Changes in consumption behaviour - impact on value added

Statistics Explained

Data extracted in April 2020.
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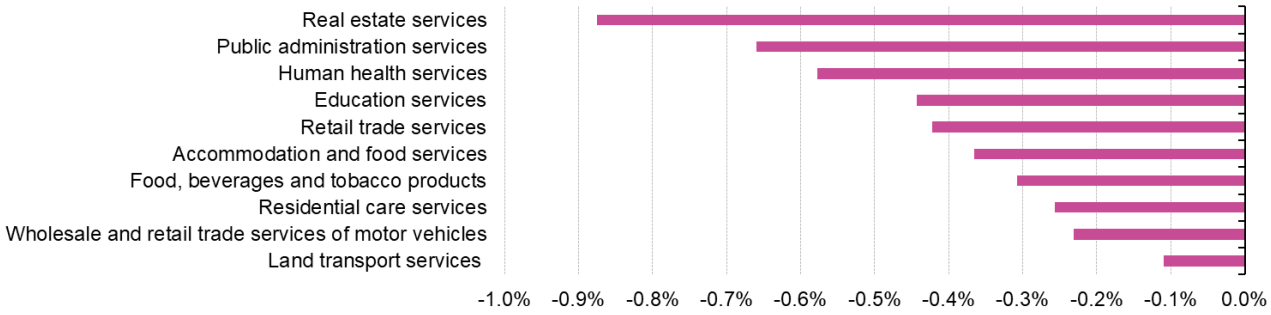
" A 10 % fall in the consumption of real estate services at EU level in 2019 would have an impact in terms of value added of -0.9 % of GDP. "

Difference of value added generated by a drop of 10% of final consumption



Source: Eurostat (online data codes: naio_10_cp17 and own calculation)

eurostat

Difference of value added generated by a drop of 10% of final consumption Source: Eurostat (naio_10_cp1700) and own calculations

This article presents the latest available European consolidated supply, use and input-output tables for the year 2019 with a focus on the final consumption and its impact on value added.

The consolidated supply, use and input-output tables are used for macro-analysis of the European Union (EU) and euro area (EA) economies. They give an annual snapshot of overall production and use of products, distinguishing 64 NACE activities and 64 products from the CPA classification . Input-output tables are particularly used as a well-established tool for analytical purposes (economic analysis, social accounting matrices and environmental accounts).

The coronavirus pandemic will impact EU economies in multiple ways. This article looks only at the impact in terms of value-added of projected changes to the consumption of specific products, compared to the 'baseline' situation, i.e. the structure of EU input and output in 2019. In the EU, the coronavirus pandemic has led to various degrees of lockdown measures in all countries. The lockdown measures affect the final consumption of certain products, to a greater or lesser degree. For example, the consumption of accommodation and food services (CPA I) decreases while the consumption of public health services (CPA Q86), pharmaceutical products (CPA C21) or food products (CPA C10) increases or remains stable.

EU consumption accounted for 67 % of GDP

The statistics tracking EU demand in 2019 by household, NPISH (non-profit institutions serving household) and government (final consumption expenditure in terms of national accounts) reveal that final consumption totalled EUR 9 383 157 million or 67 % of the EU's GDP. Two thirds of consumption was made up of household consumption, 2 % was NPISH consumption and the remaining 30 % was government consumption.

The main products consumed (see Table 1) in the EU are real estate services (mainly rentals) and public health and social work services (both accounting for 14 % of final consumption) as well as manufactured products (15 %), trade services (12 %), education services (7 %) and accommodation and food services (6 %).

Breakdown in final consumption, EU, 2019

Products	Products	2019
CPA_A	PRODUCTS OF AGRICULTURE, FORESTRY AND FISHING	1.3
CPA_B	MINING AND QUARRYING	0.2
CPA_C	MANUFACTURED PRODUCTS	15.0
CPA_D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING	1.9
CPA_E	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION SERVICES	0.9
CPA_F	CONSTRUCTIONS AND CONSTRUCTION WORKS	0.6
CPA_G	WHOLESALE AND RETAIL TRADE SERVICES; REPAIR SERVICES OF MOTOR VEHICLES AND MOTORCYCLES	12.2
CPA_H	TRANSPORTATION AND STORAGE SERVICES	3.4
CPA_I	ACCOMMODATION AND FOOD SERVICES	6.0
CPA_J	INFORMATION AND COMMUNICATION SERVICES	2.5
CPA_K	FINANCIAL AND INSURANCE SERVICES	3.3
CPA_L	REAL ESTATE SERVICES	13.6
CPA_M	PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES	1.0
CPA_N	ADMINISTRATIVE AND SUPPORT SERVICES	1.6
CPA_O	PUBLIC ADMINISTRATION AND DEFENCE SERVICES; COMPULSORY SOCIAL SECURITY SERVICES	10.7
CPA_P	EDUCATION SERVICES	6.9
CPA_Q	HUMAN HEALTH AND SOCIAL WORK SERVICES	13.5
CPA_R	ARTS, ENTERTAINMENT AND RECREATION SERVICES	2.3
CPA_S	OTHER SERVICES	2.5
CPA_T	SERVICES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS AND SERVICES PRODUCED BY HOUSEHOLDS FOR OWN USE	0.5
CPA_U	SERVICES PROVIDED BY EXTRATERRITORIAL ORGANISATIONS AND BODIES	0.0

Source: Eurostat (online data code: naio_10_cp17)

eurostat

Table 1: Breakdown in final consumption, EU, 2019 Source: Eurostat (naio_10_cp1700) and own calculations

Out of all manufactured products (see Figure 1), the main products that EU households consumed were food, beverages and tobacco products (5.7 % of final consumption), motor vehicles, trailers and semi-trailers (1.9 %), textiles, clothing, leather and related products (1.5 %), coke and refined petroleum products and basic pharmaceutical products (both 1.1 % of final consumption).

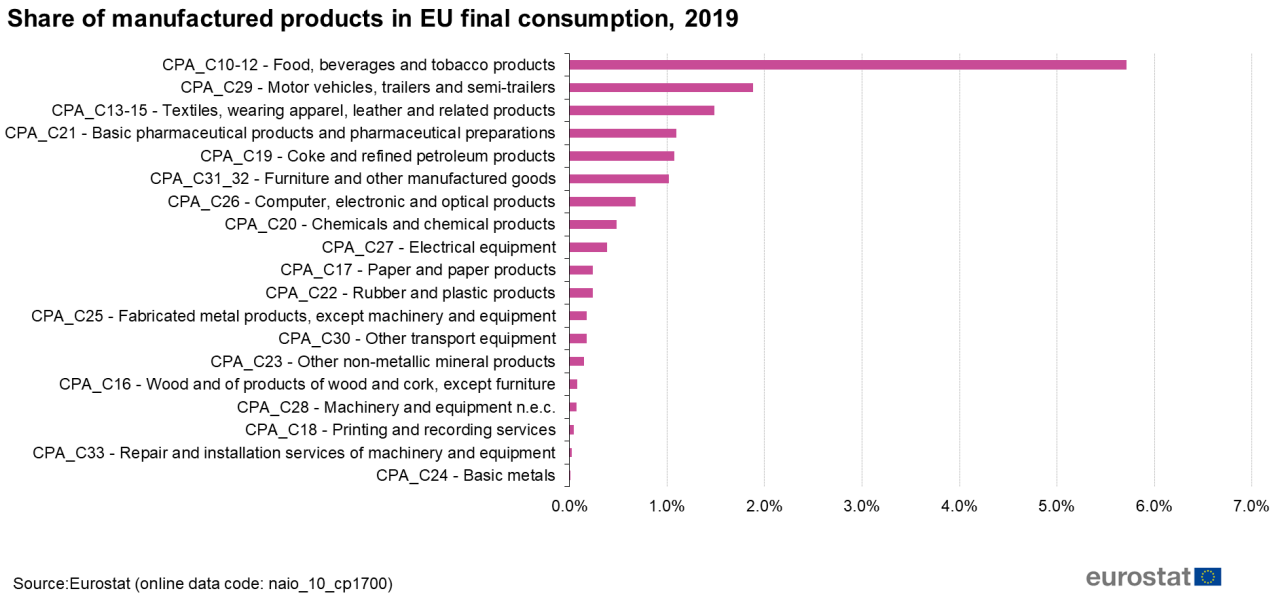


Figure 1: Share of manufactured products in EU final consumption, 2019 Source: Eurostat (naio_10_cp1700)

The production value added generated by consumption in the EU is 59 % of GDP

In 2019, the value added generated by EU final consumption reached EUR 8 200 987 million, representing 58.9 % of the EU's GDP. The consumption of some products generated more value-added than others (see Figure 2). Real estate services consumption generated EUR 1 276 955 million of value added, public administration and defence services EUR 999 382 million, public health services EUR 885 361 million, education services EUR 646 901 million, retail trade services EUR 630,824 million, accommodation and food services EUR 563 206 million.

However, this order is reversed when looking at the value added by final consumption compared to the value added of the product or service itself (see Figure 3). The consumption of travel agency, tour operator and other reservation and travel-related services (CPA_N79) generated EUR 64 527 million in value added, which is more than twice the value-added of this industry. This means that travel agency services (N79) generated spillover effects in other industries totalling EUR 7 822 million, mainly in accommodation and food services (I). The value added generated by the consumption of food, beverages and tobacco products was 166 % of the product value added. Spillover value is mainly generated for agricultural products (A01).

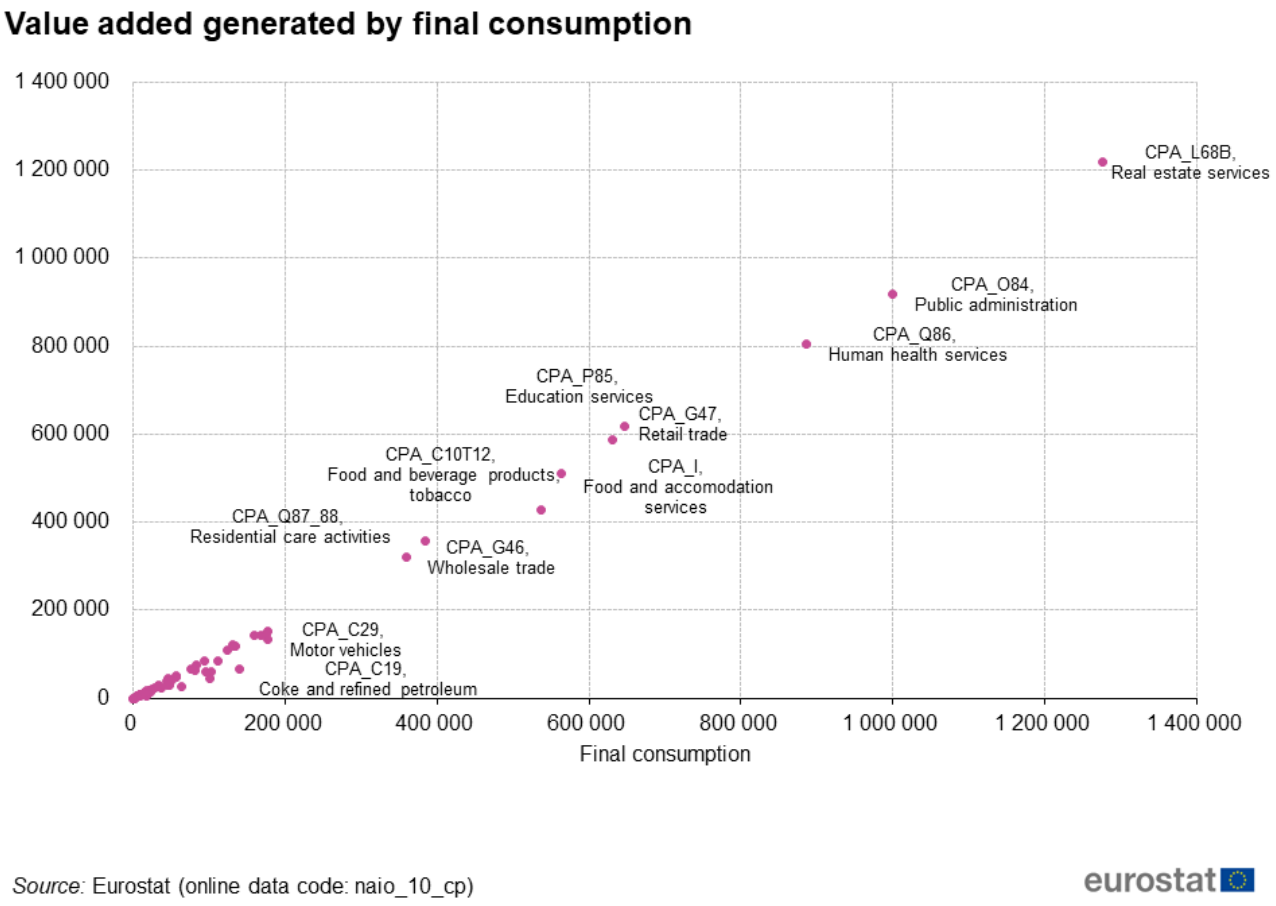


Figure 2: Value added generated by final consumption Source: Eurostat (naio_10_cp1700) and own calculations

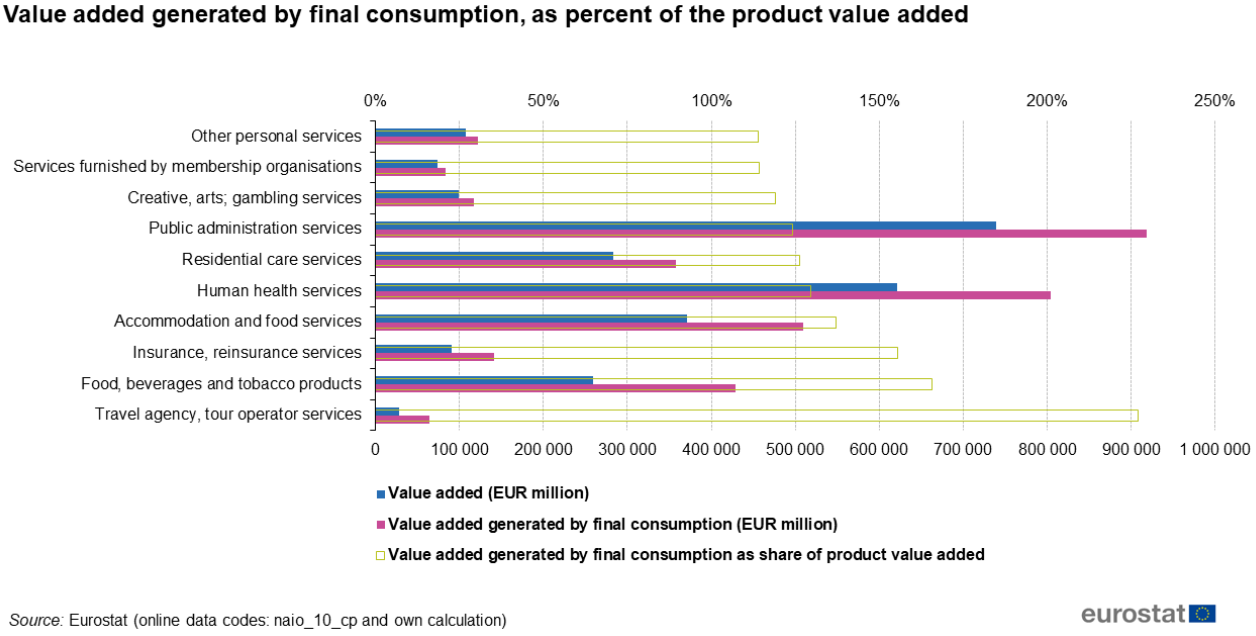


Figure 3: Value added generated by final consumption, as percent of the product value added Source: Eurostat (naio_10_cp1700) and own calculations

Simulated changes in final consumption

Eurostat has used the data to simulate some scenarios of how the structure of the 2019 economy would have been impacted by a COVID pandemic. It does not seek to forecast for 2020 or beyond - in this context, see the European Commission's spring forecast (published on 6 May 2020).

In late March-early April, the European press and national statistical institutes started providing some data on changes to consumption behaviour. The French statistical institute, INSEE, stated in its Economic Outlook for France of 26 March 2020 Note de conjoncture INSEE 26 March 2020 that, 'regarding consumption, we estimate that total household consumption in France also currently stands at 65% of its normal level, with obviously some very strong sectoral differences.' The German statistical institute, Destatis, indicated in its press release No 146 of 23 April 2020, that 'the demand for specific convenience goods is falling in the corona crisis.(. . .) Products of specific segments may either not be available briefly, or the demand may be satisfied in some areas.'

A simulation has been made of the effect of the coronavirus pandemic on value added, with reference to the EU's production structure in 2019, unaltered by the pandemic. The simulation also leaves the value-added components (employee wages and labour costs, gross operating surpluses and mixed income) unchanged, even though the coronavirus pandemic obviously has effects on the intermediate consumption structure of industries and on the labour and capital inputs to the production process. The only variable factor in the simulation is final consumption. Out of 64 products that describe the EU production structure in the input-output table, a projected increase or decrease in the consumption of each of the 64 products was first looked at. The second simulation took into consideration changes to final consumption for all products with some positive (increase) and some negative (decrease) changes. For each change to final consumption, the value added generated by that part of final consumption has been evaluated, all other things being equal, and has been compared with the baseline situation in the EU in 2019 (presented in the previous section).

A 10 % fall in the consumption of real estate services would have an impact in terms of value added of -0.9 % of GDP

If the EU's consumption of real estate services falls by 10 %, the value added generated by the consumption of these services would fall by EUR 121 780 million, representing a -0.9 % decrease in GDP. Figure 4 illustrates the top products for which a 10 % fall in consumption has the biggest impact in terms of share of GDP. Services provided by the public administration (CPA_O84) would cut 0.7 % off GDP if the consumption of these services falls by 10 %. Public health services would have an impact of -0.6 % of GDP, education services (-0.5 %), and so on.

The mathematical formula used to calculate the value added generated by consumption means that a 10 % increase in the consumption of one product would have the same magnitude as the effect illustrated in Figure 3, but in a positive direction.

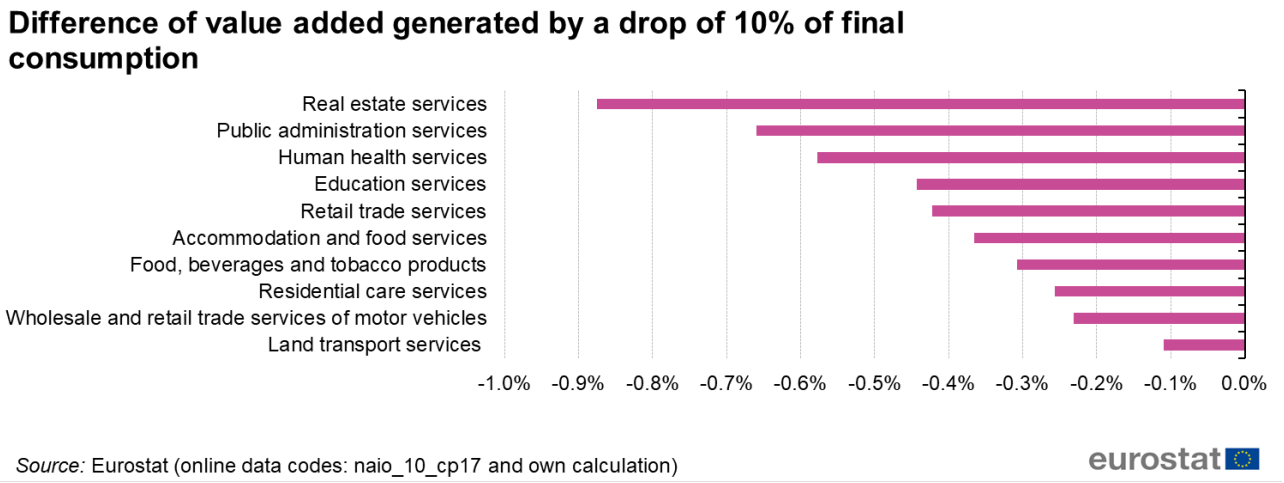


Figure 4: Difference of value added generated by a drop of 10% of final consumption Source: Eurostat (naio_10_cp1700) and own calculations

Impact in value added terms of simulating changes to the EU consumption in 2019

The framework of the supply, use and input-output tables allows applications of Leontief's Input-Output analysis at the EU economy level (see the section Context for more details). The data for EU in 2019 is taken and a range of decreases and increases in final consumption is envisaged, depending on the products. The scale of the change in final consumption is based on a reasonable estimate made by the author of this article, and is not underpinned by actual data as such data are not yet available at EU level.

Based on the assumptions given in Table 2 on changes to final consumption, the value added generated by final consumption could drop by 4.7 % of EU GDP in 2019.

Changes in final consumption

	Products	Change of final consumption
CPA_A	PRODUCTS OF AGRICULTURE, FORESTRY AND FISHING	3
CPA_B	MINING AND QUARRYING	-20
CPA_C	MANUFACTURED PRODUCTS	-20
CPA_C21	Basic pharmaceutical products and pharmaceutical preparations	0
CPA_D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING	-3
CPA_E	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION SERVICES	-2
CPA_F	CONSTRUCTIONS AND CONSTRUCTION WORKS	-10
CPA_G	WHOLESALE AND RETAIL TRADE SERVICES; REPAIR SERVICES OF MOTOR VEHICLES AND MOTORCYCLES	-10
CPA_H	TRANSPORTATION AND STORAGE SERVICES	-30
CPA_I	ACCOMMODATION AND FOOD SERVICES	-50
CPA_J	INFORMATION AND COMMUNICATION SERVICES	5
CPA_K	FINANCIAL AND INSURANCE SERVICES	-5
CPA_L	REAL ESTATE SERVICES	-5
CPA_M	PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES	-5
CPA_N	ADMINISTRATIVE AND SUPPORT SERVICES	-5
CPA_O	PUBLIC ADMINISTRATION AND DEFENCE SERVICES; COMPULSORY SOCIAL SECURITY SERVICES	5
CPA_P	EDUCATION SERVICES	5
CPA_Q	HUMAN HEALTH AND SOCIAL WORK SERVICES	5
CPA_R	ARTS, ENTERTAINMENT AND RECREATION SERVICES	-20
CPA_S	OTHER SERVICES	-20
CPA_T	SERVICES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS AND SERVICES PRODUCED BY HOUSEHOLDS FOR OWN USE	-20
CPA_U	SERVICES PROVIDED BY EXTRATERRITORIAL ORGANISATIONS AND BODIES	-20

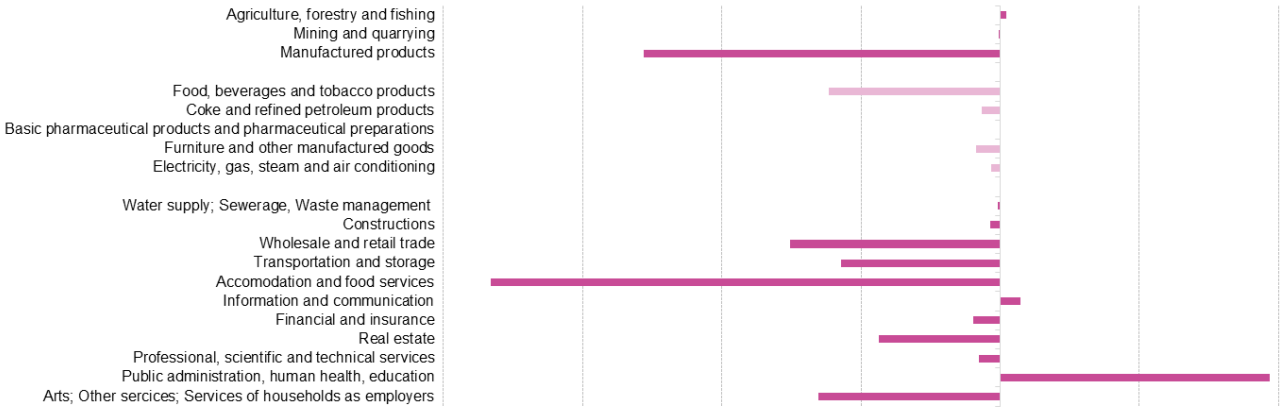
Source: Eurostat (Author's assumptions)

eurostat

Table 2: Changes in final consumption Source: Eurostat (naio_10_cp1700) and own calculations

The loss in value added caused by changes to consumption is driven by the value added generated by the consumption of accommodation and food services that would fall by 1.8 % of GDP, followed by a fall in the consumption of manufactured products equating to -1.3 % of GDP. Although the consumption of some products is set to increase (see Figure 5), the value added they would generate would total EUR 147 969 million (+1 % of GDP), far from offsetting the simulated fall by € 804 856 million (–5.8 % of GDP).

Difference in value added generated by final consumption changes, share of GDP



Source: Eurostat (naio_10_cp17 and own calculation)

eurostat

Figure 5: Difference in value added generated by final consumption changes, share of GDP Source: Eurostat (naio_10_cp1700) and own calculations

Source data for tables and graphs

- Download Excel file

Data sources

Eurostat compiles supply and use tables for the EU and the euro area. All statistics relating to national accounts are in line with the methodological framework European System of Accounts 2010.

Context

On the basis of EU statistics tracking input and output, a standard input-output technique to calculate the results of the Leontief quantity model applied to value-added was used. First, a domestic input coefficient matrix (A) for each homogeneous branch of activity was calculated, showing the direct inputs needed to produce one unit of output. Then the Leontief inverse matrix was calculated (the inverse of I — A, I being the identity matrix) to obtain a matrix of output multipliers. Then the inverse matrix was multiplied by a column vector of private final consumption to calculate the total output produced by private final consumption. Lastly, output coefficients of value-added pre-multiplied the former results to calculate value-added generated by private consumption.

The data are collected under the European System of National and Regional Accounts (ESA 2010) transmission programme. EU Member States transmit supply and use tables (SUTs) to Eurostat annually and input-output tables (IOTs) every five years, up to 36 months after the end of the reference period.

The SUTs give detailed information on production processes, interdependencies in production, the use of goods and services, and income generated in production. They form the basis for symmetrical IOTs, which are produced by applying certain assumptions to the relationship between outputs and inputs and are used by policy-makers for input-output analysis.

European tables for the years 2010 to 2016 are based on a consolidation of available national supply and use tables. The data for only a few Member States is missing and has been estimated for the purpose of the European tables. The European tables for 2017 to 2019 are the result of projection methods based on the 2016 European consolidated tables and macroeconomic data for 2017 to 2019.

Eurostat has compiled consolidated European tables for the EU and the euro area in line with the ESA 2010 from reference year 2010 onwards.

Other articles

- Building the System of National Accounts - supply and use tables (chapter of online publication Building the System of National Accounts)
- National accounts and GDP

Database

- ESA Supply, use and Input-output tables
- FIGARO tables: EU inter-country supply, use and input-output tables.

Dedicated section

- ESA Supply, Use and Input-output tables

Publications

- European exports 2000-2007: direct and indirect effects on employment and labour income in the EU 27 and euro area - Statistics in focus 36/2012
- CO2 emissions induced by EU's final use of products are estimated to be 9 tonnes per capita - Statistics in focus 22/2011

Methodology

- Eurostat Manual of Supply, Use and Input-Output Tables
- Methodological information on the consolidated European tables for years 2008 and 2009
- Technical Documentation eeSUIOT project

External links

- International Input-Output Association (IIAO) - IIAO newsletters
- UNSD Handbook on Supply, Use and Input-Output Tables with Extensions and Applications