEU		CZE
	IRL	HRV		DNK		DEU
	ITA	HUN		ESP		DNK
	LTU	IDN		EST		ESP
	LVA	IND		FIN		EST
	LUX	JPN		FRA		FIN
	MLT	KOR		GBR		FRA
	NLD	MEX		GRC		GBR
	PRT	NOR		HRV		GRC
	SVK	POL		HUN		HRV
	SVN	ROU		IDN		HUN
		RUS		IRL		IDN
		SWE		ITA		IND
		TUR		JPN		IRL
		USA		KOR		ITA
		ZAF		LTU		JPN
		WWA		LUX		KOR
		WWE		LVA		LTU
		WWF		MEX		LUX
		WWL		MLT		LVA
		WWM		NLD		MLT
		CHL		NOR		NLD
		ISL		POL		NOR
		ISR		PRT		POL
		NZL		ROM		PRT
		ARG		SVK		RUS
		BRN		SVN		SVK
		KHM		SWE		SVN
		COL		TUR		SWE
		CRI		TWN		TUR
		HKG		USA		TWN
		KAZ		ZAF		ZAF
		MYS		WWA		WWA
		MAR		WWE		WWE
		PER		WWF		WWF
		PHL		WWL		WWL
		SAU		WWM		WWM
		SGP		CHL		CHL
		TWN		ISL		ISL
		THA		ISR		ISR
		TUN		NZL		NZL
		VNM		ARG		ARG
		ROW		BRN		BRN
				KHM		KHM
				COL		COL
				CRI		CRI

Code	EUROZONE	Non_EUROZONE	BRIC	Non_BRIC	USMCA	Non_USMCA
Description	Eurozone	Non-Eurozone	BRIC	Non-BRIC	USMCA	Non-USMCA
				KAZ		HKG
				MYS		KAZ
				MAR		MYS
				PER		MAR
				PHL		PER
				ROU		PHL
				SAU		ROU
				SGP		SAU
				THA		SGP
				TUN		THA
				VNM		TUN
				ROW		VNM
						ROW

Code	EASTASIA	Non_EASTASIA	CCTR	Non_CCTR
Description	East Asia	Non-East Asia	Common countries	Non-Common countries
Countries	IDN	AUS	AUS	ZAF
	JPN	AUT	AUT	WWA
	KOR	BEL	BEL	WWL
	TWN	BGR	BGR	WWE
		BRA	BRA	WWF
		CAN	CAN	WWM
		CHE	CHE	CHL
		CHN	CHN	ISL
		CYP	CYP	ISR
		CZE	CZE	NZL
		DEU	DEU	ARG
		DNK	DNK	BRN
		ESP	ESP	KHM
		EST	EST	COL
		FIN	FIN	CRI
		FRA	FRA	KAZ
		GBR	GBR	MYS
		GRC	GRC	MAR
		HRV	HRV	PER
		HUN	HUN	PHL
		IND	IDN	SAU
		IRL	IND	SGP
		ITA	IRL	THA
		LTU	ITA	TUN
		LUX	JPN	VNM
		LVA	KOR	ROW
		MEX	LTU	
		MLT	LUX	
		NLD	LVA	
		NOR	MEX	
		POL	MLT	
		PRT	NLD	
		ZAF	NOR	
		RUS	POL	
		SVK	PRT	
		SVN	RUS	
		SWE	SVK	
		TUR	SVN	

Code	EASTASIA	Non_EASTASIA	CCTR	Non_CCTR
Description	East Asia	Non-East Asia	Common countries	Non-Common countries
		USA	SWE	
		WWA	TUR	
		WWL	TWN	
		WWE	USA	
		WWF	ROU	
		WWM	HKG	
		CHL		
		ISL		
		ISR		
		NZL		
		ARG		
		BRN		
		KHM		
		COL		
		CRI		
		HKG		
		KAZ		
		MYS		
		MAR		
		PER		
		PHL		
		ROU		
		SAU		
		SGP		
		THA		
		TUN		
		VNM		
		ROW		

Industries

OECD

ISIC Rev.4	Code	Industry	Code10	Code3
01, 02, 03	01T03	Crop and animal production, hunting and related service activities	P	P
05, 06	05T06	Forestry and logging	P	P
07, 08	07T08	Fishing and aquaculture	P	P
09	09	Mining and quarrying	P	P
10, 11, 12	10T12	Manufacture of food products, beverages and tobacco products	M1	M
13, 14, 15	13T15	Manufacture of textiles, wearing apparel and leather products	M2	M
16	16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	M3	M
17, 18	17T18	Manufacture of paper and paper products	M3	M
19	19	Printing and reproduction of recorded media	M4	M
20, 21	20T21	Manufacture of coke and refined petroleum products	M5	M
22	22	Manufacture of chemicals and chemical products	M6	M
23	23	Manufacture of basic pharmaceutical products and pharmaceutical preparations	M6	M
24	24	Manufacture of rubber and plastic products	M6	M
25	25	Manufacture of other non-metallic mineral products	M6	M
26	26	Manufacture of basic metals	M7	M
27	27	Manufacture of fabricated metal products, except machinery and equipment	M7	M
28	28	Manufacture of computer, electronic and optical products	M7	M
29	29	Manufacture of electrical equipment	M7	M
30	30	Manufacture of machinery and equipment n.e.c.	M7	M
31, 32, 33	31T33	Manufacture of motor vehicles, trailers and semi-trailers	M7	M
35,36, 37, 38, 39	35T39	Manufacture of other transport equipment	M4	M
41, 42, 43	41T43	Manufacture of furniture; other manufacturing	S2	S
45, 46, 47	45T47	Repair and installation of machinery and equipment	S1	S
49, 50, 51, 52, 53	49T53	Electricity, gas, steam and air conditioning supply	S1	S
55, 56	55T56	Water collection, treatment and supply	S2	S
58, 59, 60	58T60	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	S1	S
61	61	Construction	S1	S
62, 63	62T63	Wholesale and retail trade and repair of motor vehicles and motorcycles	S1	S
64, 65, 66	64T66	Wholesale trade, except of motor vehicles and motorcycles	S1	S
68	68	Retail trade, except of motor vehicles and motorcycles	S2	S
69, 70, 71, 72, 73, 74, 75, 77, 78, 79, 80, 81, 82	69T82	Land transport and transport via pipelines	S1	S
84	84	Water transport	S2	S
85	85	Air transport	S2	S
86, 87, 88	86T88	Warehousing and support activities for transportation	S2	S
90, 91, 92, 93,94,95, 96	90T96	Postal and courier activities	S2	S
97, 98	97T98	Accommodation and food service activities	S2	S

WIOD

NACE Rev.2	Code	Industry	Code10	Code3
A01	c1	Crop and animal production, hunting and related service activities	P	P
A02	c2	Forestry and logging	P	P
A03	c3	Fishing and aquaculture	P	P
B	c4	Mining and quarrying	P	P
C10-C12	c5	Manufacture of food products, beverages and tobacco products	M1	M
C13-C15	c6	Manufacture of textiles, wearing apparel and leather products	M2	M
C16	c7	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	M3	M
C17	c8	Manufacture of paper and paper products	M3	M
C18	c9	Printing and reproduction of recorded media	M3	M
C19	c10	Manufacture of coke and refined petroleum products	M4	M
C20	c11	Manufacture of chemicals and chemical products	M5	M
C21	c12	Manufacture of basic pharmaceutical products and pharmaceutical preparations	M5	M
C22	c13	Manufacture of rubber and plastic products	M6	M
C23	c14	Manufacture of other non-metallic mineral products	M6	M
C24	c15	Manufacture of basic metals	M6	M
C25	c16	Manufacture of fabricated metal products, except machinery and equipment	M6	M
C26	c17	Manufacture of computer, electronic and optical products	M7	M
C27	c18	Manufacture of electrical equipment	M7	M
C28	c19	Manufacture of machinery and equipment n.e.c.	M7	M
C29	c20	Manufacture of motor vehicles, trailers and semi-trailers	M7	M
C30	c21	Manufacture of other transport equipment	M7	M
C31_C32	c22	Manufacture of furniture; other manufacturing	M7	M
C33	c23	Repair and installation of machinery and equipment	M7	M
D35	c24	Electricity, gas, steam and air conditioning supply	M4	M
E36	c25	Water collection, treatment and supply	M4	M
E37-E39	c26	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	M4	M
F	c27	Construction	S2	S
G45	c28	Wholesale and retail trade and repair of motor vehicles and motorcycles	S1	S
G46	c29	Wholesale trade, except of motor vehicles and motorcycles	S1	S
G47	c30	Retail trade, except of motor vehicles and motorcycles	S1	S
H49	c31	Land transport and transport via pipelines	S1	S

NACE Rev.2	Code	Industry	Code10	Code3
H50	c32	Water transport	S1	S
H51	c33	Air transport	S1	S
H52	c34	Warehousing and support activities for transportation	S1	S
H53	c35	Postal and courier activities	S1	S
I	c36	Accommodation and food service activities	S2	S
J58	c37	Publishing activities	S1	S
J59_J60	c38	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	S1	S
J61	c39	Telecommunications	S1	S
J62_J63	c40	Computer programming, consultancy and related activities; information service activities	S1	S
K64	c41	Financial service activities, except insurance and pension funding	S1	S
K65	c42	Insurance, reinsurance and pension funding, except compulsory social security	S1	S
K66	c43	Activities auxiliary to financial services and insurance activities	S1	S
L68	c44	Real estate activities	S2	S
M69_M70	c45	Legal and accounting activities; activities of head offices; management consultancy activities	S1	S
M71	c46	Architectural and engineering activities; technical testing and analysis	S1	S
M72	c47	Scientific research and development	S1	S
M73	c48	Advertising and market research	S1	S
M74_M75	c49	Other professional, scientific and technical activities; veterinary activities	S1	S
N	c50	Administrative and support service activities	S1	S
O84	c51	Public administration and defence; compulsory social security	S2	S
P85	c52	Education	S2	S
Q	c53	Human health and social work activities	S2	S
R_S	c54	Other service activities	S2	S
T	c55	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	S2	S
U	c56	Activities of extraterritorial organizations and bodies	S2	S

EXIOBASE

Code	Industry	Code10	Code3
A_PARI	Cultivation of paddy rice	P	P
A_WHEA	Cultivation of wheat	P	P
A_OCER	Cultivation of cereal grains nec	P	P
A_FVEG	Cultivation of vegetables, fruit, nuts	P	P
A_OILS	Cultivation of oil seeds	P	P
A_SUGB	Cultivation of sugar cane, sugar beet	P	P
A_FIBR	Cultivation of plant-based fibers	P	P
A_OTCR	Cultivation of crops nec	P	P
A_CATL	Cattle farming	P	P
A_PIGS	Pigs farming	P	P
A_PLTR	Poultry farming	P	P
A_OMEA	Meat animals nec	P	P
A_OANP	Animal products nec	P	P
A_MILK	Raw milk	P	P
A_WOOL	Wool, silk-worm cocoons	P	P
A_MANC	Manure treatment (conventional), storage and land application	P	P
A_MANB	Manure treatment (biogas), storage and land application	P	P
A_FORE	Forestry, logging and related service activities (02)	P	P
A_FISH	Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing (05)	P	P
A_COAL	Mining of coal and lignite; extraction of peat (10)	P	P
A_COIL	Extraction of crude petroleum and services related to crude oil extraction, excluding surveying	P	P
A_GASE	Extraction of natural gas and services related to natural gas extraction, excluding surveying	P	P
A_OGPL	Extraction, liquefaction, and regasification of other petroleum and gaseous materials	P	P
A_ORAN	Mining of uranium and thorium ores (12)	P	P
A_IRON	Mining of iron ores	P	P
A_COPO	Mining of copper ores and concentrates	P	P
A_NIKO	Mining of nickel ores and concentrates	P	P
A_ALUO	Mining of aluminium ores and concentrates	P	P
A_PREO	Mining of precious metal ores and concentrates	P	P
A_LZTO	Mining of lead, zinc and tin ores and concentrates	P	P
A_ONFO	Mining of other non-ferrous metal ores and concentrates	P	P
A_STON	Quarrying of stone	P	P
A_SDCL	Quarrying of sand and clay	P	P
A_CHMF	Mining of chemical and fertilizer minerals, production of salt, other mining and quarrying n.e.c.	P	P
A_PCAT	Processing of meat cattle	M1	M
A_PPIG	Processing of meat pigs	M1	M
A_PPLT	Processing of meat poultry	M1	M
A_POME	Production of meat products nec	M1	M
A_VOIL	Processing vegetable oils and fats	M1	M
A_DAIR	Processing of dairy products	M1	M

Code	Industry	Code10	Code3
A_RICE	Processed rice	M1	M
A_SUGR	Sugar refining	M1	M
A_OFOD	Processing of Food products nec	M1	M
A_BEVR	Manufacture of beverages	M1	M
A_FSHP	Manufacture of fish products	M1	M
A_TOBC	Manufacture of tobacco products (16)	M1	M
A_TEXT	Manufacture of textiles (17)	M2	M
A_GARM	Manufacture of wearing apparel; dressing and dyeing of fur (18)	M2	M
A_LETH	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)	M2	M
A_WOOD	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (20)	M3	M
A_WOOW	Re-processing of secondary wood material into new wood material	M3	M
A_PULP	Pulp	M3	M
A_PAPR	Re-processing of secondary paper into new pulp	M3	M
A_PAPE	Paper	M3	M
A_MDIA	Publishing, printing and reproduction of recorded media (22)	M3	M
A_COKE	Manufacture of coke oven products	M4	M
A_REFN	Petroleum Refinery	M4	M
A_NUCF	Processing of nuclear fuel	M4	M
A_PLAS	Plastics, basic	M5	M
A_PLAW	Re-processing of secondary plastic into new plastic	M5	M
A_NFER	N-fertiliser	M5	M
A_PFER	P- and other fertiliser	M5	M
A_CHEM	Chemicals nec	M5	M
A_RUBP	Manufacture of rubber and plastic products (25)	M6	M
A_GLAS	Manufacture of glass and glass products	M6	M
A_GLAW	Re-processing of secondary glass into new glass	M6	M
A_CRMC	Manufacture of ceramic goods	M6	M
A_BRIK	Manufacture of bricks, tiles and construction products, in baked clay	M6	M
A_CMNT	Manufacture of cement, lime and plaster	M6	M
A_ASHW	Re-processing of ash into clinker	M6	M
A_ONMM	Manufacture of other non-metallic mineral products n.e.c.	M6	M
A_STEL	Manufacture of basic iron and steel and of ferro-alloys and first products thereof	M6	M
A_STEW	Re-processing of secondary steel into new steel	M6	M
A_PREM	Precious metals production	M6	M
A_PREW	Re-processing of secondary precious metals into new precious metals	M6	M
A_ALUM	Aluminium production	M6	M
A_ALUW	Re-processing of secondary aluminium into new aluminium	M6	M
A_LZTP	Lead, zinc and tin production	M6	M

Code	Industry	Code10	Code3
A_LZTW	Re-processing of secondary lead into new lead, zinc and tin	M6	M
A_COPP	Copper production	M6	M
A_COPW	Re-processing of secondary copper into new copper	M6	M
A_ONFM	Other non-ferrous metal production	M6	M
A_ONFW	Re-processing of secondary other non-ferrous metals into new other non-ferrous metals	M6	M
A_METC	Casting of metals	M6	M
A_FABM	Manufacture of fabricated metal products, except machinery and equipment (28)	M6	M
A_MACH	Manufacture of machinery and equipment n.e.c. (29)	M7	M
A_OFMA	Manufacture of office machinery and computers (30)	M7	M
A_ELMA	Manufacture of electrical machinery and apparatus n.e.c. (31)	M7	M
A_RATV	Manufacture of radio, television and communication equipment and apparatus (32)	M7	M
A_MEIN	Manufacture of medical, precision and optical instruments, watches and clocks (33)	M7	M
A_MOTO	Manufacture of motor vehicles, trailers and semi-trailers (34)	M7	M
A_OTRE	Manufacture of other transport equipment (35)	M7	M
A_FURN	Manufacture of furniture; manufacturing n.e.c. (36)	M7	M
A_RYMS	Recycling of waste and scrap	M7	M
A_BOTW	Recycling of bottles by direct reuse	M7	M
A_POWC	Production of electricity by coal	M4	M
A_POWG	Production of electricity by gas	M4	M
A_POWN	Production of electricity by nuclear	M4	M
A_POWH	Production of electricity by hydro	M4	M
A_POWW	Production of electricity by wind	M4	M
A_POWP	Production of electricity by petroleum and other oil derivatives	M4	M
A_POWB	Production of electricity by biomass and waste	M4	M
A_POWS	Production of electricity by solar photovoltaic	M4	M
A_POWE	Production of electricity by solar thermal	M4	M
A_POWO	Production of electricity by tide, wave, ocean	M4	M
A_POWM	Production of electricity by Geothermal	M4	M
A_POWZ	Production of electricity nec	M4	M
A_POWT	Transmission of electricity	M4	M
A_POWD	Distribution and trade of electricity	M4	M
A_MGWG	Manufacture of gas; distribution of gaseous fuels through mains	S2	S
A_HWAT	Steam and hot water supply	M4	M
A_WATR	Collection, purification and distribution of water (41)	M4	M
A_CONS	Construction (45)	S2	S
A_CONW	Re-processing of secondary construction material into aggregates	S2	S
A_TDMO	Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessories	S1	S

Code	Industry	Code10	Code3
A_TDFU	Retail sale of automotive fuel	S1	S
A_TDWH	Wholesale trade and commission trade, except of motor vehicles and motorcycles (51)	S1	S
A_TDRT	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods (52)	S1	S
A_HORE	Hotels and restaurants (55)	S2	S
A_TRAI	Transport via railways	S1	S
A_TLND	Other land transport	S1	S
A_TPIP	Transport via pipelines	S1	S
A_TWAS	Sea and coastal water transport	S1	S
A_TWAI	Inland water transport	S1	S
A_TAIR	Air transport (62)	S1	S
A_TAUX	Supporting and auxiliary transport activities; activities of travel agencies (63)	S1	S
A_PTEL	Post and telecommunications (64)	S1	S
A_FINT	Financial intermediation, except insurance and pension funding (65)	S1	S
A_FINS	Insurance and pension funding, except compulsory social security (66)	S1	S
A_FAUX	Activities auxiliary to financial intermediation (67)	S1	S
A_REAL	Real estate activities (70)	S2	S
A_MARE	Renting of machinery and equipment without operator and of personal and household goods (71)	S1	S
A_COMP	Computer and related activities (72)	S1	S
A_RESD	Research and development (73)	S1	S
A_OBUS	Other business activities (74)	S1	S
A_PADF	Public administration and defence; compulsory social security (75)	S2	S
A_EDUC	Education (80)	S2	S
A_HEAL	Health and social work (85)	S2	S
A_INCF	Incineration of waste: Food	M4	M
A_INCP	Incineration of waste: Paper	M4	M
A_INCL	Incineration of waste: Plastic	M4	M
A_INCM	Incineration of waste: Metals and Inert materials	M4	M
A_INCT	Incineration of waste: Textiles	M4	M
A_INCW	Incineration of waste: Wood	M4	M
A_INCO	Incineration of waste: Oil/Hazardous waste	M4	M
A_BIOF	Biogasification of food waste, incl. land application	M4	M
A_BIOP	Biogasification of paper, incl. land application	M4	M
A_BIOS	Biogasification of sewage sludge, incl. land application	M4	M
A_COMF	Composting of food waste, incl. land application	M4	M
A_COMW	Composting of paper and wood, incl. land application	M4	M
A_WASF	Waste water treatment, food	M4	M
A_WASO	Waste water treatment, other	M4	M
A_LANF	Landfill of waste: Food	M4	M
A_LANP	Landfill of waste: Paper	M4	M
A_LANL	Landfill of waste: Plastic	M4	M
A_LANI	Landfill of waste: Inert/metal/hazardous	M4	M

Code	Industry	Code10	Code3
A_LANT	Landfill of waste: Textiles	M4	M
A_LANW	Landfill of waste: Wood	M4	M
A_ORGA	Activities of membership organisation n.e.c. (91)	S2	S
A_RECR	Recreational, cultural and sporting activities (92)	S2	S
A_OSER	Other service activities (93)	S2	S
A_PRHH	Private households with employed persons (95)	S2	S
A_EXTO	Extra-territorial organizations and bodies	S2	S
ZZZ	Empty selection	S2	S

Variables

OECD

Code	Variable	Units
TAXSUB	Taxes less subsidies on intermediate and final products	Million USD
VALU	Value added at basic prices	Million USD
EXP	Total exports	Million USD

WIOD

Code	Variable	Units
TXSP	Taxes less subsidies on products	Million Euros
VA	Value added at basic prices	Million Euros
LAB	Labour compensation	Million Euros
CAP	Capital compensation	Million Euros
IntTTM	International transport margins	Million Euros
EMP	Total employment	Thousand persons engaged
EMPM	Male employment	Thousand persons engaged
EMPF	Female employment	Thousand persons engaged
EMPHS	High-skilled employment	Thousand persons engaged
EMPMS	Medium-skilled employment	Thousand persons engaged
EMPLS	Low-skilled employment	Thousand persons engaged
EMP1	15-29 years old employment	Thousand persons engaged
EMP2	30-49 years old employment	Thousand persons engaged
EMP3	>=50 years old employment	Thousand persons engaged
LABM	Male labour compensation	Million Euros
LABF	Female labour compensation	Million Euros
LABHS	High-skilled labour compensation	Million Euros
LABMS	Medium-skilled labour compensation	Million Euros
LABLS	Low-skilled labour compensation	Million Euros
CO2	CO_2 emissions	Thousand tonnes
EXP	Total exports	Million Euros

EXIOBASE

Code	Variable	Units
PRIMINP	Total primary inputs	Million Euros
T_S	Taxes less subsidies on products	Million Euros
VA	Value added	Million Euros
CAP	Operating surplus	Million Euros
CAP_FK	Operating surplus: Consumption of fixed capital	Million Euros
CAP_RL	Operating surplus: Rents on land	Million Euros
CAP_RR	Operating surplus: Royalties on resources	Million Euros
CAP_OS	Operating surplus: Other net operating surplus	Million Euros
LAB	Compensation of employees	Million Euros
LABLS	Compensation of employees: Low-skilled	Million Euros
LABMS	Compensation of employees: Medium-skilled	Million Euros
LABHS	Compensation of employees: High-skilled	Million Euros
O_T	Other net taxes on production	Million Euros
EMP	Employment	Thousand persons engaged
EMPLS	Employment: Low-skilled	Thousand persons engaged
EMPMS	Employment: Medium-skilled	Thousand persons engaged
EMPHS	Employment: High-skilled	Thousand persons engaged
EMPM	Employment: Male	Thousand persons engaged
EMPF	Employment: Female	Thousand persons engaged
EMPLS_M	Employment: Low-skilled male	Thousand persons engaged
EMPLS_F	Employment: Low-skilled female	Thousand persons engaged
EMPMS_M	Employment: Medium-skilled male	Thousand persons engaged
EMPMS_F	Employment: Medium-skilled female	Thousand persons engaged
EMPHS_M	Employment: High-skilled male	Thousand persons engaged
EMPHS_F	Employment: High-skilled female	Thousand persons engaged
EMPVUL	Employment: Vulnerable employment	Thousand persons engaged
EMPH	Employment hours	Million hours
EMPHLS	Employment hours: Low-skilled	Million hours
EMPHMS	Employment hours: Medium-skilled	Million hours
EMPHHS	Employment hours: High-skilled	Million hours
EMPHM	Employment hours: Male	Million hours
EMPHF	Employment hours: Female	Million hours
EMPHLS_M	Employment hours: Low-skilled male	Million hours
EMPHLS_F	Employment hours: Low-skilled female	Million hours
EMPHMS_M	Employment hours: Medium-skilled male	Million hours
EMPHMS_F	Employment hours: Medium-skilled female	Million hours
EMPHHS_M	Employment hours: High-skilled male	Million hours
EMPHHS_F	Employment hours: High-skilled female	Million hours
EMPHVUL	Employment hours: Vulnerable employment	Million hours
CO2	CO_2 - combustion – air	Kilograms
CH4	CH_4 - combustion – air	Kilograms
N2O	N_2O - combustion – air	Kilograms
SOx	SO_x - combustion – air	Kilograms
NOx	NO_x - combustion – air	Kilograms
NH3	NH_3 - combustion – air	Kilograms
CO	CO - combustion – air	Kilograms
EXP	Total exports	Million Euros

Components

Exports

Country analysis		Region analysis	
Code	**Component**	**Code**	**Component**
T	Factor in country	**T**	Factor in country
f	Factor in industry	**f**	Factor in industry
Z	Foreign intermediate upstream country	**Z**	Foreign intermediate upstream country
g	Foreign intermediate upstream industry	**g**	Foreign intermediate upstream industry
R	**Factor in / Exporter / Final producer country**	**R1**	**Factor in / Domestic upstream country**
h	Factor in / Domestic upstream industry	**h**	Factor in / Domestic upstream industry
		R	**Exporter / Final producer country**
i	Exporter / Final producer industry	**i**	Exporter / Final producer industry
S	Importer / Final user country	**S**	Importer / Final user country
j	Importer industry	**j**	Importer industry
P	Final producer country	**P**	Final producer country
k	Final producer industry	**k**	Final producer industry
Q	Final user country	**Q**	Final user country

Country analysis

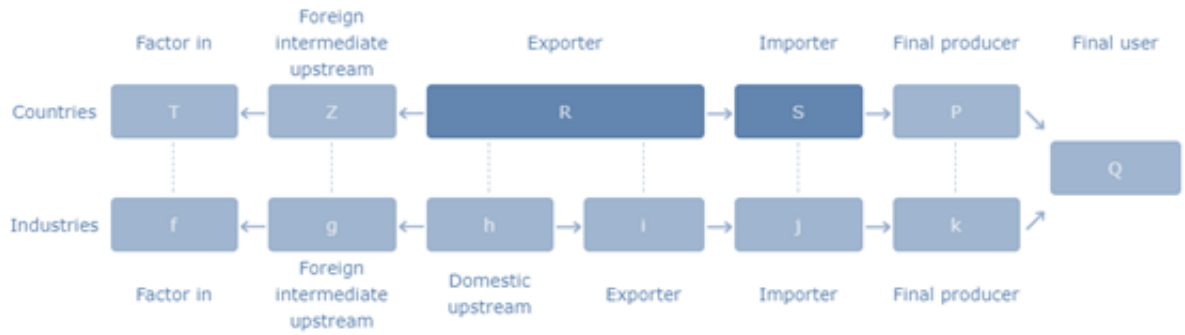

Figure A1.28. Decomposition of factor content in exports (country analysis)

Source: Own elaboration

Region analysis

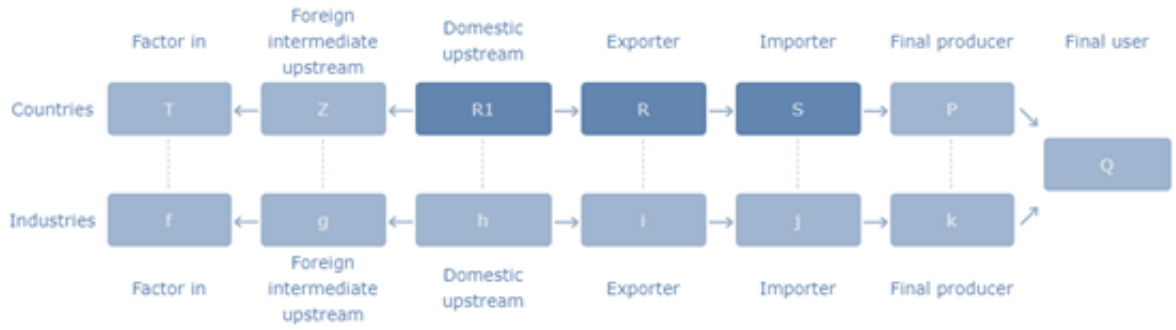

Figure A1.29. Decomposition of factor content in exports (region analysis)

Source: Own elaboration

Final demand

Country analysis	
Code	**Component**
T	Factor in foreign country
f	Factor in foreign industry
Q	**Factor in / Final user country**
h	Factor in domestic industry
P	Final producer country
k	Final producer industry
c	Final demand category

Region analysis	
Code	**Component**
T	Factor in foreign region
f	Factor in foreign industry
Q1	**Factor in domestic country**
Q	**Final user country**
h	Factor in domestic industry
P	Final producer country
k	Final producer industry
c	Final demand category

Direct household contribution to the footprint

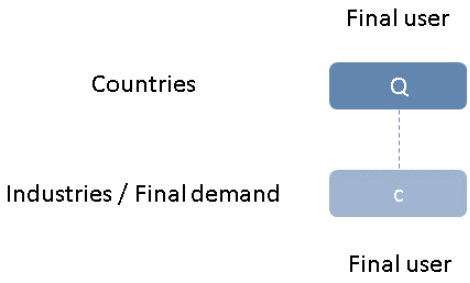

Figure A1.30. Decomposition of factor content in final demand (household)

Source: Own elaboration

Domestic factor content in final demand

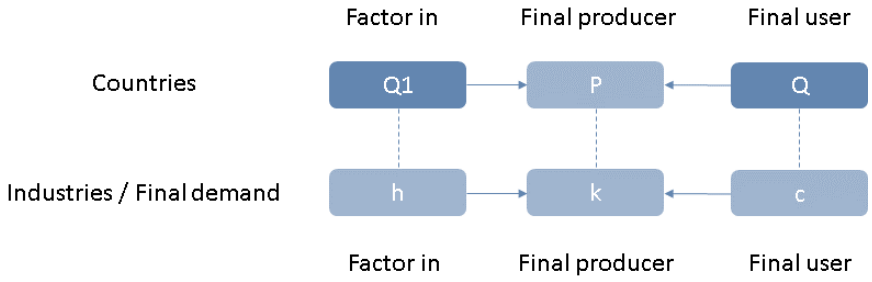

Figure A1.31. Decomposition of factor content in final demand (domestic)

Source: Own elaboration

Foreign factor content in final demand

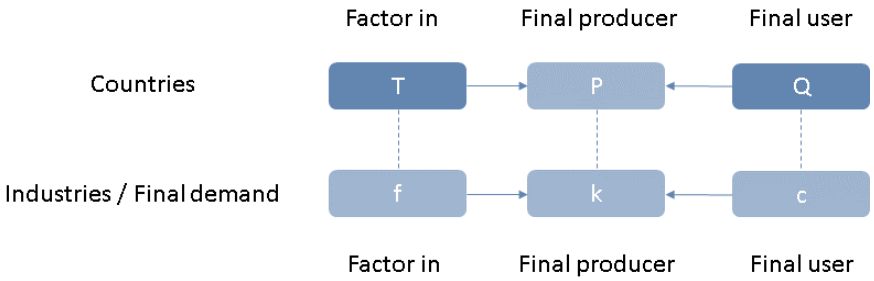

Figure A1.32. Decomposition of factor content in final demand (foreign)

Source: Own elaboration

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