STATISTICS DENMARK

Documentation of statistics for Input-Output Tables 2019

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1 Introduction

The purpose of the input-output table is by means of an organized tabulation of detailed economical-statistics to inform about the interactions between production, imports and uses in the economy for a given period. An input The table facilitates a compilation of an input-output model showing direct and indirect interactions in the economy.

2 Statistical presentation

On the basis of National Accounts product balances tables are compiled which in monetary terms describes how goods and services have been flowing in the economy between suppliers and users. The table contains detailed data for economic structures which enables the compilation of an input-output model that can be used to calculate direct as well as indirect consequences of changes in the level of final demand.

2.1 Data description

An input-output table gives a detailed description of the production structure in the economy and the use of goods and services. Thus, the table can be seen as a further specification of the three main national accounts; products (goods and services), production and generation of income. The input-output table therefore constitutes an integrated part of national accounts statistics and is consistent with the national accounts in specific years and over time.

The reason why the input-output table has a specific role to play nevertheless compared to other national accounts statistics is that it facilitates a compilation of an input-output model. An input-output model is a mathematical reformulation of the tables. It is by nature linear and as such quite easy to use. Building on the internal dependencies between suppliers and users the model can measure the direct as well as indirect effects on e.g. employment and energy use of changes in final demand.

Tables are compiled in current prices as well as previous years prices (PYP). Currently they are available on an annual basis for the period 1966 to 2019. Tables with import-adjusted growth contribution is now published http://www.Statbank.dk in the table IOVB. It is calculated with an input-output model based on the input-output tables.

2.2 Classification system

As the input-output tables are so closely integrated with the final national accounts classifications are the same.

Danish Industry Classification (DB07), which is a Danish version of the international nomenclatures NACE, Rev. 2, ISIC, Rev. 4, includes some standard groupings of industries, 127, 36, 19 and 10 industries. National accounts as well as the input-output tables use a slightly modified version version of this classification with 117, 69, 38, 21 and 12 industries. The grouping of 117 industries in the final Danish national accounts is with few exceptions similar to the 127 grouping and the 117 industries can be aggregated to each of the other standard groupings of DB07.

Consumption by households as well as the individual part of government consumption are in the input-output tables distributed by the COICOP classification while the collective part of government consumption are split into 10 different COFOG groups.

In an international (especially EU-) perspective there is a high degree of comparability with national accounts and input-output tables made by other countries.

2.3 Sector coverage

All industries in "Dansk Branchekode 2007" (Danish Industry Classification 2007) (DB07) are covered. However, the most detailed level of publication is the same 117 industries as the final national accounts operates on.

2.4 Statistical concepts and definitions

The national accounts as well as the input-output tables are compiled according to the definitions in EU's "European System of National and Regional Accounts - ESA2010", which is a European version of the UN's "A System of National Accounts 2008". Chapter 9 in the ENS-manual gives a framework for compiling supply/use tables and how they can be used to compile input-output tables.

2.5 Statistical unit

Input-output tables are a product of of the final national accounts and the units relevant for input-output are therefore the same as there. For the compilation of output, intermediate consumption, taxes linked to production and subsidies, wages and salaries, employment, fixed capital formation and depreciation, the statistical unit is the local kind-of-activity unit. For the compilation of distributive and financial transactions, which cannot be divided up unambiguously among the individual kind-of-activity units belonging to a decision making unit (enterprise), the unit is the larger institutional unit, which in most cases will be the same as the legal unit which is the enterprise.

2.6 Statistical population

All units conducting Danish economic activity

2.7 Reference area

Denmark

2.8 Time coverage

The input-output tables are available for every year since 1966. Publication of the tables follows the publication of the final national accounts which currently extents to 2019. However, at the 69 industry level, two additional years are compiled.

2.9 Base period

Not relevant.

2.10 Unit of measure

The input-output tables are compiled in 1000 DKK. Tables are published in current prices as well as in previous years prices.

2.11 Reference period

The reference period of the figures in the annual final national accounts is the calendar year. Flow figures refer to transactions during the year, while employment figures of the type number of employed are averages over the year.

2.12 Frequency of dissemination

Annually as the final annual national accounts.

2.13 Legal acts and other agreements

The act on Statistics Denmark (Lov om Danmarks Statistik) subsections 6 and 8-12.

Council Regulation (EC) No 2223/96 of 25 June 1996 concerning the European system of national and regional accounts in the Community (ESA 95) (OJ L 310 30.11.96, p. 1). Commission Regulation (EC) No 1889/2002 of 23 October 2002 on the implementation of Council Regulation (EC) No 48/98 completing and amending Regulation (EC) No 2223/96 with respect to the allocation of financial intermediation services indirectly measured (FISIM) within the European System of national and regional Accounts (ESA). Commission Decision of 17 December 2002 further clarifying Annex A to Council Regulation (EC) No. 2223/96 as concerns the principles for measuring prices and volumes in national accounts.

2.14 Cost and burden

No direct burden since the table is derived from the National Accounts.

2.15 Comment

Input-output tables has their own subject page

3 Statistical processing

The national accounts as well as the input-output tables are compiled according to the definitions in EU's "European System of National and Regional Accounts - ESA2010", which is a European version of the UN's "A System of National Accounts 2008". In terms of data the input-output tables is almost entirely based on supply and use tables.

3.1 Source data

The input-output table is based on the functional part of the final version of the National Accounts, complemented with a variety of assumptions as laid down by ESA 2010. The only exception is the the elements of Gross Value Added; Other taxes on production, Compensation of employees and Gross surplus and mixed income.

3.2 Frequency of data collection

The input-output tables are published annually at the same time as the final national accounts

3.3 Data collection

Not relevant for the statistics

3.4 Data validation

The full integration between the input-output tables and the national accounts means that the validation of data is done once it has been secured that all data comparable between the two systems are equal.

3.5 Data compilation

Input-output-tables are almost entirely based on the detailed product balances in the final national accounts. When the balances are finalized and put together they work as input in the input-output table compilation process. The next step is more or less nothing but a re-organization of all this very detailed information. However one crucial assumption is necessary. It is the so-called "fixed products sales structure". It means that no matter to which use (input or final demand) a product is used it will be supplied in the same relative proportion from Danish industries and imports as it is supplied to the economy in total. The introduction of this one important assumption means that the input-output tables distance themselves a little bit from actual statistics that can be observed in the real world.

As a new feature import corrected contributions to growth are calculated using the input-output method. In the input-output method, input-output tables are used to calculate how much import the individual components in the final demand have given rise to both directly and indirectly. After this, the import is deducted from the individual components in the final use, so that precisely the Danish-produced parts of the final demand are left. These components, which together make up Danish GDP, can finally be calculated as a growth contribution.

3.6 Adjustment

The input-output tables are completely coherent with the national accounts and therefore there are no need for any corrections.

4 Relevance

Input-output tables are used by e.g. Central Government Administration, trade associations, consultancy companies and others as an important part of large macroeconomic and general equilibrium models and also as an independent tool for assessment of the consequences for e.g. employment and CO2-emissions of various changes in final demand.

4.1 User Needs

Input-output tables can be regarded as data sets particularly well suited for analyses of detailed economic production and consumption structures. Input-output tables as well as -models are particularly well suited for general assessments of economic political measures, the influence of various industries or groups of industries, the dependence between industries or between industries and final demand etc., including measures of CO2 emissions related to various economic activities. Such calculations are of particular interest to Government administration, ministries, trade associations, consultancy companies, organizations, etc. Moreover, input-output tables are used as the core of large scale macroeconomic and general equilibrium models.

4.2 User Satisfaction

Nothing to notice.

4.3 Data completeness rate

National accounts and input-output tables meet the requirements in the Council Regulation (EU) No 549/2013 of May 21 2013 on the European system of national and regional accounts in the European Union (ESA2010) (OJ L 174 26.06.2013, p. 1).

5 Accuracy and reliability

The inaccuracy of the national accounts figures relates to the inaccuracy of the various sources, which are used. However, the conceptual consistency and, the uniform adaptation of the sources over time contribute to reducing the inaccuracy of the national accounts figures. In particular, the combination of the primary sources into a coherent system in many cases gives rise to the detection of errors, which therefore are not reflected in the final national accounts or in the input-output tables.

No estimates of uncertainty are carried out.

The uncertainty of the last two years in the series of input-output tables with 69 industries is greater than tables at the full 117 industry levels. Furthermore, the table for 2020 is under the influence of the significant economic changes that Covid-19 has brought, and is therefore subject to extra great uncertainty.

5.1 Overall accuracy

When the national accounts were aligned with the definitions in the European System of National Accounts ESA 2010, the national accounts were at the same time undergoing a major revision, which means that all the levels were examined and evaluated. A reasonable accuracy of the national accounts figures is maintained by compiling the product balances at a very detailed level. Furthermore, the compilation of the central variable GDP is to the greatest extent possible done from the 3 points of view: production, expenditure and income, so these figures may be compared. Nevertheless some degree of uncertainty is linked to the data. A further reason for a possible lack of accuracy of the data in the table may be unreliability of the assumptions made in order to set up the table.

5.2 Sampling error

Not relevant for this statistics.

5.3 Non-sampling error

The "fixed product sales assumption" will lead to overestimation of some cells and underestimation of other cells.

5.4 Quality management

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

5.5 Quality assurance

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

5.6 Quality assessment

Input-output tables are compilations in matrix format of the central parts of the final national accounts applying a minimal number of assumptions and calculations.

5.7 Data revision - policy

Statistics Denmark revises published figures in accordance with the Revision Policy for Statistics Denmark. The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

5.8 Data revision practice

At the moment, preliminary input-output tables are not calculated. Consequently, only the final yearly table is available.

6 Timeliness and punctuality

The input-output tables are released once every year at the same time as the final national accounts. The time of release is approximately (almost) 3 years after the end of the reference year.

6.1 Timeliness and time lag - final results

The input-output tables are, like the final yearly national accounts, published yearly, about 3 years after the end of the reference year.

6.2 Punctuality

The table is usually published without delay according to schedule.

7 Comparability

With a few exceptions the input-output tables can be aggregated into the Danish Industry Classification (DB07) and, thus, input-output tables can therefore easily be combined with other statistics applying the DB07 classification. There is a high degree of international comparability of input-output tables. A lot of effort has been put into keeping the entire time series of input-output tables intact from 1966 through 2011 with no breaks.

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7.1 Comparability - geographical

In an international perspective the comparability between Danish and foreign input-output tables is generally good, but not quite as good as in the case of national accounts itself. This is due to the fact that there is an important assumption to be made and this assumption may vary between countries. However, within the framework of the ESA 2010 manual it is tried to secure comparability between EU-countries.

7.2 Comparability over time

Since the preparation of national accounts statistics is based on the idea that the figures are comparable over time to the greatest possible degree, the same will be the case for a time-series of input-output tables set up from the national accounts using uniform methods. For 2005 and onwards, the input-output tables, in current prices, are based on the national accounts supply and use tables, while tables for the period 1966-2004 are obtained by adapting an older set of tables to new classifications and definitions, as has been sought adjusted for the known data problems. Be noted that for the period 1966-2004 the older set of tables already were a result of adjustments due to past changes in classifications and methods. As a result, the 1966-2004 input-output tables in their present form are far from primary statistical data, and uncertainty of the tables can be expected to be greater.

7.3 Coherence - cross domain

As the input-output tables industry classification is the same as for the national accounts, which is derived from the Danish Industrial Classification DB07, it is possible to compared them with other statistics compiled by industry. However, comparisons with other statistics at a detailed industry level will often show differences, partly because of differences in definitions of variables and partly as a result of the national accounts reference period being the calendar year and its requirements for total coverage of economic activity To obtain a high degree of comparability the countries of the European Union have since 2003 transmitted input-output tables with common classifications.

7.4 Coherence - internal

The simultaneous use of the detailed product balances in the national accounts as well as in input-output tables is a guarantee that the two statistics are fully coherent.

8 Accessibility and clarity

Input-output data is disseminated mostly on the internet through the http://www.Statbank.dk and the input-output subject page https://www.dst.dk/inputoutput in various file formats. The latter is easier to use because extraction of input-output data from the statbank requires some knowledge of what you are looking for.

The strongly aggregated input-output tables published in Statistical Yearbook and Statistical 10-year review are great for a quick overview of the material.

8.1 Release calendar

The publication date appears in the release calendar. The date is confirmed in the weeks before.

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8.3 User access

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

8.2 Release calendar access

The Release Calender can be accessed on our English website: Release Calender.

8.4 News release

There is no specific news release about input-output tables.

8.5 Publications

Input-output tables are published in four different publications

Until the spring of 2011 there was an annual outright input-output publication Input-output tables and analyses

Since 2019, most of the multiplier tables that existed in the previous publication have been available for download at http://www.StatBank.dk.

In the following publications (in Danish) there are aggregated versions of the input-output table

Statistisk Årbog (Statistical yearbook) , Statistisk Tiårsoversigt (Statistical 10-year review) og Nationalregnskabsstatistik (National accounts statistics)

8.6 On-line database

Input-output data can be found in [Statbank](http://(http://www.statbank.dk)

Moreover, the data can be downloaded as full tables from the input-output subject page

8.7 Micro-data access

The homepage https://www.dst.dk/input-output gives access to input-output tables and national accounts employment data at the most detailed level. In raddition, the homepage offers downloads of satellite accounts for energy and air emissions. These data is presented using exactly the same principles, definitions and classifications as national accounts and input-output tables, and it is therefore possible to combine data for use in a wide range of analyzes of trends and structures in Danish economy.

8.8 Other

Input-output tables are aggregated to EU's format (65 industries) and transmitted to Eurostat. After some adaptation the tables of as many of the 28 EU-member states as possible will be published at the homepage of the EU.

8.9 Confidentiality - policy

Not relevant for this statistics.

8.10 Confidentiality - data treatment

Not relevant for this statistics.

8.11 Documentation on methodology

The methods for transforming final annual National Accounts data into input-output tables are presently only documented for internal use.

8.12 Quality documentation

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

9 Contact

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