5. The expenditure approach

5.0 GDP according to the expenditure approach

For 2012, the calculation of expenditure-based GDP can be summarised as in table 5.1 below:

Table 5.1 GDP, expenditure approach, 2012

	DKK mill.	pct. of GDP
Total final consumption expenditure	1 410 337	74.9
Household final consumption expenditure	877 971	46.6
NPISH final consumption expenditure	30 731	1.6
General government final consump. expenditure	501 635	26.6
Gross capital formation	370 127	19.7
Gross fixed capital formation	356 786	19.0
Changes in inventories	9 851	0.5
Acquisitions less disposals of valuables	3 490	0.2
Exports of goods and services	1 008 578	53.6
Imports of goods and services	906 417	48.1
GDP	1 882 625	

The table shows that household final consumption expenditure in Denmark made up a little less than half of GDP in 2012, general government final consumption expenditure a good quarter, gross capital formation one-fifth and net exports the final 5.4%. Exports of goods and services accounted for 53.6% and imports 48.1%.

5.1 The reference framework

The most important sources for the estimate of the components of expenditure-based GDP are the following:

Household final consumption expenditure:
Retail trade statistics, DOI (level of retailable consumption)
The FU [household budget survey] (structure of retailable consumption, services)
VAT statistics
Register of housing-related social benefits (Boligstøtteregister)
Housing surveys (housing stock, stratified)
Energy statistics (electricity, gas, district heating)
Statistics on financial institutions (financial services)
Statistics on public finances (user payments to public institutions)
Tax statistics (quantities of goods on which excise duties are levied)
Supply side estimates
Motor vehicle statistics (households' acquisitions of new cars)
Balance of payments statistics (tourist revenue and expenditure)

Final consumption expenditure in NPISHs:
Financial statements from NPISH organisations
General Government Accounts (Private schools who were formerly part of general government)

Gross fixed capital formation:
Agricultural statistics
Public finance statistics
Accounts statistics for industries predominated by public corporations
Register of buildings and dwellings (BBR)
Index of construction costs
Product statistics for the IT industries
ICT expenditure
External trade statistics
Account statistics for non-agricultural private sector
Specific industry statistics

Media statistics
Register of motor vehicles
Register of vessels
Register of aircrafts

Research and Development
R&D statistics
External trade statistics

Acquisitions less disposals of valuables:
Industrial commodity statistics
External trade statistics
Household budget survey (FU)

Changes in inventories:
Account statistics for non-agricultural private sector
Tax accounts
Accounting statistics for industries where public corporations predominate
Specific industry statistics, including agricultural statistics
Energy statistics
Agricultural statistics

Imports and exports of goods and services:
External trade statistics (Intrastat and Extrastat)
Balance of payments statistics

For some consumption groups of household final consumption expenditure, more than one source is available. In these cases, an assessment of which source is the most reliable for estimating the variable (consumption group) has been made. The assessment mainly relates to whether the household budget survey (FU) should be replaced by another source.

It is widely known that information in the household budget survey is surrounded by a good deal of uncertainty when it comes to items based on households' own accounting, i.e. in general small items of expenditure, as opposed to those items where an interviewer notes expenditure as evidenced by supporting documents, which are typically the larger items. When the survey is processed, everything possible is done to eliminate any bias resulting from differential non-response. However, it must be admitted, that there is a good deal of uncertainty surrounding the figures which households themselves have recorded.

Against this background, the main rule in the Danish national accounts has been that wherever possible the FU has been replaced by other information to *determine levels*, but it is widely used to determine the structure of expenditure – for the breakdown of food consumption into individual foodstuffs, for example. In various important cases, the FU is the only available source, but in the vast majority of such cases the items concerned are consumption items where, firstly, an interviewer has recorded expenditure from the household's supporting documents and, secondly, the expenditure concerned is common to virtually all households. These two circumstances are characteristic of those items in the survey which can be determined with a good deal of certainty. The fact that an interviewer has seen the supporting documents – telephone bills, for example – rules out the risk of items being forgotten, and the fact that this is general, recurrent expenditure for almost all households means that the sampling uncertainty for the items in question is relatively low. In these cases, FU figures are quite justifiably used to determine levels in the national accounts.

For retailable consumption, i.e. that share of private final consumption which passes through retail trade, the FU figures are replaced by retail sales figures which must be considered a much better statistical source for determining levels of private consumption. But this source is not sufficiently detailed to enable it to be used as the basis for the breakdown of expenditure into the national accounts consumption groups. The FU figures are therefore used to divide the aggregate groups from retail sales statistics into the detailed consumption groups. For this breakdown, the FU figures for the consumption of alcohol and tobacco etc. are replaced by figures based on tax/duty-adjusted quantities. For these expenditure items, the FU figures are known to be very much underestimated.

For energy products and acquisitions of motor vehicles, there is special information available based on physical data. In these cases, the FU figures are replaced either when the initial estimates of private consumption of the expenditure components in question are made, or later during the balancing process. The FU figures for the consumption of hotel and restaurant services are also known to be seriously underestimated. For these groups, the initial household consumption estimate is therefore based on supply, i.e. sales in hotels and restaurants, the starting point being that share of the supply which was allocated to household consumption in the most recent final national accounts. A detailed description of sources and methods underlying the initial estimates for the individual consumption groups can be found in Section 5.7.

5.2 The border line cases

5.2.1 The borderline cases for HFCE

Household final consumption expenditures on dwelling services are covered by two consumption groups 04100 Rents and 04200 Imputed rents for owner-occupiers. Both these groups are based on supply side estimates. Thus the production value of industry 680023 Renting of residential buildings, is also the HFCE value for consumption group 04100, and the production value of industry 680024, Owner-occupied dwellings, is also the value of consumption group 04200, imputed rents for owner-occupiers.

Wages and salaries include all income received by employed persons including income in kind. The Danish tax authorities generally do not distinguish between income in cash and income in kind. In general the data on wages and salaries received from the tax authorities include salary in kind. There are some special cases where salaries in kind are not part of the taxable income and therefore not included in the data from the tax authorities, e.g. internet connections with access to the company network. In these cases a supplementary calculations is made to account for this. Also in some case the taxable value of a fringe benefit is lower than the market value. In these cases a mark-up is calculated to reflect the market value when calculating the value of the fringe benefit.

In the agriculture industry there are additions to the production of livestock, milk and eggs to account for the retained consumption of these products by members of the household. These mark-ups are then recorded as consumption in the relevant consumption groups.

Materials for minor repairs to and interior decoration of dwellings of are covered by the household budget survey (FU), where there are questions regarding a series of purchases related to these activities e.g. wallpaper, paints and other materials for maintenance work.

The value of any goods purchased under hire-purchase agreements is included in the estimate of HFCE as the source of the level of HFCE is based on the retail turn-over statistics, which record the sale of retail goods to households including sales that are made under hire-purchase agreements.

In the household budget survey there are specific questions regarding the purchase and sales of used/second hand goods for durable and semi-durable goods. This enables us to estimate correctly the net purchase of these types of goods. For non-durables the purchase and sales of second hand goods negligible and therefore these are not considered important.

For information regarding the calculation of FISIM, insurance services used for HFCE, the implicit service charge for pension funding services and direct payments from insurer to repairer please refer to chapters 5.7.3 and 3.4. All of these calculations are made in a special subsystem, where detailed information on e.g. insurance is available. This facilitates the distribution of insurance to household final consumption and intermediate consumption respectively thus ensuring that the part of insurance paid by the consumers (e.g. home insurance) is actually recorded as HFCE. The calculations are based on accounts from insurance and financial institutions which facilitate the calculation of the implicit service charge as detailed information on premiums and claims.

Car registration taxes are part of product taxes. The car registration tax is placed on a handful of goods in the SUT namely V870303 Passenger Cars, V870305 Used passenger cars, V870410 Trucks less than 5 tons and V871103 Motorcycles and mopeds. Apart from V870410 Trucks less than 5 tons these goods are for a big part

going to private household consumption and thus the car registration taxes are also being placed as household consumption.

From the public accounts division a data file is received with the public sector accounts coded according to national accounts definitions. This general government accounts statistics contains information on among other expenditures by type, i.e. transfers in kind e.g. have a special code in the accounts as does service charges etc. In the SUT the service charges are placed on special products labelled sales income (Salgsindtægter in Danish) and they are on the use side being recorded as intermediate consumption or HFCE. The expenditures labelled social transfers in kind are used to establish the totals for general government final consumption in the SUT. The detailed information thus available ensures the proper allocation of the items from the general government accounts. The detailed information also insures that taxes are not treated as HFCE.

In the SUT the production of NPISH is placed on separate product numbers. The production of these products is then recorded as NPISH final consumption thereby ensuring they are not recorded as HFCE.

5.2.2 The borderline cases for GFCF

Information on changes in livestock used in production year after year is available from the agricultural accounts produced within Statistics Denmark and these are used for GFCF for livestock.

Information in the changes in trees that are cultivated year after year is available from the publication Forest and plantations (in Danish Skove og plantager) from University of Copenhagen. Information on increments in growing stocks is only available every 4 to 5 years. When this information is not available the average increment in the last period is used.

For the borderline cases concerning please refer to chapters 3 and 5.10.

5.3 Valuation

When the final demand components are estimated directly from the point of view of the purchaser, the observed value level is purchasers' prices including non-refundable VAT, as required by the ESA2010. In these cases, there is no need to process primary data to obtain value levels. In all other cases, for example when a final demand component is estimated from the supply side, it is ensured that proper trade margins, product taxes and -subsidies and VAT are included. This is typically done as part of setting up product balances.

For own-produced products the value is calculated as the sales price of the product times the volume. For instance in the case of the consumption of own-produced eggs the value is calculated as the volume of own-produced eggs times the price the farmer receives when selling his eggs thus ensuring the price level being basic prices.

Data on gross fixed capital formation is taken form accounting statistics. Data is thus readily available in purchasers’ prices and there is no need for additional corrections. Regarding own account gross fixed capital formation the international recommendations in the Frascati manual is applied ensuring the correct valuation of these.

In the national accounts, exports of goods are based directly on Statistics Denmark’s estimates of external trade. The value levels in external trade statistics are f.o.b. for exports and c.i.f. for imports. Please refer to sections 5.13-5.16 and section 10.4 for further information

5.4 Transition from private accounting and administrative concepts to ESA2010 national accounting concepts

In household and business accounts, purchases of goods and services are recorded in terms of purchasers' prices including non-refundable VAT. Refundable VAT is not included in the acquisition prices, on which information is available, which is consistent with the ESA 2010 net VAT system.

Various acquisitions which the national accounts treat as gross fixed capital formation are included in business accounts as current operating expenditure in the form of intermediate consumption or wages and salaries which

are not capitalised. Examples would be consumables as well as purchased and own-produced software. The corrections which have to be made to bring business accounts into line with national accounts concepts were described in Chapter 3 as part of the description of the output-based estimate of GDP. The corrections on the expenditure side are a mirror image of the corrections to output value (e.g. own-produced software) and intermediate consumption (consumables and purchased software) in the output-based estimate. The logical corrections to the output, expenditure and income sides are made simultaneously for the intermediate system, as described in chapter 3.4. Regarding the valuation of inventories please refer to chapters 3.4 and 5.11.

5.5 The role of direct and indirect estimation methods and of benchmarks and extrapolations

By far the largest share of expenditure-based GDP is calculated using a direct estimate. The most important exceptions are household consumption of hotel and restaurant services, dwelling services, consumption in NPISH, which are all calculated indirectly from the supply side.

Other than for those areas of the economy (general government, owner-occupied dwellings, NPISH), where the output- and expenditure-based calculations cannot by definition be independent, GDP from the production side and GDP from the expenditure side are largely independent of one another prior to balancing.

Acquisitions less disposables can in principle be estimated in two ways, either directly using information on the expenditure (uses) side (purchaser's side) or indirectly on the basis of supplies of products to the domestic market, using estimated shares of supplies to the final demand components to calculate final uses from the resources side.

In the Danish national accounts, the initial estimates for the final demand components are compiled as direct estimates from the expenditure side.

Since the Danish national accounts are adjusted in a detailed product balance system, there is a systematic confrontation in connection with the balancing. One of the strongest cross-checks for the compilation of national accounts consists in comparing information from purchasers on their acquisitions less disposals of the individual products or groups of products with information on the sellers' side on supplies to the domestic market.

Regarding the estimation of black economy data are based on survey data obtained from supplementary questions asked once a year in connection with the LFS. Please refer to chapter 7 for more details.

Table 5.2 Estimation method used for GDP expenditure approach, 2012

	Survey censuses	Adm. Records	Combined data	Benchm. extrapol.	Commodity Flow Model	CFC (PIM)	Dwellings Stratific. Method	FISIM	Other E&M	Other	Total
	DKK mill.										
National account industry											
Househ. final consumpt. exp.	342 932	78 622	0	0	243 997	0	173 002	0	0	0	838 553
01 – Food and non-alc. bev.	79 301	19 186	0	0	0	0	0	0	0	0	98 487
02 – Alc. bev., tobacco and narc.	0	29 299	0	0	0	0	0	0	0	0	29 299
03 – Clothing and footwear	38 747	0	0	0	0	0	0	0	0	0	38 747
04 – Housing, water elect. etc.	4 636	0	0	0	79 651	0	173 002	0	0	0	257 290
05 – Furnishings etc.	39 314	0	0	0	1 727	0	0	0	0	0	41 042
06 - Health	22 114	0	0	0	3 962	0	0	0	0	0	26 075
07 – Transport	36 304	30 137	0	0	27 176	0	0	0	0	0	93 617
08 - Communication	17 971	0	0	0	0	0	0	0	0	0	17 971
09 – Recreation and culture	80 260	0	0	0	12 678	0	0	0	0	0	92 938
10 – Education	0	0	0	0	6 513	0	0	0	0	0	6 513
11 – Restaurants and hotels	0	0	0	0	42 761	0	0	0	0	0	42 761
12 – Misc. Goods and services	24 480	0	0	0	69 528	0	0	0	0	0	94 009
NPISH final consumpt. exp.	0	7 823	22 115	0	0	793	0	0	0	0	30 731
Gen. gov. final consumpt. exp.	0	423 777	0	0	0	55 926	0	0	0	0	479 703
Gross fixed capital formation	83 758	71 103	90 547	7 426	3 528	0	0	0	104 288	-714	359 936
111 Dwellings	0	0	0	0	0	0	0	0	76 578	0	76 578
112 Other buildings and struct.	25 118	37 496	24 525	118	0	0	0	0	0	-3051	84 206
113 Machinery and equipm.	20 141	11 714	66 022	7 308	0	0	0	0	0	0	105 185
114 Weapon systems	0	1 462	0	0	0	0	0	0	0	0	1 462
115 Cultivated biol. resources	-77	0	0	0	0	0	0	0	0	0	-77
117 Intell. property products	38 577	20 431	0	0	3 528	0	0	0	27 710	2 337	92 583
Changes in inventories	4 331	0	-3 663	0	0	0	0	0	126	-859	-66
- materials and supplies	1 382	0	-3 273	0	0	0	0	0	126	-859	- 2 624
- work-in-progress	1 189	0	0	0	0	0	0	0	0	0	1 189
- finished goods	0	0	-390	0	0	0	0	0	0	0	-390
- goods for resale	1 760	0	0	0	0	0	0	0	0	0	1 760
Acq. less disposals of valuables	0	0	0	0	3 490	0	0	0	0	0	3 490
Exports of goods and services	0	0	0	0	0	0	0	0	0		1 003 151
goods	0	0	0	0	0	0	0	0	0		613 324
services	0	0	0	0	0	0	0	0	0		389 827
Imports of goods and services	0	0	0	0	0	0	0	0	0		868 029
goods	0	0	0	0	0	0	0	0	0		528 678
services	0	0	0	0	0	0	0	0	0		339 351

5.6 The main approaches taken with respect to exhaustiveness

As regards the legitimate (as opposed to the black) economy excluding fringe benefits, the most important steps taken are corrections and supplements to the sources underlying the calculations of household consumption expenditure. Retail sales statistics do not cover all industries of retail trade. In the national accounts calculations, these statistics are therefore supplemented by VAT statistics to ensure that the whole of retail trade is covered, as described in section 5.7.

The calculations of fringe benefits, the black economy and illegal activities are discussed in chapter 7.

5.7 Household final consumption expenditure (HFCE)

5.7.1 Overview

Various sources are used to provide information on household final consumption expenditure. The two most important are:

- The retail index (Danish abbreviation DOI), which contains information on level of sales to private individuals, and
- The household budget survey (Danish abbreviation FU)

Section 5.7.2 describes in detail how the FU and DOI are combined and used to the three main groups of goods in DOI:

1. Food, beverages and tobacco and convenience goods
2. Clothing etc.
3. Other consumer goods.

For non-retail consumption, i.e. other goods and all services, the preferred source is in general the FU with a number of corrections. In cases where the FU is known to cause problems, supply statistics are used, i.e. supplies of certain product balances and the commodity flow method or alternatively, the balanced consumption group as in the early versions of the provisional national accounts.

Table 5.3 shows the main source, estimation method and value for each of the 74 consumption groups in the national accounts' most detailed consumption grouping. The estimation methods are described in section 5.7.2. The following abbreviations are used:

DOI:	Retail turnover index
FU:	Uncorrected household budget survey
FU corr.:	Household budget survey with certain – in most cases conceptual – corrections
FU + product:	Household budget survey plus a product balance
Supply:	Supply-side estimates using commodity flow method
FNR:	Balanced values for the latest provisional national accounts calculated in year t+1
BB:	Balance of payments statistics
Energy:	The energy sub-system which compiles supply and use of energy products

Table 5.3 Statistical sources for the national accounts estimates of household final consumption expenditure, 2012

		Source	Estimation method	Value
				DKK mill.
Consumption group				
01110	Bread and cereals	FU/DOI	Grossed up FU	13 354
01120	Meat	FU/DOI	Grossed up FU	21 265
01130	Fish	FU/DOI	Grossed up FU	3 753
01141	Eggs	FU/DOI	Grossed up FU	1 370
01142	Milk, cream, yoghurt etc.	FU/DOI	Grossed up FU	7 522
01143	Cheese	FU/DOI	Grossed up FU	5 076
01150	Oils and fats	FU/DOI	Grossed up FU	3 111
01167	Fruit and vegetables except potatoes	FU/DOI	Grossed up FU	14 373
01179	Potatoes etc.	FU/DOI	Grossed up FU	1 961
01181	Sugar	FU/DOI	Grossed up FU	601
01182	Ice cream, chocolate and confectionery	FNR	Balanced preliminary accounts	12 764
01190	Food products n.e.c.	FU/DOI	Grossed up FU	4 359
01210	Coffee, tea and cocoa	FU/DOI	Grossed up FU	3 864
01220	Mineral waters, soft drinks, fruit and vegetable juices	FNR	Balanced preliminary accounts	7 776
02112	Spirits and wine	FNR	Balanced preliminary accounts	9 941
02130	Beer	FNR	Balanced preliminary accounts	4 992
02900	Tobacco etc.	FNR	Balanced preliminary accounts	18 547
03113	Articles of clothing	FU/DOI	Grossed up FU	31 334
03140	Cleaning, repair and hire of clothing	FU corr	Corrected FU	457
03200	Footwear	FU/DOI	Grossed up FU	7 857
04100	Actual rentals for housing	Supply	Supply-side estimate	66 325
04200	Imputed rentals for housing	Supply	Supply-side estimate	108 821

Table 5.3 Statistical sources for the national accounts estimates of household final consumption expenditure, 2012, cont.

		Source	Estimation method	Value
				DKK mill.
04300	Maintenance and repair of the dwelling	FU	FU	7 447
04401	Water supply and sewerage services	FU	FU	13 994
04402	Refuse collection, other services n.e.c.	Supply	Supply-side estimate	6 546
04510	Electricity	Energy	Use in energy sub-system	22 709
04520	Gas	Energy	Use in energy sub-system	6 481
04530	Liquid fuels	Energy	Use in energy sub-system	4 780
04545	Hot water, steam etc.	Energy	Use in energy sub-system	22 645
05100	Furniture, furnishing, carpets etc.	FU/DOI	Grossed up FU	16 170
05200	Household textiles	FU/DOI	Grossed up FU	3 690
05312	Household appliances	FU/DOI	Grossed up FU	6 954
05330	Repair of major household appliances	FU	FU	440
05400	Glassware, tableware and household utensils	FU/DOI	Grossed up FU	4 601
05500	Tools and equipment for house and gardens	FU/DOI	Grossed up FU	4 192
05610	Non-durable household goods	FU/DOI	Grossed up FU	3 717
05620	Domestic services and home care services	Supply	Supply-side estimate	2 567
06112	Pharmaceutical products and other medical products	FU/DOI	Grossed up FU	7 780
06130	Therapeutic appliances and equipment	FU/DOI	Grossed up FU	3 463
06200	Out-patient services	FU		10 477
06300	Hospital services	Supply	Supply-side estimate	3 732
07100	Purchase of vehicles	FNR	Balanced preliminary accounts	29 910
07213	Maintenance and repair of vehicles	FU corr	Corrected FU	19 615
07220	Fuels and lubricants for personal transport equipment	Energy	Use in energy sub-system	26 794
07240	Other services in respect of personal transport equipment	FU corr	Corrected FU	11 396
07300	Transport services	FU corr	Corrected FU	12 436
08100	Postal services	FU corr	Corrected FU	317
08200	Telephone and data communication equipment	FU	FU	2 943
08300	Telephone and data communication services	FU	FU	15 301
09110	Radio and television sets etc.	FU/DOI	Grossed up FU	7 642
09120	Photographic equipment etc.	FU/DOI	Grossed up FU	1 398
09130	Data processing equipment	FU/DOI	Grossed up FU	7 056
09140	Recording media for pictures and sound	FU/DOI	Grossed up FU	2 247
09150	Repair of a/v and data processing equipment	FU	FU	823
09200	Other major durables for recreation and culture	FU/DOI	Grossed up FU	3 697
09300	Other recreational items and equipment, gardens and pets	FU/DOI	Grossed up FU	17 984
09400	Recreational and cultural services	FU corr	Corrected FU	31 626
09513	Books, newspapers, periodicals and misc. printed matter	FU/DOI	Grossed up FU	8 780
09530	Stationery and drawing materials etc.	FU/DOI	Grossed up FU	1 001
09600	Package holidays	Supply	Supply-side estimate	13 670
10000	Education	Supply	Supply-side estimate	6 571
11100	Catering services	FNR	Balanced preliminary accounts	41 789
11200	Accommodation services	FNR	Balanced preliminary accounts	7 001
12110	Hairdressing salons and personal grooming establishments	FU corr	Corrected FU	7 004
12123	Appliances, articles and products for personal care	FU/DOI	Grossed up FU	10 240
12310	Jewellery, clocks and watches	FU/DOI	Grossed up FU	1 677
12320	Other personal effects	FU/DOI	Grossed up FU	3 479
12401	Retirement homes, day-care centres etc.	Supply	Supply-side estimate	4 314
12402	Kindergartens, crèches etc.	Supply	Supply-side estimate	11 038
12500	Insurance	Supply	Supply-side estimate	19 789
12600	Financial services n.e.c.	Supply	Supply-side estimate	40 310
12700	Other services n.e.c.	FU + product	FU + product balance	8 289
99800	Final consumption of non-residents on the economic territory	BB	Balance of Payment data	-38 863
99900	Final consumption of residents in the ROW	BB	Balance of Payment data	38 894

5.7.2 Main data sources and their conversion to national accounts results

As stated in section 5.7.1, various sources are used to provide information on household final consumption expenditure, and the two most important are:

- The retail index (Danish abbreviation DOI), which contains information on level of sales to private individuals, and
- The household budget survey (Danish abbreviation FU)

Although the first of these sources is officially referred to as the "retail turnover index" (DOI), it is in fact a monthly estimate of the level of retail turnover. To calculate the index, turnover in the sample is grossed up to cover the total population of retail trade enterprises. The national account uses the DOI levels for compiling household consumption expenditure.

The DOI breaks down retail into three categories, namely:

- sales to private individuals
- sales to (market producers) enterprises
- sales to (non-market) public institutions

This breakdown is important, since only sales to private individuals are relevant to the estimate of household final consumption expenditure. If the only sales known were total sales in retail enterprises, the calculation would be less reliable. The minor share of sales reported as being to private individuals, but which are actually to sole proprietorships, and should therefore not be included are assumed for practical purposes to offset the minor share of sales from manufacturing and wholesale enterprises to private individuals, which also should be included in the estimate of household final consumption expenditure.

The main idea behind the calculation system is a breakdown of household consumption expenditure into groups by purpose/products, each group being calculated on the basis of the most reliable of the available sources, but in a way which seeks to make optimum use of all available information. The basic breakdown of household consumption expenditure is into retail and non-retail consumption expenditure. The former is the share of final consumption expenditure of goods which involves retail trade. In this context, retail trade excludes motor vehicles etc. and energy goods, which are not covered by the DOI.

Sales to private individuals as taken from the DOI are normally considered the best source of information on household final consumption expenditure. In particular, this source is not subject to the same sampling uncertainty and problems with the treatment of tourist expenditure and other possible skewness as the FU. The enterprises are sampled on the basis of yearly turnover, based on VAT-declarations to the Tax administrations. In the sample all enterprises with a turnover of more than 20 million DKK/year (ex VAT) are included. The remaining sample is based on stratified random selection. The total sample size was approximately 3.500 enterprises on 1 January 2014. The sample is renewed by 1/4 to 1/3 every year. The breakdown of goods in DOI is not very detailed. DOI breaks down sales into three main groups of goods:

1. food, beverages, tobacco and convenience goods (FD)
2. clothing etc (B)
3. other consumer goods (A)

For the national accounts, target totals have to be worked out at a much more detailed level. The next stage is therefore to use the FU to split the main groups of goods into subgroups. The view taken here is that the FU is essentially more reliable as a distribution key than as an estimate of levels. There are exceptions, however, where the FU is known to give a misleading picture of consumption expenditure.

Both the DOI and the FU is in purchasers' prices including VAT, i.e. the value relevant to household final consumption expenditure. Consequently, no valuation correction is needed.

The calculation for the national accounts consumption groups based on DOI and FU can be broken down in following steps:

Step 1: Link between the three main groups in DOI and the national accounts consumption groups

It is necessary to create a link between the three main groups from the DOI and the national accounts consumption groups. The following links were adopted between the national accounts consumption groups defined by purpose - c.f. Section 9.1, table 9.2 - and main groups of goods in the DOI:

FD - Food, beverages and tobacco, convenience goods:

01110 Bread and cereals
01120 Meat

01130 Fish
01141 Eggs
01142 Milk, cream, yoghurt etc.
01143 Cheese
01150 Oils and fats
01167 Fruit and vegetables except potatoes
01181 Sugar
01182 Ice cream, chocolate and confectionery
01190 Food products n.e.c.
01210 Coffee, tea and cocoa
01220 Mineral water, soft drinks, fruit and vegetable juices
02112 Spirits and wine
02130 Beer
02900 Tobacco etc.
05610 Non-durable household goods
12123 Appliances, articles and products for personal care

B - Clothing:
03113 Articles of clothing
03200 Footwear

A - Other consumer goods
05100 Furniture, furnishing, carpets etc.
05200 Household textiles
05312 Household appliances
05400 Glass, tableware and household utensils
05500 Tools and equipment for house and garden
06112 Pharmaceutical products and other medical products
06130 Therapeutic appliances and equipment
09110 Radio and television sets etc.
09120 Photographic equipment etc.
09130 Data processing equipment
09140 Recording media for pictures and sound
09200 Other major durables for recreation and culture
09300 Other recreational items and equipment, gardens and pets
09514 Books, newspapers, periodicals and misc. printed matter
09530 Stationery and drawing materials etc.
12310 Jewellery, clocks and watches
12320 Other personal effects

Step 2: Adding retail trade industries not covered by DOI and deducting goods used as input in construction

The DOI does not cover all retail trade industries (outside the motor vehicle group and energy). As a first step, the missing DK-NACE retail trade industries are identified and their VAT sales are used instead. VAT sales multiplied by one plus the VAT rate is as a general rule assumed to be equivalent to DOI sales to private consumers. The following detailed NACE industries are used:

43.21.00 Electrical installation
47.41.00 Retail sale of computers, peripheral units and software in specialized stores
47.42.00 Retail sale of telecommunications equipment in specialized stores
47.52.10 Retail sales of paints, varnishes and lacquers
47.52.20 DIY centres and tool stores
47.59.40 Retail sale of musical instrument
47.59.90 Retail sale of furniture, lighting equipment and household articles n.e.c. in specialized stores
47.65.00 Retail sale of games and toys in specialized stores
47.73.00 Dispensing chemist in specialized stores
47.74.00 Retail sale of medical and orthopaedic goods in specialized stores
47.76.30 Retail sale of pet animals and pet food

47.78.40 Activities of commercial art galleries
47.78.90 Retail sale of other goods n.e.c.
47.81.00 Retail sale via stalls and markets of foods, beverages and tobacco products
47.82.00 Retail sale via stalls and markets of textiles, clothing and footwear
47.89.00 Retail sale via stalls and markets of other goods

The major part of these industries are used in full, however there are some exceptions as described below:

For the very large industry 47.41.00 Retail sale of computers, peripheral units and software in specialized stores, it is assumed that only 85% of VAT sales are to private consumers. This percentage is based on the high level of household consumption of PCs which emerged from the FU over a number of years, an item which is subject to a great deal of sampling uncertainty in any given year.

The DOI covers “do-it-yourself centres” (DIY centres) and paint and wallpaper shops. Most sales in these units, however, are goods used for input in construction and not household consumption expenditure. Only 5% of sales are assumed to be household consumption expenditure and the remaining 95% to be input in construction. The latter share, including VAT, is deducted from sales to households as consumers according to DOI on the basis of VAT sales in 47.52.10 Retail sales of paints, varnishes and lacquers and 47.52.20 DIY centres and tool stores. However, with these percentages it should be remembered that all materials for repair and maintenance of buildings in the Danish national accounts are channelled through the special materials industry 430004, as described in chapter 3.12. The shares of expenditure on materials, which goes to ordinary minor repair and maintenance of dwellings, and which is normally the responsibility of tenants, and the corresponding share for owner-occupiers, are lumped together under consumption in households under the product balance "building repairs".

Step 3: Grossing up the household budget survey

For any given year, the FU is grossed up by the national accounts division using the method recommended by the primary statistics division. The Danish FU includes a correction for differential non-response in the individual strata. The reason is that in Denmark it is possible to use income information from register data relating to households in the sample, thus ensuring that all income groups are correctly represented in the grossing up.

Step 4: National accounts coding of the FU and extra grossing up

A key is established to convert from the FU product codes to the national accounts consumption groups and the grossed up FU is aggregated to consumption groups. A correction is also made for definitional differences between the national accounts and the FU (insurance, gambling, etc.). There is then an extra grossing up to correct for any skewness in the FU's average household size and persons not living in households. The correction factor is calculated as the average number of persons in the country in the reference year divided by the number of persons covered by the FU.

The “extra grossed up FU” is used as the only source and without any further adjustments for consumption groups:

04300 Maintenance and repair of dwelling
04401 Water supply and sewerage services
05330 Repair of major household appliances
08200 Telephone and data communication equipment
08300 Telephone and data communication services
09150 Repair of a/v and data processing equipment

Step 5: Creating a distribution for the DOI, supplemented and corrected for, and for the FU

For each of the three main groups of goods in DOI, the initial estimate is equal to the value of retail sales to private consumers taken from the DOI as supplemented and corrected. Within each of the main groups of goods, the totals are distributed over the individual consumption groups as shown in step 1 in proportion to the FU distribution (the extra grossed up FU from step 4. The FU figures are grossed up/down so that the totals match the supplemented and corrected DOI. But five groups where the FU figures are systematically skew are not included. These are 01182 Ice cream, chocolate and confectionary, 01220 Mineral waters, soft drinks, fruits and vegetable juices, 02112 Spirits and wine, 02130 Beer and 02900 Tobacco etc.

Figures are added for farmers' consumption of own products and direct sales to private consumers in consumption groups 01120 Meat, 01141 Eggs and 01142 Milk, cream, yoghurt, etc. The source is agricultural statistics. The consumption of own products by other economic operators, as assessed for tax purposes, is considered to be covered via the DOI's VAT-based grossing up. During a subsequent step, there is an allowance for fringe benefits, black and illegal activity.

Step 6: Initial values based on the provisional national accounts

The following consumption groups initial value is based on the provisional accounts calculated in year t+1:

01182 Ice cream, chocolate and confectionary
01220 Mineral waters, soft drinks, fruit and vegetable juices
02112 Spirits and wine
02130 Beer
02900 Tobacco etc.
07100 Purchase of vehicles

The goods covered by these consumption groups are all imposed by product taxes, and information about the taxed quantities combined by the tax rules are the basis for the estimates of household consumption. When the provisional accounts are less detailed, they are broken down to the detailed final accounts consumption groups using the latest final year.

Step 7: Allocation of consumption of non-resident (tourist income)

When the target totals are calculated on the basis of the FU, purchases by foreign tourists in Denmark is not included in the consumption expenditure on the economic territory. In order to incorporate this expenditure in the relevant consumption groups a correction is made on the basis of input/output multipliers. The following consumption groups based on the FU are corrected for tourist expenditure:

03140 Cleaning, repair and hire of clothing.
06200 Out-patient services
07213 Maintenance and repairs of mother vehicles
07240 Other services in respect of personal transport equipment
07300 Transport services
08100 Postal services
09400 Recreational and cultural services

Step 8: Consumption groups estimated from the supply side

For various consumption groups, the best initial estimate is obtained by using supply values either directly or as a supplement to the FU. In some of these groups household final consumption is the only - or at least the dominant - domestic use of the products in question; within insurance and financial services, household final consumption is determined in the subsystems in which the entire balances of supply and use are compiled for each product. The following consumption groups are covered by supply side estimates:

04100 Actual rentals for housing
04200 Imputed rentals for housing
05620 Domestic services and home care services
06300 Hospital services
09600 Package holidays
10000 Education
12401 Retirement homes, day-care centres etc.
12402 Kindergartens, crèches etc.
12500 Insurance
12600 Financial services n.e.c.

Step 9: Water and energy

Initial estimates for the consumption groups are obtained from the products balances for energy products compiled in the special “energy sub system”:

04510 Electricity
04520 Gas
04530 Liquid fuels
04545 Hot water, steam etc.
07220 Fuels and lubricants for personal transport equipment

Step 10: Tourist expenditure and –income

Consumption groups 99800 (P34) Final consumption of non-residents on the economic territory and 99900 (P33) Final consumption of residents in the ROW, which is the same as tourist income and –expenditure, are given from the balance of payment import and export of services, that are described in sections 5.14 and 5.16.

Step 11: Inclusion of fringe benefits, black and illegal activity

After the above described calculations, fringe benefits and expenditure on black and illegal activities are added to relevant consumption groups. There is no explicit adjustment made to exclude items used as intermediate consumption of producers of illegal activities, since this is assumed to be a minor issue. The calculation of fringe benefits, black and illegal activities is described in section 7.

Step 12: Balancing correction based on experience

Finally, the values for the individual consumption groups are multiplied by a set of factors which are determined by experience with the balancing of the national accounts during previous year (t-1). When the initial estimates are made, account is taken of any known bias in the estimate of the individual consumption groups based on sources from the expenditure (uses) side. If, for example, the first of the consumption groups, 01110, bread and cereals, was adjusted in the latest final national accounts to a value which was two percent above the initial estimate, the level obtained from Step 9 is multiplied by a factor of 1.02 when the final initial estimate is worked out for household consumption of group 01110.

Step 13: Balancing in the framework of the national accounts product balance system

The target totals as described in step 1-12 for household consumption expenditure are included with the other estimates for the supply and use components in the balancing of the national accounts. In Denmark's case, supply and use or, equivalently, GDP as compiled from the output and expenditure angles – are balanced in a very detailed product balance system covering around 2.530 products. The product balance system is further described in section 6.1.

Table 5.4 shows the grossed up household budget survey (step 4), the target totals (step 10), adjustment to exhaustiveness (step 11) and the balanced final value (step 13).

Table 5.4 Initial estimates and final balanced value for the household consumption by COICOP, and the grossed up household budget survey, 2012

		FU	Target totals	Exhaustiveness	Final balanced value
		DKK mill.			
Consumption group					
01110	Bread and cereals	14 277	13 361	26	13 354
01120	Meat	21 881	20 893	45	21 265
01130	Fish	4 780	3 763	13	3 753
01141	Eggs	1 477	1 295	22	1 370
01142	Milk, cream, yoghurt etc.	6 659	7 588	12	7 522
01143	Cheese	5 090	4 925	0	5 076
01150	Oils and fats	2 424	2 967	0	3 111
01167	Fruit and vegetables except potatoes	16 808	14 031	160	14 373
01179	Potatoes etc.	1 950	1 897	0	1 961
01181	Sugar	443	596	0	601
01182	Ice cream, chocolate and confectionery	9 276	12 049	246	12 764
01190	Food products n.e.c.	3 489	4 404	0	4 359
01210	Coffee, tea and cocoa	3 364	3 859	0	3 864
01220	Mineral waters, soft drinks, fruit and vegetable juices	4 633	7 638	256	7 776
02112	Spirits and wine	8 957	10 065	56	9 941
02130	Beer	3 221	4 969	264	4 992
02900	Tobacco etc.	7 347	17 933	3 347	18 547
03113	Articles of clothing	31 022	30 622	10	31 334

Table 5.4 Initial estimates and final balanced value for the household consumption by COICOP, and the grossed up household budget survey, 2012, cont.

		FU	Target totals	Exhaustiveness	Final balanced value
		DKK mill.			
03140	Cleaning, repair and hire of clothing	447	452	0	457
03200	Footwear	7 843	7 683	0	7 857
04100	Actual rentals for housing	70 267	65 186	0	66 325
04200	Imputed rentals for housing	77 901	108 274	458	108 821
04300	Maintenance and repair of the dwelling	10 872	7 020	2 384	7 447
04401	Water supply and sewerage services	11 058	14 279	0	13 994
04402	Refuse collection, other services n.e.c.	12 094	6 108	0	6 546
04510	Electricity	21 453	23 413	0	22 709
04520	Gas	6 675	6 453	0	6 481
04530	Liquid fuels	3 490	5 272	0	4 780
04545	Hot water, steam etc.	32 317	24 125	0	22 645
05100	Furniture, furnishing, carpets etc.	15 703	16 038	10	16 170
05200	Household textiles	4 015	3 676	0	3 690
05312	Household appliances	7 905	7 037	0	6 954
05330	Repair of major household appliances	131	449	345	440
05400	Glassware, tableware and household utensils	6 254	4 527	0	4 601
05500	Tools and equipment for house and gardens	4 829	4 414	0	4 192
05610	Non-durable household goods	5 657	3 529	0	3 717
05620	Domestic services and home care services	5 929	2 831	1 104	2 567
06112	Pharmaceutical products and other medical products	6 475	7 811	0	7 780
06130	Therapeutic appliances and equipment	2 681	3 449	0	3 463
06200	Out-patient services	10 825	10 909	56	10 477
06300	Hospital services	201	3 962	0	3 732
07100	Purchase of vehicles	36 774	30 137	0	29 910
07213	Maintenance and repair of vehicles	15 548	18 817	337	19 615
07220	Fuels and lubricants for personal transport equipment	29 567	27 176	0	26 794
07240	Other services in respect of personal transport equipment	5 378	11 295	5 851	11 396
07300	Transport services	16 501	12 555	174	12 436
08100	Postal services	553	424	0	317
08200	Telephone and data communication equipment	3 394	2 136	0	2 943
08300	Telephone and data communication services	16 019	15 411	0	15 301
09110	Radio and television sets etc.	5 994	7 714	0	7 642
09120	Photographic equipment etc.	1 010	1 409	0	1 398
09130	Data processing equipment	6 902	6 954	853	7 056
09140	Recording media for pictures and sound	1 667	2 419	0	2 247
09150	Repair of a/v and data processing equipment	179	849	689	823
09200	Other major durables for recreation and culture	1 825	3 112	0	3 697
09300	Other recreational items and equipment, gardens and pets	17 298	18 021	5	17 984
09400	Recreational and cultural services	27 556	31 533	355	31 626
09513	Books, newspapers, periodicals and misc. printed matter	5 381	9 106	0	8 780
09530	Stationery and drawing materials etc.	917	1 057	10	1 001
09600	Package holidays	12 937	12 678	0	13 670
10000	Education	4 243	6 553	39	6 571
11100	Catering services	35 487	42 157	6 778	41 789
11200	Accommodation services	10 575	7 382	0	7 001
12110	Hairdressing salons and personal grooming establishments	5 671	7 107	868	7 004
12123	Appliances, articles and products for personal care	10 663	9 875	0	10 240
12310	Jewellery, clocks and watches	3 178	1 738	0	1 677
12320	Other personal effects	2 389	3 293	0	3 479
12401	Retirement homes, day-care centres etc.	727	4 270	0	4 314
12402	Kindergartens, crèches etc.	9 067	11 031	0	11 038
12500	Insurance	42 403	19 869	0	19 789
12600	Financial services n.e.c.	2 303	39 964	0	40 310
12700	Other services n.e.c.	2 195	8 197	1 170	8 289
99800	Final consumption of non-residents on the economic territory		-38 863	0	-38 863
99900	Final consumption of residents in the ROW		38 667	0	38 894
	Total	806 421	869 378	25 943	877 971

5.7.3 Detailed calculations by COICOP items

The detailed description of the method of calculation regarding HFCE can be found in chapter 5.7.2. In this section only a few special cases are described.

07100 Purchase of vehicles

The Danish car scrap scheme contains no requirement for buying a new car in order to qualify for the premium. The premium is in fact on the scrapping service and not on the condition of buying a new car. The aim of the Danish car scarp scheme is purely environmentally and is designed to encourage people to use environmentally sound scrapping services. Typically, the household gives the car to tan authorised car-scrapper who then in turn collects the premium. However, as recommended in GNIC/232, and implemented in the process of lifting the transversal reservations, Denmark treats the car scrap scheme as a subsidy on products.

09130 Data processing equipment

The target for expenditure on software, including games is based on the grossed up FU. But as described in step 13 in the previous section, the targets for household consumption are balanced with other estimates for supply and use in a product balance system. This means that the household consumption of software will be balanced to the total supply together with the rest of the use side.

12500 Insurance

Household final consumption of insurance is determined in a subsystem in which the entire balances of supply and use are compiled. A description of the calculation of output of insurance is found in section 3.17. The distributions between intermediate consumption by industries and household final consumption are calculated for detailed products. For instance “Other non-life insurance” covers a number of different types of insurance. The different types of insurance are allocated individually depending on their character. E.g. air transport insurance is allocated to air transport, house insurance is allocated to dwellings, and family insurance is allocated to household final consumption expenditure.

12600 Financial services n.e.c.

Household final consumption of financial services (both directly paid and FISIM) is determined in a subsystem in which the entire balances of supply and use are compiled. A description of the calculation of output of financial services is found in section 3.17. The distributions between intermediate consumption by industries and household final consumption are calculated for detailed products.

5.8 NPISH final consumption expenditure

NPISHs are included in the Business Register to an unknown extent. However, it is not unrealistic to assume, that the major part in terms of volume is covered. Statistics Denmark collects a sample of annual accounts for each industry, and then grosses up to the population using data on wages. The annual accounts contain useful information regarding market- and non-market production as well as current transfers to and from the industries. It is thus possible to determine whether a price is economically significant or not and thus distinguish between market and non-market production for a given good.

Output is calculated in accordance with ESA 2010 section 3.49:

Table 5.5 Calculation of NPISH output, 2012

	DKK mill.
Intermediate consumption	16 079
+ Wages	22 851
+ Depreciations	793
+ Other production taxes	188
- Other production subsidies	19
= Output	39 892

Table 5.6 Calculation of output and final use for different types of NPISH

DK-NACE	Industry	Sources	Output	NPISH Final Consumption Expenditure	Household Final Consumption Expenditure	Estimation method
			DKK mill.			
850010	Primary Education	Ministry of Education	7 239	5 300	1 940	Note 1.
850020	Secondary Education	Ministry of Education, Surveys censuses, data on wages	4 235	2 823	1 412	Note 2.
850042	Adult-, other educ. (non-market)	Surveys censuses, data on wages	4 181	2 808	1 373	Note 2.
880000	Social work without accomond.	Surveys censuses, data on wages	6 164	4 471	1 693	Note 2.
910002	Libraries, museums (non-market)	Surveys censuses, data on wages	1 870	1 377	493	Note 2.
930012	Sport activities (non-market)	Surveys censuses, data on wages,	2 966	2 696	270	Note 3.
940000	Activities of membership org.	Surveys censuses, data on wages,	13 237	11 256	1 981	Note 2.

Estimation method:
1. Covers entire population
2. Grossing to population by using data on wages
3. Grossing to population by using data on wages as well as industry survey

The data source for primary level education, industry 850010 comes from administrative records directly from the Ministry of Education. The records are detailed and classifying according to ESA 2010 is straightforward.

The data source for industry 850020, high school level education and business schools, are primarily administrative records, but supplemented by annual reports from schools for children with disabilities. The annual reports are then grossed up using data on wages reported by the entire industry.

The data source for industries 850042 (Adult education), 880000 (childcare and centres), 910002 (libraries and museums), 940000 (associations and organisations) are annual reports. The samples are then grossed up using data on wages reported by the entire industry.

The data source for industry 930012 (sports associations) is a combination of annual reports and a comprehensive questionnaire made in 2011. The income structure for the industry is a macro-estimation based on the questionnaire, as is the intermediate consumption. D.1 comes from data on wages reported by the entire industry.. A large sample of annual reports are then used to estimate the structure of the remaining variables, such as costs on loans, insurance premiums, current transfers made by the industry and depreciations.

The data sources for Religious associations, not included in the government sector, are a sample of annual, websites for the respective religious associations, Familiestyrelsen (the authority that approves the religious communities, Center for Religion at Aarhus University, Lektor Peter Birkelund Andersen from 'Institut for Tværkulturelle og Regionale Studier' at Copenhagen University regarding Scientology. The grossing up from sample to industry is made according to the number of members of the religious communities.

NPISH Final Consumption Expenditure is calculated in accordance with ESA 2010 section 3.97. As explained in chapter 3 sections 22 through 25 NPISH output is broken down by products on the basis of the various uses of the products. This includes a distinction between output of non-market producers' services for consumption and for sales income. NPISH final consumption expenditure is therefor given by the product that are output from non-market producers whereas products that are the result of sales income are being labelled household final consumption expenditures.

Subscriptions and contribution payments of households to NPISH are excluded from household final consumption expenditure, as these are treated as current transfers. Output of NPISH includes own account formation of software, and it is excluded from NPISH consumption expenditure. The estimates of NPISH consumption expenditure do not include social transfers in kind.
Distinction between market- and non-market producers is made in accordance with ESA 2010 section 3.30-3.36.

5.9 Government final consumption expenditure

Government final consumption expenditure can be split into:

1) Individual consumption expenditure
2) Collective consumption expenditure

1) Individual consumption expenditure

Individual consumption expenditure consists of:

- Social transfers in kind – general government and NPISHs non-market production (D.631) and
- Social transfers in kind – market production purchased by general government and NPISHs (D.632).

In this chapter only the part relating to general government is described. A description of the part relating to NPISH can be found in chapter 5.8.

Social transfers in kind – general government and NPISHs non-market production (D.631) consists of output of government, individual non-market services less sales income from these individual services less the value of own-produced software in those units. The sources and methods for estimating output were described in Section 3.1.3.1 as part of the description of the output-based estimate of GDP and Section 4.12 referring to the consumption of fixed capital. Reference should therefore be made to these sections. Information on sales income is taken directly from government accounts. The value of own-produced software is based on total wages and salaries for highly qualified computer staff assumed to be working on the development of software and large databases. A mark-up factor is applied to total wages and salaries to cover intermediate consumption and the consumption of fixed capital.

Social transfers in kind – market production purchased by general government and NPISHs (D.632) refers to goods and services which general government purchases on the market and makes available to households. According to ESA 2010, such purchases are not included in intermediate consumption or the output value of general government but are allocated directly to final uses as individual consumption of market goods and services paid for by government. This is logical, since the products purchased by government non-market producers are not processed further before being made available to households. In the vast majority of cases, they are supplied directly from the market producer - a general practitioner, for example - to the recipient households. In Denmark's case, almost all transfers in kind of market products are health insurance benefits. The values are taken directly from government accounts which have 100% coverage, and must be considered fully reliable.

2) Collective consumption expenditure

Collective consumption expenditure consists of output of government non-market services used for collective, i.e. non-individualisable, government consumption, minus sales income from these collective services minus the value of the research and development and software produced in those units. The sources and methods for estimating the output value were described in Section 3.1.3.1 as part of the description of the output-based estimate of GDP and Section 4.12 referring to the consumption of fixed capital. Reference should therefore be made to these sections. Information on sales income can be taken directly from government accounts. The value of own-produced software is based on total wages and salaries for highly qualified computer staff assumed to be working on the development of software and large databases. A mark-up factor is applied to total wages and salaries to cover intermediate consumption and the consumption of fixed capital.

The split between transfers of individual non-market goods or services and government collective consumption expenditure is based on the COFOG classification as defined in ESA 2010 Paragraph 3.104.

The relationship between government output and government final consumption expenditure by sub-sector is shown in table 5.4.

Table 5.7 Relationship between general government output and final consumption expenditure by sub-sector, 2012

	S.1311	S.1313	S.1314	S.13, total
	DKK mill.			
+ Compensation of employees	83 935	228 424	2 280	314 639
+ Consumption of fixed capital	26 863	29 063	-	55 926
+ Intermediate consumption	63 361	113 880	778	178 020
+ Other taxes on production and –subsidies, net	794	-4 448	1	-3 653
= Output	174 953	366 919	3 059	544 932
+ Social benefits in kind	442	29 530	-	29 972
+ Income from sales	-23 165	-31 837	-8	-55 010
+ Own account research and development and software	-16 295	-1 964	-	-18 260
= Consumption expenditure	135 936	362 649	3 051	501 635

Note. S.1311: Central government, S.1313 Local government, S.1314 Social security funds

5.10 Acquisitions less disposals of produced fixed assets

5.10.1 Overview

The components of final expenditure are estimated in the Danish national accounts by the following product breakdown:

Table 5.8 Gross fixed capital formation in assets, by type

	DDK mill.
Buildings and structures	160 590
Dwellings	77 186
Non-residential buildings	45 252
Structures	38 152
Transport equipment	28 834
ICT equip., other machinery and equipment and military equipment	74 778
Computer hardware	17 345
Telecommunication equipment	2 359
Other machinery and equipment and weapon systems	55 073
Cultivated biological resources	2
Intellectual property products	92 583
R&D	53 622
Mineral exploration and evaluation	2 032
Software	30 814
Originals	6 114
Total	356 785

5.10.2 Main data sources and their conversion to national accounts result

As far as possible all of these components are estimated using the expenditure approach. Since the account statistics for non-agricultural private sector in 1999 was extended to cover most industries with market producer units, it has been possible to estimate the capital formation in tangible fixed assets in most industries with a distribution by buildings, structures and a residual consisting of machinery, transport- and other equipment. The estimates from the uses side are confronted with the available information on the domestic supply of investment goods by product in an “investment matrix” framework similar to the framework used in supply and use matrices. A more comprehensive description of the methods used in the compilation of investment matrices can be found in section 0 below.

The estimates for the construction of new buildings are based on either the accounting statistics which provides a very detailed coverage of the actual observations, or a calculation based on the exhaustive register of buildings (the BBR), and prices per square meter for the different types of buildings.

In the statistical sources for agriculture, certain industries dominated by a few big units and government or government controlled units, can be assumed to contain very reliable estimates of GFCF. For all industries covered by the industrial accounts statistics, the same kind of information is available. It should, however, be taken into account that the GFCF-estimates are often less reliable than other estimates based on the industrial accounts statistics. Annual GFCF-figures tend to be more volatile than, for instance, the figures for intermediate consumption. Fluctuations in the reported figures will be reflected in the grossed up values, adding to uncertainties in the GFCF-estimates of industries for which the investment figures are only partially based on questionnaires or published annual reports. Furthermore the methods used in grossing up will tend to underestimate investment in newly started enterprises that have not yet supplied questionnaires or annual reports to the accounts statistics. During the start-up phase such enterprises will often have comparatively small sales and employment, but considerable capital formation can take place in the same period.

Even after the introduction of a direct estimate of capital formation in machinery and equipment which is expenditure-based, it seems likely that the estimate for this component will still to some degree need to be adjusted to take into account the supply of investment goods.

5.10.3 Detailed estimation methods used by an code

Transport equipment

The initial estimate prior to balancing for acquisitions less disposals of motor vehicles, is based on the Vehicle Statistics Register, which in turn is based on the Register of Motor Vehicles. Similarly, the estimate of capital formation in large ships and aircrafts is based on register information for each individual vessel and each individual aircraft. Capital formation in small ships, boats and aircraft, railway rolling stock, containers and other types of – less important types of – transport equipment is estimated from the supply side using the commodity flow method. In 2012, capital formation in transport equipment covered 53 products in the supply and use tables.

Dwellings

The construction of new dwellings is estimated from the number of square metres of activity in the exhaustive Register of Buildings and Dwellings (BBR). "Square metres of activity" means the number of square metres constructed on average in the calendar year (quarter). The capital formation is therefore counted as and when the building progresses and not on the completion date. The square metres of activity are calculated from information in the BBR on dates when the individual buildings are started and completed. There are four types of new housing construction in the calculation, each with an average price per square metre – a "standard square metre". The calculation is stratified into two geographical areas, the extended Copenhagen region (which also cover some major urban areas in Jutland (Århus and “Trekantsområdet”)) and the rest of the country. The square metre prices are noticeably higher in the Copenhagen region than elsewhere. The benchmark for these prices dates back to 2007, when a committee under Statistics Denmark, examined all available sources which provided information on housing construction costs.

The productivity correction factor is based on a comparison of the benchmark figures for years 1969, 1979 and 1993 with changes in the building costs index for housing construction in the intervening periods.

If normal procedure was followed the 2007 benchmark prices should be projected to the current year using changes in the index of construction costs for housing reduced by 1% for productivity increases which, by their very nature, will not be captured in an input-based building costs index.

However, the year 2007 was on the top of the business cycle, which was followed by some years with significant decline the GDP, and taking the benchmark forward by a cost index was not considered a reasonable procedure for the years 2008 and 2009. Instead, average price per square meter was significant reduced during the years 2008 and 2009 based on an estimate which fit with the balancing of the supply and use tables. The exogenously determined reduction in construction costs could be interpreted as a decline in the profit margins the constructer charge, forced by the large decline in construction activity in 2008 and 2009.

In addition to construction of new dwellings based on “Square metres of activity”, GFCF for dwellings consists of capital repair and costs of ownership transfer (real estate agents, lawyers, stamp duties, government sales income connected with court rulings). The estimation of capital repair is explained in chapter 3 and the estimation of costs of ownership transfer is explained in section 3.12.

Table 5.9 shows the calculation of the main components of capital formation in housing construction. It shows the value of new construction and capital repair (major repairs) and costs of ownership transfers. Capital repairs include hidden construction activity.

Table 5.9 Calculation of capital formation, dwellings, 2012

	Extended Copenhagen area	Rest of Denmark	Extended Copenhagen area	Rest of Denmark	Extended Copenhagen area	Rest of Denmark	Whole Country
	sq. m. of activity		const. cost per sq. m.		value of construction		
			DKK		DKK 1 000		
Basic prices							
Single family houses	789 844	636 345	9 643	8 766	6 228 017	4 561 769	10 789 787
Multi-family houses	398 065	209 630	11 994	11 549	3 903 239	1 979 461	5 882 700
Garages and carports	158 663	227 616	2 191	2 191	284 247	407 848	692 094
Weekend Cottages	75 488	94 600	8 328	8 328	514 015	644 070	1 158 085
Construction of new dwellings							18 522 666
Purchasers prices							
Construction of new dwellings							22 814 826
Capital repair							45 877 161
Costs of ownership transfers							8 494 115
GFCF at purchasers' prices							77 186 102

Non-residential construction

Private non-residential construction

This is calculated the same way as housing construction. The value of new construction is calculated by multiplying the standard square metre price according to the 2007 benchmark by square metres of activity. The prices for non-residential buildings have been adjusted the same way as the prices for dwellings for the years 2008 and 2009. Regarding private non-residential buildings, it must be taken into account that productivity increases when projecting square metre prices on the basis of the construction costs index.

Table 5.10 shows gross fixed capital formation for non-residential buildings, including the price multiplied with quantity estimation for construction of private non-residential buildings. Costs of ownership transfer and capital repair is also shown in the table.

Table 5.10 Calculation of capital formation, private non-residential construction, 2012

	Extended Copenhagen area	Rest of Denmark	Extended Copenhagen area	Rest of Denmark	Extended Copenhagen area	Rest of Denmark	Whole Country
	sq. m. of activity		const. cost per sq. m.		value of construction		
			DKK		DKK 1 000		
Basic prices							
Farm buildings	205 624	756 862	2 163	2 163	357 177	1 314 936	1 672 112
Factories, workshops	153 866	248 167	4 981	4 527	615 295	902 258	1 517 553
Offices, shops	448 745	372 048	10 534	9 374	3 794 172	2 799 630	6 593 802
Other private property	151 608	165 383	13 130	13 370	1 598 590	1 775 292	3 373 882
Construction of new non-residential buildings							13 157 349
Purchasers prices							
Construction of new non-residential buildings							13 547 483
Capital repair							5 047 217
Costs of ownership transfers							2 498 332
Public construction for commercial use							2 533 064
Public construction for non-commercial use							21 625 925
GFCF at purchasers' prices							45 252 021

Public construction for commercial use

This component of capital formation is calculated from the accounting statistics for industries, where public corporations predominate. In these statistics, the information on new capital formation is divided by type of investment using a breakdown by DK-NACE industry and subsector.

Public construction for non-commercial purposes

Capital formation in buildings by government non-market producer units, is estimated from the OIMA system (the calculation system for government non-market activity), which is in turn based on the national accounts estimate of the general government sector in the DIOR database. The information on new capital formation in the OIMA is broken down by type of investment using the breakdown of capital formation by DK-NACE industry and subsector. However, at this level of detail, no distribution of asset by type is available, and the distribution for the current year is estimated by using previous year's distribution together with common sense.

Table 5.11 GFCF non-residential buildings, 2012

	DKK mill.
Private non-residential construction	18 588
Public construction for commercial use	2 540
Public construction for non-commercial purposes	20 975

Table 5.11 shows investment in non-residential buildings. The costs of ownership transfers are excluded.

Structures

The estimation of GFCF for structures can be subdivided into 3 types of structures, Private structures, public commercial structures and public non-commercial structures, all of which has a different source. Table 5.12 shows the values for 2012.

Table 5.12 GFCF, structures, 2012

	DKK milll.
Private structures	4 431
Public commercial structures	19 714
Public non-commercial structures	14 006

Private structures

Capital formation is calculated from the expenditure side, as the total value of all new civil engineering structures, according to the available sources. In practice almost all investment in such structures are covered either by agricultural statistics, by surveys of investment in extraction of crude oil and gas or by the industrial accounts statistics. The calculation is the same as the one used to calculate target totals for capital formation by industry. It is assumed that there are no net product taxes and VAT levied on private structures.

Public commercial structures

Capital formation in structures in public corporations from accounting statistics for industries where public corporations predominate.

Public non-commercial structures

Capital formation in structures for general government sector comes from the DIOR database. Figures for general government sector are based on the DOIR database, which also contain figures for GFCF. The information on new capital formation in the OIMA is broken down by type of investment with the help of the breakdown of capital formation by DK-NACE industry and subsector. However, at this level of detail, no distribution of asset by type is available, and the distribution for the current year is estimated by using previous year's distribution together with common sense.

This capital formation for structures can be seen in Table 5.11.

Livestock

The relatively minor item "changes in agricultural livestock" is explained in the chapter 5.2.2.

Machinery and equipment

Machinery and equipment, which include Computer hardware, Telecommunication equipment, other machinery and equipment and weapon systems, are at the level of product derived by the commodity flow method. However, the target totals are derived from the account statistics but some adjustments take place using the information on supply at the product level.

Intellectual property products

Exploratory drilling

In Denmark's case, the only expenditure on mineral exploration at present is on exploratory drilling in the North Sea oil and gas-fields. All concession-holders have to supply accounts to the Danish supervisory authorities, containing information on expenditure on items such as exploratory drilling. The national accounts' estimate is based on this exhaustive accounting information.

Software and large databases

Purchased software and large databases

In the Danish national accounts, the total capital formation of purchased software is estimated from the supply side using the commodity flow method.

The current practice in the Danish business accounts seems to contain purchases of software under various headings: To the extent that the software is capitalized the correct solution should be to show it as an investment in intangible fixed assets, but some software will probably still be included as part of tangible fixed assets, especially when software and hardware are purchased together. Some GFCF in software can be found in business accounts among acquisitions of equipment etc. that are treated as current expenses or written down during the accounting year, and some software may even be included in other categories of intermediate consumption. A description of the conversion from business accounts data to the concepts used in the national accounts can be found in chapter 3.

Estimating investments in software from accounts statistics have not yet been feasible. In accounts statistics the information on acquisitions and disposals of intangible fixed assets cover licences, trademarks, sole agencies, software, goodwill and capitalised development, rationalisation and research etc., in other words a mixture of figures which have to be included in gross fixed capital formation and figures which should be excluded. In practice this information is useless without further specification.

Since 1996 the product statistics for the IT-industries gives a detailed breakdown by product of turnover in the IT-industries. The turnover in each of the industries is broken down into software and different types of IT-services. A considerable share of this turnover is in fact trade in hardware and standard software. The trade activity is separated out and treated as wholesale or retail trade and the production is converted into trade margins. On the other hand some production of software is by-product in wholesale trade, renting of machinery and equipment and in telecommunications and this production is included in the supply.

Estimates of imports and exports are based on information from foreign trade in services, based on information used in the compilation of balance of payments. Please refer to chapter 5.14 for a description of the treatment of foreign trade in services.

In the final national accounts for 2012, total capital formation in purchased software and large databases has been estimated from the commodity-flow as 14,632 million DKK. This figure includes standard software as well as some IT-services (planning, programming, adjustment, installation etc.) that should be included as a part of the GFCF in software. As illustration simplified product balances are shown for software excluding own account (but including value of recorded media) and the relevant IT-services that include production of customised software and tailoring of software to specific needs.

Table 5.13 Software excluding own account, 2012

Software

Supply	Basic price
	DKK mill.
Domestic production	6.729
Imports	8.063
Total supply	14.793

Use	Basic price	Wholesale trade margin	Retail trade margin	Net tax on products	VAT	Purchasers' price
	DKK mill.					
Intermediate consumption	2 801	1 602	529	0	139	5 071
Household final consumption	775	402	500	0	401	2 082
Investment in software	6 451	3 820	555	0	649	11 475
Change in inventories	14	2	0	0	0	15
Exports	4 751	16	0	0	0	4 767
Total use	14 793	5 846	1 584	0	1 188	17 646

Table 5.14 Software programming, consultancy etc., 2012

Software programming, consultancy etc.						
Supply	Basic price					
	DKK mill.					
Domestic production	48 251					
Imports	12 478					
Total supply	60 728					
Use	Basic price	Wholesale trade margin	Retail trade margin	Net tax on products	VAT	Purchasers' price
	DKK mill.					
Intermediate consumption	47 449	0	0	0	4 017	51 462
Household final consumption	0	0	0	0	0	0
Investment in software	2 909	0	0	0	275	3 183
Exports	10 375	0	0	0	0	10 375
Total use	60 728	0	0	0	4 292	65 020

Software and large databases produced at own account

Own-produced software etc. accounted for 16,181 million DKK or 53% of total GFCF in software and databases in 2012.

Own output is calculated from the supply side, more specifically from total wages and salaries which in each of the national accounts' 117 industries are considered to relate to own output of software.

Total wages and salaries are compiled from Statistics Denmark's salary statistics, i.e. the statistical system which provides information on wage and salary levels and changes by job category. This statistics cover all workplaces with ten or more employees. A new version of the system for compilation of own-account software was introduced with the data revision published in 2005. For all years starting in 1995 the information on wages and salaries was made available to the national accounts division on a more detailed level than before. In the new system the employment figures used for calculation of the value of own-account software are grossed up to cover the economy as a whole[15].

Since 1995 the starting point is total wages and salaries according to the statistics on employees in DISCO groups 251, Software and applications developers and analysts, and in 252, Database and network professionals. DISCO is the Danish implementation of ISCO, the international classification of occupations. It is thus assumed that wages and salaries in the category of 50% of DISO 2511 “systems analyst”, 100% of DISCO 2512, “Software developers”, 100% of DISCO 2513, “Web and multimedia developers”, 100% of DISCO 2514, “Applications programmers”, 20% of DISCO 2519, “Software and applications developers and analysts not elsewhere classified”, 50% of DISCO 2521, “Database designers and administrators”, 50% of DISCO 2522, “Systems administrators”, 50% of DISCO 2523, “Computer network professionals” and 20% of DISCO 2529, “Database and network professionals not elsewhere classified”. In this way it is taken into consideration, that some of the people with the highest education are usually working as executives or as consultants and analysts who are involved in decision making with respect to choice of software systems or even in research and development. The inclusion of ordinary application programmers in the calculation is an important improvement, as most of the coding of computer programs has actually been done by people in this group[16].

[15] Previously there was no grossing up for wages and salaries in small units with fewer than ten employees. Only the wages and salaries for ISCO-group 213 were used in the calculation, while the wages and salaries of the majority of applications programmers, who have for a long time been classified in a subgroup of ISCO 312 were excluded due to the fact that their education for many years did not have status as high level education in Denmark. On the other hand no deduction was made for other work than development of software for GFCF.

[16] It must be emphasised that groups DISCO 3122, IT-operators, or DISCO 3129, programming of industrial robots are not included in the calculations as these people are working with the operating of computers or computerized systems and they are usually not writing computer programs.

According to international recommendations only half of the work time of the selected people is considered production of software for GFCF, as no better estimate exist. It is furthermore as in the earlier calculations assumed that only 25% of this time is spent on production of own-account software in NBR industry 620000 is production of own-account software because the programmers of this industry produces most of the customised software sold to other units.

In 2012 the total wages and salaries of the people in question working in market production are multiplied by a mark-up factor of 2.356 or, to put it another way, total wages and salaries are grossed up by 135.6%. This factor is based on accounting ratios in the published industrial accounts statistics for industry 620000 adjusted for that part of the activity that is considered trade in hardware or software. It covers intermediate consumption (including overheads at firm level), the consumption of fixed capital, other taxes on production, net, and net operating surplus. For own-account production of software in non-market activities a reduced mark-up factor of 2.1713 is used, that is output is grossed up by 117,13% in 2012, as no mark-up for net operating surplus is applied for non-market activity.

Entertainment, literary or artistic originals

As might be expected, there are no statistical sources providing information on the value of original works produced in any given year. For *other than film and television* originals, it has therefore been necessary to base the national accounts calculation on the assumption that the value of the originals in question is equal to the discounted value of future royalty incomes which they will earn.

The problem is that the future royalties are not, of course, known. Denmark is in a favourable situation compared with other countries in that information on current income from royalties from culture and entertainment is available in annual statistics. In the national accounts the simple assumption is chosen, to use the value of royalties received by the artists in question in year t as a proxy for the value of originals created in year t. The reasoning behind this simple convention is as follows: Since there is no information on future royalty earnings, it is assumed that in the long term royalties actually increases somewhat faster than the economy as a whole, since leisure activities have income elasticity greater than one. More specifically, the future real growth rate is taken to be equal to the real rate of interest, which likewise is normally greater than the growth rate of the economy. With these assumptions, the equilibrium value of the originals created in any given year may be estimated as the income from royalties in the same year.

The value of GFCF *for film and television* is based on benchmark calculations from 2007-2009. GFCF for the subsequent years are calculated using the average ratio between GFCF and total production of the products in question in the three years prior to the year in question. The benchmark calculations are based on data on production and development funding from the Danish Film Institute (DFI). This is thought to cover all film production because close to all film production in Denmark is funded by the DFI. Television program data are based on the accounts of the Danish broadcasting stations.

The value thus calculated for 2012 was DKK 6 114 million.

Research and development (R&D)

Private R&D

The estimation of private R&D (R&D output produced by market producers) is compiled in a sub-system, which is mainly based on R&D statistics (Frascati Manual) and foreign trade statistics. Total output is measured by sum of costs, and the starting point is R&D expenditure estimated in accordance with the GERD definition (Gross Domestic Expenditure on Research and Development) which is adjusted to match national account definitions. The transformation of R&D expenditure in accordance with the Frascati Manual towards output and GFCF in accordance with ESA2010 follow the recommended procedure in the *Manual on measuring Research and Development in ESA2010*.

To estimate output in accordance with the definitions in the national accounts, it has, generally speaking, been necessary to conduct the following adjustments in R&D expenditure, estimated in accordance with the GERD definition:

1. Investments in buildings and equipment are removed from the GERD figures. The values for GFCF are directly distinguishable in the source statistics.
2. Overlapping investments in software is excluded. If the producers of R&D output report that some R&D expenditure is target towards a software output, this expenditure is excluded.
3. An estimate for subsidies is subtracted. This is a very small item; the government pay virtually no subsidises towards R&D. Figures from government accounting is used as source.
4. An estimate for gross operating surplus is added, it summarizes the input of capital services into production of R&D-services. Capital services consist of consumption of fixed capital and a return to capital. In practise is the estimate for gross operation surplus estimated as a mark-up on wages and intermediate consumption.
5. Other adjustments. Contain adjustments which can be attributed towards identified errors, balancing purposes and consistency across time etc.

Table 5.15 below shows the calculation of R&D output for the year 2012 for market R&D. In practise, the calculation is made at the level of industry, by the 117-classification.

Table 5.15 Calculation of market output of R&D, 2012

	DKK mill.
Frascati Output (GERD)	37 036
Investment included in Frascati output	-2 813
Overlap with software	-6 748
Subsidies	-2
Supplement of gross operation surplus	4 830
Other adjustments	1 000
Adjusted Frascati output	33 304
Of which: Own-account	25 369
Of which: Purchased	7 935

The item “Other adjustments” contains an adjustment of 1,000 million DKK. It can be sub-divided into two adjustments – both based on judgement by the compiler. The first is supplement deduction for overlap with software for the financial industries; it is believed that the combined value of software and R&D is too high prior to the adjustment, the deduction for software amount to 250 million dkk. The second adjustment is made to increase the level of R&D in the *720001 Research and development industry*, which was deemed too low compared with the size of output for the industry. In total, the R&D output was adjusted upward with 1,250 million DKK for the industry 720001 Research and development.

In the final balancing process of the supply and use tables, further adjustment could be made to the R&D figures.

The second part of the compilation is about GFCF in R&D. Table 5.16 shows the results. The source for import and export of R&D is foreign trade statistics and the source for purchased R&D is R&D statistics in accordance with the Frascati Manual. R&D statistics contain information on industries buying R&D products, but no information on industries selling the R&D, it is assumed that most of the R&D is sold by the industry *720001 Research and development*, but the*720001 Research and development* can only sell as much as they produce. Note the total output in table 5.16 is 34.504 million dkk which include purchase of 1.200 million dkk as intermediate, and explain the difference in relation to table 5.15. All R&D purchased by the industry *720001 Research and development* is treated as intermediate consumption.

Table 5.16 R&D (market), Gross fixed capital formation, 2012

	DKK mill.
Own account R&D	25 369
Purchased R&D	9 134
Domestic output	34 504
Import	8 422
Total supply (basic price)	42 926
Intermediate consumption	1 200
Gross fixed capital formation	35 984
Export	5 742
Total use (basic price)	42 926

Non-market R&D for General Government

R&D produced by the general government is compiled in the office for government statistics. Own-account production of R&D is identified by using the COFOG distribution of government expenditures.

The COFOG distribution has 10 main headings (first level); General public services, Defence, Public order and safety, Economic affairs, Environment protection, Housing and community amenities, Health, Recreation, culture and religion, Education and Social protection. At second level of the classification, it is possible to separate out R&D expenditure. The second level is a breakdown of first level headings into 6-9 subgroups, depending on the specific heading. Statistics Denmark has selected the following second level headings as R&D: 01.4 Basic Research, 01.5 R&D general public services, 02.4 R&D Defence, 03.5 R&D Public order and safety, 04.8 R&D Economic affairs, 05.5 R&D Environmental protection, 06.5 R&D Housing and community amenities, 07.5 R&D Health, 08.5 R&D Recreation, culture and religion, 09.7 R&D Education, 10.8 R&D Social protection.

All own-account expenditure classified as R&D in accordance with the COFOG classification is “transferred” to GFCF for R&D.

Breakdown of GFCF by industry and type (“Investment matrices”)

GFCF by industry

There is considerable user interest in the breakdown of gross fixed capital formation by industry, and we therefore describe below the sources and methods used for this breakdown, even though it may not always seem directly relevant to GNI. The methods used for estimation of GFCF from the uses side will, however, influence total output of a number of important products that are mainly used, and directly or indirectly they will affect the size of total gross value added.

Industries with general government non-market activity

OIMA (the calculation system for government non-market activity) based on the DIOR database determines the totals, divided by investment into "new capital formation" and "capital formation in existing buildings and structures". Figures are also received for capital formation in software, divided by industry. The OIMA capital formation is transferred to the intermediate system using MLS codes:

6100: New fixed capital formation
6321: Purchases minus sales of existing buildings and structures.
6105: Research and development

The worksheets with the detailed breakdown of capital formation into DK-NACE industries and subsectors (integrated county, municipal authority and central government, non-integrated county, municipal authority and central government, funds etc.) are received every year from the Public Finances Division. No detailed (or even provisional) breakdown of the individual subsectors' capital formation into buildings and structures, machinery and equipment etc. is produced annually, but such a breakdown was available for the year 1995. These breakdowns have been projected to the following years using series on most detailed level available from the division of government finances as basis for the extrapolation. The figures in a full breakdown are matched with the final OIMA system figures in the national accounts' 117-industry breakdown. Figures for purchases minus sales of existing buildings and structures in a breakdown by industry are included.

Industries covered by corporations controlled by government

A worksheet containing the results of statistics for industries where public corporations predominate is received from the Public Finances Division. This sheet supplies input data for various industry-specific calculations as well as capital formation figures for buildings and structures which are used to work out the value of new buildings and new structures in public enterprises in the construction system.

The worksheet includes capital formation in buildings, structures, machinery and equipment and transport equipment plus software, divided by DK-NACE industry. With the help of an extract from accounting statistics for industries where public corporations predominate, it is also possible to produce a separate estimate for that share of the capital formation which relates to purchases minus sales of existing buildings and structures.

In 2012 industries where public corporations predominate covers national accounts' 117 industries 350010-383900, 510000-530000, 600000-610000, 920000, 930020.

Industries covered by the industrial accounts statistics

In 2012 national accounts' 117 industries 080090-330000, 414300-470000, 490020-500000, 520000, 550000-590000, 620000-630000, 680010-720001, 730000-820000, 840021, 850010-850020,850041-910002 and 930011-96000, CFCF by industries is estimated by using industrial accounts statistics (SBS).

The statistics are now exhaustive in this field, i.e. they assign accounting figures to all units in the industries in question. The information is available as firm and/or workplace statistics. For national accounts purposes, the two sets are processed so that all the capital formation information used is allocated to workplaces, and it is this information which is used to compile capital formation by function. With the processing of accounting statistics, information on capital formation is transferred to the sub-system for compiling investment matrices, with the following sub-division:

MTRa: Purchases of tangible assets
MTRs: Sale of tangible assets
BYGn: Construction of new buildings
BYGe: Purchases of existing buildings
BYGs: Sale of existing buildings
ANLn: New layout and rebuilding of roads, harbours, etc.
ANLe: Purchase of existing roads, harbours, etc.
ANLs: Sales of existing roads, harbours, etc.

A problem in the industrial accounts statistics is that start-ups are seldom included in the statistics on the basis of reporting forms or accounts. In such cases, information on capital formation is normally compiled from employment or VAT information using standard ratios based on enterprises which have been operating normally throughout the period in question. As already mentioned, capital formation must be expected to be underestimated in respect of businesses which have just started up.

Attempts have been made to correct for this undervaluation with the help of statistics on start-ups. In the compilation of investment matrices, Business Demography statistics is used to estimate a supplement which covers the investment for start-ups.

Industries covered by other sources

There are independent sources of information on capital formation in a few other private industries. The industry *060000 Extraction of oil and gas* is covered by information gathered by the Danish Energy Agency (“Energistyrelsen”). GFCF for the industry *K Finance and Insurance* is compiled by using intermediate consumption as an indicator. Agricultural capital formation is taken from agricultural statistics.

GFCF by industry and type

Buildings and other structures

Capital formation in buildings in government non-market services, public corporations, agriculture and industries covered by the industrial accounts statistics is worked out in the systems which process the capital

formation in question - cf. above. Within these areas, capital formation is normally retained as calculated, with the estimated breakdown into new building and purchases less sales of existing buildings.

Total construction of buildings is estimated in the construction and civil engineering system, the basis for government commercial and non-commercial building being the information on capital formation compiled for the calculation system for capital formation in a breakdown by industry. The calculation of the output value of construction and civil engineering ignores, of course, that share of capital formation accounted for by purchases and sales of existing buildings. Capital formation in industry 680023-680024, dwellings, is fixed as the value calculated in the construction and civil engineering system.

The residual of private non-residential building is allocated to the (now relatively few) industries which do not have accounts-based target totals for capital formation in construction. The initial targets are here based on any kind of available information and if necessary on more or less well founded extrapolations from the values in previous years.

Net purchases and net sales of existing buildings on Danish territory should add up to the same total value. (At present, in line with the calculations of construction and civil engineering, all change of ownership costs are for practical reasons distributed together with construction of new buildings). Purchases or sales of existing buildings are as a general rule shown in those industries where the figures can be based on sources. However, it was decided to allocate the residual to industry 680030 Renting, non-residential buildings.

As was the case with buildings, capital formation in structures in government non-market services, public enterprises, agriculture and industries covered by accounting statistics is worked out in the systems which process the capital formation in question. We assume here that there is normally no capital formation in structures other than in industries for which it can be compiled from a specific source. One exception is branch 680030, Renting, non-residential buildings, to which is allocated the residual of investment/disinvestment in existing structures, since, as for buildings in the strict sense, we are constrained by the rule that used structures may not appear or disappear through purchases/sales between industries. The value of new structures is thus determined from the expenditure side, and it is the systems for the compilation of capital formation in a breakdown by industry which supply the final figures for capital formation in structures for the calculation of the output value of construction and civil engineering.

Initial estimates for capital formation in construction and civil engineering in a breakdown by industry are obtained as the sum of the initial estimates for buildings and structures.

Transport equipment

Motor vehicles

Briefly, the method is as follows: information is received from vehicle statistics on opening and closing stocks of motor vehicles recorded in the central register of motor vehicles, and these figures are then divided up by type of vehicle, size category and year of first registration. Next, by matching with the business register, the national accounts' 117 branch codes are added to the vehicles in the industries to give a division into the 117 industries/households, albeit with an undistributed remainder which the National Accounts Division itself has to divide up to ensure that the system tallies. The figures correspond to those used in the "vehicle distribution system". Vehicles by industries with year of registration which match the reference year is used as distribution key for the total investment in vehicles. Total CFCF for Vehicles are estimated from the supply side, and compiled as part of the setup of the supply and use tables. The figures for all capital formation in vehicles are then summed to give the contribution of vehicles to the capital formation target totals for transport equipment.

Other transport equipment

Supply of other transport equipment: railway rolling stock, containers, ships and aircraft.
For other types of transport equipment counted as capital formation, the supply is calculated by product number on the basis of the sources used for the compilation of the supply and use tables (SUTs). The SUT balances for ships and, over the last few years, railway rolling stock as well, plus larger aircraft, are compiled as predetermined values which are retained for the balancing of the SUT. Here, information on the individual deliveries is used, and in a few cases changes in inventories have been specifically calculated imputed (2064 changes in inventories) to produce a match between the supply and use information.

On the basis of a few relatively simple assumptions about which industries invest in the various types of transport equipment and parts etc., the contribution of these products to the target totals for capital formation in transport equipment can be worked out. When these figures are combined with the targets for capital formation in motor vehicles, we get the column showing the initial estimates for target total code 2052 capital formation, transport equipment.

Machinery and equipment

For government non-market services, public corporations, industries included in the industrial accounts statistics, agriculture, the extraction of oil and gas, financial services and insurance, once again capital formation in machinery and equipment and transport equipment - taken together - is calculated from accounting statistics information - cf. above. For each of these industries, targets can be set for the different types of capital formation:

5131 Transport equipment
5132 Computer hardware
5133 Telecommunication equipment
5139 Other Machinery and equipment

Software

The estimation of total investment in software is explained in chapter xxx. The total account of investment in purchased software is distributed by industries by using the survey on ICT-expenditure. Own-account software is investment in the same industry as it is produced.

The new survey of Danish ICT-expenditure from 2003

A new statistical source that shows outlays for IT related purposes by industry has become available for the first time in 2003. The questionnaire based statistic on Danish business ICT-expenditure examines ICT expenditure in enterprises and in the public sector (state and municipalities).

The results from the survey were grossed up to cover all units covered by the industrial accounts statistics and distributed by workplaces by methods like those used to distribute other accounts information that are only available on the enterprise level. The results were used to distribute purchased computer software industry in the investment matrix for machinery and equipment.

R&D

The calculation of R&D output and investment is done by the level of industries. Section xxx describe calculation of R&D output and investment.

5.11 Additions to the value of non-produced non-financial assets

There are two groups in this category of product transactions:

AN.1123 Land improvements
AN.116 Costs of ownership transfer for non-produced non-financial assets

AN.1123

In Denmark's case, this category covers only soil improvement work in agriculture (drainage etc.), information on which is available from agricultural statistics. This component of capital formation is calculated together with capital formation in structures, and is covered by capital formation in private structures as shown in Table 5.9.

AN.116

This heading covers the costs of transfers of ownership (estate agents, lawyers, stamp duties, public sales income relating to courts of law) of land and natural resources etc. Since the costs of transferring the ownership of land can seldom be estimated independently of the costs of transferring the ownership of the buildings and installations on that land, the aggregate costs of transferring the ownership of land and real estate are

considered to be part of gross fixed capital formation in buildings and structures as described in Section 5.10. The transfer of ownership costs for land and real estate included in the estimate of gross fixed capital formation in 2012 can be seen in Table 5.17.

Table 5.17 Transfer of ownership costs for land and real estate, 2012

	DKK mill.
Stams, Courts of law etc.	485 924
Lawyers	4 198 824
Real estate agents	6 958 836
Total	11 643 584

5.12 Changes in inventories

The principles underlying the national accounts' treatment of changes in inventories as compared with the estimates in business accounts were discussed in chapter 3. The section below is more technical and includes an example of the national accounts' calculations of inventories. As already mentioned, for a correct estimate of GDP, it has to be possible to split changes in inventories (reported at market prices on the respective dates) between the start and end of the period in question into product transactions in national accounts terms and revaluations (plus, in some cases, other volume changes). In the national accounts, changes in inventories (product transactions) are posted to the capital account whereas revaluations go to the revaluation account. It is also important to ensure that the estimate of changes in inventories at industry level is consistent with the estimate based on special information on the individual products.

The calculation of changes in inventories can be divided into:

- Changes calculated on the basis of the change in inventories during the year, according to accounts. These changes occur under MLS codes 2060 (raw materials), 2061 (wholesaling), 2062 (retailing) and 2065 (finished goods and work in progress);

- Changes which are calculated regularly on the basis of special information relating to changes in stocks of individual goods, mainly under MLS code 2063.

Changes which are calculated from special information on any given year or introduced at the time of the actual balancing are entered under MLS code 2064.

The table below shows information on the main source and estimation method for the different inventory types.

Table 5.18 Inventories by kind, 2012

Type of inventory	Main source	Change
		DKK mill.
Raw materials	Accounts statistics	- 3 305
Biological assets	Forestry data	1 189
finished goods and work in progress	Accounts statistics	- 390
Wholesaling	Accounts statistics	1 602
Retailing	Accounts statistics	283
Agricultural and energy (special treatment)	Industry specific Accounts statistics	649
Other inventory changes related to balancing etc.	Industry specific accounts statistics	9 823

5.12.1 Accounting figures underlying the calculation of inventories broken down by industry

Account statistics for non-agricultural private sector

From 1995, the old accounting statistics for manufacturing was replaced by the new industrial accounts statistics, whose coverage have be extended over time to more and more private urban industries. In 2012

Industrial accounts statistics covers DK-NACE industries 060000-330000, 383900, 450010-470000, 490020-590000, 610000-630000, 680010, 690010-720001, 730000-820000 and 950000.

In the industrial accounts statistics, all the firms and workplaces in the statistics are assigned the accounting figures which come from questionnaires, annual reports or the tax accounts for firms not covered by the sample. In cases where neither annual accounts, questionnaires nor tax accounts are collected, the missing accounting figures are calculated with the help of "standard ratios" compiled with reference to units for which the data are known. This therefore applies to a large number of small units which are known from VAT statistics only. By grossing up, therefore, the accounting statistics' inventories cover all firms and workplaces in the accounting statistics' industries and there should be no need for the figures to be grossed up any further. The connection between the inventory items in the industrial accounts statistics and the intermediate system codes can be seen in Table 5.18.

Table 5.19 Connection between the account statistics for non-agricultural private sector and the intermediate system (MLS)

		MLS-code	MLS-code
Items in industrial accounts statistics		Opening	Closing
44	Raw materials, ancillary materials, fuel and packaging	5060	6060
45	Work in progress	5065	6065
46	Finished goods	5065	6065
47	Goods for resale	5061/5062	6061/6062

The primary statistics processing throws up problems such as the lack of concordance between manufacturing/trading activity and the incidence of finished goods and inventories of goods for resale. For the national accounts calculations, there is a (computerised) reallocation of inventories in such units which appear to be incorrectly allocated. The inventories from the accounting statistics thus revised are then transferred to the intermediate system.

Tax account statistics

Changes in inventories in industries based on tax account statistics in 2012 have generally only comparatively small inventories of materials used for intermediate consumption. Since the input data for the tax accounting system include information on closing stocks only, opening stocks have to be based on the closing figures from the previous year. Some improbable changes in the inventories of the individual branches are thus unavoidable, most of them arising from a change in the delimitation or branch allocation of units from one year to the next. Since it is not possible in the tax accounting system to trace these changes back to the individual enterprises, a number of estimated corrections have to be made in the breakdowns of opening stocks, where possible in the form of switches from one industry to another or one sector to another within the same industry. The corrected inventories are supplied to the intermediate system in the usual form.

Industry-specific accounting statistics

To the extent that inventory data are collected in sub-systems using industry specific accounting statistics, the national accounts changes in inventories are calculated outside the central inventory calculation system. The resulting aggregate changes in inventories are transferred to the intermediate system under the codes for changes in inventories only, i.e. 206x, and no stocks are input into the system. In 2012, there were only 2063 changes in inventories in agriculture, 010000, which were transferred to the intermediate system file. Thus any changes in inventories in other industries, where the calculations are based on industry-specific accounting statistics, are ignored unless they come under 2063 or 2064 inventories.

5.12.2 Breakdown of inventories by product

The intermediate system collects data on the industries' inventories at the level of DK-NACE industry/sector and intermediate system codes. For the calculation of changes in inventories in the intermediate system, opening and closing stocks are needed at average prices for the year, and this in turn requires a complete breakdown of inventories by good. The system for the goods breakdown is therefore part of the system for producing the intermediate system, as well as being part of the system for the breakdown of accounting figures by product.

In the national accounts, there may in principle be inventories of raw materials in all industries, not only manufacturing but also in trade, even, or construction and civil engineering and service industries. Inventories

of finished products and work in progress occur in manufacturing and a few service industries, whilst inventories of goods for resale, as a result of the definition by activity of the trading industries, occur only in wholesale and retail trade industries. The intermediate system inventories are broken down by sector.

The breakdown by product of the industries' inventory totals is based on the product composition in the balanced supply and use tables for the previous year. The main rule is that for each of the intermediate system's inventory totals there is a column or a combination of columns from the previous year's supply and use matrix. From each of these columns, those products are selected which can go into the inventories in question, i.e. negative SUT values (scrap, disinvestment or negative consumption) are omitted and services, for example, or expenditure on advertising or electricity are not included in the basis for the distribution. The only records in the SUT columns which are extracted for the breakdown of wholesale and retail inventories are those which include wholesale or retail margins. Each inventory total at DK-NACE industry/sector level is then divided up by product in proportion to the selected values from an SUT column or with weighted values from more than one SUT column.

The breakdown by product of the intermediate system inventory totals is at MLS code/DK-NACE industry/sector level, whilst the supply and use matrices (SUTs) contain only breakdowns by commodity number/target total module code/industry. For the breakdown of inventories of raw materials and finished goods, the calculation is based on an SUT for the previous year, which is grossed up to include breakdowns for all DK-NACE industries, with the national accounts industry breakdown used for all sub-industries. For inventories of finished goods, raw materials and goods for resale, the same breakdown by product is used for each sector represented in the industry.

Totals for inventories of finished goods are broken down as the output of the industry at basic prices. The raw materials totals are broken down as the input of the industry at purchasers' prices excluding VAT. As a general rule, wholesale inventories are divided on the basis of the composition of inputs at basic prices for the types of industry which may be assumed to buy the goods in question. However, there are various branches whose inventories of goods for resale cannot be divided up in this way, and for most of these fixed breakdowns have been laid down. Inventories of retail goods are likewise divided using the composition of basic prices plus wholesale margins for consumption groups, with the individual groups weighted using a key corresponding to the key for the conversion from retail trade branch to consumption group used in the consumption and retail trade margin systems.

Table 5.20 Method for the breakdown of inventories by product

Type of inventory	MLS codes	Value level	National accounts industries	Broken down as previous year's SUT
Finished products	5065/6065	basic prices	All	National accounts industry output
Raw materials	5060/6060	purchasers' prices excl. VAT	All	National accounts industry intermediate consumption
Wholesale	5061/6061	basic prices	Main rule	Input in national accounts industry acc. key
		Included in manufacturing basic prices		Output in national accounts branch
		Included in construction and civil engineering basic prices		Input in national accounts branch(es) acc. key
	451110-451920			Fixed breakdowns by product number
	454000			Fixed breakdowns by product number
	461100			Fixed breakdowns by product number
	462100-463100			Fixed breakdowns by product number
	463600-463890			Fixed breakdowns by product number
	464330			Fixed breakdowns by product number
	464910			Fixed breakdowns by product number
	464990			Fixed breakdowns by product number
	465220			Fixed breakdowns by product number
	467100			Assumed covered by energy system
Retail	5062/6062	basic prices + wholesale margin	All except 477630	Consumption group(s) acc. key

For various industries such as agriculture and those which consist solely of general government, industry target totals are not used for inventories. For agriculture, changes in inventories are covered by the special calculation of agricultural inventories (2063 inventories) at product level.

5.12.3 Calculation of national accounts changes in inventories

For each type of inventory, changes in inventories in the business accounts are calculated as the value of closing stocks minus the value of opening stocks, estimated according to the enterprises' own accounting principles, which means that opening and closing stocks are calculated at different price levels. In the national accounts, changes in inventories should be estimated at the average prices for the year. Ideally, changes in inventories should be monitored throughout the year and all changes split into revaluations (holding gains) and national accounts changes in inventories. Normally, a reasonable approximation of the correct change can be produced by converting the value of both opening and closing stocks to the average prices for the year using the ratio of the year's average price to the price on the date of the inventory estimate. The national accounts change in inventories is then calculated as the difference between closing and opening stocks, at the average prices for the year (ignoring sporadic instances of inventory values being written up or down for reasons other than price changes).

The method used has been unchanged since the benchmark years 1988-92. The price indices used for the conversion of inventories to the average prices for the year are now in every case the "NF index" which can be found for all product numbers in the inventory calculations and is based predominantly on the producer price index. As the end-of-year index , 2/3 of the December index + 1/3 of the following January index is used. No different treatment is attempted for inventories estimated according to different accounting principles.

Opening and closing stocks are converted to average prices for the year for all combinations of product number/target total module code/DK-NACE industry/sector following the breakdown of inventory totals by product. The national accounts change in inventories is calculated as closing stocks minus opening stocks for each of these combinations.

Goods which appear in 2063-inventories and energy goods are also included in the breakdown by product of inventories of raw materials, since inventories in the accounts include such stocks. When the changes in inventories columns are worked out in the SUTs, it is assumed that these goods are covered in full by 2063 changes in inventories, and they are therefore omitted from the other changes in inventories, although they are, of course, included in the intermediate system figures for national accounts changes in inventories by MLS industry/sector.

The difference between the MLS industries' (i.e. the detailed DK-NACE industries') national accounts and business accounts changes in inventories is transferred to the intermediate system as a "price correction" under MLS codes 2098 referring to inventories of raw materials and 2099 for inventories of goods for resale. These items are used here to switch from business accounts to national accounts intermediate consumption and consumption of goods for resale.

Table 5.21 Comparison of changes in inventories in business accounts and national accounts, DK-NACE industries, 2012

MLS code	DK-NACE	Sector	Opening	Closing	Change	Increase in inventories	Price correction
			DKK 1 000				
2060	016100	S11	113 278	140 824	27 546	15 434	-12 112
2060	016100	S14	108 558	112 577	4.019	-7 088	-11 107
2060	016200	S11	39 663	44 063	4.400	279	-4 121
2060	016200	S14	31 258	49 676	18.418	14 843	-3 575
2060	016400	S11	268 910	223 505	-45.405	-71 660	-26 255
2060	031100	S11	19 021	33 779	14.758	15 002	244
2060	031100	S14	16 104	16 318	214	156	-58
2060	031200	S14	1 350	119	-1 231	-1 264	-33
2060	032100	S11	59 356	68 724	9 368	9 328	-40
2060	032100	S14	468	806	338	343	5
2060	032200	S11	147 323	139 579	-7 744	-8 513	-769
2060	032200	S14	41 600	48 947	7 347	7 333	-14
2060	061000	S11	600 332	572 775	-27 557	-37 662	-10 105
2060	081100	S11	13 791	12 655	-1 136	-1 043	93
2060	081100	S14	69	65	-4	-4	0
2060	081200	S11	55 629	55 401	-228	223	451
2060	081200	S14	4 667	4 711	44	76	32
2060	089100	S11	95	89	-6	1	7
2060	089200	S11	2 245	2 230	-15	10	25
2060	089200	S14	7	7	0	2	-2
2060	089300	S11	12 457	12 468	11	118	107
2060	089300	S14	190	178	-12	-12	0
2060	089900	S11	12 895	15 927	3 032	3 172	140
2060	089900	S14	36	33	-3	-1	2
2060	091000	S11	89 978	70 555	-19 423	-20 717	-1 294
2060	091000	S14	105	83	-22	-23	-1
2060	099000	S11	98	79	-19	-20	-1
2060	099000	S14	3	3	0	1	1
2060	101110	S11	95 045	116 446	21 401	17 851	-3 550
2060	101110	S14	148	159	11	8	-3
2060	101190	S11	57 334	106 642	49 308	46 725	-2 583
2060	101190	S14	1 476	1 579	103	59	-44
2060	101200	S11	36 552	36 691	139	-1 135	-1 274
2060	101200	S14	1	1	0	0	0

Table 5.22 Examples of the calculation of inventories.

Inventories of raw materials in DK-NACE industry 032200: freshwater fish farms, divided by sector, 2012

Product Nº	DK-NACE indust.	Opening Price 2012-pr. = 100	Closing Price 2012-pr. = 100	Opening stock	Closing stock	Change without price- corr.	Opening stock, 2012-prices	Closing stock, 2012-prices	Change in national accounts	Price corr.
		index		DKK 1 000						
V030100	S11	109.09	93.31	14 531	3 472	-11 059	13 320	3 761	-9 559	1 500
V050800	S11	95.24	118.18	3	1	-2	3	1	-2	0
V051103	S11	95.24	118.18	15 718	4 795	-10 923	16 503	4 057	-12 446	-1 523
V051105	S11	96.81	104.40	6 696	1 847	-4 849	6 917	1 769	-5 148	-299
V230903	S11	97.83	102.26	48 734	13 401	-35 333	49 813	13 104	-36 709	-1 376
V271005	S11	92.14	95.88	274	154	-120	297	161	-136	-16
V271007	S11	92.14	95.88	25	7	-18	27	7	-20	-2
V271013	S11	94.52	96.72	46 211	111 997	65 786	48 888	115 797	66 909	1 123
V271015	S11	96.02	98.11	4 169	901	-3 268	4 342	918	-3 424	-156
V271021	S11	98.48	99.22	1 157	306	-851	1 175	308	-867	-16
V271101	S11	96.72	98.29	306	173	-133	316	176	-140	-7
V391704	S11	97.45	101.10	533	143	-390	547	141	-406	-16
V391711	S11	98.41	100.51	74	20	-54	75	20	-55	-1
V391713	S11	98.41	100.51	16	4	-12	16	4	-12	0
V391900	S11	97.95	100.96	4	1	-3	4	1	-3	0
V392302	S11	101.89	98.26	3 699	959	-2 740	3 631	976	-2 655	85
V392304	S11	98.99	99.18	4	1	-3	4	1	-3	0
V560700	S11	99.86	102.45	1 437	390	-1 047	1 439	381	-1 058	-11
V560801	S11	98.16	99.11	12	3	-9	12	3	-9	0
V560805	S11	98.16	99.11	4	1	-3	4	1	-3	0
V560900	S11	98.16	99.11	91	24	-67	93	24	-69	-2
V611000	S11	99.60	99.93	204	54	-150	205	54	-151	-1
V950700	S11	98.88	100.94	3 423	924	-2 499	3 462	915	-2 547	-48
Total	S11			147 325	139 578	7 747	151 093	142 580	-8 513	-766
V030100	S14	109.09	93.31	4 103	1 217	-2 886	3 761	1 318	-2 443	443
V050800	S14	95.24	118.18	1	0	-1	1	0	-1	0
V051103	S14	95.24	118.18	4 438	1 681	-2 757	4 660	1 422	-3 238	-481
V051105	S14	96.81	104.40	1 891	648	-1 243	1 953	621	-1 332	-89
V230903	S14	97.83	102.26	13 761	4 699	-9 062	14 066	4 595	-9 471	-409
V271005	S14	92.14	95.88	77	54	-23	84	56	-28	-5
V271007	S14	92.14	95.88	7	2	-5	8	2	-6	-1
V271011	S14	94.52	96.72	13 049	39 275	26 226	13 805	40 608	26 803	577
V271012	S14	96.02	98.11	1 177	316	-861	1 226	322	-904	-43
V271019	S14	98.48	99.22	327	107	-220	332	108	-224	-4
V271021	S14	96.72	98.29	86	61	-25	89	62	-27	-2
V271101	S14	97.45	101.10	150	50	-100	154	49	-105	-5
V391704	S14	98.41	100.51	21	7	-14	21	7	-14	0
V391711	S14	98.41	100.51	5	2	-3	5	2	-3	0
V391713	S14	97.95	100.96	1	0	-1	1	0	-1	0
V391900	S14	101.89	98.26	1 044	336	-708	1 025	342	-683	25
V392302	S14	98.99	99.18	1	0	-1	1	0	-1	0
V392304	S14	99.86	102.45	406	137	-269	407	134	-273	-4
V560700	S14	98.16	99.11	4	1	-3	4	1	-3	0
V560801	S14	98.16	99.11	1	0	-1	1	0	-1	0
V560805	S14	98.16	99.11	26	8	-18	26	8	-18	0
V560900	S14	99.60	99.93	57	19	-38	57	19	-38	0
V611000	S14	98.88	100.94	966	324	-642	977	321	-656	-14
V950700	S14	109.09	93.31	4 103	1 217	-2 886	3 761	1 318	-2 443	443
V030100	S14	95.24	118.18	1	0	-1	1	0	-1	0
Total	S14			41 599	48 944	7 345	42 664	49 997	7 333	-12

Note: All Product Nº are placed in 117- Indust. Nº group: 030000

5.12.4 Calculation of changes in inventories using information on products

Special 2063 inventories are calculated for a small number of national accounts product numbers, all of them agricultural products and including a few pre-processed ones regularly calculated from information on the individual goods (excluding some specific changes in inventories which, by tradition, are entered under MLS code 2064).

Table 5.23 Increases in inventories calculated from information on products, 2012

CODE: 2063	PRODUCT-Nº	MLS CODE	Purchasers' prices incl. VAT
			DKK 1 000
Bovine animals, live, other than for breeding	V010203	2063	89 602
Pigs, live	V010300	2063	-48 956
Meat from bovine animals, fresh/refrigerated	V020100	2063	1 456
Butter and other fats from milk	V040500	2063	-11 724
Cheese	V040601	2063	-21 498
Wheat, wheat and rye mixed seed	V100100	2063	825 800
Rye	V100200	2063	46 900
Barley	V100300	2063	492 800
Oats	V100400	2063	11 500
Maize	V100500	2063	-3 841
Millet, other grain	V100800	2063	-187
Mink, beaver, fox and seal fur	V430101	2063	89 602
Increase in inventories, special products	Total	2063	-1 381 852

The calculation of 2063 changes in inventories is based on information on inventories in *physical units*, in contrast to the general method which is based on information on the *value* of inventories at industry level.

For those products included in the energy system, changes in inventories are calculated in the Environment and Energy Division in connection with the estimate of energy balances. The starting point here is information from *Energistyrelsen* [the Danish Energy Agency] on volumes and prices of the individual goods. Changes in inventories divided by product are received from the Environment and Energy Division, with no indication as to where in the inventories and industries the changes occur. As for the 2063 changes in inventories, the 2064 changes for energy are based on information on physical quantities.

Table 5.24 Increases in inventories from the energy system 2012

CODE: 2064	PRODUCT-Nº	MLS CODE	Purchasers' prices incl. VAT
			DKK 1 000
Hard coal and hard coal briquettes	V270100	2064	-216 481
Coke and semi-coke of coal	V270400	2064	28 679
Petroleum oils and crude oils	V270900	2064	-4 666 968
Kerosene-type jet fuel and medium oil	V271001	2064	5 137 300
Aviation spirit and motor spirit	V271005	2064	1 666 978
Light oil, special spirits	V271009	2064	-372 040
Medium oil, petroleum	V271011	2064	-308 114
Gas-oil, except for processing	V271012	2064	4 340 508
Automotive diesel	V271015	2064	-321 878
Fuel oils other than for further processing	V271019	2064	1 917 688
Fuel oils etc. for processing	V271023	2064	-5 177
Natural gas, propane, butane, etc.	V271101	2064	68 425
Petroleum coke	V271301	2064	-21 570
Increase in energy inventories	Total	2064	7 247 350

5.12.5

5.12.6 Special changes in inventories - other 2064 inventories

The other 2064 changes in inventories are also compiled for individual goods, but in principle should not be produced on a regular basis as results from national accounts subsystems. It is debatable whether this is the case with all products occurring here. The estimate of some 2064 changes in inventories for ships and railway rolling stock has gradually become an ongoing process. However, more often than not changes in inventories are either introduced with the balancing or their actual figure is not finally fixed until that point, and cannot be worked out from the accounting sources. Some of these changes may, however, occur within inventories covered by the accounts.

Table 5.25 Increases in inventories, other special inventories, 2012

CODE: 2064	PRODUCT-Nº	MLS CODE	Purchasers' prices incl. VAT
			DKK 1 000
Rapeseeds, incl. crushed seeds	V040107	2064	300 000
Fats and oils of fish	V220300	2064	350 000
Fireworks	V360400	2064	300 000
Raw hides and skins of bovine animals, horses	V410100	2064	100 000
Raw furskins	V430100	2064	-100 714
Dress, skirt trousers etc., female	V620400	2064	250 000
Stove, wash boiler, furnace not electric	V732102	2064	-20 000
Refrigerator and freezers	V841802	2064	-10 000
Dishwashers, household use	V842201	2064	-50 000
Washing machines maximum of 10 kg clothes	V845001	2064	-70 000
Dryers maximum of 10 kg clothes	V845103	2064	-15 000
Parts for electric motors	V850300	2064	1 646 852
Apparatus for room- and soil-heating	V851603	2064	-10 000
Ovens, stoves, cookers, etc.	V851613	2064	-25 000
Seating with wooden frames	V940103	2064	-150 000
Wooden kitchen furniture	V940307	2064	-60 000
Wooden furniture, not for business use	V940308	2064	-150 000
Constr. toys, toy animals, tricycles etc	V950300	2064	290 000
Increase in other special inventories	Total	2064	2 576 138

Initially, 2064 changes in inventories are worked out by linkage with the supply and use tables (SUTs) with no breakdown by sector or industry. As regards the institutional accounts, however, a breakdown by sector is necessary, and these changes in inventories are subsequently broken down (somewhat roughly) by industry and sector.

5.12.7 Relation between changes in inventories calculated based on inventory totals broken down by industry and information on individual products.

Table 5.26 outlines how national accounts changes in inventories are obtained. Since the purpose here is to show where there is a possible overlap between changes calculated from different sources, the aggregate inventory calculations are divided up into 2060-, 2061-, 2062- and 2065- inventories on the one hand and 2063- and 2064- inventories on the other.

Table 5.26 Relation between changes in inventories broken down by industry and information on individual products

Industries Products	Industries where changes in inventories are calculated on the basis of inventories in accounts	Industries where changes in inventories cannot be calculated from inventories in accounts	Changes in inventories by product
Products for which changes in inventories are worked out using a breakdown of changes in inventories in the accounts	These are obtained as the difference between opening and closing stocks as broken down in the accounts, calculated in average prices for the year. There may be 2064-changes in inventories here, in which case there are balancing corrections to the changes in inventories originally calculated.	Only 2063- or 2064- changes in inventories can occur here.	*Here, chan. in invent. broken down by product are obtained as the sum of the changes in invent divided over the individual industries + any 2063- and 2064- chang. in invent.*
Products for which the aggregate change in inventories is calculated in terms of goods (2063- and 2064- inventories)	These are calculated on the basis of the breakdown of inventories but at the same time are incl. in those changes in inv. which are calc. on the basis of information on goods. To avoid double counting, they are omitted when the aggr. change in invent. is worked out in a breakdown by product. They are, however, incl. in the calc. of the industries' national acco. changes in invent. and the change from business accoun. to national accounts consumption.	This area is covered in full by changes in inventories calculated on the basis of information on goods, even though these are not available in a breakdown by industry. It covers items such as stocks of energy in energy supply and transport industries, which are calculated in A-files.	Total changes in inventories for goods where changes are calculated on the basis of information by good.
Changes in inventories broken down by industry.	Total changes in inventories calculated from inventories in the business accounts plus any additions (2064).	*These changes in inventories are included in the totals compiled at goods level with no breakdown by industry.*	National accounts aggr. changes in invent..

The first column in the table shows the changes in inventories according to the intermediate system, broken down by good according to the "inventory breakdown system". The national accounts aggregate changes in inventories are obtained as the sum of these changes excluding those goods for which all changes are determined in terms of goods as 2063- or 2064-inventories. Implicitly, the value of the overlap between the two calculations is also estimated in the inventory breakdown system. It is the cells (row 4, column 2) and (row 3, column 4) for which information is available before the start of the balancing.

It is clear that the calculation of the overlap will be somewhat uncertain. The system used for distribution of accounts statistics' inventories by products has some built in "handles" that are used to adjust the changes inside the overlap to the changes that are calculated as 2063- or energy inventory changes while keeping the values of opening and closing stocks equal to their values from accounts statistics. There is, however, also a certain amount of uncertainty about the figures in the accounting statistics which refer to inventories. If the calculated inventory data conflict with other information when the product balances are balanced, it may still in some cases be reasonable to amend the aggregate changes in inventories[17].

5.13 Acquisitions less disposals valuables

Acquisitions less disposals of valuables are estimated from the supply side using the commodity flow method. Table 5.27 shows net acquisitions of valuables divided into those products which were included in this capital accumulation category in 2012.

[17] The balancing, however, normally complies with the principle that there has to be a counterpart entry to corrections to inventories in other changes in inventories which may reasonably be considered to have taken place within the same enterprise. There are only a few exceptions, most often the introduction of 2064 changes in inventories in the goods in question.

Table 5.27 Acquisitions less disposals of valuables, 2012

Product nº	Text	Category	DKK mill.
V570201	Kelem and similar hand-woven rugs	AN.133	211
V710206	Diamonds, unfitted	AN.131	58
V711301	Articles of jewellery of silver	AN.133	990
V711303	Articles of jewellery of precious metals	AN.133	769
V711401	Articles of silversmiths' wares	AN.133	26
V711403	Articles of goldsmiths'/silversmiths' wares of precious metals	AN.133	18
V711600	Goods of natural pearls/cultured pearls	AN.131	0
V711700	Imitation jewellery n.e.c.	AN.133	372
V711800	Coins	AN.133	65
V970100	Paintings, drawings and pastels, collages etc.	AN.132	467
V970200	Original engravings, prints or lithographs	AN.132	207
V970300	Original sculptures or statuary	AN.132	209
V970500	Collections and collectibles	AN.132	3
V970600	Antiques of an age exceeding 100 years	AN.132	12
Total			3 490

5.14 Exports of goods

For a more detailed description of the sources and methods used to compile the export of goods in the External Economy unit please refer to chapter 10.

Goods accounted for DKK 618 752 million, or 60%, of the DKK 1 035 249 million total exports of goods and services in 2012.

Table 5.28 Exports of goods, 2012

	DKK mill.
Exports of goods, Intrastat	380 579
Exports of goods, Extrastat	238 173
Exports of goods, Total	618 752

Note: The national accounts total is split between intra and extra stat trade using detailed data from the External Economy unit.

In the national accounts, exports of goods are based directly on Statistics Denmark's estimates of external trade. External trade statistics are described in greater detail in chapter 11. The estimates use one method for EU trade (Intrastat) and a different one for trade with non-EU countries (Extrastat).

The statistics have the same geographical coverage as the national accounts and are grossed up to cover all external trade in goods regardless of any administrative threshold values for the reporting of EU trade to the Intrastat system. EU trade not reported is estimated on the basis of the quarterly VAT returns on all EU trade. Therefore the primary statistics do not need to be grossed up for use in the national accounts. The value levels in external trade statistics are f.o.b. for exports and c.i.f. for imports.

The external trade statistics include all exports listed in §3.165 in ESA2010. The estimate for smuggled goods is calculated in the National Accounts unit whereas the other items are collected by the Externat Trade unit. The items listed in §3.166 in ESA2010 are excluded from the External Trade statistics except from for the items mentioned in the table below. For these items the National Accounts unit make corrections when implementing the data in the supply use tables. The items are treated as follows:

- Merchanting figures are received from export of services statistics and added to the export of goods. In the supply use table this is placed on the product number T460009
- Provisioning and bunkering is placed on three product numbers in the supply use table according to supplementary information from the external trade in goods statistics. Thus the entries 3 to 6 in the table below sum to zero reflecting that the total for provisioning and bunkering is unchanged.
- Goods sold abroad after processing abroad are based on data from the external trade in services statistics. The data from the trade statistics contain information on processing by firm. The data on each

firm's export of goods after processing abroad is combined with information from the industrial commodity statistics to determine what products are exported. In a few cases the exporting firms are not covered by the industrial commodity statistics. In these cases expert judgement is used for the distribution on products.

- Goods exported for use in construction abroad by Danish companies are marked with a special code in the external trade with goods statistics thus making it possible to remove them before use in the national accounts statistics.
- Goods sent abroad after processing in Denmark and goods sent abroad for processing are both marked with special codes in the external trade with goods statistics thus making it possible to remove them before use in the national accounts statistics.
- Exportation of household goods when moving like the items above can be identified in the external trade statistics and thus removed before use in the national accounts statistics.
- Finally goods returned are removed from the external trade with goods. Here detailed information from the external trade statistics is used to identify the original products involved.

Table 5.29 Corrections to external trade in goods statistics, exports, 2012

	DKK mill.
Exports according to external trade statistics	613 324
Merchanting	16 458
Provisioning incl. bunkering	-8 063
Bunkering regarding foreign ships	3 900
Bunkering regarding foreign air crafts	800
Provisioning excl. bunkering	3 363
Goods sold abroad after processing abroad	3 041
Goods exported for use in construction abroad by Danish companies, repairs	-2 591
Goods exported for use in construction abroad by Danish companies, maintenance	-332
Goods sent abroad after processing in Denmark	-1 600
Goods sent abroad for processing	-2 071
Exportation of household goods when moving 2)	-325
Goods returned	-1 883
Goods returned in import statistics 4)	-5 271
Export of goods in National Accounts	618 752

Export and import in the external trade statistics only include goods that cross the border. As the criteria in ESA2010 is change of ownership, a correction of the external trade figures regarding transactions involving changes of ownership of goods, which do not cross the border, is needed. This correction is based on detailed information from external trade statistics regarding e.g. goods returned and the balance of payments statistics regarding e.g. bunkering.

5.15 Exports of services

Exports of services accounted for DKK 416 497 million, or 40%, of the DKK 1 035 249 million total exports of goods and services in 2012.

Table 5.30 Exports of services, 2012

	DKK mill.
Exports of services, Intrastat	179 248
Exports of services, Extrastat	237 248
Exports of services, Total	416 496

Note: The national accounts total is split between intra and extra stat trade using detailed data from the External Economy unit.

The estimate of the services export is based on a survey conducted by the External Economy unit in Statistics Denmark. For a more detailed description of the sources and methods used to compile the export of services in the External Economy unit please refer to chapter 10. The survey includes questions regarding the export of construction services and processing services making it possible to estimate the processing fee.
The data from the External Economy unit contains information on the kind of activity of the exports and the industry of the exporter. This information is used to determine what products are exported. For each kind of activity export there is made a distribution on products. In some cases the entire kind of activity export is placed on one product. For instance the export labelled commissions regarding commodity trade is placed on the product for commissions in the supply use tables. This is the case for DKK 239 044 million, or 57% of the service exports.

DKK 73 195 million or 18% is distributed by products using the industry of the exporter. This is the case for amongst others the data on computer services and royalties and license fees. Thus the export labelled computer services in the service export data are assumed to be regarding software licenses if the exporting industry is the software producing industry.

The remaining DKK 104 258 million or 25% are distributed by products using fixed percentage distributions for each kind of activity export.

5.16 Imports of goods

Goods accounted for DKK 567 066 million, or 62%, of total imports of goods and services in 2012 (DKK 921 170 million).

Table 5.31 Imports of goods, 2012

	DKK mill.
Imports of goods, Intrastat	382 530
Imports of goods, Extrastat	184 537
Imports of goods, Total	567 067

Note: The national accounts total is split between intra and extra stat trade using detailed data from the External Economy unit.

Table 5.32 Corrections to external trade in goods statistics, imports, 2012

	DKK mill.
Exports according to external trade statistics	528 678
Bunkering regarding ships	40 285
Bunkering regarding air crafts	2 318
Bunkering not regarding ships and air crafts	3 499
Spare parts and other provisioning in conjunction with repairs of ships	2 575
Spare parts and other provisioning in conjunction with repairs of air crafts	245
Spare parts and other provisioning in conjunction with other repairs related to transportation	81
Goods bought abroad for processing abroad	974
Goods imported for use in construction in Denmark by foreign companies, repairs	-1 491
Goods imported for use in construction in Denmark by foreign companies, maintenance	-447
Goods received from abroad for processing in Denmark	-1 323
Goods returned after processing in Denmark	-2 828
Exportation of household goods when moving 2)	-216
Illegal imports of goods	1 871
Goods returned	-5 271
Goods returned in import statistics 4)	-1 883
Import of goods in National Accounts	567 066

Reference should be made to Section 5.14, since sources and methods are the same for imports as for exports of goods, except for procurements, for which the source is the account statistics for shipping.

5.17 Imports of services

Imports of services accounted for DKK 354 104 million, or 38%, of the total imports of goods and services in 2012 (DKK 921 170 million).

Table 5.33 Imports of services, 2012

	DKK mill.
Imports of services, Intrastat	194 650
Imports of services, Extrastat	159 454
Imports of services, Total	354 104

Note: The national accounts total is split between intra and extra stat trade using detailed data from the External Economy unit.

Reference should be made to Section 5.15, since the sources and methods are the same for imports as for exports of services.