

AX United Kingdom of Great Britain and Northern Ireland

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AX.1 Introduction

The UK input-output table submitted to GTAP is derived from the database of the UK-CGE model, which is documented in Verikios et al. (2020). The UK-CGE model database is constructed using the 2013 product-by-product input-output (IO) tables published by the UK Office for National Statistics (2016)⁸¹, and distinguishes the 127 industries of the UK Standard Industrial Classification at the 2-digit level.⁸² The 127 industries, listed in table 8.113, consist of:

- i 105 market-based industries (white background in industry description column of table 8.113);
- ii 11 commodities and industries representing services provided by the government sector ;
- iii 11 commodities and industries representing services provided by not-for-profit institutions serving households.

Other data sources for taxes and components of GOS were required to split some data in the Office for National Statistics (ONS) IO table into component parts required for modelling. Those interested in a detailed description of the processes involved in constructing the UK-CGE model database should consult Verikios et al. (2020). For the current documentation, however, only those parts of the data preparation procedures that are relevant to the structure of a GTAP IO table will be noted.

The monetary values in the UK-CGE model database are in £ million. The UK-CGE database has been updated from 2013 to 2016 using a UK-CGE model simulation with shocks to macroeconomic aggregates. It is from this updated database that the UK input-output table submitted to GTAP is constructed.

The 127 UK-CGE commodities are mapped to an aggregation of the GSEC3 commodities as shown in table @1. In all but one case, each aggregated GSEC3 commodity is assigned a label that is a concatenation of the standard labels of the component GSEC3 commodities. Obviously, for the “AgricHunting” commodity this was not possible. Two UK-CGE commodities – ONS codes 66 and 64-69n – were disaggregated between their component GSEC3 commodities prior to the aggregation.

For ease of reference, the aggregated GSEC3 sectors in the submitted IO table are listed in table 8.114, while the mapping from GSEC3 commodities to the aggregated GSEC3 sectors is shown in table 8.115.

⁸¹ONS website <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/datasets/ukinputoutputanalyticaltables/detailed>

⁸²See https://onsdigital.github.io/dp-classification-tools/standard-industrial-classification/ONS_SIC_hierarchy_view.html.

Table 8.113: Mapping from UK-CGE commodities to the aggregated GSEC3 commodities in the submitted IO table.

Commodi number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
1.	1	Products of agriculture, hunting and related services	AgricHunting	pdr wht gro v_f osd c_b pfb ocr ctl oap rmk wol
2.	2	Products of forestry, logging and related services	frs	frs
3.	3	Fish and other fishing products; aquaculture products; support services to fishing	fish	fish
4.	5	Coal and lignite	coa	coa
5.	06&07	Extraction Of Crude Petroleum And Natural Gas & Mining Of Metal Ores	oil_gas_omn	oil gas omn
6.	8	Other mining and quarrying products	oil_gas_omn	omn
7.	9	Mining support services	oil_gas_omn	omn
8.	10.1	Preserved meat and meat products	cmt_omt	cmt omt
9.	10.2-3	Processed and preserved fish, crustaceans, molluscs, fruit and vegetables	ofd_per_sgr	ofd
10.	10.4	Vegetable and animal oils and fats	vol	vol
11.	10.5	Dairy products	mil	mil
12.	10.6	Grain mill products, starches and starch products	ofd_per_sgr	per ofd
13.	10.7	Bakery and farinaceous products	ofd_per_sgr	ofd
14.	10.8	Other food products	ofd_per_sgr	ofd sgr
15.	10.9	Prepared animal feeds	ofd_per_sgr	ofd
16.	11.01-6 and 12	Alcoholic beverages & Tobacco products	b_t	b_t
17.	11.07	Soft drinks	b_t	b_t
18.	13	Textiles	tex	tex
19.	14	Wearing apparel	wap	wap

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Commodi- number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
20.	15	Leather and related products	lea	lea
21.	16	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	lum	lum
22.	17	Paper and paper products	ppp	ppp
23.	18	Printing and recording services	ppp	ppp
24.	19	Coke and refined petroleum products	p_c	p_c
25.	20A	Industrial gases, inorganics and fertilisers (all inorganic chemicals) - 20.11/13/15	chm	chm
26.	20B	Petrochemicals - 20.14/16/17/60	chm	chm
27.	20C	Dyestuffs, agro-chemicals - 20.12/20	chm	chm
28.	20.3	Paints, varnishes and similar coatings, printing ink and mastics	chm	chm
29.	20.4	Soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	chm	chm
30.	20.5	Other chemical products	chm	chm
31.	21	Basic pharmaceutical products and pharmaceutical preparations	bph	bph
32.	22	Rubber and plastic products	rpp	rpp
33.	23OTHER	Glass, refractory, clay, other porcelain and ceramic, stone and abrasive products - 23.1-4/7-9	mmm	mmm
34.	23.5-6	Cement, lime, plaster and articles of concrete, cement and plaster	mmm	mmm
35.	24.1-3	Basic iron and steel	i_s	i_s
36.	24.4-5	Other basic metals and casting	nfm	nfm

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Commodity number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
37.	25OTHER	Fabricated metal products, excl. machinery and equipment and weapons & ammunition - 25.1-3/25.5-9	fmp	fmp
38.	25.4	Weapons and ammunition	fmp	fmp
39.	26	Computer, electronic and optical products	ele	ele
40.	27	Electrical equipment	eeq	eeq
41.	28	Machinery and equipment n.e.c.	ome	ome
42.	29	Motor vehicles, trailers and semi-trailers	mvh	mvh
43.	30.1	Ships and boats	otn	otn
44.	30.3	Air and spacecraft and related machinery	otn	otn
45.	30OTHER	Other transport equipment - 30.2/4/9	otn	otn
46.	31	Furniture	omf	omf
47.	32	Other manufactured goods	omf	omf
48.	33.15	Repair and maintenance of ships and boats	omf	omf
49.	33.16	Repair and maintenance of aircraft and spacecraft	omf	omf
50.	33OTHER	Rest of repair; Installation - 33.11-14/17/19/20	omf	omf
51.	35.1	Electricity, transmission and distribution	ely	ely
52.	35.2-3	Gas; distribution of gaseous fuels through mains; steam and air conditioning supply	gdt	gdt
53.	36	Natural water; water treatment and supply services	wtr	wtr
54.	37	Sewerage services; sewage sludge	wtr	wtr

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Commodi number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
55.	38	Waste collection, treatment and disposal services; materials recovery services	wtr	wtr
56.	39	Remediation services and other waste management services	wtr	wtr
57.	41-43	Construction	cns	cns
58.	45	Wholesale and retail trade and repair services of motor vehicles and motorcycles	trd	trd
59.	46	Wholesale trade services, except of motor vehicles and motorcycles	trd	trd
60.	47	Retail trade services, except of motor vehicles and motorcycles	trd	trd
61.	49.1-2	Rail transport services	otp	otp
62.	49.3-5	Land transport services and transport services via pipelines, excluding rail transport	otp	otp
63.	50	Water transport services	wtp	wtp
64.	51	Air transport services	atp	atp
65.	52	Warehousing and support services for transportation	whs	whs
66.	53	Postal and courier services	cmn	cmn
67.	55	Accommodation services	afs	afs
68.	56	Food and beverage serving services	afs	afs
69.	58	Publishing services	cmn	cmn
70.	59-60	Motion Picture, Video & TV Programme Production, Sound Recording & Music Publishing services & Programming And Broadcasting services	cmn	cmn
71.	61	Telecommunications services	cmn	cmn
72.	62	Computer programming, consultancy and related services	cmn	cmn

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Commodi number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
73.	63	Information services	cmn	cmn
74.	64	Financial services, except insurance and pension funding	ofi	ofi
75.	65	Insurance and reinsurance, except compulsory social security & Pension funding	isr	isr
76.	66	Services auxiliary to financial services and insurance services	Was split between ...	ofi isr
77.	68.1-2	Real estate services, excluding on a fee or contract basis and imputed rent	rsa	rsa
78.	68.2IMP	Owner-Occupiers' Housing Services	dwe	dwe
79.	68.3	Real estate services on a fee or contract basis	rsa	rsa
80.	69.1	Legal services	obs	obs
81.	69.2	Accounting, bookkeeping and auditing services; tax consulting services	obs	obs
82.	70	Services of head offices; management consulting services	obs	obs
83.	71	Architectural and engineering services; technical testing and analysis services	obs	obs
84.	72	Scientific research and development services	obs	obs
85.	73	Advertising and market research services	obs	obs
86.	74	Other professional, scientific and technical services	obs	obs
87.	75	Veterinary services	obs	obs
88.	77	Rental and leasing services	obs	obs
89.	78	Employment services	obs	obs

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Commodity number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
90.	79	Travel agency, tour operator and other reservation services and related services	obs	obs
91.	80	Security and investigation services	obs	obs
92.	81	Services to buildings and landscape	obs	obs
93.	82	Office administrative, office support and other business support services	obs	obs
94.	84	Public administration and defence services; compulsory social security services	osg	osg
95.	85	Education services	edu	edu
96.	86	Human health services	hht	hht
97.	87-88	Residential Care & Social Work services	hht	hht
98.	90	Creative, arts and entertainment services	ros	ros
99.	91	Libraries, archives, museums and other cultural services	ros	ros
100.	92	Gambling and betting services	ros	ros
101.	93	Sports services and amusement and recreation services	ros	ros
102.	94	Services furnished by membership organisations	ros	ros
103.	95	Repair services of computers and personal and household goods	ros	ros
104.	96	Other personal services	ros	ros
105.	97	Services of households as employers of domestic personnel	ros	ros

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Commodity number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
106.	38g	Waste collection, treatment and disposal services; materials recovery services non-market	wtr	wtr
107.	49.3-5g	Land transport services and transport services via pipelines, excluding rail transport non-market	otp	otp
108.	52g	Warehousing and support services for transportation non-market	whs	whs
109.	59-60g	Motion Picture, Video & TV Programme Production, Sound Recording & Music Publishing services & Programming And Broadcasting services non-market	cmn	cmn
110.	84g	Public administration and defence services; compulsory social security services non-market	osg	osg
111.	85g	Education services non-market	edu	edu
112.	86g	Human health services non-market	hht	hht
113.	87-88g	Residential Care & Social Work services non-market	hht	hht
114.	90g	Creative, arts and entertainment services non-market	ros	ros
115.	91g	Libraries, archives, museums and other cultural services non-market	ros	ros
116.	93g	Sports services and amusement and recreation services non-market	ros	ros

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Commodity number	ONS industry code	Industry description	Mapping to sectors of submitted IO table	Component GSEC3 commodities
117.	64-69n	Financial (64-66), Real Estate (68.1-68.3) and Legal (69.1) Services NPISH	Was split between ...	ofi isr rsa obs
118.	72n	Scientific research and development services NPISH	obs	obs
119.	75n	Veterinary services NPISH	obs	obs
120.	81n	Services to buildings and landscape NPISH	obs	obs
121.	85n	Education services NPISH	edu	edu
122.	86n	Human health services NPISH	hht	hht
123.	87-88n	Residential Care & Social Work services NPISH	hht	hht
124.	90n	Creative, arts and entertainment services NPISH	ros	ros
125.	91n	Libraries, archives, museums and other cultural services NPISH	ros	ros
126.	93n	Sports services and amusement and recreation services NPISH	ros	ros
127.	94n	Services furnished by membership organisations NPISH	ros	ros

Table 8.114: Commodities in the submitted IO table

Commodity number	Aggregated GSEC3	Commodity number	Aggregated GSEC3
1	AgricHunting	26	ome
2	frs	27	mvh
3	fsh	28	otn
4	coa	29	omf
5	oil_gas_omn	30	ely
6	cmt_omt	31	gdt
7	ofd_pcr_sgr	32	wtr
8	vol	33	cns
9	mil	34	trd
10	b_t	35	otp
11	tex	36	wtp
12	wap	37	atp
13	lea	38	whs
14	lum	39	cmn
15	ppp	40	afs
16	p_c	41	ofi
17	chm	42	isr
18	bph	43	rsa
19	rpp	44	dwe
20	nmm	45	obs
21	i_s	46	osg
22	nfm	47	edu
23	fmp	48	hht
24	ele	49	ros
25	eeq		

Table 8.115: Mapping from GSEC3 commodities to sectors of the submitted IO table

GSEC3 number	GSEC3 Code	Description	Aggregated GSEC3
1	pdr	Paddy rice	AgricHunting
2	wht	Wheat	AgricHunting
3	gro	Cereal grains nec	AgricHunting
4	v_f	Vegetables, fruit, nuts	AgricHunting
5	osd	Oil seeds	AgricHunting
6	c_b	Sugar cane, sugar beet	AgricHunting
7	pfb	Plant-based fibers	AgricHunting
8	ocr	Crops nec	AgricHunting
9	ctl	Bovine cattle, sheep and goats, horses	AgricHunting
10	oap	Animal products nec	AgricHunting
11	rmk	Raw milk	AgricHunting
12	wol	Wool, silk-worm cocoons	AgricHunting
13	frs	Forestry	frs
14	fsh	Fishing	fsh
15	coa	Coal	coa

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GSEC3 number	GSEC3 Code	Description	Aggregated GSEC3
16	oil	Oil	oil_gas_omn
17	gas	Gas	oil_gas_omn
18	omn	Minerals nec	oil_gas_omn
19	cmt	Bovine meat products	cmt_omt
20	omt	Meat products nec	cmt_omt
21	vol	Vegetable oils and fats	vol
22	mil	Dairy products	mil
23	pcr	Processed rice	ofd_pcr_sgr
24	sgr	Sugar	ofd_pcr_sgr
25	ofd	Food products nec	ofd_pcr_sgr
26	b_t	Beverages and tobacco products	b_t
27	tex	Textiles	tex
28	wap	Wearing apparel	wap
29	lea	Leather products	lea
30	lum	Wood products	lum
31	ppp	Paper products, publishing	ppp
32	p_c	Petroleum, coal products	p_c
33	chm	Chemical products	chm
34	bph	Basic pharmaceutical products	bph
35	rpp	Rubber and plastic products	rpp
36	nmm	Mineral products nec	nmm
37	i_s	Ferrous metals	i_s
38	nfm	Metals nec	nfm
39	fmp	Metal products	fmp
40	ele	Computer, electronic and optical products	ele
41	eeq	Electrical equipment	eeq
42	ome	Machinery and equipment nec	ome
43	mvh	Motor vehicles and parts	mvh
44	otn	Transport equipment nec	otn
45	omf	Manufactures nec	omf
46	ely	Electricity	ely
47	gdt	Gas manufacture, distribution	gdt
48	wtr	Water	wtr
49	cns	Construction	cns
50	trd	Trade	trd
51	afs	Accommodation, Food and service activities	afs
52	otp	Transport nec	otp
53	wtp	Water transport	wtp
54	atp	Air transport	atp
55	whs	Warehousing and support activities	whs
56	cmn	Communication	cmn
57	ofi	Financial services nec	ofi
58	isr	Insurance	isr
59	rsa	Real estate activities	rsa
60	obs	Business services nec	obs
61	ros	Recreational and other services	ros
62	osg	Public Administration and defense	osg
63	edu	Education	edu
64	hht	Human health and social work activities	hht
65	dwe	Dwellings	dwe

AX.2 Data processing steps

Detailed commodity tax revenues for all intermediate inputs across all activities are obtained from the ONS.⁸³

GOS is divided into its components. An ONS spreadsheet provides a breakdown of GOS into self-employment income (that is, imputed wages of owner operators) and other income.⁸⁴

Net of depreciation rates of return are calculated as follows. First we determine the real interest rate as the product of the steady-state growth rate (30-year average GDP growth rate) and the ratio of aggregate capital rentals and aggregate investment. Industry gross rates of return are then determined as the sum of the industry depreciation rate and the real interest rate - industry depreciation rates are calculated based on historical data.⁸⁵ This means that the net of depreciation rate of return for all industries equals the real interest rate. Steady-state capital stocks are then determined as the ratio of industry rentals to the gross rate of return.

Returns to land are based on shares estimated for Australian industries mapped to UK industries. The differences between GOS and the components of GOS, determined as just described, are allocated into a residual ‘other costs’ item for each industry. The UK-CGE model is used to shocks these ‘other costs’ to zero.

Compensation to employees is split between wages & salaries and national insurance contributions using ONS data.⁸⁶ The national insurance contributions are part of industry taxes on labour in the UK-CGE database and, consequently, in the UK IO table submitted to GTAP.

Income taxes for each primary factor in each industry are obtained from HM Treasury Budget 2013. As the income tax rates for each primary factor in the UK-CGE database vary across industries, it should be noted that, in the UK IO table submitted to GTAP, industry primary factor taxes include the income tax levied on each primary factor.⁸⁷

Another noteworthy feature of the mapping of UK-CGE primary factor data to GTAP format is that, in the UK IO table submitted to GTAP, self-employment income (that is, imputed wages of owner operators) has been aggregated with labour income.⁸⁸

The UK-CGE database is updated from 2013, the year of the ONS UK IO table and other data used in the preceding steps, to 2016 using the UK-CGE model with shocks to macroeconomic aggregates calculated from UK national accounts data.

⁸³ONS website <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/adhocs/007674taxesminussubsidiesonproductsreferenceyear2013>

⁸⁴ONS website reference number 007583 <https://www.ons.gov.uk/economy/grossdomesticproductgdp/adhocs/007583breakdownofgrossoperatingsurplusmixedincomeoftheukbyin>

⁸⁵ONS website <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/datasets/capitalstock>

⁸⁶ONS website as part of the Annual Business Survey. <https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinessseconomyannualbusinesssurveysectionsas>

⁸⁷Data allocation choice 1.

⁸⁸Data allocation choice 2.

The final step in producing the submitted UK IO table is the mapping of UK-CGE data to GTAP format, following the sectoral aggregation of table 8.113 and data classification choices highlighted in the previous steps.

References

Verikios, G., Hanslow, K., Bahyl, D. and Gharibnavaz, R. (2020), 'A Multi-Sector Model of the United Kingdom: Theory, Data and Parameters', Economics and Business Statistics Discussion Paper 2020-02, Griffith University, Queensland, Australia.