

AL Norway

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AL.1 Overview

This document describes the Norwegian input–output table (IOT) constructed for GTAP version 11. As an overview, the submitted IOT was based on the 2017 Norwegian data submitted by the Norwegian Statistical Agency (SSB) to Eurostat⁴⁸ and based on the European System of Accounts 2010 (ESA). Some adjustments were made to make the table conform to the GTAP format, with table balance maintained with each adjustment.

Step 1: The source table

The source table is the 2017 Norwegian IOT⁴⁹ in the ESA format (European Communities 2013)⁵⁰ with units of million Norwegian kroner. The table has 64 commodities plus main final consumers: households, government, capital, changes in stocks, and exports. The commodity classification is CPA64 (Table 8.79), which is an aggregation of CPA2008 level 2 from Eurostat.⁵¹ The table is presented as an industry-by-industry table “provided that industry-by-industry is a good approximation of product-by-product”. The table is valued in basic prices and the flow tables for domestic and imported products were provided separately. While Supply and Use Tables (SUT) are available, only the symmetric IOT was used.

The commodity classification used by SSB does not match that used by GTAP, requiring both aggregation and disaggregation.

Step 2: Concordance creation

The major effort in constructing the Norwegian IOT for the GTAP database was transforming SSB’s table into the GTAP classification. The GTAP classification is more detailed in several sectors and either the Norwegian IOT must be disaggregated or the GTAP sectors aggregated. However, the new 65-sector classification of GTAP has allowed some sectors that were previously aggregated from SSB’s data to remain disaggregated.

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⁴⁸Statistical Office of the European Communities, <http://ec.europa.eu/eurostat>

⁴⁹<https://www.ssb.no/en/nasjonalregnskap-og-konjunkturer/metoder-og-dokumentasjon/supply-and-use-and-input-output-tables>

⁵⁰<http://ec.europa.eu/eurostat/en/web/products-manuals-and-guidelines/-/KS-02-13-269>

⁵¹<https://ec.europa.eu/eurostat/web/cpa/cpa-2008>

Disaggregation of the IOT was based on a simple share distribution. This distribution was applied across the rows and columns and then for the intersection of the rows and columns. After disaggregation, the balance of the rows and columns remains consistent in all sectors.

The simple share method of disaggregation of change in inventories sometimes caused problems where subsectors have different signs. In such cases we have disaggregated change in inventories using total use (excluding change in inventories) instead.

The mapping from SSB's classification to GTAP's classification is detailed in Table 8.80.

Step 3: Removal of negative flows

There was a negative value in the capital formation for Motor vehicles and parts. This negative value was relocated to changes in stocks to conform to GTAP requirements. Other transport equipment had negative gross operating surplus in 2017, so this was replaced with the approximate average of the previous 2 years' tables (2015 and 2016) and change in inventories modified to maintain balance.

Step 4: Removal of re-exports

The Norwegian IOT contains re-exports (a column of exports in the final consumption of imports).

The re-exports were subtracted from the exports. To keep the IOT balanced, this means that the supply of these exports must be reduced. In the case of some commodities, current-year imports were insufficient to have supplied re-exports, so re-exports must have at least partially come from stocks (imports in earlier years). We first increase changes in stocks (from negative values towards zero) in preference and if possible, and then any remaining re-exports are taken from the imports matrix in proportion to use. That is, the column of residual re-exports was transposed to represent the use of imports. The use of imports in each sector was reduced as a share of the percent of re-exports in the total use of imports.

This method conforms to the approach recommended by the GTAP.

Step 5: Mapping to the GTAP classification and balances

After all these steps the data is mapped to the GTAP classification as described in Step 2 and put in the required GTAP format. Various checks and balances are performed to ensure consistency.

Two pieces of information were crudely estimated: 1. AI14 – Employment of Capital, is estimated as the total of Consumption of Fixed Capital and Net Operating Surplus (European Communities 2013) 2. AI15 – Employment of Land, is left as zero

Various very minor changes were made to remove rounding issues. Imbalances from the

disaggregation process were absorbed in Changes in Stocks.

Step 6: Tax data

The ESA tables contain the commodity taxes on domestic and imported products and the taxes on production. All taxes are allocated to the producing sectors (essentially value-added components). However, the ESA tables do not distribute the taxes cell-by-cell. The taxes were therefore distributed cell-by-cell in proportion to use.

SSB has previously provided some commodity tax data for final consumption split between households, government, and capital. These data do not distinguish between domestic and imported consumption. It is also uncertain whether these tax data provide full coverage. These older data were used as a first estimate for commodity taxes on final consumption, supplemented with the current rates of value-added tax in Norway.

The tax data are only first-order estimates.

Submission

The submission is in an EXCEL data book with the following sheets:

1. 2017 IOT Domestic/Imports: The original IOTs submitted to ESA
2. GTAP Norway: The modified IOT after disaggregation, sign checks and balancing
3. Concordance: The mapping used between the ESA and GTAP classifications
4. Tax (SSB): Some tax rate estimates for final consumption
5. GTA_Tax: The tax data in GTAP format
6. GTAP_UF: The GTAP new format
7. GTAP_UP: The GTAP old format

References

European Communities (2013). European system of accounts - ESA 2010. Eurostat Methodologies and Working Papers. Luxembourg.

Table 8.79: Statistics Norway's CPA64 classification

CPA64	Description
R01	Products of agriculture, hunting and related services
R02	Products of forestry, logging and related services
R03	Fish and other fishing products; aquaculture products; support services to fishing
RB	Mining and quarrying
R10_12	Food products, beverages and tobacco products
R13_15	Textiles, wearing apparel and leather products
R16	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
R17	Paper and paper products
R18	Printing and recording services
R19	Coke and refined petroleum products
R20	Chemicals and chemical products
R21	Basic pharmaceutical products and pharmaceutical preparations
R22	Rubber and plastics products
R23	Other non-metallic mineral products
R24	Basic metals
R25	Fabricated metal products, except machinery and equipment
R26	Computer, electronic and optical products
R27	Electrical equipment
R28	Machinery and equipment n.e.c.
R29	Motor vehicles, trailers and semi-trailers
R30	Other transport equipment
R31_32	Furniture; other manufactured goods
R33	Repair and installation services of machinery and equipment
RD	Electricity, gas, steam and air-conditioning
R36	Natural water; water treatment and supply services
R37_39	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services
RF	Constructions and construction works
R45	Wholesale and retail trade and repair services of motor vehicles and motorcycles
R46	Wholesale trade services, except of motor vehicles and motorcycles
R47	Retail trade services, except of motor vehicles and motorcycles
R49	Land transport services and transport services via pipelines
R50	Water transport services
R51	Air transport services
R52	Warehousing and support services for transportation
R53	Postal and courier services
RI	Accommodation and food services
R58	Publishing services
R59_60	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services
R61	Telecommunications services
R62_63	Computer programming, consultancy and related services; information services
R64	Financial services, except insurance and pension funding
R65	Insurance, reinsurance and pension funding services, except compulsory social security
R66	Services auxiliary to financial services and insurance services
R68B	Real estate services (excluding imputed rents)
R68A	Imputed rents of owner-occupied dwellings
R69_70	Legal and accounting services; services of head offices; management consulting services
R71	Architectural and engineering services; technical testing and analysis services

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CPA64	Description
R72	Scientific research and development services
R73	Advertising and market research services
R74_75	Other professional, scientific and technical services; veterinary services
R77	Rental and leasing services
R78	Employment services
R79	Travel agency, tour operator and other reservation services and related services
R80_82	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services
R84	Public administration and defence services; compulsory social security services
RP	Education services
R86	Human health services
R87_88	Social work services
R90_92	Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services
R93	Sporting services and amusement and recreation services
R94	Services furnished by membership organisations
R95	Repair services of computers and personal and household goods
R96	Other personal services
RT	Services of households as employers; undifferentiated goods and services produced by households for own use

Table 8.80: Concordance between CPA64 and GTAP65

CPA64	Description	GTAP code	GTAP Description
R01	Products of agriculture, hunting and related services	1	Rice
		2	Wheat
		3	Other Grains
		4	Veg & Fruit
		5	Oil Seeds
		6	Cane & Beet
		7	Fibres crops
		8	Other Crops
		9	Cattle
		10	Other Animal Products
		11	Raw milk
		12	Wool
R02	Products of forestry, logging and related services	13	Forestry
R03	Fish and other fishing products; aquaculture products; support services to fishing	14	Fishing
RB	Mining and quarrying	15	Coal
		16	Oil
		17	Gas
		18	Other Mining Extraction
R10_12	Food products, beverages and tobacco products	19	Cattle Meat
		20	Other Meat
		21	Vegetable Oils
		22	Milk
		23	Processed Rice
		24	Sugar and molasses
		25	Other Food
		26	Beverages and Tobacco products
		27	Manufacture of textiles
		28	Manufacture of wearing apparel
R13_15	Textiles, wearing apparel and leather products	29	Manufacture of leather and related products
		30	Lumber
R16	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	31	Paper & Paper Products
R17	Paper and paper products	31	Paper & Paper Products
R18	Printing and recording services	31	Paper & Paper Products
R19	Coke and refined petroleum products	32	Petroleum & Coke
		33	Manufacture of chemicals and chemical products
		34	Manufacture of pharmaceuticals, medicinal chemical and botanical products
R20	Chemicals and chemical products	32	Petroleum & Coke
		33	Manufacture of chemicals and chemical products
		34	Manufacture of pharmaceuticals, medicinal chemical and botanical products

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CPA64	Description	GTAP code	GTAP Description
R21	Basic pharmaceutical products and pharmaceutical preparations	32	Petroleum & Coke
		33	Manufacture of chemicals and chemical products
		34	Manufacture of pharmaceuticals, medicinal chemical and botanical products
R22	Rubber and plastics products	35	Manufacture of rubber and plastics products
R23	Other non-metallic mineral products	36	Manufacture of other non-metallic mineral products
R24	Basic metals	37	Iron & Steel
		38	Non-Ferrous Metals
R25	Fabricated metal products, except machinery and equipment	39	Manufacture of fabricated metal products, except machinery and equipment
R26	Computer, electronic and optical products	40	Manufacture of computer, electronic and optical products
R27	Electrical equipment	41	Manufacture of electrical equipment
R28	Machinery and equipment n.e.c.	42	Manufacture of machinery and equipment n.e.c.
R29	Motor vehicles, trailers and semi-trailers	43	Manufacture of motor vehicles, trailers and semi-trailers
R30	Other transport equipment	44	Manufacture of other transport equipment
R31_32	Furniture; other manufactured goods	45	Other Manufacturing
R33	Repair and installation services of machinery and equipment	45	Other Manufacturing
RD	Electricity, gas, steam and air-conditioning	46	Electricity; steam and air conditioning supply
		47	Gas manufacture, distribution
R36	Natural water; water treatment and supply services	48	Water supply; sewerage, waste management and remediation activities
R37_39	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	48	Water supply; sewerage, waste management and remediation activities
RF	Constructions and construction works	49	Construction
R45	Wholesale and retail trade and repair services of motor vehicles and motorcycles	50	Wholesale and retail trade; repair of motor vehicles and motorcycles
R46	Wholesale trade services, except of motor vehicles and motorcycles	50	Wholesale and retail trade; repair of motor vehicles and motorcycles
R47	Retail trade services, except of motor vehicles and motorcycles	50	Wholesale and retail trade; repair of motor vehicles and motorcycles
R49	Land transport services and transport services via pipelines	52	Land transport and transport via pipelines
R50	Water transport services	53	Water transport
R51	Air transport services	54	Air transport
R52	Warehousing and support services for transportation	55	Warehousing and support activities
R53	Postal and courier services	56	Information and communication
RI	Accommodation and food services	51	Accommodation, Food and service activities
R58	Publishing services	56	Information and communication

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CPA64	Description	GTAP code	GTAP Description
R59_60	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	56	Information and communication
R61	Telecommunications services	56	Information and communication
R62_63	Computer programming, consultancy and related services; information services	56	Information and communication
R64	Financial services, except insurance and pension funding	57	Other Financial Intermediation
R65	Insurance, reinsurance and pension funding services, except compulsory social security	58	Insurance
R66	Services auxiliary to financial services and insurance services	57	Other Financial Intermediation
R68B	Real estate services (excluding imputed rents)	59	Real estate activities
R68A	Imputed rents of owner-occupied dwellings	65	Dwellings
R69_70	Legal and accounting services; services of head offices; management consulting services	60	Other Business Services
R71	Architectural and engineering services; technical testing and analysis services	60	Other Business Services
R72	Scientific research and development services	60	Other Business Services
R73	Advertising and market research services	60	Other Business Services
R74_75	Other professional, scientific and technical services; veterinary services	60	Other Business Services
R77	Rental and leasing services	60	Other Business Services
R78	Employment services	60	Other Business Services
R79	Travel agency, tour operator and other reservation services and related services	60	Other Business Services
R80_82	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	60	Other Business Services
R84	Public administration and defence services; compulsory social security services	62	Other Services (Government)
RP	Education services	63	Education
R86	Human health services	64	Human health and social work
R87_88	Social work services	64	Human health and social work
R90_92	Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services	61	Recreation & Other Services
R93	Sporting services and amusement and recreation services	61	Recreation & Other Services
R94	Services furnished by membership organisations	62	Other Services (Government)
R95	Repair services of computers and personal and household goods	45	Other Manufacturing
R96	Other personal services	61	Recreation & Other Services
RT	Services of households as employers; undifferentiated goods and services produced by households for own use	61	Recreation & Other Services