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Manufacturing services

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INTRODUCTION

According to the European Classification of Economic Activities (NACE Rev. 2) "Manufacturing industry" covers all activities – processing of goods as well as providing services – included within Section "C".

Globalization, increasing roll of multinational companies in manufacturing industry, applying special contracts between market players means new challenges concerning the development of related economic indicators, especially producer price indices (PPI's). The observation of producer prices regarding manufacturing services in Hungarian Central Statistical Office (HCSO) is traditionally carried out within Department of Price Statistics by the experts of the PPI staff.

The main objective of this paper is to present Hungarian classification of economic activities and products, give an overview of turnover and price statistics as well as provide same practical examples related to the data collection in manufacturing industry – taking into account the treatment of subcontracted activities.

1. CLASSIFICATIONS ISSUES

For compilation of statistical indicators concerning manufacturing services, Hungary, as a member of the European Union, applies harmonized national versions of the following main economic classification systems:

➢ **NACE Rev 2 / TEÁOR'08** (the statistical classification of economic activities in the European Communities / in Hungary).

➢ **CPA'08 / TESZOR'08** (the European/ Hungarian Classification of Products by Activity).

➢ **PRODCOM / ITO** is the classification of goods used for statistics on industrial production in the EU / in Hungary).

The structure of the above mentioned classifications is the following:

1.1. NACE Rev 2 / TEÁOR'08

In Hungary, the Statistical Research and Methodology Department is responsible for classifications. The primary and secondary activities are derived from administrative sources and some surveys. The classification of economic units depends on the value added, turnover and labor data. The top-down approach on the basis of the estimation of value added data has been introduced and the old primary activity is kept for 2 years (stability rule). Local units are classified independently from the enterprise.

According to NACE Rev. 2, service activities regarding manufacturing industry are concentrated in divisions NACE "*33 Repair and installation of machinery and equipment", "18 Printing and reproduction of recorded media"* and *contract processing activities* respectively. At the lowest four-digit class-level processing of a good and providing related services are mainly classified to the same class without any distinction (in general the classification of activities does not depend on the criterion of carrying them out on own account or on a contract or fee basis).

1.2. CPA'08 / TESZOR'08

"*While the activities are not distinguished in NACE, the corresponding output is different, depending on whether the input material is owned by the manufacturing unit or not. In the second case, the output of the activity is the service performed on and incorporated in the input material, and this is what the contractor is paid for. Therfore, in general, CPA distinguishes between goods produced for own account and the services performed on goods on a fee or contract basis.*"[1]

The coding rules for the first four digits (XXXX) are the same as those for the NACE Rev. 2. Distinction of the manufacturing services is possible by special treatment of fifth and sixth digits of the code. However, some services activities are distingushed in NACE level (e.g. 13.30 Textile finishing services, 18.11 Newspaper printing services, 24.53 Casting services of light metals, or repair, maintenance and installation services classified in division 33).

For services performed on a fee or contract basis on goods the contractors do not own, the output is involved in specific subcathegories, usually coded "XXXX9" and "XXXX99" respectively, having the heading "sub-contracted operations as part of manufacturing of...". "*These subcategories include partial or whole operations within the process of production of the products mentioned, carried out by a contractor on materials owned by the principal. The contractor is paid for the work carried out and the services rendered can include the provision of a small quantity of additional materials needed for this work. These services are covered by CPC division 88, expect for group 13.3 where it is division 89. Sub-contracted operations do not include goods of the same category, if the goods are produced by a contractor that owns the main input material*"[2]

Within the short-term statistics, the CPA has a special role to coordinate the development of the PPI. This coordination is ensured by the hierarchical structure of the CPA to create details more homogenous from the lowest level of CPA.

1.3. PRODCOM / ITO

PRODCOM is the title of the EU production statistics for Mining, quarrying and manufacturing, i.e. Sections "B"and "C" of the NACE Rev. 2. PRODCOM headings are coded using an eight-digit numerical code.

Hungarian Industrial Product Classification (ITO in Hungarian) is based on NACE Rev. 2 (1-4. digit), CPA'2008 (1-6. digit), and PRODCOM (7-8. digit). It consists not only in industrial products, but also includes the major industrial services (5th and 6th digit are "9" and "99" by CPA). ITO facilitates the comparison of the domestic production to the international one, while the production data can be confronted with foreign trade data as well.

In the PRODCOM manual, industrial services cover only treatment[3], maintenance and repair[4], and assembly work[5].

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[1] Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008) ;
(3.3 Rules for specific activities)
[2] CPA 2008 Introductory guidelines
[3] « The treatment process does not involve any change in the form of the product. In contrast to contract processing, the treatment of a given product in the PRODCOM list does not involve converting it into another product in the list.

Concerning contract processing (outsourcing)[6], according to the contract specifications the contractor can

> ***produce a new product***
> – contractor carries out the full production process (that results into a new product with a new code in the PRODCOM list, different from codes of input elements), and

> ***provide manufacturing service*** – contractor carries out parts of a production process that does not result into a product with a new code in PRODCOM list.

To summarize, according to the PRODCOM manual, a contract processing resulting into a new product is not considered as an industrial (manufacturing)[7] service, but as a production of a good.

For the above mentioned reasons, in Hungarian PRODCOM survey the information about the full production process in contract processing is recorded by filling two rows, first for total processing of the relevant product (sum of the processing on own account and of contract processing), second only for contract processing emphasised from total values using a special code "B".

1.4. Examples of activities of manufacturing in subcontract work

Mode of the processing	quantity processed	quantity sold		turnover		taxes
		measure		export	domestic	
	total	export	domestic			

Case 1.: *production*, the code used is the product code

Code: 14133120 *Women's or girls' overcoats…*

T (total)	100	60	40	600	1200	
B (contract processing**)**	60	60		600		

Case 2.: *industrial service*, in code the 5th digit is "9"

Code: 14139900 *Sub-contracted operations as part of manufacturing of overcoats...*

T (total)	30	30		150		
B (contract processing**)**						

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[4] « Only the value of maintenance and repair work should be recorded, using the relevant reporting codes, whereby the value is to be recorded as the costs actually charged for the maintenance and repairs. Maintenence and repairs involving major reconstruction of the product being repaired or maintained should be entered as production. »

[5] « Assembly work involves constructing a product by assembling a number of separate components into a product for which there is no separate number in the PRODCOM list. »

[6] Contract processing (subcontracting) is a technological process made by the subcontractor on materials, intermediates, owned and put at disposal by the orderer (principal). The raw materials, semi-finished products taken over for contract work are not purchased by the subcontractor, they belong to the ownership of the orderer (principal). Contract processing can relate to the production of new products and to carrying out partial processing, respectively.
Source of definition: HCSO

[7] Remark : every manufacturing service is considered as an industrial service, but the opposite is not true (activities of divisions except C).

To answer the key issue – *what it means "manufacturing service" (especially if the contractor / manufacturing service provider carries out the full production process and what's more, buys the row materials)* – is not easy.

With the object to analyze and clarify this problem, we should take into account the next additional questions:

➢ Who owns the manufactured products (company, who owns the "main material input" / "main input of resources" or not)?

➢ What it means "material input" / "input of resources" (raw material only or + intellectual property)?

➢ Is every contract processing in division "C" manufacturing service or not (what about the transformation of materials into new products)?

Figure 1.
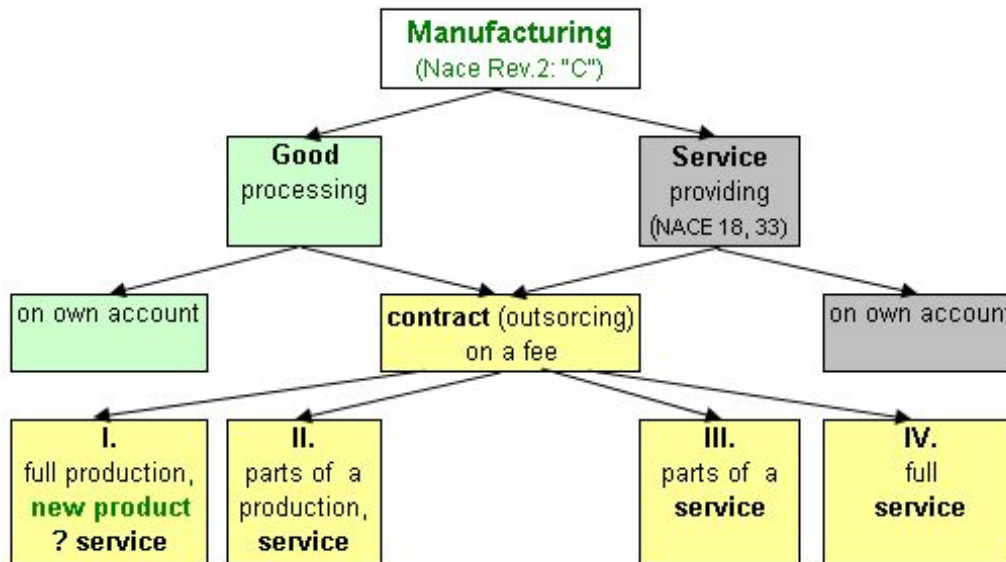
In general, according to the description of the relevant European rules (NACE, SNA, ESA, PRODCOM, Intrastat…) we can know, the necessary consistency of requirements and meta information require further development.

Concerning the base issue, the North American Industry Classification System (NAICS v. 2007) is for example more clear than NACE. The main principles of description regarding manufacturing service providers (e.g. how to threat input of resources such as capital goods, manufacturing techniques) should be considered in further development of European and other international regulations, and better explained in methodological guides.

2. TURNOVER STATISTICS

Annual product statistics are one of the most demanded industrial statistics. Data users usually require as detailed product statistics as possible. By the PRODCOM regulation, 90% of the national production shall be covered in each related activity class of divisions "B" and "C". Regarding manufacturing in subcontract work, some statistical indicators are available only from the PRODCOM/ IPA survey. Data of subcontract work are also available by products.

2.1. Statistics of production enterprises manufacturing in subcontract work

The annual production survey including the methodology relating to subcontracting work has been harmonised with relevant European rules. For data transmitted for PRODCOM purposes, sold quantities and sales of products are computed.

According to the published data of annual industry statistics, it should be noted that while in "total" values the number of production enterprises manufacturing in subcontract work has significant share (about 10%), at the same time related turnover is not considerable (1,3%). But it is true that the related Value Added should be more important than proportional to the turnover.

Table 1.

| Published data of annual industry statistics, 2009	Number of production enterprises (pieces)	Total sales value (thousand EUR)[8]
Total Published data of annual industry statistics	8 013	76 098 205
Products and services, manufactured in subcontract work	743	973 272
Share of manufacturing in subcontract work %	9,3%	1,3%

Source: website of the HCSO

The detail structure of activities of manufacturing in subcontract work in Hungary is shown in Table 3.

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[8] Yearly average rate, 2009: 280,6 HUF/EUR

In Hungarian national practice "*CB Manufacture of textiles, wearing apparel, leather and related products" h*as the biggest share. The number of production enterprises reporting PRODCOM level data concerning this product group is about 250. The representation of other product groups is lower (see Figure 2.).

Figure 2.
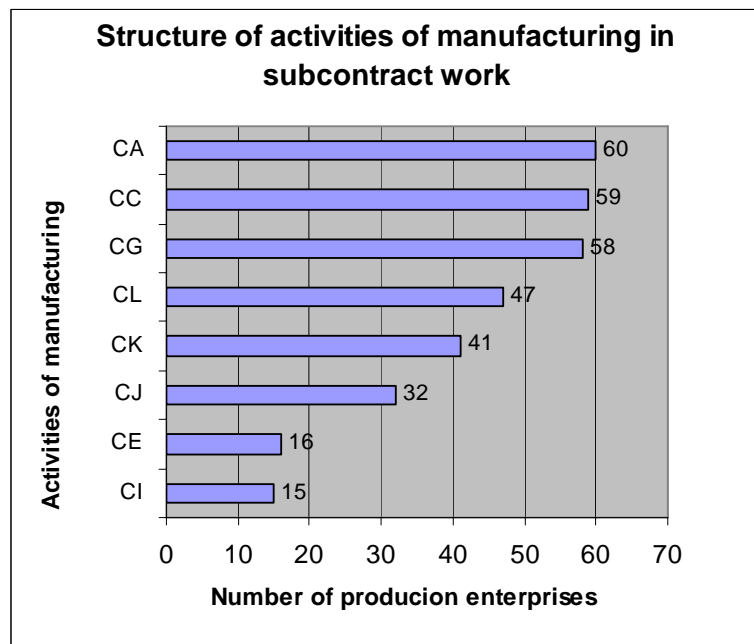
Regarding the volume of total turnover of products and services the share of "*CB Manufacture of textiles, wearing apparel, leather and related products" (23 %)* and of "CL Manufacture of transport equipment" (23 %) is approximately the same, compared to the total turnover of manufacturing in subcontract work. The enumeration is continued by the "CI" Manufacture of computer, electronic and optical products" (19%), and the aggregated share of this three areas is about two third.

Table 2.

Manufacturing in subcontract work Annual statistics, 2009	**Number** of companies	**Sales value**
Total subcontract work	100,0 %	100,0 %
Manufacturing in subcontract work, „C"	98,8 %	97,2 %
Manufacture of textiles, wearing apparel	33,1 %	**23,1 %**
Manufacture of transport equipment	6,3 %	**22,9 %**
Manufacture of computer, electronic and optical products	2,0 %	**19,2 %**

3. PRICE STATISTICS

Industrial producer price indices (PPI's) are harmonized with the European short term regulation (STS)[9] and reflect the price development of sold products and services produced/performed by enterprises classified in the industry. The indices are calculated by classes of the standard industrial classification of all economic activities (NACE / TEÁOR). The PPI's are computed as the weighted average of domestic and export price indices at every aggregation level.

The *monthly indices compared to the previous month* are aggregated by two-step Laspeyres weighting. Firstly the price relatives of representative items for the reference month compared to the previous month are calculated. Then the indices of commodity groups (PRODCOM 6. digit) are determined as the arithmetical means of price relatives of the representative items. Afterwards the price indices of 4-digit branches are computed as the weighted arithmetical means of price indices of the commodity groups. Weights refer to the annual sales of industrial products and services of each commodity group in the year two years prior to the reference year in the respective sales direction. Weights are changed every year.

The *indices compared to the same month or to December of previous year* are calculated with chain linking method, using indices compared to previous month (that are described above). In order to compute long time series annually re-weighted price indices are linked together without any adjustment; otherwise said chain indices are calculated.

The observation of prices of manufacturing services is carried out within the monthly PPI survey.

3.1. Source of data and scope of data suppliers

Industrial producer price indices are based on data of the compulsory monthly survey[10], by questionnaire. To help the fast and accurate collection of data, an electronic data collection system was introduced on 1st January 2007, and since 1st January 2008 the data can be sent by e-mail on questionnaires downloadable from the HCSO website.

The scope of data suppliers reporting price statistics data is representative and independent of size groups regarding the number of employed persons. Those economic units are observed, which according to the 'Annual production survey' (PRODCOM) referring to two years prior to the reference year (t-2), had significant annual sales in the product groups dominating the total production value of the given section. The observed sample is revised in each year. The monthly representative price survey refers to almost 1400 enterprises (i.e. data providers) and to nearly 6000 products or services.

Concerning manufacturing services (with code of representative items XXXX.99.00), approximately 60 enterprises provide prices for about 250 items regarding 30 commodity groups (PRODCOM 6. digit).

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[9] Regulation 1158/2005 of the European Parliament and the Council amended the original STS Regulation

[10] HCSO-questionnaire N° 1007 ('Monthly price survey of industrial products and services') in the NPSDC (National Programme for Statistical Data Collection, based on a government decree).

4. PRINCIPLES OF MANUFACTURING SERVICES

In Hungary, outsourcing "net values" prices (fees or payment on a contract basis related to the good or service) are collected for contractors processing on material inputs owned by others. For the principals, gross approach is applied (collecting prices of the good or service sold on own account). However, in most cases the principal is a non-domestic company, and that's why it is not included in the sample.

4.1. Specific experience on the "net values" prices in manufacturing

Hungary has already a specific experience in the record of some "net values", which concerns mainly the treatment of "*Manufacture of textiles, wearing apparel, leather and related products* ", "*Manufacture of food products, beverages and tobacco products*", "*Manufacture of wood and paper products, and printing*", "*Manufacture of rubber and plastics products, and other non-metallic mineral product*", "*Manufacture of transport equipment*", "*Manufacture of machinery and equipment n.e.c.*" and "*Manufacture of electrical equipment.*"

4.2. The main pricing method used

In case of contract processing (outsourcing) the contractors do not own and do not sell the product produced; they receive payments (fees) for service (processing) and price for accessories according to the contract conditions.

The *pricing method based on working time* (mainly average hourly rates for a specific process) and the *unit values* relative to the goods processed are the main techniques applied in order to establish the "net values" price series.

4.3. Description of price representatives

Prices are collected for a detailed set of price specifications of products, for which the prices refers to a level of detail, where there are no further varieties of the products.

The price of the provided manufacturing service depends mainly on the contracts specifications: type of good/service, material (accessories) added, destination (domestic / non-domestic buyer) and size (number, weight, and/or volume), such as the type of client and exchange rate. Prices exclude taxes (e.g. VAT) and include discounts, rebates and surcharges.

Thus **the price of manufacturing in subcontract work** *can be expressed as follows:*

Price = Fee or payment on contract basis for the contract work (+ price for accessories or a small quantity of additional materials needed for this work)

4.4. Examples of price representatives

In Hungarian PPI observation system, ITO / PRODCOM codes of the representative items are applied. One of the main difficulties to observe "net prices" for manufacturing in subcontract work is that codes of price representatives regarding the full production process are not distinguished obviously compared to the processing on own account. Therefore it is proposed to link the PPI database with Industrial Production database to gain additional information (whether the second row "B" of the "Annual statistics of industrial production" survey was filled or not; see subtitle 1.4. case 1.).

During the validation process, it is essential to check the completeness of quantity and value data, which are compared to those of the previous month and to the same month of previous year respectively. Further possibility to ensure appropriate quality of reported prices can be to compare product-level average price of an enterprise with the average domestic price – assuming, that in general the average price (fee or price on contract basis) in subcontract work is significantly lower than the price of the product produced on own account.

The next practical examples are real price representative items for services performed on a fee or contract basis coded as "XXXX99YY" and observed by the Hungarian PPI staff.

1391 Manufacture of knitted and crocheted fabrics

Representatives of the fee of
  ➢ price per kg of manufacturing of fabrics (type 1.)
  ➢ price per kg of manufacturing of fabrics (type 2.)

1412 Manufacture of workwear

Representatives of the fee of
  ➢ price per ready-made men's other garment, of cotton, for industrial wear
  ➢ price per ready-made women's other garments, of cotton, for industrial wear

1413 Other outerwear

Representatives of the fee of sewing + price accessories
  ➢ price per ready-made men's trousers of denim, model number 32
  ➢ price per ready-made men's trousers of cotton, model number 32
Representatives of the fee of
  ➢ price per norm hour of operations as part of manufacturing of women's dresses
  ➢ price per norm hour of operations as part of manufacturing of women's trousers

1414 Underwear

Representatives of the fee of sewing + price accessories
  ➢ price per ready-made brassieres
  ➢ price per women's blouses
Representatives of the fee of
  ➢ price per setting of the arm of the women's blouses
  ➢ price per norm minute of cutting of brassieres

1512 Luggage, handbags and the like, saddlery and harness

Representatives of the fee of
  ➢ price per cutting of the component (model id. code 1.)
  ➢ price per cutting of the component (model id. code 2.)

1520 Footwear

Representative of the fee of preparation + price accessories
- ➢ price per 100 pairs of preparation of the uppers of the boots

Representatives of the fee of
- ➢ price per 100 pairs of preparation of the uppers of the sports footwear
- ➢ price per 100 pairs of preparation of the uppers of the sandals
- ➢ price per 100 pairs of preparation of the uppers of the boots
- ➢ price per 100 pairs of preparation of the removable insoles

2211 Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres

Representatives of the fee of
- ➢ Price per piecework of preparation of the tyres (model 1.)
- ➢ Price per piecework of preparation of the tyres (model 2.)

2229 Manufacture of other plastic products

Representatives of the fee of
- ➢ price per 100 pieces of assembly of climates (model 1.)
- ➢ price per 100 pieces of assembly of the radios (model 2.)

2572 Manufacture of locks and hinges

Representative of the fee of
- ➢ Price per piecework of preparation of the chairlegs

2611 Manufacture of electronic components

Representative of the fee of
- ➢ Price per piecework of preparation of the faces (id. code 1.)
- ➢ Price per piecework of preparation of the faces (id. code 2.)

2829 Manufacture of other general-purpose machinery n.e.c.

Representative of the fee of
- ➢ price per 1000 pieces of assembly of resistances

2830 Manufacture of agricultural and forestry machinery

Representatives of the fee of
- ➢ Price per piecework of preparation of part of mowing machine (France)
- ➢ Price per piecework of preparation of part of sprayer (id. code 1.)

2931 Manufacture of electrical and electronic equipment for motor vehicles

Representatives of the fee of
- ➢ price per 1000 hours of operations of the compound cables (model 1.)
- ➢ price per 1000 hours of operations of the compound cables(model 2., Batterie)

3020 Manufacture of railway locomotives and rolling stock

Representative of the fee of
- ➢ Price per piecework of preparation of railway coaches (for Switzerland)

3212 Manufacture of jewellery and related articles

Representative of the fee of
- ➢ price per gramme of preparation of gold jewellery

5. SUMMARY

As other areas of the economy, manufacturing industry is also affected by globalization. Due to the improvements in traffic and communication infrastructure, work can be outsourced to any part of the world. To produce comparable macroeconomic indicators at word level, the development of techniques in order to handle the increasing role of multinational companies and effects of globalization is essential. It is necessary establish close cooperation between statisticians at national level, as well as good contacts between experts of international organizations and certain countries to exchange practices.

Price collection regarding manufacturing services in Hungary follows a special treatment within the PPI survey. Gross approach (collecting prices of the good or service sold on own account) concerning the principal and net approach (collecting fees or payment on contract basis related to the good or service) for the contractor are applied. It should be noted that in most cases the principal is a non-domestic company and that's why it is not included in the sample.

One of the main challenges to observe prices for manufacturing is that codes of representative items are not distinguished obviously regarding the production process in subcontracting work vs. the processing on own account – because of the differing treatment of full production and parts of the production in the "Annual statistics of industrial production" survey.

During the validation process it is essential to check the completeness of quantity and value data, which is maintained usually through the expertise of the few trained analysts assigned to it. To aim that companies classified as a manufacturing company provide right data for computing of related economic indicators, it is also needed to build good cooperation between data collectors of NSI's and data suppliers. Subsequently, if data collectors are not sure if the classification or reported data is correct, it is suggested to contact the company regarding any significant price change and ask contributors about their activities, contract details and related price conditions respectively.

To ensure appropriate quality of PPI's, the aggregated data are compared with indicators of the same content, arising from different sources, and deviations are investigated.

Table 3.

Structure of activities of manufacturing in subcontract work in Hungary

The frame of observation is all enterprises classified to industry (sections B,C,D),as well as non-industrial enterprises, 2009 year

Published data of annual industry statistics	Accounts	
	Number of production enterprises (pieces)	Volume of total turnover of products and services, manufactured in subcontract work (thousand EUR)
Total Published data of annual industry statistics	743	973 272
C= Manufacturing	734	946 450
CA Manufacture of food products, beverages and tobacco products	60	68 641
CB Manufacture of textiles, wearing apparel, leather and related products	246	224 794
CC Manufacture of wood and paper products, and printing	59	112 175
CD Manufacture of coke, and refined petroleum products	3	60 590
CE Manufacture of chemicals and chemical products	16	41 452
CF Manufacture of pharmaceuticals, medicinal chemical and botanical products	6	9 409
CG Manufacture of rubber and plastics products, and other non-metallic mineral products	58	49 540
CI Manufacture of computer, electronic and optical products	15	186 629
CJ Manufacture of electrical equipment	32	62 164
CK Manufacture of machinery and equipment n.e.c.	41	107 456
CL Manufacture of transport equipment	47	223 011
J= Information and communication	7	7 461

Source: website of the HCSO