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Mini Presentation on Turnover/Output

Turnover and Output Measurement for Freight Transport by Road in Germany

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1. Definition of the service being collected

The NACE sector freight transport by road (60.24; ISIC 6023) includes all kinds of transporting cargo on the road, including renting of trucks with driver, furniture removal and animal-drawn transport. Post and courier activities as well as cargo handling operations are excluded.

2. Unit of measure to be collected – units, tons, dollar value, margin, etc.

The output of the industry in freight transport by road is measured in tons (transportation volume) and tonnes-kilometres (tkm – transportation performance). 1 tkm is the performance of transporting 1 t of goods for 1 km. The measurement of these units is task of transport statistics.

The turnover of the industry is measured in €, of course. The service statistics cope with this task.

3. Market conditions and constraints

In the past in Germany freight transport by road (especially long distance commercial transport) was quantitatively limited by numerous administrative regimentations, in particular to protect railways against competition. In the 90s of the past century important liberalisation measures took place: The tariffs for the commercial long-distance transports were cancelled by the "law for the abrogation of the tariffs for road transport", starting from January 1st 1994. However, restrictions still existed in the form of contingents, concessions and the regulation of short-distance transportation. These were cancelled in 1998 when the "road freight transportation act" (*Güterkraftverkehrsgesetz*) was put into force. Today, the market is deregulated and liberalized as far as possible. Only a permission which can be received relatively easily is necessary to start a commercial transport enterprise in Germany in this sector. Transport on own account is permission-free.

In this market it is very common to work with sub contractors. There are numerous self employed persons with own trucks. More than 60% of the enterprises in this sector have less than five persons employed. These small enterprises often have no direct market contact to the shipper but only to an agent (freight forwarder).

Therefore, the sector "Freight transport by road" (NACE 60.24/ISIC 6023) is strongly enmeshed in the sector "Activities of other transport agencies – freight forwarding" (NACE 63.40/ISIC 6309). Most of the market relations are relations between these agents and the senders. Another problem is to delimit the sector "Freight transport by road" from the sector "Courier activities" (NACE 64.12/ISIC 6412) containing parcel, express and courier services.

4. Standard classification structure and product detail /levels

... does the standard include an exhaustive, up to date listing of products produced by the industry or group being studied? Are the products reflective of significant output groupings?

4.1 Output

4.1.1. Main analysing variables

- Weight of the transported cargo in tons (t):
  This means the gross-gross weight of goods and includes the total weight of the goods, all packaging, and tare-weight of the container, swapbody and pallets containing goods.

- Tonnes-kilometre (tkm) effected during the journey: This unit of measure of goods transport represents the transport of one tonne by road over one kilometre. The reported distance is the distance actually run.

4.1.2. Main classification variables

- Type of transport (hire or reward/own account);

  Transport for "hire or reward" (*gewerblicher Güterkraftverkehr*) is defined as the haulage for remuneration of goods on behalf of third parties. Transport "on own account" (*Werkverkehr*) is transport of goods that is not for "hire or reward". 60% of the goods were transported in the year 2005 in Germany for hire or reward, 40% on own account; in total only 37% were transported by enterprises with the main economic activity in transport, storage and communication (NACE I).

- Main traffic relations (seen from the point of a national vehicle)

  Main traffic relations are:
  - National transport (road transport between two places (a place of loading and a place of unloading) located in the inland),
  - international transport outwards (a place of loading in the inland and a place of unloading in a foreign country),

- international transport inwards (a place of loading in a foreign country and a place of unloading in the inland),
- transit (places of loading and unloading in foreign countries and transit through the inland).

Of minor importance are

- cabotage (place of loading and unloading in the same foreign country) and
- cross trade road transport (place of loading and unloading in two different foreign countries).

- Type of goods. The cargo is classified in groups referring to an appropriate classification. At the moment the categories of goods carried by road are those defined by the NST/R nomenclature (Standard Goods Nomenclature for Transport Statistics/revised - Eurostat) from 1968.[1]

The NST/R classification has the following structure:

Level 1: 10 chapters identified by one-digit numerical codes (0 to 9);
Level 2: 52 groups identified by two-digit numerical codes;
Level 3: 175 headings identified by three-digit numerical codes.

The 10 chapters are:

0	Agricultural products and live animals
1	Foodstuffs and animal fodder
2	Solid mineral fuels
3	Petroleum products
4	Ores and metal waste
5	Metal products
6	Crude and manufactured minerals, building materials
7	Fertilizers
8	Chemicals

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[1] The German translation of the NST/R is called *Güterverzeichnis für die Verkehrsstatistik* (GVV).

9	Machinery, transport equipment, manufactured articles and miscellaneous article

Starting with Council Directive 78/546 on road transport statistics, an aggregation into 24 groups was introduced on EU-level for practical reasons (the 52 groups were too detailed and the 10 chapters not detailed enough) . These 24 groups appear in all subsequent EU-legal acts on transport statistics, although they have never been incorporated into the official NST/R system.[2]

If several different types of goods are transported during one laden journey, only the main type of good (the good with the uppermost weight) has to be reported.

The NST/R is a rather old nomenclature. At a Eurostat meeting in March 2000, the principle of a new goods classification (NST-2000) to replace NST/R was approved. The main principle of the proposed new classification is that the criterion for classification of goods should be the economic activity from which the goods originate. This approach is the same as used in the CPA (1996), where the structure (divisions) of CPA is the same as NACE Rev 1. NST-2000 will, therefore, be based on the CPA categories. NST-2000 which shall entry into force in 2008 will have 20 first-level groups of which 14 are directly based on CPA-categories. Six additional NST-2000 groups have been defined to deal with special categories of transported goods which are important for transport statistics and cannot be defined using the CPA (see annex II).

- Type of freight

The type of freight, also known as type of cargo or mode of appearance, is an optional variable in the EU-regulation on freight transport statistics. In principle, the mode of appearance (basically how the goods are packaged - if at all - for conveyance) seems to be an important aspect for the transport world. It will determine the kind of vehicle to be used. However, as there is a strong relation between the kind of commodity and the mode of appearance (the commodity will to a high extent determine the mode of ap-

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[2] For a description of these 24 groups, see annex I.

pearance), information on the kind of commodity is indispensable for prognoses of the mode of appearance.

0	Liquid bulk goods (no cargo unit)
1	Solid bulk goods (no cargo unit)
2	Large freight containers
3	Other freight containers
4	Palletised goods
5	Pre-slung goods
6	Mobile, self-propelled units
7	Other mobile units
8	(Reserved)
9	Other cargo types

In Germany only the positions 0 – 5 are asked separately, the position 6 – 9 are asked together in a new position "other". Due to the relatively small sample, size cross tables by type of good and type of freight cannot be published in Germany.

4.2 Turnover

Included in the turnover data is turnover made by enterprises with their main economic activity within the sector "Freight transport by road". Revenues of other activities of these enterprises can be included in the collected turnover data as well. Revenues of freight road transport activities are not included when obtained by enterprises with their main economic activity in another sector than "Freight transport by road". The standard classification follows the concept of the main economic activity of an enterprise.

The aim of service statistics is not to measure the turnover gained by freight transport but the development and structure of the enterprises offering mainly this service to others.

5. Evaluation of standard vs. definition and market conditions

5.1 Output

Transport statistics are mainly required to support the national and EU transport policy; transport is also an important part of regional and environmental politics. A national and international key political objective is to shift the split of the modes of transport, favouring rail, short-sea shipping and inland waterways transport over road transport, and thereby removing the existing coupling of economic growth with increased road traffic. Transport statistics therefore have to constitute a comprehensive transport information system for all modes, including detailed data on flows of goods.

The main user group often consists of governmental institutions. Politicians and research institutes need data on transportation, mainly for forecasting and planning purposes. Transport statistics are the basis for decisions in transportation politics and measures of the transport authorities of the Federation and the *Länder* as well as of institutions of the European Union.

But transportation is a "derived activity"; transportation never takes place for sake of transport only. It is always closely related to other activities such as trade and production. Therefore, political transportation planning and measures as well as economic and legal regulations of road transportation are based on founded knowledge about the quantity and structure of the transported cargo.

From the view of transportation politics, transportation research and transportation enterprises, the Standard Goods Classification for Transport Statistics (NST/R and, in the future, NST-2000) is suitable to provide the necessary detailed information for the observation of the transport markets. For the enterprises the information pattern is complemented by figures on mode of appearance.

5.2 Turnover

Most market relations of the road freight transportation enterprises are not relations to the senders but to transport agents (freight forwarders). In many cases these agents do not only offer to organise all services within the transport chain but hold their own vehicles and use them for providing road transportation. Prices for the transport service are not dominated by the relation carrier – sender but agent – sender. The market power of the carriers is, due to the high

competition and the enormous amount of small enterprises, rather low compared to the market power of the transport agents.

A significant share of the transport service in the German road freight transportation market is – due to the liberalisation– not provided by German enterprises but by enterprises from other European countries; especially from the Netherlands, Denmark and Eastern Europe. The turnover of these enterprises is not included in the collected data though they offer their service on the German market. An additional problem is the regionalisation of transport turnover. In case of international transport the crucial question is how to split up the turnover by the tangled states.

As seen the used concept is not optimised for measuring the turnover obtained by road freight transport. It does only measure the total turnover made by German enterprises with their main economic activity in the sector of freight transport by road. Therefore it is not the optimal concept for examining the German market for road freight transportation.

6. National accounts concepts

... and measurement issues for the area related to GDP measurement

In National Accounts (NA) in principal all available data has to be taken into account in order to calculate the output of industries. The data-processing begins with data validation related to the comparability of the new data within time series and with other data sources and additionally with further calculations for other variables in the national accounts. In each case the most suitable data compared to the concepts and definitions of the European System of Accounts (ESA) is chosen. For the time being there are mainly three different sources, that is the business register, the annual VAT statistic and the annual structural business statistic (SBS) for service industries.

In Germany for a long time the VAT statistic has been the traditional data source for NACE 60.24. Starting with the reporting year 2000 the service statistic (SBS) delivers additional information. However the service statistic has to overcome the initial difficulties of any new implemented statistic in order to get results that are consistent as time series and compatible with other statistics in the same industry. As for the NACE 60.24 the turnover in the service statistics in 2003

comes only to 81,3 % of the turnover in the VAT statistic (decreasing from 87,5% in 2002). On the basis of a research made in our office upon the influence of VAT groups on the turnover of the VAT statistics, we may assume that this difference isn't a reflection of the VAT groups in the VAT statistics. For these reasons it was decided for the time being to keep using in the National Accounts the turnover of the VAT statistic as the main data source for output compilation. For the future it has to be decided each year again about the quality and suitability of the data and to answer the question about using the VAT statistics or the service statistics for calculating the turnover in the national accounts.

Insofar as none of the original data sources are fully in accordance with NA concepts it is necessary to combine different data sources and to make special adjustments. NA concepts do not fully agree with national business accounting rules and the data sources often do not offer the appropriate information in a sufficient breakdown. Some of the necessary adjustments are operated on the four digit level of the NACE, but some of them are done on a more aggregated level. For this reason the description of the calculations for the NACE 60.24 in the national accounts cannot be given up to the final results because some imputations and assessments that may have an important impact on the final results of NA are not available in full breakdown of industries.

A special adjustment has to be made in order to show the turnover of secondary activities in trade only with the trade margin: we eliminate the value of the goods purchased for resale as a quota of the total turnover as in the VAT statistic. That quota will be estimated using data of the service statistics about "merchandises and services for resale" and further information. Additionally information from service statistics is used to estimate intermediate consumption (via an input-output ratio) and thus calculating gross value added (GVA) as difference between output and intermediate consumption.

The calculation of up-to-date quarterly NA figures for output (resp. GVA) in "freight transport by road" is based on tonnes-kilometres as an indicator for extrapolation of previous year's values. These indicators are also used for the breakdown of final annual figures to get quarterly results. The indicator tonnes-kilometre is derived from official monthly transportation statistics in freight transport by road.

7. Turnover/output data method(s) and criteria for choosing various output/turnover methods

7.1 Output

7.1.1. Legal Basis

Legal basis for the collection of output data on freight transport by road in all EU member states is the Council Regulation 1172/98 of May 25th 1998 "on statistical returns in respect of the carriage of goods by road."[3]

7.1.2. Short description of the survey in Germany

The reporting unit for freight transport by road statistics is the "goods road transport vehicle",[4] the statistical unit is the tractive vehicle. Lorries with a capacity less than 3.5 t are excluded. Road freight transport statistics are collected by all EU-Member States for vehicles registered in their own country. Therefore, the statistics on road transport are based on the nationality concept; they reflect the performance of the vehicles registered in the reporting country (transport of national vehicles to/from the reporting country and the performances in and between third countries). Statistics for other transport modes (railways, inland waterways, sea, air) are based on the territoriality concept. They reflect the goods and vehicles entering or leaving a country irrespective of the nationality of the transporting vehicle. Therefore, the territory concept presents a complete picture of goods transport in the reporting country. On EU-level it is possible and already realized to transform road freight data collected according to the nationality concept into data according to the territoriality concept. Because all member states have to transfer their micro data to Eurostat, Eurostat is in a position to give an overall picture of the complete flows of EU vehicles by adding the data sets together and transferring the relevant data back to the national statistical offices. This means that Germany gets the information of transports of other EU-vehicles into, from, to and through Ger-

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[3] This is a good example to prove that nomenclature of transport statistics is different from that used in turnover and price statistics, where the term "freight transport by road" would be used instead of "carriage of goods by road".

[4] "…any single road transport vehicle (lorry), or combination of road vehicles, namely road train (lorry with trailer) or articulated vehicle (road tractor with semi-trailer), designed to carry goods…" as defined in Council Regulation No. 1172/98, art. 2.

many. Nevertheless, information on transport of vehicles from Non-EU-Member States is available only to a very limited extent.

In Germany the survey is carried out as a sample survey with obligatory provision of information. The sample is stratified hierarchical, according to 4 levels. The sampling register used for the survey is the register of tractive vehicles maintained by the Federal Motoring Office (*Kraftfahrt-Bundesamt* – KBA).[5] The collection and processing of the data is the task of the KBA and of the Federal Office for Freight Transport (*Bundesamt für Güterverkehr* – BAG).[6]

Data for road freight transport are obtained through questionnaires sent out to a sample of hauliers for vehicles registered in the inland. The micro data concern the vehicles themselves, their journeys and the transported goods. Included are all journeys of single road transport vehicles (lorry), or combination of road vehicles, namely road trains (lorry with trailer) or articulated vehicles (road tractor with semi-trailer), designed to carry goods. Information about the vehicle is taken from the vehicle-register. The respondents have to give information about all journeys of the vehicle and the goods transported for the reporting period. The reporting period is a half-week. For every reporting period of the year (total 104) at the most 0.5% of the vehicles are included. The selection of the sample units takes place in a two-stage procedure. In the first stage a stratified random sample of the vehicles is drawn from the vehicle register, in the second stage a half week is selected as the reporting period for each selected vehicle.

7.2 Turnover

The turnover of the enterprises described in ch. 4 is monitored annually as absolute value as well as its quarterly change.

Both surveys – the annual structural business survey in the service sector and the quarterly survey in selected service branches – are organised as decentralised annual resp. quarterly mandatory sample surveys. The stratified random samples (annually 15%, quarterly 7.5%) are based on the statistical business register, filled with data by tax and labour administration, and cover a wide range of enterprises with their main economic activity within the service sectors.

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[5] In English often referred to as "Federal Bureau of Motor Vehicles and Drivers".

[6] In English often referred to as "Federal Office for Goods Transport".

The samples are stratified in this order by regions, branches and VAT-turnover information. The quarterly sample rate for the road freight transport enterprises is due to the stratification with 10.1% higher than the average sample rate of 7.5%.

This relative low quarterly sample rate covers more than 42% of the turnover of the road freight transport enterprises.

The annual absolute results are published as raised figures; the quarterly results are published as the change against a fixed base period. They are calculated by using raised figures. An index based on a fixed base period (year 2000) is computed by chain linking of the calculated changes against the previous quarter and previous quarter's index value. The quarterly figures are published as working day and seasonal adjusted figures as well.

At the moment there are ongoing tests if monthly VAT-turnover information is useable to create the quarterly turnover changes. But the tax authorities use a slightly different definition for turnover. This definition includes more revenues than the revenues linked to the direct market activities.

Legal basis for the annual survey are the EU- Regulation on SBS (Council Regulation 58/97) and the national "*Dienstleistungsstatistikgesetz*" (service statistics act). For the quarterly survey the legal basis are the EU-STS-Regulation (Council Regulation 1165/98) and the national "*Dienstleistungskonjunkturstatistikgesetz*".

8. Evaluation of comparability of turnover/output data (especially product lines and related broad grouping levels) with price index practices

(The purpose of Heading 8 is to help determine the optimal level of breakdown for turnover. While a less detailed level might be sufficient for the national accounts – heading 5 above – for PPI we need to determine the level of turnover detail relevant for the firm. We need good breakdowns of turnover data in order to determine proper weights for price indices. The level of detail at which price monitoring is possible might be one selection criterion.)

The German Service Statistics has produced results of turnover figures for freight transport by road and freight forwarding since 2000. During this period the accuracy of measurement of turnover figures has continuously increased. However, turnover figures are not detailed according to market segments. So, only an impression of the market size can be derived from service statistics, not a breakdown that would facilitate the development of an SPPI.

The output data about transportation performance provided by transport statistics is the most important source for the weighting pattern of the SPPI for freight transport by road in Germany. To get the weights, it was combined with data from the BAG about unit values per tonne s-kilometre for the 10 chapters of goods. This sounds far easier than it was:

- The data published by the KBA shows only aggregates for distances, cargo categories etc. The KBA was, however, able to provide more detailed data.

- This detailed data was classified according to distance, cargo category (classified according to the NST/R), and body type. Further information existed about percentages of dangerous goods in the cargo categories[7], and transports of containers (KBA).

- With this information, it was possible to arrange the data in such a way that it complied with the classification of distance categories and transport groups newly introduced for the SPPI. Then data about transportation performance for these product groups was calculated.

- To get the turnover figures, the unit values provided by the BAG had to be used as approximation for prices.[8] Of course, they referred to the NST/R chapters, so it had to be analyzed how the transportation performance of the product groups is distributed among the data provided by the KBA. This resulted in a set of matrices, which was used to calculate freight rates per tonnes-kilometre for the product groups and, by multiplication, turnover of the product groups.

In conclusion, output data is the most important source for the weighting pattern of the SPPI due to its detailed level of information. However, the data has to be regrouped to fit into the structure of the SPPI.[9]

9.   Development of an index of service production

Another task for the future might be the calculation of an index of service production (ISP) as proposed by Hong (2005).[10] The development of an ISP for freight transport has to be seen in

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[7] Source: Internal data of FSO's transportation statistics department; a summary of this analysis is comprised in Walter (2004): Gefahrguttransporte 2002. In: Wirtschaft und Statistik 8/2004, Wiesbaden, p. 854ff.

[8] Later on, this approximation can be substituted by real prices obtained from the survey.

[9] For a description of the German SPPI on Freight Transport by Road, see Goldhammer, B./Ritter, L. (2006): SPPI for Freight Transport by Road in Germany. Paper, 21ˢ Voorburg Group Meeting, Wiesbaden.

[10] Hong, E.-P. (2005): Compilation Manual for an Index of Service Production. Paper, 2 draft version, 20ᵗ meeting of the Voorburg Group. Helsinki.

the broader context of the development of ISP for the whole service sector. ISP are very important short term indicators for the economic development in the different NACE sectors. In contrast to the service sector the provision of ISP for NACE sectors in industry nowadays is a regular practice for many countries.

For freight transport two types of ISP are possible: turnover deflated by SPPI, and volume indicator. However, both approaches need improved input data: the turnover measure has not yet reached sufficient quality and the SPPI is just about being calculated for the first time; a volume indicator solely based on transportation performance (tkm) would include production of companies from other sectors than freight transport by road and exclude other services the companies of sector 60.24 offer. So, before calculating an ISP, the quality of data on which the ISP is based needs to be secured.

10. Summary and conclusion

The German statistical system offers both turnover and output data for freight transport by road in the form of services statistics and transport statistics. However, improvement of coherency between these statistics, national accounts and SPPI for freight transport by road is a major task for the future. Service statistics still lacks accuracy and hence, they are not used by the national accounts at the moment; transport statistics surely give a good estimate for the overall transportation performance, but this includes companies not mentioned in NACE 60.24 as well – not the companies mentioned in this sector form the basis for the survey, but the register of commercial road vehicles. Last, the SPPI includes large freight forwarders with own fleet registered in NACE 63.40 to get representative figures from the market leaders in freight transport by road – most of them are not registered in 60.24. These differences are the result of different aims of the statistics:

- Service statistics are classified according to NACE, not CPA. The turnover of all companies with their <u>main activity</u> in freight transport by road is measured, not the turnover gained with freight transport by road by all companies.
- Transport statistics cover <u>all</u> freight transport by road, regardless the main activity of the company.
- The SPPI tries to cover the <u>market</u> for freight transport by road, hence including the most important players: freight forwarders (NACE 63.40) and hauliers (NACE 60.24).

All of these aims are justified. But to get a comprehensive overview of one NACE sector, more coherency is needed. An Index of Service Production, based on turnover figures and SPPI, might be a way to get output figures which are more suitable to describe the development of the NACE sector 60.24 than transport statistics do.

Annex I

Description of the 24 additional groups of the NST/R-classification system

Groups of goods	NST([1]) chapter	NST([1]) groups	Description
1	0	01	Cereals
2		02, 03	Potatoes, other fresh or frozen vegetables, fresh fruits
3		00, 06	Live animals, sugar beet
4		05	Wood and cork
5		04, 09	Textiles and waste, other raw animal and vegetable materials
6	1	11, 12, 13, 14, 15, 16, 17	Foodstuffs and animal fodder
7		18	Oil seeds and oleaginous fruits and fats
8	2	21, 22, 23	Solid mineral fuels
9	3	31	Crude petroleum
10		32, 33, 34	Petroleum products
11	4	41, 46	Iron ore, iron and steel waste and blast furnace dust
12		45	Non-ferrous ores and waste
13	5	51, 52, 53, 54, 55, 56	Metal products
14	6	64, 69	Cement, lime, manufactured building materials
15		61, 62, 63, 65	Crude and manufactured minerals
16	7	71, 72	Natural and chemical fertilisers
17	8	83	Coal, chemicals, tar
18		81, 82, 89	Chemicals other than coal, chemicals and tar
19		84	Paper pulp and waste paper
20	9	91, 92, 93	Vehicles and transport equipment, machinery, apparatus, engines, whether or not assembled, and parts thereof
21		94	Manufactures of metal
22		95	Glass, glassware, ceramic products
23		96, 97	Leather, textiles, clothing, other manufactured articles
24		99	Miscellaneous articles

Annex II

NST 2000 groups

NST 2000 groups	Description
01	Products of agriculture, hunting, and forestry; fish and other fishing products
02	Coal and lignite; peat; crude petroleum and natural gas; uranium and thorium
03	Metal ores and other mining and quarrying products
04	Food products, beverages and tobacco
05	Textiles and textile products; leather and leather products
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
07	Coke, refined petroleum products and nuclear fuel
08	Chemicals, chemical products, and man-made fibres; rubber and plastic products
09	Other non-metallic mineral products
10	Basic metals; fabricated metal products, except machinery and equipment
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks
12	Transport equipment
13	Furniture; other manufactured goods n.e.c.
14	Secondary raw materials; municipal wastes and other wastes not specified elsewhere in CPA
15	Mail, parcels
16	Equipment and material utilised in the transport of goods
17	Goods moved in the course of household and office removals; baggage transported separately from passengers; motor vehicles being moved for repair; other non-market goods n.e.c.
18	Grouped goods: a mixture of types of goods which are transported together
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.
20	Other goods n.e.c.