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SPPI

Warehousing and storage

(ISIC 5210)

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Introduction

The Austrian warehousing and storage service sector is closely connected to the logistics service industry. It is a service sector with various possibilities to store goods in warehouses. This service sector becomes more innovative. Companies in different niches of warehousing and storage offer regularly integrated services to their customers. The use of digital products changes the services of this service sector. Fully automated processes are employed from some companies.

ISIC 5210 'Warehousing and storage' was discussed most recently at the Voorburg Group meeting in Dublin (2014). Germany presented a sector paper on ISIC 52 'Warehousing and support activities for transportation'.

As mentioned in the sector paper, contributions to this 2-digit level industry session one year before were primarily concerned with ISIC 5210 'Warehousing and storage" and 5224 'Cargo handling'. All papers presented in Tokyo (2013) were submitted by participants of EU member states. These countries have a common legal basis and nothing changed till now. There were mini-presentations on SPPI from Sweden, UK (United Kingdom) and France. The Netherlands and France were responsible for the output part of the session.

Presently, there are preparations for FRIBS (Framework regulation integrating business statistics) which will presumably come into force in the near future. The whole 2-digit level industry ISIC 52 is part of FRIBS.

1. Descriptions and characteristics of the industry

1.1 Definition of the industry

ISIC class 5210 'Warehousing and storage' comprises a wide range of different goods and services. In the Austrian questionnaire there are differentiations between warehousing and storage services, loading and unloading and other auxiliary services connected with warehousing and storage. The questionnaire thereby takes into account the most relevant service products of this service industry.

Important goods to be stored are containers, general cargo, bulk goods, liquid goods (e.g. oil), dangerous materials and gas. The questionnaire gives the possibility to specify other goods not mentioned as standard category in the data entry form. Important ancillary services are provided by respondents themselves. The paper contains a more detailed description of all the different services/goods of the Austrian storage and warehousing questionnaire.

Recent research from the Voorburg Group has produced a guidance paper on bundling in the compilation of services statistics. It is common practice in this service industry that service packages are offered to customers. The paper provides examples of individual services/bundled services in Austria but individual warehousing and storage companies cannot be identified due to confidentiality reasons.

For the market warehousing and storage services increasingly there are new or remodelled operations providing specialised services to cater to changed demands.[1] Digitalisation is of growing importance for the logistics service sector. Fully automated processes exist in modern logistics companies. As a result of this technological change in the logistics service

[1] OECD/Eurostat (2014), p. 150.

industry it could be observed that warehousing and storage services are also becoming more advanced. Examples are mentioned in the paper.

Industry classifications (see references for version of classification)

Table 1: Industry classifications for warehousing and storage

Industry classification	**Title**
ISIC, NACE, OENACE 52	Warehousing and support activities for transportation
ISIC, NACE, OENACE 521	Warehousing and storage
ISIC, NACE, OENACE 5210	Warehousing and storage

In the following ISIC descriptions can be found:

52 Warehousing and support activities for transportation

This division includes warehousing and support activities for transportation, such as operating of transport infrastructure (e.g. airports, harbours, tunnels, bridges, etc.), the activities of transport agencies and cargo handling.

521 Warehousing and storage

See class 5210.

5210 Warehousing and storage

This class includes:

- operation of storage and warehouse facilities for all kind of goods:
- operation of grain silos, general merchandise warehouses, refrigerated warehouses, storage tanks etc.

This class also includes:

- storage of goods in foreign trade zones
- blast freezing

This class excludes:

- parking facilities for motor vehicles, see 5221
- operation of self storage facilities, see 6810
- renting of vacant space, see 6810

NACE is nearly identical to ISIC classification. Rulings are included in the class of 'Warehousing and storage'. Due to the importance of digitalisation, the digitalisation and storage of files and documents were implemented in this NACE class. OENACE (Austrian version of NACE) is nearly identical to NACE. There are minor differences because OENACE has subclasses on 5-digit level.

Product classifications (see references for version of classification)

Table 2: Product classifications for warehousing and storage

Product classification	**Title**
CPC	
67210	Refrigerated storage services
67220	Bulk liquid or gas storage services
67290	Other storage and warehousing services
CPA, OECPA	
521011	Refrigerated storage services
521012	Bulk liquid or gas storage services
521013	Grain storage services
521019	Other warehousing and storage services

CPC 67210 Refrigerated storage services

This subclass includes:

- storage and warehousing services for frozen or refrigerated goods, including perishable food products
- blast freezing services, associated with storage and warehousing

This subclass does not include:

- specialized freezing of food on a fee or contract basis, cf. corresponding subclass in group 881, based on type of good to be frozen

CPC 67220 Bulk liquid or gas storage services

This subclass includes:

- bulk storage and warehousing services for liquids and gases, including oil and oil products, wine and the like

CPC 67290 Other storage and warehousing services

This subclass includes:

- storage services of grains
- other storage or warehousing services

CPA 521011 Refrigerated storage services

Similar to CPC 67210

Blast freezing services, associated with storage and warehousing, are not mentioned explicitly

OECPA 521011 Refrigerated storage services

See explanations CPA above.

CPA and OECPA 521012 Bulk liquid or gas storage services

Identical to CPC 67220.

CPA 521013 Grain storage services

This subcategory includes:

- storage services of grains
- operation services of grain silos

OECPA 521013 Grain storage services

See explanations CPA above.

CPA 521019 Other warehousing and storage services

This subcategory excludes:

- parking facilities for motor vehicles, see 52.21.24
- self-storage facility services, see 68.20.12
- rental services of vacant space, see 68.20.12

OECPA 521019 Other warehousing and storage services

See explanations CPA above.

OECPA (Austrian version of CPA) is identical to CPA classification. There are minor differences to CPC. CPA 521013 'Grain storage services' is an extra subcategory. Exclusions in CPA 521019 'Other warehousing and storage services' are parking facilities for motor vehicles, self-storage facility services and rental services of vacant space.

1.2 Market conditions and constraints

Table 3 shows the importance of the industry compared to the service industry and the whole economy. Warehousing and storage is presented with a share of 4,26% on OENACE 52 and 0,36% on OENACE H-N. Turnover from companies classified elsewhere in the OENACE classification cannot be mentioned.

Table 3: Importance of OENACE 521 in Austria (2018)

OENACE 2008	**Turnover - in 1.000 EUR***	**In %**
Total (H-N)	227.154.186	0,36
52 Warehousing and support activities for transportation	18.967.120	4,26
521 Warehousing and storage	807.057	
* Without Value Added Tax (VAT) Source: Statistics Austria database		

Variables (Number of enterprises and Turnover) can be followed for the period 2010 till 2018 in table 4. Similar to the data in table 3, secondary warehousing and storage activities cannot be presented. There was a growth of both variables observed for 521 'Warehousing and storage' from 2010 till 2018.

Table 4: Trend of OENACE 521 in Austria (2010 - 2018)

OENACE 2008 521 **Warehousing and storage**	**2010**	**2015**	**2018**
Number of enterprises*	103	127	144
Turnover - in 1.000 EUR**	325.001	794.325	807.057
* Legal entities ** Without Value Added Tax (VAT) Source: Statistics Austria database			

Table 5 represents key figures of the Austrian warehousing and storage service industry. Key figures are number of enterprises, number of employees and turnover for different size classes in persons employed. Some data cannot be published due to confidentiality reasons. Only the size class ‘From 0-9 persons employed‘ is available for number of employees and turnover.

Table 5: Size classes for OENACE 521 in Austria (2018)

Persons employed - number	**Number of enterprises**	**Number of employees - total yearly average**	**Turnover - in 1.000 EUR***
Total	144	2649	807.057
250 persons employed and more	1	C	C
From 50 to 249 persons employed	12	C	C
From 20 to 49 persons employed	10	C	C
From 10 to 19 persons employed	15	C	C
From 0 to 9 persons employed	106	230	192.817
* Without Value Added Tax (VAT) ** C…Confidential Source: Statistics Austria database			

The market for warehousing and storage services has low barriers to entry for service providers. For most categories of goods (e.g. general cargo) there are no high costs to enter the market. Markets for some goods (e.g. mineral oil) are stronger regulated by law but do not constitute a barrier to entry to the warehousing and storage service sector.

There is hardly any impact from public regulations on the market situation. An exception is energy supply. In order to ensure energy providing (mineral oil, mineral oil products and biogenic raw and fuels) in Austria there are companies that store energy for a consumption period of 90 days. This is regulated by law. There is one firm established as a central storage facility. Their tariffs are published in the Austrian gazette. Prices are market tariffs in Euro per ton of oil unit, net prices. For 2020/2021, a flat rate is announced applicable for all products.

The degree of concentration within this service industry is rather high. 106 enterprises (From 0 to 9 persons employed, table 5) out of 144 have 230 employees out of 2649. The turnover for these enterprises only amounts to approximately 24%.

Costumers mainly stem from the B2B area. There are B2C costumers in warehousing and storage but not included in NACE 5210. Operation of self storage facilities is one example, see 6810. B2X does not really matter for this service industry.

Warehousing and storage services are often strongly connected to other value added services. Customers are looking for companies that offer customised solutions and one-stop provider. Individuality in order acceptance, storage of the goods, order picking, delivering or invoicing play an important role in the logistics sector.

Operation of storage and warehouse facilities for all kind of goods is the primary product. Some examples of standard secondary services are mentioned in the paper.

Warehousing and storage output is created also from other Austrian service industries. This output is not relevant for SPPI index calculation resons because Statistics Austria actually follows an industry approach for its classification of service companies. Two examples of warehousing and storage output from other service industries with relevance according to our classification system are NACE 4941 ‘Freight transport by road’ and 5229 ‘Other transportation support acitivities’.

1.3 Specific characteristics of the industry

It is not common for Austrian warehousing and storage companies to offer a lot of different categories of goods. Only some of them are engaged in several specific goods (e.g. containers, general cargo and refrigerated goods). A minor number of companies are specialised only on one good (e.g. petroleum products, gas).

There are differences also in case of one good category. Temperature-controlled space for chilled and frozen goods is offered with different temperatures on customers’ needs. Additionally, dry storage space is needed for various goods. A small part of companies is specialized in warehousing and storage of frozen goods and other companies offer a combination of temperature-controlled and dry storage space.

The number of warehousing and storage companies located near rail, road and water is small. But such located companies with trimodal accessibility can have a wide range of different services. Various types of warehouses (e.g. outside and inside warehouses with further categories), stored goods (e.g. container, general cargo) or value added services (e.g. loading / unloading, check and repair services, cargo handling) comprise a broad range of services. In particular, this has to be considered in the development of a survey for this service sector.

Bundling of services is common for this service industry. This is also applicable for composite products. As mentioned in the guidance paper on bundling in the compilation of service statistics, the multitude of activities can be vast and the lines blurred between composite products and bundled services.[2]

One example of a logistic service with refrigerated goods for customers:

Warehousing and storage of refrigerated goods, order picking on pallets, etc. of the goods, transport and delivery of the goods to stores, included are order processing and delivery information. Prices: Fixed prices, prices per unit of handled goods, etc.

In this practical example, the logistic service can include four simple services. It could also be a composite service with the primary service warehousing and storage. Another approach is possible here for the logistic service. It may be a price bundle for service providers and their customers. Prices and price models depend on the type of the logistic service.

Intensive basic investigation would help in order to receive detailed information on bundled warehousing and storage services. As already discussed at Voorburg Group meetings, questionnaires can be extended by questions concerning bundled services. For warehousing and storage it is known which products are being bundled but not the relevance of single bundled activities in the service sector.

Advanced technologies have been established in the warehousing and storage service industry. Besides traditional warehousing and storage equipment, some companies use for example mobile racking or automated storage and retrieval systems. Goods handling is one important part of the warehousing and storage service which can include automated processes. Examples from companies are layer picking or voice picking, real-time inventory or packing status.

2. Measurement of SPPI

2.1 General framework

The Austrian quarterly warehousing and storage SPPI is published on 3-digit level (OENACE 521 is identical on 4- and 5-digit level) since 1st quarter of 2007 with base year 2006. More detailed subindices are not available. There is one main reason for publication of higher aggregate level. European legislation does not require lower level indices. Growing cost pressure is on NSOs (National Statistical Offices) which simply cannot afford more detailed statistics.

2.2 Measurement issues

It would be important to get more detailed warehousing and storage data on services structure from other Austrian surveys. Examples are product level data, warehousing and storage services combined with ancilliary services and primary and secondary service products.

In Austria, an industry-based SPPI is used due to the lack of a product-level classification system. The main activity determines the allocation of companies. Only analyses are done from companies that report warehousing and storage services as secondary activities. The present situation does not give the possibility to survey these activities from companies

[2] Guidance paper on bundling in the compilation of services statistics (2016, 2017), p. 6.

classified elsewhere. Legal frame is an important issue in this context. In case that the sole focus is on the main activity, a price survey of secondary activities will not be properly.

There are no other data sources available for replacing surveys. The respective Austrian trade association was asked for any direct volume information or big data that can support the price collection. Unfortunately, such information (if available) could not be provided before the next base year 2021.

Austrian business register is the sampling frame for the warehousing and storage service industry.

Basically, the sampling design looks as follows:

- Cut-off method is used, all companies above a certain threshold are chosen for the sample

  - Austrian companies that offer services in Austria and abroad

    Foreign companies that are seated in Austria

    Intragroup companies with similar characteristics (structure of the group, prices) to other companies of the free market, market prices can be oberserved

    Excluded are:

    Foreign companies that are not seated in Austria but mentioned in the Austrian business register

    Companies that only have the function of a cost center, no market prices can be observed

Turnover and other data stem from SBS (Structural Business Statistics) and STS (Short-Term Statistics). There are no statistics on service product turnover for warehousing and storage. The Austrian SPPI department collects data on service product turnover separately from companies of this service sector. In one period, companies fill in weighting and price information for the questionnaire. SPPIs are normally rebased every 5 years with new weighting data.

2.3 Description of pricing methods and criteria for choosing the method

Definition of the service being priced

There are various combinations of different provided warehousing and storage services:

- Depends on the type of stored goods, with description and further characteristics from the questionnaire or from respondents themselves

- Prices: Generally total and unit prices, prices for warehousing and storage, entry/exit of the goods in the warehouse and auxiliary services

- Bundled services

Price determining factors

There are some price determining factors that need to be taken into account in more detail. These factors are relatively easy to follow for this service industry.

Important price determining factors which are considered in the Austrian questionnnaire:

- The commodity being stored (e.g. containers, petroleum products, dangerous materials, etc.)
- The unit of a commodity being stored (e.g. type of container, tonne/1000 litres, palette/other packages and dangerous materials classes, etc.)
- The duration of the storage (e.g. day, month, etc.)
- Any specific requirements for storage (e.g. loaded or unloaded containers, petroleum products, dangerous materials, etc.)
- Any additional services (receiving, handling, dispatch or picking)[3]

Pricing methods

Direct use of prices of repeated services

Direct use of prices of repeated services is the chosen pricing method in Austria. The questionnaire depicts the different stored goods usually asked from clients in the warehousing and storage service industry. Standard service examples were built into the questionnaire supported originally by the German statistical office and during revision times by the respective Austrian trade association. The questionnaire gives the possibility for companies to report prices for different types of warehousing and storage services. Prices of repeated services can become model prices if services are not provided exactly in the form as described in the questionnaire or reported services are no longer available for the respondent.

The Austrian questionnaire consists of three parts:

1) **Repeated warehousing and storage services**
2) **Additional services for warehousing and storage services (entry/exit of the goods in the warehouse)**
3) **Other additional services for warehousing and storage services**

In the following all three parts of the questionnaire are described in more detail:

1) **Repeated warehousing and storage services**

Warehousing and storage services

- Containers

Loaded and unloaded containers, size of the containers, duration of storage and indoor and outdoor storage

[3] See also sector paper (2014) p. 14 and 15.

- General cargo

Packed non-refrigerated/refrigerated goods on a euro pallet, duration of storage, weight, indoor and outdoor storage, type of the storage, type of goods and temperature

- Bulk and grab goods and/or absorbent goods

Bulk and grab goods and/or absorbent goods, duration of storage, weight, type of goods and type of warehouse

- Liquid goods

Petroleum/mineral oil products and vegetable oils, duration of storage, weight and type of warehouse

- Dangerous materials

Dangerous materials on a euo pallet, duration of storage, weight, type of warehouse and respondents may make any difference between other packages and dangerous materials classes

- Gas

Respondents shall add quantity and unit of measurement

- Other goods

Respondents shall add type of good with quantity and unit of measurment

2) Additional services for warehousing and storage services

Entry / exit of the goods in the warehouse, unit of a good to be stored

- Containers
- General cargo
- Bulk and grab goods and/or absorbent goods
- Liquid goods
- Dangerous materials
- Gas
- Other goods

3) Other additional services for warehousing and storage services

Respondents shall add ancillary services and bundles of services to the questionnaire. If it is not possible to provide each component of the warehousing and storage service individually then a service package is foreseen. Minor companies have announced difficulties with single prices of service bundles.

Some practical examples of warehousing and storage activities with ancillary services are:

- Order picking, exit of cartons; price per carton
- Order picking from stored goods (cartons on pallets), foiling/labelling and loading of the pallets on trucks; price per pallet
- Order picking from stored goods (bagged goods), loading of the goods in containers
- Seaworthy storage of general cargo in containers
- Management of accounts receivable and order administration for the customer

SPPIs are calculated using the Laspeyres price index formula, with preference being given to a fixed-base index (constant weighting over five years). According to the Eurostat-OECD manual, SPPIs should measure the change in price of a fixed basket of representative services to constant quality. If the qualities of goods or services being compared are not identical, quality adjustment is required.

After quality changes respondents are asked to note reasons for significant changes in price and/or changes to the service product. The following quality adjustment methods are considered for the Austria warehousing and storage SPPI:

- Direct comparison/comparable replacement
- Link-to-show-no-price-change
- Overlap method
- Bridged overlap method
- Expert estimation

Prices have to be imputed for index calculations if they are missing. Only few respondents do not report prices. Response rate is near hundred percent due to a reminder system with administrative penalty proceedings. Missing prices of service products are imputed usually my means of other corresponding products of the price development in the same service group. If possible, new service products are chosen for permanently missing services.

The Austrian quarterly SPPI for warehousing and storage is used for:

- to comprehensively show price trends for the service branches
- to be used as a deflator for calculating the output volume of the service sectors (in National Accounts, for example)
- to serve as an indicator for short and long term economic analyses
- index adjustments in contracts

2.4 Evaluation of comparability of Price data with Output data

In general, comparability exists between price data and output data for warehousing and storage. Technological change and bundling of services in the service industry require further exchange of data from SBS with SPPI. NACE and OENACE were revised most recently 2008. Revised editions of CPA/OECPA 2015 exist but there were no changes compared to

warehousing and storage CPA/OECPA 2008. New findings of statistical research should be integrated into the industry and product classifications.

The method of direct use of prices of repeated services ensures correct and accurate measurement of prices/price development of warehousing and storage services in Austria. This is a simple approach for reporting companies. Administration efforts in processing the prices can be reduced in comparison to some other pricing methods.

ISIC 52 'Warehousing and support activities for transportation' will come into force with the upcoming FRIBS regulation where ISIC 5210 'Warehousing and storage' is part of this 2-digit level service industry. ISPs (Indices of Services Production) are legally required after the implementation of FRIBS and appropriated SPPIs can be used for deflation.

Surveys could differ in timing. SPPIs are produced on a quarterly basis, whereas other indices (e.g. ISPs) may be computed on a monthly basis. The transformation of quarterly data to monthly data can be done with internationally acknowledged methods.

3. Evaluation of measurement

Technological change in the warehousing and storage service sector as well as in the whole logistics industry is a challenging task for statisticians. New services emerge on the market. Such updated service offerings are much broader than only the pure storage of goods in warehouses. Price and billing models change and an adjusted questionnaire for warehousing and storage is necessary for an adequate price survey of this service sector.

Bundled warehousing and storage services are important for the currently in Austria used questionnaire. Such services need to be taken into account again for the future price survey as add-on. Adjustments of the questionnaire regarding bundled services depend on discussions with the respective trade association which will be contacted for revision (2021) of the index.

Intragroup services are partly included in the Austrian SPPI price survey. It is time-consuming to analyse these companies and their services correctly. Close cooperation with entities from a company group is necessary during the whole survey process.

Summary of main conclusions

Data availability and quality of information for warehousing and storage services are very good. A sector paper was written and presented in Dublin (2014) by Germany. Several mini presentations give detailled insight of the work from statisticians done so far. It was helpful for an update of the warehousing and storage service industry that contributions to the sector paper (ISIC 52 'Warehousing and support activitiesfor transportion') were mainly from ISIC 5210 'Warehousing and storage" and 5224 'Cargo handling'.

All examined industry and product classifications are similar in their structure with nearly identical content. Austrian specific characteristics are not frequently observable in the classifications. Despite available classifications, it is essential to contact trade associations and firms during the set-up of the survey. Classifications have to be updated more often. This becomes apparent when looking at service bundles and technological changes in the whole logistics industry.

The Austrian warehousing and storage service industry has shown growth rates in recent years. There is currently no precise data on the number of enterprises and turnover from

companies classified elsewhere in the OENACE classification but offering warehousing and storage services. Turnover statistics and SPPIs on product level are not available in Austria.

Based on experiences gained so far, turnover has to be explored in more detail.

- Turnover at the industry level includes turnover from companies that carry out warehousing and storage activities in combination with secondary activities

- Turnover at the industry level excludes turnover from companies that carry out warehousing and storage activities as secondary activities

In order to get a realistic picture of this service industry, it would be necessary to collect data on turnover from all companies carrying out warehousing and storage activities.

Statistics Austria has been taken into account bundling of services for the SPPI of warehousing and storage services. It was identified that the response quality and willingness to report bundled services are quite good. Respondents use also the opportunity to report separate prices for packaged services. As mentioned in the paper, more information is needed on single bundled services. With better information it is possible to ask prices for the most relevant service bundles in this service industry.

Direct use of prices of repeated services is the chosen pricing method. The Austrian questionnaire depicts all relevant different types of warehousing and storage services. Respondents find specified service examples in the questionnaire. If companies are engaged in special market niches they have the opportunity to fill in their individual services and prices in the questionnaire.

The response rate is very good due to several factors:

- Development of the questionnaire is aligned with experts of the warehousing and storage service sector (e.g. trade associations)

- Knowledge sharing with other international statistical offices

- Close cooperation with companies of the sample

- Good established reminder system

- Mandatory reporting

All this above mentioned factors ensure a warehousing and storage index of good quality for Austria.

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