

## **Industry aggregation in IntERACT**

*Abstract:*

This working paper describes the aggregation of the 117 industries of the national accounts used in the spring 2014 versions of the IntERACT model and presents key characteristics of this industry aggregation.

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### **The need for aggregation**

The main data source for the IntERACT computable general equilibrium sub-model (henceforth the CGE model) is the national accounts, in particular the input-output tables and the energy accounts. The input-output tables and the energy accounts operate with 117 industries. This is a significantly higher level of detail than what can be handled meaningfully in the CGE model and in the TIMES-DK model. It is therefore necessary to establish a suitable aggregation of these 117 industries.

This working paper presents the aggregation used in the spring 2014 versions of the IntERACT CGE model. As work on the model and database progresses, the aggregation may be modified. This will typically imply a higher level of disaggregation as analyses becomes more detailed and more data becomes available.

### **Aggregation criteria and resulting aggregation**

Generally, the choice of aggregation key depends on the aim of the analysis. The focal point of IntERACT is energy and the impact of energy usage and production on the national economy. Therefore, the 117 industries of the national accounts are grouped according to the way they use or produce energy as well as the overall type of output produced by the industries. In addition to this, the manufacturing industries are also grouped according to the energy intensity of production (measured as net use of energy per total supply, i.e. GJ per million DKK).<sup>1</sup> This results in the following industry aggregation:

- Energy production and distribution industries:
  - 1) Extraction of oil and gas and mining support service activities.
  - 2) Oil refinery etc.
  - 3) Production and distribution of electricity
  - 4) Manufacturing and distribution of gas
  - 5) Steam and hot water supply
  - 6) Other utilities, i.e. water collection, purification, and supply; sewerage; and waste management and materials recovery. Other utilities are included under the category energy production and distribution industries in anticipation of the revised national accounts (to be published in September 2014), as the accompanying revision of the energy accounts introduces a new allocation of the production of electricity and district heating.
  
- Transport industries:
  - 1) Industries associated with passenger transport by private car. According to the input-output table on private commodity consumption, consumer expenditures related to purchase and maintenance of motor vehicles are mainly associated with the three industries manufacture of motor vehicles and related parts, sale of motor vehicles, and repair etc. of motor vehicles. Consumer expenditures on fuels are primarily associated with the industries oil refineries, whole sale and retail. However, the three latter industries also cover many types of demands not related to passenger transport by private

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<sup>1</sup> Total supply of an industry is the value of production of the industry in question, measured in market prices.

car. Fuel costs will later be split out of these industries, but for now industries associated with passenger transport by private car only comprise the three industries:

- i. Manufacture of motor vehicles and related parts
  - ii. Sale of motor vehicles
  - iii. Repair etc. of motor vehicles
- 2) Passenger rail transport etc. and transport by suburban trains, buses and taxi operation, etc.
  - 3) Freight transport by road and via pipeline, water transport, air transport, support activities for transportation, and postal and courier activities. These rather different transport industries and transport related industries have been grouped together in order to handle the presence of negative gross surplus and mixed income for water transport and air transport in the 2009 IO table.<sup>2</sup>

Construction and housing:

- 1) Construction, i.e. construction of new buildings, civil engineering, professional repair and maintenance of buildings, and own-account repair and maintenance of buildings.
  - 2) Dwellings, i.e. owner-occupied dwellings and renting of residential buildings. The sole production of these two industries is housing to private consumers. Note that the dwelling industries consume very little energy as consumer expenditures on heating, electricity, etc. are registered as deliveries from the energy industries directly to the private consumers. Renting of non-residential buildings is categorized a private service industry.
- Service producing industries:
    - 1) Service industries in the private sector. This category covers a wide range of industries including wholesale and retail trading, financial services and consulting, and entertainment and recreation industries. It should be noted that the distinction between private and public service industries applied here is based on the structure of the industry's ownership and organization rather than their source of revenue. This implies that e.g. medical and dental practice activities are categorized as a private service industry, even though the output of these activities is typically designated as public consumption. This is in accordance with the principles applied in the industry aggregation used by the EMMA model (cf. EMMA 10, ENS 2010).<sup>3</sup>
    - 2) Service industries in the public sector. This category also covers a range of industries including public administration, hospitals, various types of education, and non-market recreational activities.
  - Commodity producing industries:
    - 1) Primary industries encompassing agriculture and horticulture, fishing, forestry, and extraction of gravel and stone.
    - 2) Highly energy intensive manufacturing industries:
      - i. manufacture of concrete and bricks

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<sup>2</sup> Gross surplus and mixed income is the part of an industry's income, which is available for compensating self-employed persons and consumption of fixed capital (depreciation). It is calculated as the residual when subtracting compensation of employees and other production taxes from gross value added for the industry in question.

<sup>3</sup> For documentation on EMMA 10 see <http://www.ens.dk/sites/ens.dk/files/info/tal-kort/fremskrivninger-analyser-modeller/modeller/emma/dokumentation/EMMA10%20dokumentation.pdf>

- ii. manufacture of glass and ceramic products
- iii. manufacture of paper and paper products
- 3) Manufacture of food, beverages and tobacco products
- 4) Other commodity producing industries

The exact categorization of each of the 117 industries of the national accounts is outlined in annex A. Annex A also provides an overview of the NR36a2 standard aggregation of the national accounts and the industry aggregation used in the EMMA model. The present IntERACT aggregation encompasses 17 industries while the EMMA aggregation is comprised of 22 industries. Comparing these two aggregation shows that EMMA is more focused on the energy consuming sectors, especially the commodity producing industries, while IntERACT has a higher degree of disaggregation in production of electricity and heating.<sup>4</sup>

As mentioned earlier, the IntERACT aggregation may be further refined in the future, as the need arises and / or data becomes available. Candidates for further disaggregation include the following industries:

- Primary industries: It may be desirable to disaggregate this industry grouping, including splitting out horticulture, as several of the industries are highly energy-intensive. Note, though, that horticulture is presently grouped with agriculture in the national accounts.
- Commodity producing industries: It may be desirable to further disaggregate the industry groupings manufacture of food, beverages and tobacco products and other commodity producing industries according to the type of energy use in production (cf. also the industry aggregation of the EMMA model).
- Freight transport by road and via pipeline, water transport, air transport etc.: It would be desirable to disaggregate this industry according to the different types of transport (i.e. freight, water, and air transport).
- Motor vehicles: It would be desirable to split fuel costs related to passenger transport by cars from oil refinery and trade industries in order to include these fuel costs in the transport category motor vehicles. However, further work on the concepts of the motor vehicle industry vs. the freight industry and the split between consumption and investment in relation to motor vehicles is required.

### **Characteristics of the chosen aggregation**

Having established the industry aggregation outlined above, this section will present the characteristics of the industries themselves and their significance in the national economy.

The characteristics of the individual industries here pertain to the production and cost structure of the industry. The main input-output table measures all inputs to an industry in terms of the monetary spending on these inputs. The energy accounts details the industries use of ener-

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<sup>4</sup> This reflects the slight difference in focus between the EMMA model and IntERACT. The EMMA model thus focuses more on energy consumption, and has typically been used in connection with the RAMSES model, which models the production of electricity and district heating. The IntERACT model consists of a general equilibrium model (CGE) and a technical energy system model (TIMES), which are soft-linked. While the division of labor in the EMMA-RAMSES set-up is on energy consumption vs. energy supply, the division of labor in the IntERACT set-up is on macro-economic effects vs. technological choices on “micro-level”. Consequently, the CGE and the TIMES model will both have to deal with energy consumption and energy production, and this is reflected in the chosen industry aggregation.

gy not only in monetary terms but also in physical units. Based on these data, the following intensity and cost share measures are created as indicators of the industries' production structure:

- Energy intensity: Net use of energy per total supply measured in GJ per million DKK. The reason for using the physical variable net use of energy to illustrate the industries energy intensities is first of all to focus on the physical energy requirements of production rather than the monetary energy bill associated with this production. The former is a result of the industries choice of technology and "laws of nature", while the latter may be significantly influenced by the regulatory framework. Secondly, in order to assess how much energy each industry actually consumes in the course of its production, the variable 'net use of energy' is chosen instead of 'supply and use of energy'. The variable net use of energy thus captures the fact that the energy converting industries only consume a small fraction of the energy supplied to them, while the remainder is converted into e.g. electricity and district heating and delivered to other industries etc.<sup>5</sup>
- Energy cost share: Energy expenditures in market prices per total supply. Note that the energy expenditures are based on 'supply and use of energy' rather than 'net use of energy', which explains the high energy cost shares for the energy converting industries.
- Labor cost share: Wages and salaries per total supply.
- Capital cost share: Gross surplus and mixed income per total supply.

Table 1 below shows that the most energy intensive industries in this aggregation are the highly-energy intensive manufacturing industries (concrete, glass, and paper), the primary industries (agriculture, forestry, fishing, and gravel and stone), as well as the two industries related to oil production (oil refineries and extraction of oil and gas). However, turning to the energy cost shares, table 1 also shows that energy expenditures constitute less than 10% of these industries' production value, except in the case of oil refineries as this is an energy converting industry.

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<sup>5</sup> There is some terminology confusion as 'net use of energy' is also known as 'gross energy consumption'. It is calculated "by dividing the use of primary energy (e.g. coal, crude oil and natural gas) used in the production process at the electricity plants and district heat plants proportionately on the users of the individual converted energy commodities. Simultaneously, the use of primary energy in the conversion industries is reset to zero.... The conversion process involves a considerably loss of energy (the conversion loss). Therefore, the total energy content used in the production process is allocated to the final users of energy in the calculation of the net energy consumption.... Furthermore, the electricity power plants consumption of energy is adjusted for the net imports of electricity, implying that this is also converted into primary energy."  
(<http://www.dst.dk/en/Statistik/dokumentation/Declarations/energy-accounts-for-denmark.aspx>).

It should be noted that the calculation of conversion losses for electricity and district heating appears to have been updated in the revised energy accounts. The numbers in table 1 are based on the old energy accounts, as the new and revised energy accounts are not fully compatible with the currently available IO table.

Table 1: Industries' input intensities and cost shares

	Net use of energy per total supply (GJ per mill DKK)	Energy expenditures (market prices) per total supply	Wages and salaries per total supply	Gross surplus and mixed income per total supply
Agriculture, forestry, fishing, gravel & stone	828	8%	12%	21%
Food, beverages, tobacco	287	2%	16%	7%
Concrete, glass, paper	997	6%	29%	9%
Other commodity production	164	2%	27%	8%
Private service industries	93	1%	36%	16%
Public services industries	87	2%	63%	6%
Construction	113	2%	32%	8%
Dwelling	4	0%	3%	66%
Extraction of oil and gas	560	0%	3%	79%
Oil refinery	802	88%	2%	0%
Electricity production & distribution	110	25%	21%	34%
Gas manufacturing & distribution	21	76%	4%	15%
Steam and hot water supply	193	23%	8%	48%
Other utilities	281	5%	16%	20%
Motor vehicles - purchase and repair	203	3%	40%	7%
Trains, buses, taxis	356	4%	32%	20%
Freight by road & pipeline, water and air transport, support activities and postal	254	4%	18%	3%
<b>Average</b>	<b>164</b>	<b>3%</b>	<b>33%</b>	<b>16%</b>

Source: Input-output tables and energy accounts for 2009 (old method)

As explained above, the high energy cost shares in the energy converting industries are a result of energy expenditures encompassing the entire cost of the intermediate input into the industry, i.e. the value of total energy inflow into these industries. The variable 'supply and use of energy', which is the basis for calculating energy expenditures, consequently does not take into account that these industries "resell" most of the energy supplied to them. This also partly explains the seemingly low capital cost share of the gas industry.

Looking more generally at the industries' capital cost shares, it should also be remembered that gross surplus and mixed income is the residual component in industries' cost structure. Economic crises, like the one in 2009, may thus significantly influence the industries' capital cost shares.<sup>6</sup>

Turning to the significance of the industries in the national economy, a simple way to examine this is to consider the industries' share of key economic statistics in 2009, as presented in table 2 below.

<sup>6</sup> The economic crisis is apparently not the only explanation for the very low capital cost share of the oil refinery industry, as this sector has exhibited quite low capital cost shares the past two decades.

Table 2: Industries' shares of key economic statistics

	Share of value-added	Share of exports	Share of employment	Share of net use of energy
Agriculture, forestry, fishing, gravel & stone	1%	2%	3%	12%
Food, beverages, tobacco	2%	11%	2%	8%
Concrete, glass, paper	1%	1%	1%	5%
Other commodity production	9%	36%	9%	12%
Private service industries	39%	19%	42%	20%
Public services industries	23%	0%	28%	9%
Construction	5%	0%	6%	4%
Dwelling	8%	0%	1%	0%
Extraction of oil and gas	3%	3%	0%	6%
Oil refinery	0%	2%	0%	4%
Electricity production & distribution	1%	0%	0%	1%
Gas manufacturing & distribution	0%	1%	0%	0%
Steam and hot water supply	1%	0%	0%	1%
Other utilities	1%	0%	0%	2%
Motor vehicles - purchase and repair	1%	2%	2%	2%
Trains, buses, taxis	1%	0%	1%	3%
Freight by road & pipeline, water and air transport, support activities and postal	3%	22%	4%	12%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Input-output tables and energy accounts for 2009 (old method)

Note: Employment is defined as total employment excl. leave of absence and measured in persons. Net use of energy is measured in GJ.

Share of value-added illustrates the industries' significance for GDP. Table 2 shows that the Danish economy is dominated by the service sector, as the two categories of service industries account for almost 62% of value-added and 71% of employment. Typically, the service industries also exhibit low energy intensities and the two service industries therefore only account for 29% of net energy use by industries.

Two of the important private service industries are wholesale and retail sale. These two industries account for respectively 7% and 4% of value-added, 6% and 8% of employment, and 5% and 4% of net use of energy. Likewise, two prominent public service industries are social work activities and public administration. These two industries account for respectively 6% and 5% of value-added and 9% and 4% of employment, but only 2% and 1% of net energy use.

Turning to the commodity producing industries and the primary industries, these industries account for 13% of value-added and 14% of employment. However, as illustrated in table 1, some of these industries are relatively energy intensive, and the commodity producing industries and the primary industries thus account for 37% of net energy use by industries. Agriculture (including horticulture) is the single largest net energy user in the national accounts, as

this sector accounted for 9% of net energy use in 2009. Manufacture of concrete and brick, which is a highly energy-intensive manufacturing industry, account for 4% of net energy use.

Some of these industries are also highly export oriented. In 2009, commodity producing industries and agriculture thus accounted for 50% of exports. It should be noted that a significant share of total exports are concentrated on relatively few industries. In the group of commodity producing industries, manufactures of engines, windmills and pumps account for 6% of total exports, while pharmaceuticals account for 5%. In the private service sector, wholesale account for 11%, while water transport tops the list accounting for 18% of exports. In total, these four industries alone thus accounted for 40% of total exports in 2009.

### **The IntERACT aggregation of industries strikes a balance**

The present IntERACT industry aggregation consists of 17 industries and industry groups. The aggregation strikes a balance between the need for detailed information on industry energy consumption and energy production, while keeping the level of disaggregation tractable. The aggregation may be updated and refined in the future, as the need arises and / or data becomes available.

## Annex A – Comparison of different mappings of the 117 industries of the national accounts.

- NR36a2 is a standard mapping in the national accounts system.
- IntERACT3 is the mapping used in the spring 2014 versions of the IntERACT model.
- EMMA is the mapping used in the EMMA model (cf. EMMA 10, ENS 2010).

Danish Industries	English names	NR36a2	IntERACT3	EMMA (Danish industry name)
010000	Agriculture and horticulture	Agriculture, forestry, fishing	Agriculture, forestry, fishing, gravel & stone	Landbrug og gartneri, skovbrug, indvinding af grus og sten
020000	Forestry	Agriculture, forestry, fishing	Agriculture, forestry, fishing, gravel & stone	Landbrug og gartneri, skovbrug, indvinding af grus og sten
030000	Fishing	Agriculture, forestry, fishing	Agriculture, forestry, fishing, gravel & stone	Fiskeri
060000	Extraction of oil and gas	Mining and quarrying	Extraction of oil and gas	Indvinding af olie og gas
080090	Extraction of gravel and stone	Mining and quarrying	Agriculture, forestry, fishing, gravel & stone	Landbrug og gartneri, skovbrug, indvinding af grus og sten
090000	Mining support service activities	Mining and quarrying	Extraction of oil and gas	Indvinding af olie og gas
100010	Production of meat and meat products	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
100020	Processing and preserving of fish	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
100030	Manufacture of dairy products	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
100040	Manufacture of grain mill and bakery products	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
100050	Other manufacture of food products	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
110000	Manufacture of beverages	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
120000	Manufacture of tobacco products	Manufacture of food and tobacco	Food, beverages, tobacco	Nærings- og nydelsesmiddel
130000	Manufacture of textiles	Textiles and leather products	Other commodity production	Anden fremstilling
140000	Manufacture of wearing apparel	Textiles and leather products	Other commodity production	Anden fremstilling
150000	Manufacture of leather and footwear	Textiles and leather products	Other commodity production	Anden fremstilling
160000	Manufacture of wood and wood products	Wood and paper products	Other commodity production	Anden fremstilling
170000	Manufacture of paper and paper products	Wood and paper products	Concrete, glass, paper	Anden fremstilling
180000	Printing etc.	Wood and paper products	Other commodity production	Anden fremstilling

Danish Industries	English names	NR36a2	IntERACT3	EMMA (Danish industry name)
190000	Oil refinery etc.	Oil refinery etc.	Oil refinery	Olieraffinaderier
200010	Manufacture of basic chemicals	Manufacture of chemicals	Other commodity production	Kemisk industri
200020	Manufacture of paints and soap etc.	Manufacture of chemicals	Other commodity production	Kemisk industri
210000	Pharmaceuticals	Pharmaceuticals	Other commodity production	Kemisk industri
220000	Manufacture of rubber and plastic products	Manufacture of plastic, glass	Other commodity production	Kemisk industri
230010	Manufacture of glass and ceramic products	Manufacture of plastic, glass	Concrete, glass, paper	Glas- og keramik industri
230020	Manufacture of concrete and bricks	Manufacture of plastic, glass	Concrete, glass, paper	Fremstilling af cement, mursten, mv
240000	Manufacture of basic metals	Basic metals, metal products	Other commodity production	Jern- og stålværker
250000	Manufacture of fabricated metal products	Basic metals, metal products	Other commodity production	Maskin- og transportmiddel-industri
260010	Manufacture of computers and communication equipment etc.	Manufacture of electronics	Other commodity production	Maskin- og transportmiddel-industri
260020	Manufacture of other electronic products	Manufacture of electronics	Other commodity production	Maskin- og transportmiddel-industri
270010	Manufacture of electric motors, etc.	Electrical equipment	Other commodity production	Maskin- og transportmiddel-industri
270020	Manufacture of wires and cables	Electrical equipment	Other commodity production	Maskin- og transportmiddel-industri
270030	Manufacture of household appliances, lamps, etc.	Electrical equipment	Other commodity production	Maskin- og transportmiddel-industri
280010	Manufacture of engines, windmills and pumps	Manufacture of machinery	Other commodity production	Maskin- og transportmiddel-industri
280020	Manufacture of other machinery	Manufacture of machinery	Other commodity production	Maskin- og transportmiddel-industri
290000	Manufacture of motor vehicles and related parts	Transport equipment	Motor vehicles - purchase and repair	Maskin- og transportmiddel-industri
300000	Manufacture of ships and other transport equipment	Transport equipment	Other commodity production	Maskin- og transportmiddel-industri
310000	Manufacture of furniture	Manufacture of furniture etc.	Other commodity production	Anden fremstilling
320010	Manufacture of medical instruments, etc.	Manufacture of furniture etc.	Other commodity production	Maskin- og transportmiddel-industri
320020	Manufacture of toys and other manufacturing	Manufacture of furniture etc.	Other commodity production	Anden fremstilling
330000	Repair and installation of machinery and equipment	Manufacture of furniture etc.	Other commodity production	Maskin- og transportmiddel-industri
350010	Production and distribution of electricity	Electricity, gas, and steam	Electricity production & distribution	Energi og fjernvarmeforsyning
350020	Manufacture and distribution of gas	Electricity, gas, and steam	Gas manufacturing & distribution	Energi og fjernvarmeforsyning
350030	Steam and hot water supply	Electricity, gas, and steam	Steam and hot water supply	Energi og fjernvarmeforsyning
360000	Water collection, purification and supply	Water, sewerage, and waste	Other utilities	Energi og fjernvarmeforsyning

Danish Industries	English names	NR36a2	IntERACT3	EMMA (Danish industry name)
370000	Sewerage	Water, sewerage, and waste	Other utilities	Øvrige tjenesteydende erhverv
383900	Waste management and materials recovery	Water, sewerage, and waste	Other utilities	Øvrige tjenesteydende erhverv
410009	Construction of new buildings	Construction	Construction	Bygge og anlæg
420000	Civil engineering	Construction	Construction	Bygge og anlæg
430003	Professional repair and maintenance of buildings	Construction	Construction	Bygge og anlæg
430004	Own-account repair and maintenance of buildings	Construction	Construction	Bygge og anlæg
450010	Sale of motor vehicles	Whole sale and retail trade	Motor vehicles - purchase and repair	Handel mv
450020	Repair and maintenance of motor vehicles etc.	Whole sale and retail trade	Motor vehicles - purchase and repair	Handel mv
460000	Wholesale	Whole sale and retail trade	Private service industries	Handel mv
470000	Retail sale	Whole sale and retail trade	Private service industries	Handel mv
490010	Passenger rail transport, interurban	Transportation	Trains, buses, taxis	Landtransport
490020	Transport by suburban trains, buses and taxi operation, etc.	Transportation	Trains, buses, taxis	Landtransport
490030	Freight transport by road and via pipeline	Transportation	Freight by road & pipeline, water and air transport, support activities and postal	Landtransport
500000	Water transport	Transportation	Freight by road & pipeline, water and air transport, support activities and postal	Skibsfart
510000	Air transport	Transportation	Freight by road & pipeline, water and air transport, support activities and postal	Luftfart
520000	Support activities for transportation	Transportation	Freight by road & pipeline, water and air transport, support activities and postal	Landtransport
530000	Postal and courier activities	Transportation	Freight by road & pipeline, water and air transport, support activities and postal	Landtransport
550000	Hotels and similar accommodation	Accommodation, food service	Private service industries	Hotel, herunder forlystelser
560000	Restaurants	Accommodation, food service	Private service industries	Hotel, herunder forlystelser
580010	Publishing	Publishing, TV, and radio	Private service industries	Kontorer, herunder finansiel sektor
580020	Publishing of computer games and other software	Publishing, TV, and radio	Private service industries	Kontorer, herunder finansiel sektor
590000	Motion picture and television programme production, and sound recording activities	Publishing, TV, and radio	Private service industries	Kontorer, herunder finansiel sektor

Danish Industries	English names	NR36a2	IntERACT3	EMMA (Danish industry name)
600000	Radio and television broadcasting	Publishing, TV, and radio	Private service industries	Kontorer, herunder finansiel sektor
610000	Telecommunications	Telecommunications	Private service industries	Kontorer, herunder finansiel sektor
620000	Information technology service activities	IT and information service	Private service industries	Kontorer, herunder finansiel sektor
630000	Information service activities	IT and information service	Private service industries	Kontorer, herunder finansiel sektor
640010	Monetary intermediation	Financial and insurance	Private service industries	Kontorer, herunder finansiel sektor
640020	Mortgage credit institutes, etc.	Financial and insurance	Private service industries	Kontorer, herunder finansiel sektor
650000	Insurance and pension funding	Financial and insurance	Private service industries	Kontorer, herunder finansiel sektor
660000	Other financial activities	Financial and insurance	Private service industries	Kontorer, herunder finansiel sektor
680010	Buying and selling of real estate	Real estate, rent. of non-res. b.	Private service industries	Øvrige tjenesteydende erhverv
680023	Renting of residential buildings	Dwellings	Dwelling	Øvrige tjenesteydende erhverv
680024	Owner-occupied dwellings	Dwellings	Dwelling	Øvrige tjenesteydende erhverv
680030	Renting of non-residential buildings	Real estate, rent. of non-res. b.	Private service industries	Øvrige tjenesteydende erhverv
690010	Legal activities	Consultancy etc.	Private service industries	Øvrige tjenesteydende erhverv
690020	Accounting and bookkeeping activities	Consultancy etc.	Private service industries	Øvrige tjenesteydende erhverv
700000	Business consultancy activities	Consultancy etc.	Private service industries	Øvrige tjenesteydende erhverv
710000	Architectural and engineering activities	Consultancy etc.	Private service industries	Øvrige tjenesteydende erhverv
720001	Scientific research and development (market)	Research and development	Private service industries	Øvrige tjenesteydende erhverv
720002	Scientific research and development (non-market)	Research and development	Public services industries	Off. adm, undervisn., sundhed
730000	Advertising and market research	Advertising and other services	Private service industries	Øvrige tjenesteydende erhverv
740000	Other technical business services	Advertising and other services	Private service industries	Øvrige tjenesteydende erhverv
750000	Veterinary activities	Advertising and other services	Private service industries	Øvrige tjenesteydende erhverv
770000	Rental and leasing activities	Travel agent, cleaning, etc.	Private service industries	Øvrige tjenesteydende erhverv
780000	Employment activities	Travel agent, cleaning, etc.	Private service industries	Øvrige tjenesteydende erhverv
790000	Travel agent activities	Travel agent, cleaning, etc.	Private service industries	Landtransport
800000	Security and investigation activities	Travel agent, cleaning, etc.	Private service industries	Øvrige tjenesteydende erhverv
810000	Services to buildings, cleaning and landscape activities	Travel agent, cleaning, etc.	Private service industries	Øvrige tjenesteydende erhverv
820000	Other business service activities	Travel agent, cleaning, etc.	Private service industries	Øvrige tjenesteydende erhverv

Danish Industries	English names	NR36a2	IntERACT3	EMMA (Danish industry name)
840010	Public administration	Public adm., defence etc.	Public services industries	Off. adm, undervisn., sundhed
840021	Rescue service ect. (market)	Public adm., defence etc.	Private service industries	Øvrige tjenesteydende erhverv
840022	Defence, public order, security and justice activities (non-market)	Public adm., defence etc.	Public services industries	Off. adm, undervisn., sundhed
850010	Primary education	Education	Public services industries	Off. adm, undervisn., sundhed
850020	Secondary education	Education	Public services industries	Off. adm, undervisn., sundhed
850030	Higher education	Education	Public services industries	Off. adm, undervisn., sundhed
850041	Adult and other education (market)	Education	Private service industries	Øvrige tjenesteydende erhverv
850042	Adult and other education (non-market)	Education	Public services industries	Off. adm, undervisn., sundhed
860010	Hospital activities	Human health activities	Public services industries	Off. adm, undervisn., sundhed
860020	Medical and dental practice activities	Human health activities	Private service industries	Øvrige tjenesteydende erhverv
870000	Residential care activities	Residential care	Public services industries	Off. adm, undervisn., sundhed
880000	Social work activities without accommodation	Residential care	Public services industries	Off. adm, undervisn., sundhed
900000	Theatres, concerts, and arts activities	Arts and entertainment ect.	Private service industries	Hotel, herunder forlystelser
910001	Libraries, museums and other cultural activities (market)	Arts and entertainment ect.	Private service industries	Hotel, herunder forlystelser
910002	Libraries, museums and other cultural activities (non-market)	Arts and entertainment ect.	Public services industries	Off. adm, undervisn., sundhed
920000	Gambling and betting activities	Arts and entertainment ect.	Private service industries	Hotel, herunder forlystelser
930011	Sports activities (market)	Arts and entertainment ect.	Private service industries	Hotel, herunder forlystelser
930012	Sports activities (non-market)	Arts and entertainment ect.	Public services industries	Off. adm, undervisn., sundhed
930020	Amusement and recreation activities	Arts and entertainment ect.	Private service industries	Hotel, herunder forlystelser
940000	Activities of membership organizations	Other service activities	Private service industries	Øvrige tjenesteydende erhverv
950000	Repair of personal goods	Other service activities	Private service industries	Øvrige tjenesteydende erhverv
960000	Other personal service activities	Other service activities	Private service industries	Øvrige tjenesteydende erhverv
970000	Activities of households as employers of domestic personnel	Households as employers	Private service industries	Øvrige tjenesteydende erhverv