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**Constructing export matrix as an integrated part of the SUT framework for Estonia**

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**Introduction**

Since 2010 year, the Eurostat ESA 2010 supply and use tables (SUTIOT) data transmission program requests the submission of use tables at basic prices for domestic output, imports and valuation matrixes on a five-yearly basis. Annually transmission of the use table is required with separation of exports of intra EU, extra EU, Euro area, Extra euro area and by CPA P64 product breakdown.

This paper presents the current practice of constructing export matrix as an integrated part of the SUT framework. The SUT according to the ESA 2010 are compiled from the reference year 2010. The matrix for exports of goods and services is estimated by CPA products and by type of exporters. Distinction is made between direct exports of goods by manufactures and other producers, exports by wholesale and retail traders of goods produced in Estonia, re-exports of goods, exports of services as well as of processing services.

More detailed export data by type of exporters are useful for both the compilation of use side trade and transport margins and use tables of imports and domestic output. The supply and use tables provide a framework for production of the consistent and reliable estimates of exports.

Further disaggregated export data by type of exporters and by type of valuation are also useful for deflation when compiling the use tables at previous year’s prices (PYP) prices. Transmission of exports at previous year’s prices is compulsory for reference year 2015 onwards.

Estimates of exports have a major impact on the expenditure measure of GDP for Estonia. The importance of exports is illustrated by its share in GDP. As of 2010, Estonia was the EU seventh most open economy with a share of exports representing 75,1% of GDP, compared to an EU average of 38,5%. Estonia’s economy is integrated with Nordic and Baltic countries, manufacturing sector is a part of the supply chain of finished goods in Nordic countries.

Diagram 1. Exports of goods and services in % of GDP in EU countries, 2010



In the part 1 the attention is given to the integration of main data sources, i.e. foreign trade statistics, Balance of payments (BoP) and the SBS and PRODCOM statistical surveys into the SUT system. In parts 2 and 3, definition and valuation of exports are discussed. In part 4, the estimation methods are described. In Annex 1 the exports ratio to output by products are given.

1. *Main data sources for exports of goods and services*

In national accounts and the supply and use system, the estimates of exports of goods and services follow the same concepts as the BoP according to BPM6 compiled by the Bank of Estonia. The main data source for exports of goods is the foreign trade statistics (FTS) produced by Enterprise and Agricultural Statistics Department of Statistics Estonia and the BoP for exports of services.

Foreign trade statistical database contains data collected through Extrastat and Intrastat systems. Extrastat data collection systems are based on customs declarations which are collected by the Tax and Customs Board and contain practically the whole information on the trade with non-EU countries (so called third countries). There are no data losses caused by non-response or by other issues. Intrastat data are based on statistical declarations and companies with lower foreign trade turnover are not obliged to submit data. Additionally there are other data losses caused by non-response or late response. Missing data are replaced with estimations and estimated figures are revised upon receiving additional information. The methodology of foreign trade statistics changed in 2004 because of Estonia’s accession to the European Union. Previously all foreign trade statistics were based on customs declarations.

Foreign trade statistics data on exports of goods are obtained at the individual level of units by enterprises broken down:

* By activities at 5-digit level of NACE Rev.2 classification;
* By commodities mainly at 8-digit level of Combined Nomenclature (CN), which is based on the Harmonized System (HS). About 96% of the total export value and 95% of the total import value in 2010 are available at detail 8-digit level. Estimated and confidential data on goods are available at the 2-digits CN level. CN list is updated every year, about 10% of CN codes change.
* By main economic categories (i.e. intermediate, capital and consumption goods) of the classification of Broad Economic Categories (BEC);
* By partner country;
* By type of transaction (Intrastat) and customs procedure (Extrastat), e.g. final export, re-export following inward processing, goods for outward processing.

Correspondence tables with regards to the main sources are established, so data for exports of goods as well as for imports are converted to the SUT activities and products. Using identity number of the exporting unit, all units are classified by activity and by institutional sector according to the SUT classifications. Commodities available at the level of 8-digit of the Combined Nomenclature are automatically converted to the main categories of BEC and to CPA products according to the SUT product classification. Goods available at the level of 2-digits of CN are converted to the SUT product classification based on previous year’s structure.

Foreign trade statistics are based on cross-border movements. Exports of goods contain exportation of goods produced in Estonia, exportation of goods imported from a foreign country (so called re-exports), temporary exportation of goods for the purpose of processing abroad, re-exportation after inward processing and supplies for foreign vessels and aircraft stores. Foreign trade statistics are compiled according to the „*Community concept*“, it also includes imports and exports flows of non-residents through Estonian warehouses, i.e. quasi transit trade. This concept does not comply with the national accounts compilation principles.

Balance of payments statistical database contains data on imports and exports flows by countries, by BOP services and by importing and exporting enterprises. Data are collected through ITRS system, enterprise-based surveys, border surveys of tourists, banking statistics and other sources. Using identity number of the unit, exporting units are classified by activity and by institutional sector according to the SUT classifications. Services are converted to the CPA based on correspondence table. Travel services estimates are based on border surveys of tourists and accomodation statistics.

The additional important data sources used for estimation of exports of goods in the SUT framework is the SBS survey and PRODCOM data. The SBS survey collects data on the total sales of goods and services to the non-residents and the sales of own-produced industrial production and industrial services to the non-residents. This data is used for comparison with the data of foreign trade statistics. PRODCOM data are used to estimate the processing fee received from the principal (contractor enterprise).

1. *Definition*

According to the ESA 2010 paragraph §3.162 exports of goods occur when economic ownership of goods changes between residents and non-residents irrespective of corresponding physical movements of goods across borders. In the FTS transactions are recorded when goods physically moved the border, whereas in the national accounts and supply and use system transactions are recorded only when ownership changes.

Exports include permanent exportation of goods and services produced in Estonia and belonging to Estonian legal persons, the sale of which provides income to residents. Re-exportation of goods after inward processing and temporary exports for outward processing are excluded from the exports values of goods. Exports also include re-exports, i.e. goods which are imported (purchased) into Estonia by a resident, but then re-exported (sold) without substantial transformation. Exports of goods sold under merchanting are included as well as.

1. *Valuation*

The export matrix of goods and services is constructed as an integrated part of the SUT framework. The matrix is estimated by type of exporters, by CPA products and by type of valuation (table 1).

By type of exporters the distinction is made between the exports of non-trade and trade activities: direct exports of goods (transaction code P.611) by producers, exports of processing services by manufactures (P.612), exports of goods produced in Estonia by traders (P.613), exports of services (P.62) and re-exports of goods (P.63). The CPA product breakdown in the SUT is about 250 product groups.

Table 1. The allocation of exports by exporter and by type of valuation

| Transaction | Trade margins | Transport margins | Use |
| --- | --- | --- | --- |
| Code | Type of exporter | Mrg.45 | Mrg.46 | Mrg.47 | Mrg.492 | Mrg.494 | Domestic output  | Imports |
| P.611 | Exports of goods by producers |  |  |  | X | X | X |  |
| P.612 | Exports of processing services by manufactures |  |  |  |  |  | X |  |
| P.613 | Exports of goods by traders | X | X | X | X | X | X |  |
| P.62 | Exports of services |  |  |  |  |  | X |  |
| P.621 | Merchanting  |  | X |  |  |  |  |  |
| P.63 | Re-export of goods | X | X | X | X | X |  | X |

The valuation of exported products is fob price at the border, which is equivalent to purchasers’ price. They include all costs incurred up to the border of the country. Further disaggregation by type of exporters is important for the conversion of exports flows at purchasers’ prices into basic prices.

In cases, when exporter of the goods is a producer, transactions valued at fob prices include transportation margins to the border. Important thing that there are no trade margins on direct exports by producers. If exporter is a trader, export price includes both trade and transport margins involved in transferring the goods from the place of production to the point of departure from the country.

For re-exports of goods, it is also assumed that valuation of transactions with imported goods entering the border at basic prices and re-exported without processing valued at purchasers’ prices include trade and transport margin valuation components.

1. *Estimation methods*
	1. *Exports of goods by producers*

Direct exports (P.611) by producers include goods exported mainly by manufacturing enterprises. Many of big companies in Estonia directly export the majority of their outputs. Direct exports also include exports of goods by units, whose main activity is agriculture, forestry, fishing, mining and energy, classified in sections 01 - 35 of NACE Rev.2 activity classification.

It was estimated that in 2010 the value of direct exports of produced goods totalled 72739 million EEK (table 2) or 42% of total exports of goods and services.

Table 2. Exports of goods and services by type of exporters at fob prices in 2010, million EEK

| Transaction code | Transaction by type of exporters | Value | % |
| --- | --- | --- | --- |
| P.6 | Total exports of goods and services: | 172 878 | 100 |
| P.611 |  Exports of goods by producers | 72 739 | 42 |
| P.612 |  Exports of processing services by manufactures | 1 365 | 1 |
| P.613 |  Exports of goods by traders | 23 629 | 14 |
| P.62 |  Exports of services | 55 455 | 32 |
|  |  of which merchanting | 2 948 | 2 |
| P.63 |  Re-export of goods | 19 690 | 11 |

For estimating direct exports of goods by producers, the following steps are taken. To be able to compare exports with output they have to be valued in the same prices, therefore, exports valued fob for each CPA product are firstly converted to basic prices. Only transport (i.e. railway and road) margin rates are applied, trade margins are not calculated for this type of export.

Then, initial estimates of exports at basic prices are compared with output value of each product. The basic rule is that the export may not exceed the output. An excess of exports over output value for a given product can be due to underestimation of output, an inventory decrease of finished goods, exports of second-hand products (used metal) to non-resident units, existence of a secondary trade activity of manufacturing enterprise and because of disinvestment. The quality checks for the estimates of exports are carried out by comparing of consistency of information from FTS and SBS and other information.

At this stage of analysis usually reveals problems with the product misclassification. There were cases when the output and exports of the same enterprise was classified under different product groups in the FTS and industrial statistics.

In 2010 the exports of product group 1.C.30 *Other transport equipment* exceeded the output because of disinvestment of railway locomotives (table 3). A large amount of capital goods were sold abroad to the non-residents.

Table 3. Exports and output of other transport equipment CPA 30 in 2010, million EEK

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| code | Product group | Exports  | Output | Export ratio by commodity | GFCF |
| 1.C.302 | Railway locomotives | 1 162 | 10 | 11620% | -590 |

If after examination, value of exports of a given product still exceeds the production, then the amount of export are partially allocated to transaction P.613.

* 1. *Exports of processing services by manufactures*

In 2010, the exports of processing fees (P.612) by manufactures amounted to 1365 million EEK with share of 1% of the total exports. Contract processing activities are quite significant in Estonia. According to the PRODCOM statistics about half of manufacturing enterprises involved in contract processing performs work for the non-resident's units. Figures in foreign trade statistics also show the significance of exports flows for processing. In the period 2000-2006, the gross values of goods sent after inward processing accounted for 14-29% of total exports of goods. Since 2007 the processing flows dropped and amounted between 2-6% in 2007-2010 (diagram 2).

Diagram 2. Exports of goods after inward processing in total exports of goods in FTS for 2000-2010

In the SUT, goods sent abroad for processing are estimated separately and recorded as transaction P.612. Under ESA95, goods sent abroad for processing were recorded “gross” under goods. The total value of the goods sent for processing accounted for 4696 million EEK in 2010 (table 4). The value of exports of goods after processing was estimated at 4377 million EEK and the value of exports of goods sent for outward processing amounted to 319 million EEK.

Table 4. The recording of exports of processing in ESA95 and ESA 2010 in 2010

| Exports of processing | ESA 95 | ESA 2010 | difference |
| --- | --- | --- | --- |
| Total processing goods | 4 696 |  | -4 696 |
|  goods sent after inward processing | 4 377 |  | -4 377 |
|  goods sent for outward processing | 319 |  | -319 |
| Processing fee |  | 1 365 | 1 365 |
| Total |  |  | -3 331 |

Under ESA2010, goods sent abroad for processing are recorded “net” as services in the supply and use tables. The value of goods sent for processing and processed goods are not included in the accounts. Processing fees are shown under production of services on the supply side and as exports of services on the use side. In 2010, the value of processing fees of 1365 million EEK is recorder in the SUT.

* 1. *Exports of goods by traders*

Exports of goods by traders (transaction P.613) include goods that are exported by units classified mainly in wholesale and retail trade (NACE 46 and 47), but also in trading of motor vehicles and motorcycles (NACE 45). This type also includes products exported by secondary trade activities of manufacturing enterprises. For this type of exports both trade and transport margins are calculated. The value of exports at basic prices is allocated in the use table to the domestic output as exports cover the goods that are domestically produced. In 2010 about 14% of total exports of goods and services accounted for exported goods by traders.

* 1. *Re-exports of goods*

Re-exports (transaction P.63) are goods which are imported into Estonia (purchased) by resident traders, but then re-exported without substantial transformation (sold to non-residents). It was estimated that in 2010 the value of re-exports amounted 19690 million EEK (table 2) or 11% of total exports of goods and services.

Estimates of re-exports are done in two steps. All cases where exports exceed the production value are firstly examined at the aggregated level by product. Then units with imports and exports flows on the same products are identified and information is analysed. This transaction is relatively more important in wholesale activity, but may occur on non-trade activities as well. For re-exports both trade and transport margins are calculated. Total value of goods at basic prices in the use table is allocated to the imports.

The products with high export ratio were textiles, coke and refined petroleum products, pharmaceutical products and basic metals (table 5).

Table 5. Exports and output of some products with high export ratio in 2010, million EEK

| Code | Product group | Exports | Re-exports | Output | Export ratio |
| --- | --- | --- | --- | --- | --- |
| 1.C.13\_15 | Textiles; wearing apparel; leather and related products  | 7 164 | 1673,3 | 5558,2 | 128,9% |
| 1.C.19 | Coke and refined petroleum products | 5 237 | 989,2 | 2907,3 | 180,1% |
| 1.C.21 | Basic pharmaceutical products and pharmaceutical preparation | 751 | 267 | 480,2 | 156,4% |
| 1.C.24 | Basic metals | 2 702 | 1670 | 1074,2 | 251,5% |

* 1. *Merchanting*

Merchanting is defined as the purchase of a good by a resident of the compiling economy from a non-resident and the subsequent resale of the good to another non-resident. During this process the good does not enter or leave the compiling economy. Merchanting margin is calculated as the value of the goods sold less the cost of purchasing them.

Under ESA 2010, merchanting has to be recorded on a gross basis: the acquisition of goods (imports) by the merchant is recorded in the accounts as a negative export, and the subsequent sale of the goods as a positive export, the difference between sales and purchases of merchanted goods is to be shown as net exports of goods under merchanting.

In the SUT, so far information on merchanting margin is available, they are allocated across the CPA products.

Annex 1. Exports ratio by commodity in 2010

| Code | Product group | Exports of goods and services | Output  | Export ratio by commodity |
| --- | --- | --- | --- | --- |
| 1 | 1 | 3 | 4 | 5=3/4 |
| All | All Commodities and Adjustments | 172 878 | 459417,1 |  |
| U | Unspecified Products and Adjustments | 0 |  |  |
| 1 | ALL COMMODITIES | 160 696 | 412604,1 | 38,9% |
| 1.U | Unspecified |  |  |  |
| 1.A.01 | Products of agriculture, hunting and related services | 2 078 | 9608,6 | 21,6% |
| 1.A.02 | Products of forestry, logging and related services | 1 923 | 6197,7 | 31,0% |
| 1.A.03 | Fish and other fishing products; aquaculture products; suppo | 432 | 863,6 | 50,0% |
| 1.B.05\_09 | Mining and quarrying | 972 | 4777,7 | 20,3% |
| 1.C.10\_12 | Food products, beverages, tobacco products | 10 760 | 18780,1 | 57,3% |
| 1.C.13\_15 | Textiles; wearing apparel; leather and related products  | 7 164 | 5558,2 | 128,9% |
| 1.C.16 | Wood and products of wood and cork (except furniture); artic | 12 862 | 17214,1 | 74,7% |
| 1.C.17 | Paper and paper products | 2 976 | 2853,3 | 104,3% |
| 1.C.18 | Printing and recording services | 1 180 | 2981,7 | 39,6% |
| 1.C.19 | Coke and refined petroleum products | 5 237 | 2907,3 | 180,1% |
| 1.C.20 | Chemicals and chemical products | 6 174 | 4915,1 | 125,6% |
| 1.C.21 | Basic pharmaceutical products and pharmaceutical preparation | 751 | 480,2 | 156,4% |
| 1.C.22 | Rubber and plastic products | 3 750 | 3827,4 | 98,0% |
| 1.C.23 | Other non-metallic mineral products  | 2 730 | 4135,4 | 66,0% |
| 1.C.24 | Basic metals | 2 702 | 1074,2 | 251,5% |
| 1.C.25 | Fabricated metal products, except machinery and equipment | 7 655 | 12031,3 | 63,6% |
| 1.C.26 | Computer, electronic and optical products | 13 205 | 11864,4 | 111,3% |
| 1.C.27 | Electrical equipment | 9 688 | 7053,6 | 137,3% |
| 1.C.28 | Machinery and equipment n.e.c. | 6 421 | 4093 | 156,9% |
| 1.C.29 | Motor vehicles, trailers and semi-trailers | 7 804 | 4017,4 | 194,3% |
| 1.C.30 | Other transport equipment | 2 258 | 852,4 | 264,9% |
| 1.C.31\_32 | Furniture; other manufactured goods | 6 246 | 6667,8 | 93,7% |
| 1.C.33 | Repair and installation services of machinery and equipment | 885 | 3903,9 | 22,7% |
| 1.D.35 | Electricity, gas, steam and air conditioning | 3 636 | 18898,2 | 19,2% |
| 1.E.36 | Natural water; water treatment and supply services |  | 1516,5 | 0,0% |
| 1.E.37\_39 | Sewerage services; sewage sludge; waste collection, treatmen | 2 721 | 4361,9 | 62,4% |
| 1.F.41\_43 | Constructions and construction works | 2 477 | 31117,9 | 8,0% |
| 1.G.45 | Wholesale and retail trade and repair services of motor vehi | 86 | 3723,7 | 2,3% |
| 1.G.46 | Wholesale trade services, except of motor vehicles and motor |  | 1288,8 | 0,0% |
| 1.G.47 | Retail trade services, except of motor vehicles and motorcyc |  |  | #DIV/0! |
| 1.H.49 | Land transport services and transport services via pipelines | 3 417 | 15527,5 | 22,0% |
| 1.H.50 | Water transport services | 3 970 | 6075,6 | 65,3% |
| 1.H.51 | Air transport services | 705 | 1486,5 | 47,4% |
| 1.H.52 | Warehousing and support services for transportation | 12 257 | 25327,9 | 48,4% |
| 1.H.53 | Postal and courier services | 169 | 1078,1 | 15,7% |
| 1.I.55\_56 | Accommodation and food services | 129 | 8102 | 1,6% |
| 1.J.58 | Publishing services | 289 | 2036,1 | 14,2% |
| 1.J.59\_60 | Motion picture, video and television programme production se | 201 | 1678,9 | 12,0% |
| 1.J.61 | Telecommunications services | 2 262 | 10873,3 | 20,8% |
| 1.J.62\_63 | Computer programming, consultancy and related services; info | 2 373 | 6510,1 | 36,4% |
| 1.K.64 | Financial services, except insurance and pension funding | 1 017 | 9246,1 | 11,0% |
| 1.K.65 | Insurance, reinsurance and pension funding services, except | 46 | 1884,9 | 2,4% |
| 1.K.66 | Services auxiliary to financial services and insurance servi | 601 | 2504,7 | 24,0% |
| 1.L.68 | Real estate services | 208 | 30058,8 | 0,7% |
| 1.M.69\_70 | Legal and accounting services; services of head offices; man | 2 132 | 7860,8 | 27,1% |
| 1.M.71 | Architectural and engineering services; technical testing an | 675 | 4087,2 | 16,5% |
| 1.M.72 | Scientific research and development services | 219 | 3440,2 | 6,4% |
| 1.M.73 | Advertising and market research services | 1 097 | 3764,5 | 29,1% |
| 1.M.74\_75 | Other professional, scientific and technical services; veter | 147 | 1046 | 14,1% |
| 1.N.77 | Rental and leasing services | 1 868 | 6026,4 | 31,0% |
| 1.N.78 | Employment services | 1 122 | 2386,2 | 47,0% |
| 1.N.79 | Travel agency, tour operator and other reservation services | 7 | 1387,1 | 0,5% |
| 1.N.80 | Security and investigation services | 34 | 1736 | 2,0% |
| 1.N.81 | Services to buildings and landscape, industrial cleaning ser | 44 | 2003,2 | 2,2% |
| 1.N.82 | Business support services | 466 | 2108,6 | 22,1% |
| 1.O.84 | Public administration and defence; compulsory social securit | 173 | 21381 | 0,8% |
| 1.P.85 | Education services | 26 | 13596 | 0,2% |
| 1.Q.86 | Human health services | 45 | 10519,7 | 0,4% |
| 1.Q.87\_88 | Residential care services; social work services without acco | 0 | 1573,9 | 0,0% |
| 1.R.90\_92 | Creative, arts and entertainment services; library, archive, | 79 | 3297,2 | 2,4% |
| 1.R.93 | Sporting services and amusement and recreation services | 55 | 2648,3 | 2,1% |
| 1.S.94 | Services furnished by membership organisations | 5 | 1660,6 | 0,3% |
| 1.S.95 | Repair services of computers and personal and household good | 10 | 505,7 | 2,0% |
| 1.S.96 | Other personal services | 80 | 1551,7 | 5,2% |
| 1.T.97\_98 | Services of households as employers of domestic personnel; u |  | 67,8 | 0,0% |