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SPPI for Rail Transportation in Finland

Statistics Finland

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CONTENTS

1. Introduction

At the Voorburg Group meeting in Aguascalientes in 2008 it was decided that in the 2009 meeting in Norway the following service branches would be covered in mini presentations:

•Banking and Credit
•Rail Transportation
•Water Transportation

Due to the fact that Statistics Finland has been developing an SPPI for NACE Rev. 2: 492 Freight rail transport, we decided to volunteer for SPPI mini presentation on rail transportation. This paper provides deeper insight into the development framework of this service branch in Finland and serves as an extension of the PPI mini presentation given in the 2009 Voorburg Group meeting in Oslo.

Statistics Finland started the development work on the SPPI for NACE Rev. 2: 492 Freight rail transport in 2006. Development work is still ongoing and its purpose is to compile a price index for the deflating use of National Accounts. In future, the plan is also to extend the coverage of the overall producer price index for services produced by Statistics Finland by including an index for freight rail transportation as a new service branch.

The freight rail transport industry in Finland is so heavily concentrated on one dominant enterprise, that the index will not be public due to confidentiality reasons. In this paper, we describe the industry in Finland and the experiences of Statistics Finland in developing the price index for freight rail transportation.

2. Definition of the service being priced

According to the CPA 2008 classification, 492 Freight rail transport includes freight transport on mainline rail networks as well as short line freight railroads. Warehousing and storage (52.10), freight terminal activities (52.21), operation of railroad infrastructure; related activities such as switching and shunting (52.21) and cargo handling, (52.24) are excluded from this class.

In a more detailed level, CPA 2008 is distributed into the following classes:

49.20.11 Railway transport services of freight by refrigerator cars
This subcategory includes:
- railway transport services of frozen or refrigerated goods, in special refrigerator cars

49.20.12 Railway transport services of freight by tanker cars, petroleum products
This subcategory includes:
- railway transport services of petroleum products (crude oil, natural gas and refined petroleum products) in special tank cars

49.20.13 Railway transport services of freight by tanker cars, bulk liquids and gases
This subcategory includes:
- railway transport services of other bulk liquids or gases in special tank cars

49.20.14 Railway transport services of intermodal containers

This subcategory includes:
- railway transport services of individual articles and packages assembled and shipped in specially constructed shipping containers designed for ease of handling in transport

49.20.15 Railway transport services of letters and parcels
This subcategory includes:
- railway transport services of mail on behalf of national and foreign postal authorities
- railway transport services of letters and parcels on behalf of postal and courier services

49.20.16 Railway transport services of dry bulk goods
This subcategory includes:
- railway transport services of dry bulk goods such as cereals, flours, cement, sand, coal, etc.

49.20.19 Other railway transport services of freight
This subcategory includes:
- railway transport services of cars, trucks and truck trailers
- railway transport services of live animals
- transport services by railway of other freight n.e.c.
This subcategory excludes:
- transport services by railway of passengers and their accompanying vehicles, see 49.10.19

The CPA 2008 classification cannot be applied as such to the freight rail transport industry in Finland, so the price information is collected according to the following classification based on the most common carriage groups in Finland. The carriage groups are chosen in cooperation with the informant enterprise and they cover most of the freight rail transports in Finland.

- Freight rail transports of mechanical forest industry:
  - -raw wood
  - -sawn timber
- Freight rail transports of chemical forest industry
  - -paper
  - -chemical pulp
- Freight rail transport of metal industry
- Freight rail transport of chemical industry

In the beginning the plan was to collect information also from the group "Other transports", but this group was excluded due to its mixed content and difficulty in defining the content of group. The share of this group was only marginal. Loading and unloading of the cargo are excluded from the index since their share is also marginal in companies' turnover.

The scope for the price index of freight rail transportation is business to business; consumer services are thus excluded. Developments in the prices of the services in rail transportation (passenger rail transportation) purchased by consumers are monitored with the Consumer Price Index. At the moment there are no plans to include passenger trail transportation in the SPPI for rail transportation, since according to National Accounts the use of enterprises in this sector is marginal.

3. Pricing unit of measure

In the freight rail transportation service branch the pricing unit of measure depends on the chosen pricing method (e.g. contract method, unit value). Based e.g. on the pricing methodology used in Finland (unit value), the pricing unit of measure is cents per tonne-kilometre. The reported prices are averages from the different carriage groups listed in Chapter 2 above.

4. Market conditions and constraints

a) Size of the industry

According to the Business Register of Statistics Finland, in year 2007, there were five enterprises classified into the industry Rail Transportation. At the moment, rail transportation industry in Finland has one dominant enterprise which is responsible for most of the freight rail transports and all of the passenger rail transportation in Finland. The development of turnover of the dominant enterprise in years 2000-2007 according to the Transport and Communications Statistical Yearbook for Finland 2008 is described in Figure 1. The growth of turnover in passenger and freight rail transport has been rather stable during the last years.

Figure 1: Turnover of VR in passenger and freight rail transport 2000-2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

In freight rail transportation the dominant enterprise operates mainly as freight carrier in forest, metal and chemical industries in domestic and international traffic. It carries raw materials to factories and finished products to ports and target markets. A high proportion of carryings are to and from Russia. About half of the enterprise's turnover is comprised of freight rail transport and the other half of passenger transportation (see Figure 1). (Annual report 2008. VR Ltd).

According to the Finnish Rail Administration, in Finland the market share of rail transports of domestic traffic is 25%, which is clearly higher than the average in the so-called old member states of the European Union (EU 15). In 2006, 43.6 million tonnes of goods were transported via railways in Finland, and total haulage was 11.1 billion tonne kilometres. In 2007, the volume of freight rail transport totalled 40.3 million

tonnes, which is eight per cent less than in the year before. Domestic freight transport increased by one per cent from the previous year. International rail transport decreased by 20 per cent. (Transport and Communications Statistical Yearbook for Finland 2008).

According to Annual report of the Finnish Rail Administration (2008) international freight traffic on the railways increased, but domestic freight traffic declined in 2008. The total volume of rail freight was 4% higher than the year before. The effect of the economic downturn was visible in freight traffic only towards the end of the year.

In 2007 the commodity groups with the largest shares of freight transported via railways in Finland by dominant enterprise were transport of wood, products of paper industry, mineral products and products of chemical industry (see Table 1). The average length of haulage was about 260 kilometres in 2007.

Table 1: Tonnes in goods transport by commodity group (%), 2007. (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd)

Mil. tonnes	2007 (%)
Yhteensä - *Total*	**100,0**
Vegetable and animal products	0,5
Mineral products	16,1
Wood and woodworks	40,4
Products of paper industry	22,8
Products of metal industry	7,2
Machines and equipment	1,7
Products of chemical industry	10,7
Other goods	0,5

b) Special conditions or restrictions

Finland's national goods traffic in rail transportation was opened to competition at the beginning of 2007 (rail passenger transportation will possibly be opened to competition in the coming years). The opening of competition facilitates the entry of new qualified railway companies into the Finnish transport market. Previously, domestic goods traffic could be practised only by VR Ltd. Eastern transit traffic across the Finland-Russia border remains closed to competition, which means that transit traffic can be practised by VR Ltd and OAO Russian Railways (RZD). The intention is to reform the transit traffic agreement for rail traffic between Finland and Russia in the coming years. So far, the goods traffic is still concentrated on one actor, VR Ltd. Since opening to competition, a couple of enterprises have started to operate in the Finnish market, but VR Ltd is still the top selling enterprise. (Iikkanen, 2007).

In freight rail transportation, the most important group of users is comprised of industries with a high freight intensity. This means that industrial production produces a lot of transports relative to the value added of their output. In Finland, such industries are the forest-, metal- and chemical industries and the manufacturing of fuel. The high market share of freight rail transports is largely explained by a transport intensive production structure. (Iikkanen, 2007). The railway network of Finland is maintained and developed by the Finnish Rail Administration.

The competitiveness of freight rail transport is best in strong and steady streams of goods. Such streams of goods enable round-trip pendeling traffic, which expedites the circulation of carriages and makes the need for exchange work as slight as possible. In weak streams of goods which require a lot of carriage exchange work, freight rail transport is competitive only over long distances. In these kinds of transports competitiveness is weakened due to time spent in transport, which is usually multiple compared to freight transport by road. Due to a strengthening of streams of goods and centralisation of industry freight rail transport is concentrated on main railways. (Iikkanen, 2007).

In Finland, the demand for freight rail transports is dependent on the transportation needs of a few major customers. According to Iikkanen (2007), the transports of the fifteen largest customers make up 85 per cent of total transportation demand. The most important customers operate in the forest industry, metal industry and in chemical industry (producers of fertilizers and oil based fuels).

In raw wood transports, freight rail transports are used mostly by large production plants that produce paper pulp. The production plants acquire the wood from a large area. Consequently the haulage distances can be very long. A significant amount of wood is also imported from Russia. Transports of raw wood used in the mechanical forest industry are usually mostly managed by road, on account of the short distances. The metal industry uses freight rail transports mainly in transports of different raw material as concentrates, scrap metal and coal, and in transports of semi-finished products (e.g. steel coils). In the metal industry, freight rail transport is competitive only in large streams of goods. That is why e.g. most of the deliveries to customers are managed by trucks. In the chemical industry freight rail transports can be divided into three main groups: domestic acid and fertilizer transports, imports of ammonia and crude oil and other raw material imports. (Iikkanen, 2007).

c) Record keeping practice

Revenue and volume data for freight rail transport on a detailed level are recorded in the book-keeping system of the dominant enterprise. By establishing an ongoing cooperation, these data can now be used to calculate the index according to the unit value method while keeping the respondent burden at a minimum. The dominant enterprise reports price data based on unit value for the SPPI of freight rail transportation quarterly. Additionally, the enterprise reports yearly the turnover distribution between the carriage groups, so structural changes between carriage groups can be monitored.

Data of volumes in rail transportation are received at the yearly level from the Transport and Communications Statistical Yearbook published by Statistics Finland's Transport and tourism Department. Additionally, the Finnish Rail Administration publishes yearly a report on rail transportation, which includes also information on volumes at the yearly level. The Consumer Price Index collects price information on passenger traffic.

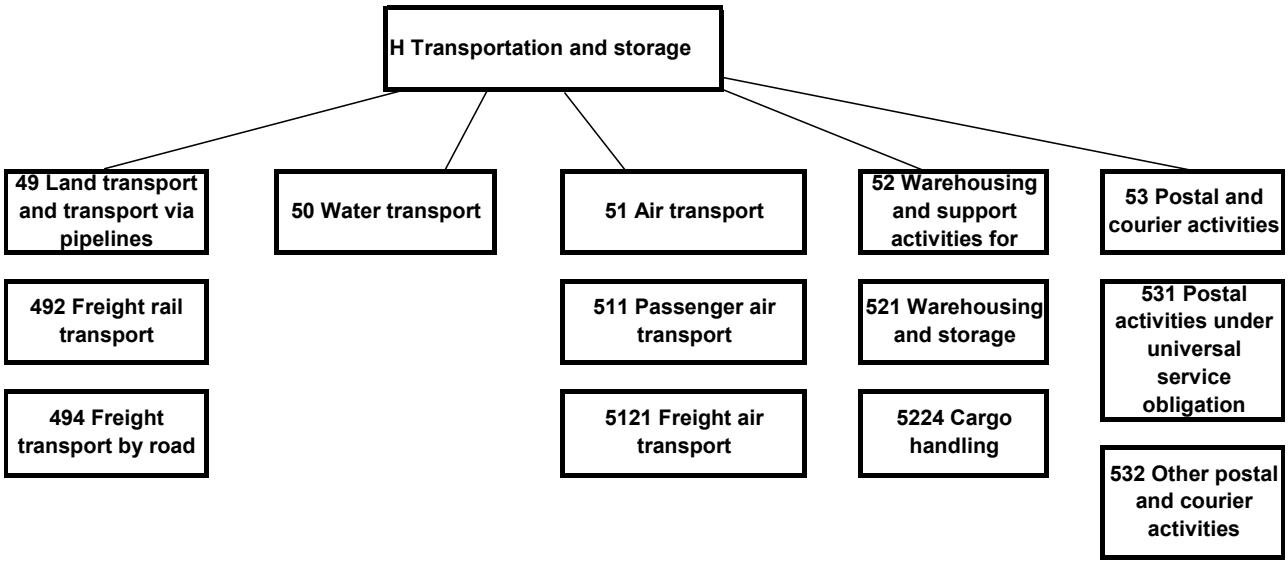
5. Standard classification structure and detail related to the area

The Finnish standard classification structure TOL 2008 is identical to NACE Rev. 2 at the 3-digit level. TOL 2008 does not have more detailed level breakdown of activities in rail transportation industry.

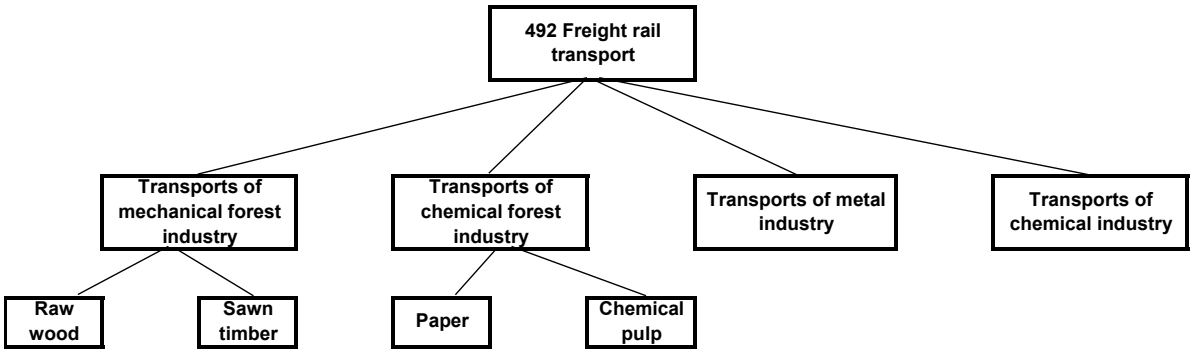
6. Evaluation of standard vs. definition and market conditions

Rail transportation services are part of section H in TOL 2008, which is broken down into NACE Rev. 2. divisions 49, 50, 51, 52 and 53. The index aggregation structure is as follows:

Scheme 1: Index aggregation structure for SPPI for H Transportation and storage in Finland



Scheme 2: Index aggregation structure for SPPI for Freight rail transport in Finland



7. National Accounts concepts and measurement issues for this area

In compilation of output at current prices in the Statistics Finland National Accounts (NA) an internal working classification is used in NA as follows in Table 2.

Table 2: Classification used by NA. Classes covered by Finnish SPPI are in bold.

601010	Passenger rail transport
601020	**Freight rail transport**
602110	Tram and metro traffic
602120	Bus transport
602200	**Taxi operation**
602300	Other passenger land transport
602400	**Freight transport by road**
603000	Transport via pipeline
611000	Sea and coastal passenger water transport
612000	**Sea and coastal freight water transport**
613000	Time based chartering
621000	**Passenger air transport**
622000	**Freight air transport**
631100	Stevedoring
631200	**Other cargo handling and ware housing**
632100	Other support activities for land transportation
632200	Other support activities for water transportation
632300	Other support activities for air transportation
633000	Activities of travel agencies
634000	Activities of other transport agencies
641100	**Postal activities**
641200	**Other postal and courier activities**
642010	**Data and text transmission activities**
642020	**Other telecommunications activities**
642030	Radio- and television activities via cable

The data source for the compilation of output of market producers is mainly the survey of the Transport and Tourism Unit which is conducted once every year. This survey is supported by the results of the Input/Output analysis as well as by data from the annual company reports and detailed auditing reports. This data source is used to compile the production account. The survey results and the raw data from company reports/auditing reports are going to be adapted for NA requirements.

The National Accounts Department within Statistics Finland is currently investigating the usefulness of SPPI for rail transportation for deflation purposes in cooperation with the Price Statistics Unit. The investigation concerns the plausibility of the index, mainly due to difficulties in using unit value approach. Until now National Accounts has been using an implicit price index in deflating of freight rail transport. In deflating of passenger rail transport National Accounts uses information from consumer price index.

8. Pricing method(s) and criteria for choosing various pricing methods

The pricing method used in calculating an SPPI for freight rail transport is unit value. The data supplier is able to separate the income received from each carriage group and the tonne-kilometres of each carriage group. Based on this, the data supplier calculates the average price in cents per tonne-kilometre. At the moment, Statistics Finland is evaluating the usability of unit value method in freight rail transportation.

It is typical of the industry of freight rail transport that most of the customer contracts are yearly and the price changes once a year (fuel and electric surcharges are excluded). It would be desirable to monitor the contract prices of different customers, but consensus on this has not been reached between the data supplier and Statistics Finland. The best practice would be, if e.g. five representative and stable contracts were monitored, in which the conditions would stay unchanged for as long as contract is representative. E.g. the contract of Customer A, transport from place x to place y.

In freight rail transport the prices are affected by stations of departure: distance between the stations, characters of cargo (whether it is a forest industry product or a metal industry product or a chemical industry product), gross weight and volume of cargo. The contracts are usually tailored by enterprise and in some cases they can be conditional: the customer gets a reduction when the real volume exceeds the anticipated volume. Loading and unloading are usually excluded from the contracts.

Statistics Finland collects price data from the dominant enterprise quarterly. The data are available about 10 days after the reference period. Price data have been collected since the beginning of 2005, so the base year for the index is 2005=100.

The price index is calculated as follows: first price ratios for every variant is calculated by comparing the current unit value to unit value price in the previous period. Then geometric means of these price ratios are calculated for each carriage group. The index figure for each carriage group of previous period is multiplied with its change. Finally these index figures are weighted together by using the turnover distribution between the carriage groups, which gives the point figures of the period.

9. Quality adjustment methodologies

Monitoring the prices by using unit values is difficult due to e.g. structural changes that occur during a quarter (haulage distance, volume of freight, etc.) that affect the prices. Since the unit values cannot be reported by customer, also the changes in customer structure during a period can affect the price. The price of freight rail transport is not directly proportional with distance (if haulage distance is 2x the price is not 2y). This affects average prices, which is a problem. Identifying direct price changes in an SPPI is difficult when calculating an index based on unit value.

Since the informant enterprise reports yearly on the distribution of turnover between carriage groups, the structural changes between groups can be monitored and applied to the price index when needed. Within the sub index it is difficult to monitor structural changes and quality between quarters. One requirement stemming from the use of unit values for the calculation of an SPPI for freight rail transportation is the creation of homogeneous subgroups of services at a very detailed level.

10. Evaluation and comparability with turnover/output measures

Compilation of turnover and output in the short-term business statistics

Finnish short-term statistics on services turnover are produced on the basis of administrative register data. Monthly turnover indices are calculated using monthly reports of the companies on VAT paid to the tax authorities. This information, which contains the total taxable turnover, is available for Statistics Finland two months after the reference month. Due to confidentiality reasons the index is not public. Short-term turnover data is used in the compilation of the trend indicator of output and quarterly national accounts.

Compilation of turnover by product

Currently the Structural Business Statistics of Statistics Finland collect no detailed turnover data on rail transportation at service product level. Structural Business Statistics receive group level information on turnover, expenditure structure, balance sheet and personnel from the Tax Administration's tax payment control records data. Turnover data at the level of passenger and freight rail transportation are collected by the Transport and Tourism Unit and the information is published yearly in Transport and Communications Statistical Yearbook. Information on volumes and tonne-kilometres is also collected and published at commodity group level.

Due to the fact that rail transportation is not included in the service branches for which turnover data at product level should be collected according to Annex 8 of the SBS Recast Regulation, the situation will not change in the foreseeable future.

11. Summary

- Statistics Finland has been developing an SPPI for freight rail transportation since 2006. The index cannot be published due to confidentiality reasons: there is one major enterprise that dominates the industry. Finland’s national goods traffic in rail transportation was opened to competition at the beginning of 2007.

- The unit value prices for SPPI of rail transportation are reported quarterly by the major enterprise. Pricing unit of measure is cents per tonne-kilometre in each carriage group.

- The CPA classification cannot be used as such in freight rail transport industry in Finland, so the price information is collected according to an applied classification.

- Representative service groups for the index calculation have been selected in close co-operation with the company. The chosen service groups cover most of the freight rail transports in Finland.

- Statistics Finland is currently evaluating the usefulness of the price index for deflation purposes of National Accounts and later in the SPPI overall index.

Sources:

Iikkanen, Pekka: The realisation of competition in railway goods traffic and an evaluation of its effects. The Finnish Rail Administration. Helsinki 2007. Strategies and studies by the Finnish Rail Administration 1/2007

Annual report 2008. VR Ltd

Annual report of Finnish Rail Administration (2008)

Transport and Communications Statistical Yearbook

Annex

Table 1: Turnover of VR 1990-2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

EUR mil.	1990	2000	2001	2002	2003	2004	2005	2006	2007
Rail transport	**572,8**	**604,8**	**617,0**	**618,1**	**648,7**	**652,6**	**653,8**	**698,9**	**710,2**
Passenger transport	218,5	274,5	281,6	288,0	296,9	304,4	320,4	340,0	370,2
Freight transport	354,4	330,3	335,4	330,1	351,8	348,2	333,4	358,9	340,0

Table 2: Tonnes in goods transport[1], 1980–2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

Tonnes (1 000)	1980	1990	2000	2004	2005	2006	2007
Total	**29 574**	**34 562**	**40 501**	**42 663**	**40 722**	**43 560**	**40 288**
National transport	20 442	21 948	24 071	26 255	23 479	25 959	26 204
International transport	9 132	12 614	16 430	16 408	17 243	17 601	14 084
Full wagons loaded (exports)	..	..	1 118	1 612	1 512	1 353	1 437
Full wagons unloaded (imports)	..	..	15 312	11 597	12 349	12 010	9 104
Transit goods	..	..	2 671	3 199	3 381	4 238	3 543
Commercial transports average length of transport (km)	281,8	241,8	249,6	236,9	238,3	253,9	259,1

[1)] *Since 1995 full wagon consignments*

Table 2: Tonne-kilometres in goods transport[2], 1980–2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

Million tonne-km	1980	1990	2000	2004	2005	2006	2007
Total	**8 335**	**8 357**	**10 107**	**10 105**	**9 706**	**11 060**	**10 434**
National transport	6 223	5 944	6 802	7 197	6 607	7 375	7 581
International transport	2 112	2 413	3 305	2 908	3 099	3 685	2 852
Full wagons loaded (exports)	..	..	294	327	319	316	294
Full wagons unloaded (imports)	..	..	3 011	1 977	1 975	2 037	1 530
Transit goods	..	..	473	604	806	1 332	1 028
Commercial transports average length of transport (km)	281,8	241,8	249,6	236,9	238,3	253,9	259,1

[2)] *Since 1995 full wagon consignments*

Table 3: Tonnes in goods transport by commodity group, 1980–2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

Ml. tonnes	1980	1990	2000	2003	2004	2005	2006	2007	2007 (%)
Total	**28,9**	**33,0**	**40,5**	**43,5**	**42,7**	**40,7**	**43,6**	**40,3**	**100,0**
Vegetable and animal products	0,6	0,4	0,4	0,3	0,3	0,3	0,2	0,2	0,5
Mineral products	7,1	8,4	7,6	8,1	6,3	6,2	7,6	6,5	16,1
Wood and woodworks	8,5	10,1	15,7	17,2	17,6	17,5	18,0	16,3	40,4
Products of paper industry	5,2	6,3	7,9	8,3	8,8	7,9	9,2	9,2	22,8
Products of metal industry	3,6	2,9	3,8	3,7	3,9	3,3	3,3	2,9	7,2
Machines and equipment	0,2	0,4	0,6	0,8	0,9	0,9	0,8	0,7	1,7
Products of chemical industry	3,3	3,9	4,3	4,8	4,5	4,3	4,2	4,3	10,7
Other goods	0,5	0,7	0,2	0,3	0,4	0,3	0,3	0,2	0,5

Table 4: Tonne-kilometres in goods transport by commodity group, 1980–2007 (Source: Transport and Communications Statistical Yearbook for Finland 2008, VR-Group Ltd.)

Ml. tonne-km	1980	1990	2000	2003	2004	2005	2006	2007	2007 (%)
Yhteensä - *Total*	**8 168**	**7 877**	**10 107**	**10 047**	**10 105**	**9 706**	**11 060**	**10 434**	**100,0**
Vegetable and animal products	187	114	124	105	96	86	73	62	0,6
Mineral products	2 214	1 851	1 825	1 900	1 542	1 693	2 351	1 870	17,9
Wood and woodworks	2 004	2 001	3 091	2 944	3 092	2 975	3 201	3 286	31,5
Products of paper industry	1 341	1 395	2 020	2 012	2 230	2 006	2 401	2 406	23,1
Products of metal industry	1 218	1 064	1 494	1 422	1 502	1 279	1 325	1 107	10,6
Machines and equipment	76	108	299	332	322	377	410	395	3,8
Products of chemical industry	981	1 103	1 165	1 215	1 198	1 184	1 201	1 220	11,7
Other goods	147	241	89	116	123	106	97	88	0,8