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Sector Paper: ISIC 52
"Warehousing and support activities for transportation"

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1. Introduction

This sector paper represents a consolidation of the revisited sector paper on ISIC (rev. 4) 5210 "warehousing and storage" presented in Vienna in 2010 and the results of the session on "Warehousing and support activities" which took place in Tokyo in 2013.

Before 2010 the Voorburg Group paid only little attention to the warehousing and storage sector. Only in 2004, two papers on SPPI's for warehousing and storage were compiled by the United States of America[1] and New Zealand[2], with the US only describing refrigerated warehousing and storage, but New Zealand covering cargo handling as well. Regarding turnover, there was no paper on this sector until 2010. Hence, turnover was covered for the first time in the revisited sector paper on "warehousing and storage" in 2010. This revisited sector paper identified the challenges associated with classification of warehousing and storage, collection of turnover data, and developing producer price indices. The paper provided some options, highlighted challenges and noted the implications of the choices that must be made when endeavoring to develop or revise turnover statistics and price deflators for warehousing and storage.

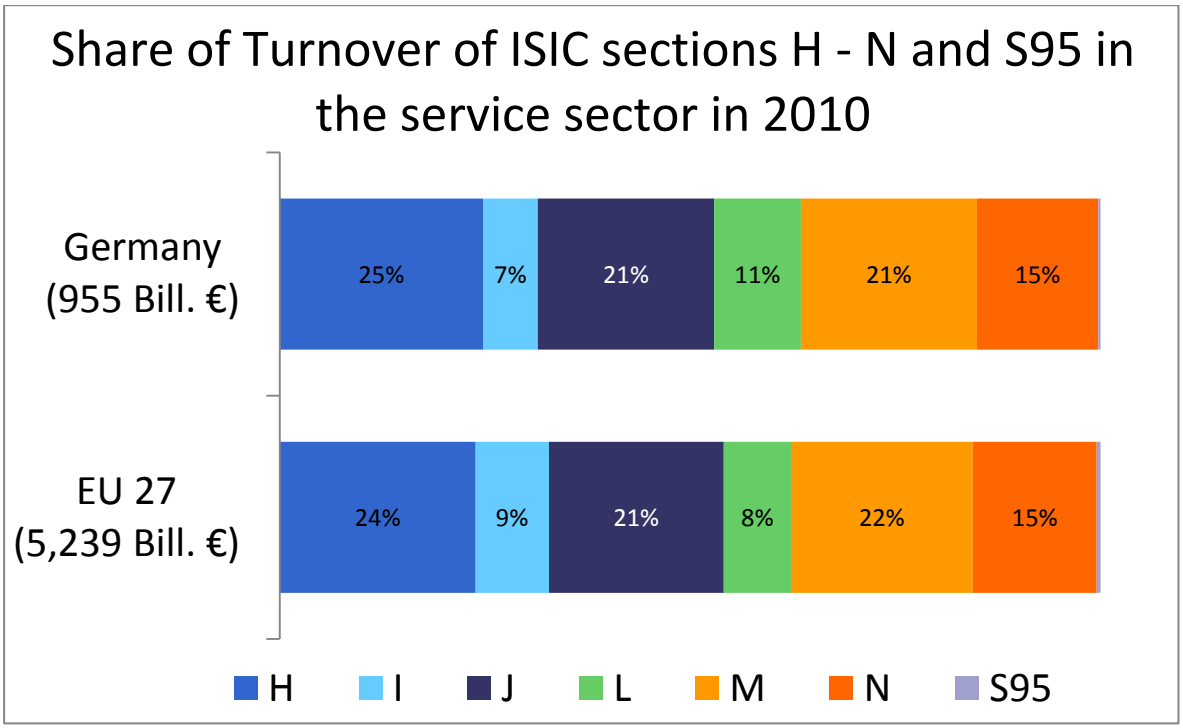
The session on ISIC 52 in 2013 was intended to provide experiences on collection of turnover data and producer prices for the whole 2-digit industry. The contributions to this session were primarily concerned with ISIC 5210 "warehousing and storage" and 5224 "cargo handling". All papers presented in this session were submitted by participants of EU member states. These countries perform the surveys in the services sector on a common legal basis.

In most countries the industry with all its parts is completely covered by surveys on turnover. SPPIs are only produced for a few sub-industries. This is questionable, given the importance of 5229 within the service sector. It should also be noted that the traditional transportation and logistics sector is in transition from low tech services to high tech support services like value added logistics and supply chain management services.

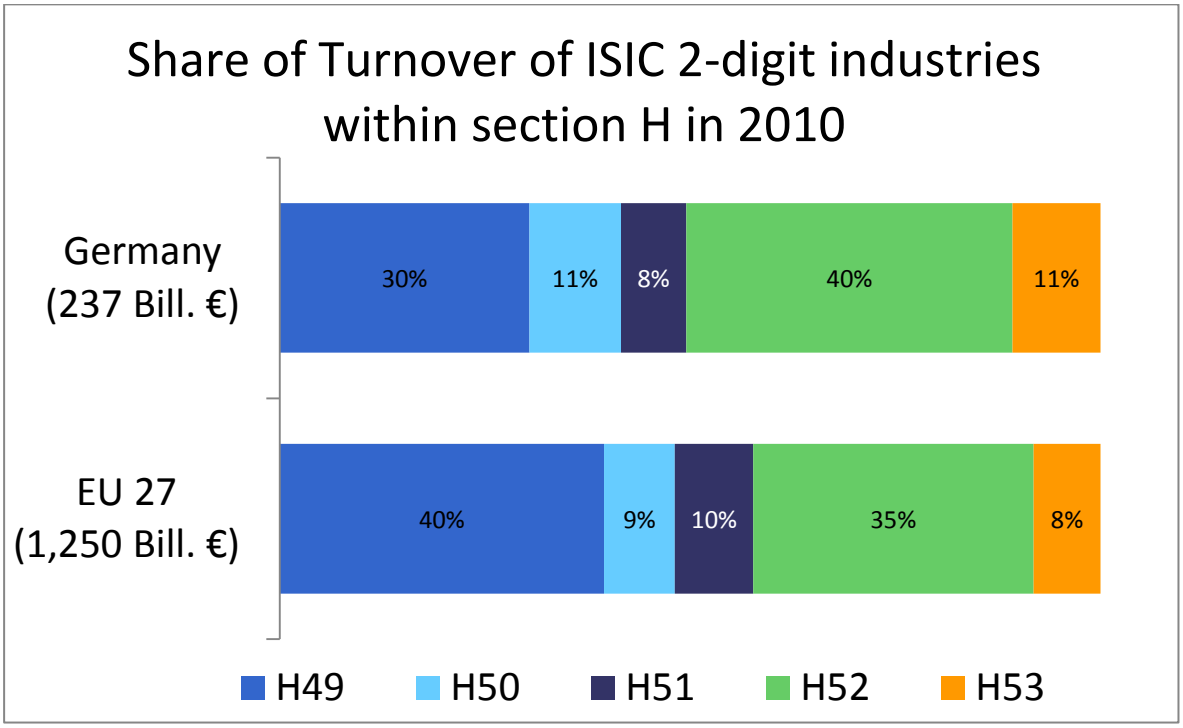
[1] Lucier (2004)
[2] Parbhu (2004)

2. Classifications

With about 25% of turnover in base year 2010 the transport and logistics section is the most important in the services sector – both in the EU and in Germany.



Among the 2-digit industries in section H in the European Union the land transport is the most important one, whereas in Germany the support activities have the highest share of turnover.



2.2. Industry Classification

Division 52 of ISIC Rev. 4 includes all kinds of "warehousing and storage" activities and services for the operation of transport infrastructure for all types of transport carriers (land, air and water), e.g. roads, rail-roads, airports or car parks. First, on the 3-digit-level the industry distinguishes between support activities and warehousing and storage activities. There is no further breakdown of the warehousing and storage activities in ISIC Rev. 4.
On the 4-digit-level most of the support activities are subdivided by mean of transport – except for cargo handling and other transportation support activities (such as agents for transport and weighing). This also applies for most of the other important industry classifications (NACE Rev. 2.0, JSIC, ANZSIC 2006 and NAICS). In some of the industry classifications "cargo handling" is not seen as separate branch, but as a service related to the different means of transport.

	ISIC Rev. 4	**6 industries**
	NACE Rev. 2.0	**6 industries** (identical to ISIC)
	JSIC	**16 industries**
	ANZSIC 2006	**4 industries**
	NAICS	**15 industries**

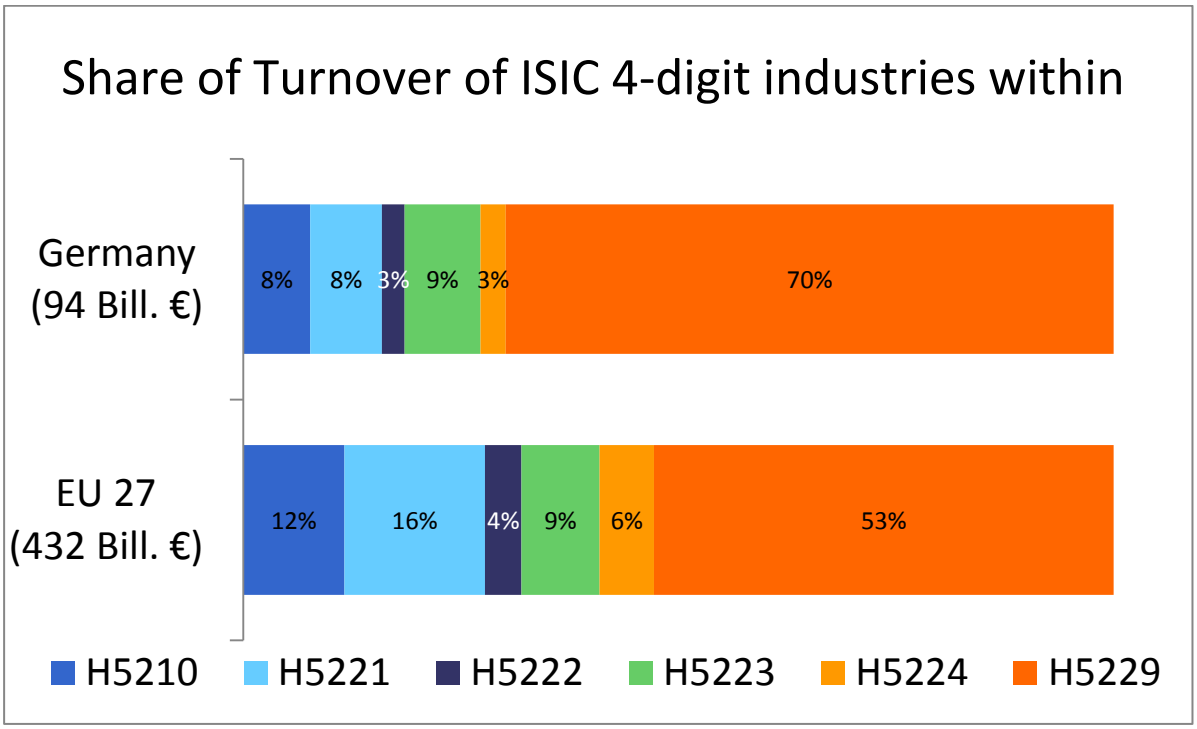
It is obvious that in the sector of transport support activities JSIC and NAICS are much more detailed than other industry classifications. The following list illustrates the breakdown of ISIC division H52 "Warehousing and support activities for transportation" into 4-digit classes.

521 Warehousing and storage

5210 Warehousing and storage

522 Support activities for transportation

5221 Service activities incidental to land transportation
5222 Service activities incidental to water transportation
5223 Service activities incidental to air transportation
5224 Cargo handling
5229 Other transportation support activities



Warehousing and storage services are always classified as supporting transport services – no surprise, as storage means transportation in the 4th dimension, i.e. the brigdeover between the time the good is transported to the warehouse and the time it is further used. ISIC Revision 4 describes “warehousing and storage” in group 521, class 5210 with no further breakdown. Other regional and national industry classifications based on ISIC make finer delineations. For example, NAICS, as configured for the United States and Canada, puts the services into group 4931 (warehousing and storage), further broken down by general warehousing and storage (49311), refrigerated warehousing and storage (49312), farm product warehousing and storage (49313), and other warehousing and storage (49319).
ANZSIC, used in Australia and New Zealand, defines an own division for warehousing and storage services (53), which is identical with the group (530) and subdivided into two classes: grain storage services (5301), and other warehousing and storage services (5309). So, a major difference between the classification systems mentioned above is the detail of breakdown. It depends on the national standards and requirements whether a NSI should catch the detail in its statistics or not.

Often, warehousing and storage is an important secondary activity of companies classified elsewhere in the transport and logistics sector. On the other hand, the companies with their primary activity in warehousing and storage – i.e. companies that belong to the industrial sector “warehousing and storage” – are offering a wide range of services belonging to other transport and logistics activities. So, the “industry” view on warehousing and storage will be certainly different from the “product” view, a characteristic we often find in the transport and logistics sector.

A main reason for this is that support activities for transportation are inherently multimodal, such as freight forwarding activities, or have multimodal aspects. When comparing services of freight forwarding agents with services of general freight trucking establishments the overlap of service portfolios is even higher. Thus, the reason for the high share of turnover of "other support activities" in Germany in contrast to the European Union might lie in a slightly different focus of the establishments. Hence, it is worth taking a look at both industry and product classifications.

Appendix 1shows the details and explanations of the classifications discussed.

2.3. Product Classification

In general, product classifications in use throughout the world follow a comparable approach by describing different types of supporting transport services. The degree of detail, however, can differ. Let us take a closer look on the product classification systems:
The product classifications distinguish from 25 and 35 service products. The North American classification (NAPCS) is the most detailed of these multinational classifications. Again in NAPCS the warehousing and storage is in a different 2-digit group than the other support services.

CPC Ver. 2.0	**25 subclasses**
CPA 2008	**31 sub-categories**
NAPCS Canada 2012 Version 1.1	**35 products**

In CPC 2.0 the supporting transport services (division 67) are organized very similar to the structure of ISIC. Cargo handling services and storage and warehousing services are classified independently from the mode of transport, all other supporting services are broken down by mode of transport. The following list illustrates the structure of products for the 4-digit classes, few of them are broken down further into subclasses.

671 Cargo handling services

- 6711 Container handling services
- 6719 Other cargo and baggage handling services

672 Storage and warehousing services

- 6721 Refrigerated storage services
- 6722 Bulk liquid or gas storage services
- 6729 Other storage and warehousing services

673 Supporting services for railway transport

- 6730 Supporting services for railway transport
- 6731 Railway pushing or towing services
- 6739 Other supporting services for railway transport

674 Supporting services for road transport

- 6741 Bus station services
- 6742 Highway, bridge and tunnel operation services
- 6743 Parking lot services
- 6744 Towing services for commercial and private vehicles
- 6749 Other supporting services for road transport

675 Supporting services for water transport

- 6751 Port and waterway operation services (excl. cargo handling)
- 6752 Pilotage and berthing services
- 6753 Vessel salvage and refloating services
- 6759 Other supporting services for water transport

676 Supporting services for air or space transport

6761 Airport operation services (excl. cargo handling)
6762 Air traffic control services
6763 Other supporting services for air transport
6764 Supporting services for space transport

679 Other supporting transport services

6791 Freight transport agency services and other freight transport services
6799 Other supporting transport services n.e.c.

Again, in NAPCS the warehousing and storage services are classified in a different group, whereas in CPC and in CPA cargo handling and warehousing services are part of the support activities.
A special feature of the North American Product classification is that maintenance and repair services of motor vehicles, locomotives, vessels and aircrafts are incorporated in this group of services.

3. Turnover Statistics

As noted in the introduction, the Voorburg Group has not previously addressed turnover practice for the whole 2-digit industry of "Warehousing and support activities for transportation".

3.1. Data Availability

We can distinguish three purposes of turnover measurement:

- **structural business statistics (SBS):** should provide a comprehensive overview of the industry and its companies. Turnover is just one variable to be measured besides others like number of employees, number of companies, investments etc. Absolute figures are published. Frequency: low, normally yearly. Publication date is often several months after the end of the reporting period. Industry-based statistics.
- **short-term statistics (STS):** should give an idea of the current direction of the economy. Often, only an index figure is given for turnover development. Details are not of high importance, but timeliness matters: publication data soon after the end of the reporting period. Frequency: high (monthly or quarterly). Industry based statistics.
- **Statistics on service product turnover:** important data source for the weighting schemes of SPPI's. It details the service products and requires sector knowledge for the design and completion of the survey. Frequency: low, in some countries only every five years if at all. Ideally product-based statistics.

For H52 the detailed status of surveys was collected before the 2013 meeting in Tokyo. 25 countries responded the request for information, among these 13 EU member states. Most of the 25 respondents collect turnover/output information at least on an annual basis for every 4-digit subclass of the 2-digit industry and nearly all EU member states do so.

3.2. Collection of Data and Data Issues

To calculate turnover figures, the surveyed NSI's use censuses, sample surveys and administrative data. It looks as if the kind of survey – sample, sample combined with administrative data or census – depends on the frequency of the data collection. Samples or samples in combination with the use of administrative data are rather common for surveys during the year, i.e. short term statistics whereas for annual surveys censuses are not unusual. Furthermore – especially for SBS data collected less frequently – it is more likely that a census is in use for branches with large entities.

A main challenge when collecting turnover for supporting transport activities is the high importance of secondary activities to companies in this sector, as well as the influence of companies from other sectors offering these services as well. Due to the very large overlap in the range of services with other sectors of the "transport and logistics" sector, the classification of enterprises is often extremely difficult.

Thus – especially when publishing very detailed data – it is a must to check that the assignment of the respondents to the sector is correct. Most NSIs that use sample surveys or census for measuring turnover do this by asking for the activity of responding companies. Other ways for ensuring are cross-checking with other statistics and the business register, enterprise profiling, asking experts or checking annual reports of the companies.

Checking administrative data is more complicated. An in-depth examination of the entity's industry classification by personal visits or sampling for additional checks of activities and other data would be a contradiction to the purpose of using administrative data: reduction of

cost and burden. Another big problem with the use of administrative data is that it has not been designed for statistical purposes. E.g. data from German tax authorities has the following weaknesses:

- Definition of turnover is different; e.g. the tax authority includes sales of assets which are not included in what turnover statistics want to measure.
- For VAT purposes enterprise groups are allowed to form VAT-groups in order to be treated as single enterprise. Thus, turnover gained by sales between subsidiaries is not counted and total revenue is allocated to the dominant enterprise. For the allocation of turnover to the subsidiaries additional sources are required.

Due to the different methodologies of SBS and STS e.g. in the Netherlands the growth rate of SBS turnover differs with respect to the STS turnover growth rate. This also caused by the fact that the user purposes of these statistics differ. SBS provides structural information, STS provides estimations of the growth rates. The STS turnover statistics' main purpose is to cover the economic market trends on the short term. Therefore non-real shifts are excluded in the STS turnover statistics as well as in the National Accounts. In the SBS however these shifts are included and may cause a difference in growth rates. Therefore the information of the SBS statistics is being used for fine-tuning the structures within the already determined production level.

3.3. Recommended Approaches

For developing turnover statistics, the NSIs may follow the approaches listed in the table below. The category tells the quality of the achieved data – not every statistics need a "best". If "speed" is the major requirement for data (e.g. for STS), then a "good" solution may do. And, of course, respondents' burden and resources at hand are important factors to consider when choosing the appropriate method. As realized by the detailed status reports and the mini-presentation on turnover for ISIC H52 by the Netherlands, country practices differ for annual and sub-annual statistics, i.e. SBS and STS. It's obvious that for estimation of growth rates the collection of product turnover detail is not required. On the other hand the observation of structural changes within the industry and between the industries is very important, if nothing else for the concepts and regularly scheduled revisions of SPPIs.

Table 1: Options for Developing Turnover Statistics – Support activities[3]

Category	Data Source	Level of Detail Collected	Frequency	Cost	Comments
Best	Survey/ Census	Industry turnover and product turnover detail;	Sub-annual collection (monthly or quarterly)	Most expensive Largest response burden	Would serve both SBS and STS requirements Allows greatest flexibility to identify specific revenue streams, residential and non-residential allocations can be collected directly. Timely data

[3] The table is taken over from Goldhammer, 2010, „Revisited sector paper on Warehousing and storage"

Good	Survey/ Census	Industry detail only	Sub-annual	Expensive High response burden	Full fulfillment of STS requirements Industry detail may not be sufficient to delineate sources of revenue or important residential/non-residential components using ISIC. Timely data
Good	Combination of census (large companies) and administrative data	Industry detail only	Sub-annual	Less expensive low response burden	Industry detail may not be sufficient for SBS Timeliness questionable Different definitions for turnover in administrative data files may cause (justifiable) bias
Minimum	Administrative (tax data, industry association data etc.,)	Industry detail only	Annual	Least expensive Little or no response burden	Income and production definitions can differ adding imprecision to estimates using tax data in place of actual revenue received for services Timeliness questionable

4. SPPI

A core problem for setting up an SPPI for transportation support services is the decision whether to create a product-based SPPI or an industry-based SPPI. For the “transport and logistics” sector these two concepts are fundamentally different because of the very large overlap in the services portfolio among the 4- and 2-digit industries of ISIC section H. From an industry point of view, especially freight forwarding companies offer many services that are the primary activity of other industries. If an NSI decides to set up an industry-based SPPI, these services need to be considered.

If instead one decides for a product-based index, then the secondary production of other industries has to be considered. In the preparation of the revisited sector paper on warehousing and storage activities it has been found that some NSIs focus on warehousing and storage companies and their warehousing and storage service products only, a rather narrow concept. It is recommended to follow either the industry-based or the product-based concept, depending on the national situation. Another solution was presented by Hungary, which calculate both industry-based and product-based indices by using the same set of price quotations but different weighting schemes.

The kind of turnover figures requested for the production of producer price indices depends on the kind of SPPI the NSI intends to produce. For the calculation of an industry based SPPI turnover figures for the industry are required, including the secondary activities. For the calculation of a product based SPPI the turnover generated with the various supporting transport services is necessary, independently from the classification of the provider. This leads to the question who is asked for prices.

The main sources of addresses are official business registers, often combined with sector information, e.g. address lists commercially issued for the logistics industry. The method of determining the respondents differs from country to country. The most popular approach seems to be – in line with the recommendations of the SPPI methodological guide[4] - PPS-sampling (Probability Proportional to Size). It is often combined with a cut-off limit – only companies above a certain minimum limit are considered – and a total stratum, i.e. all companies exceeding a certain level of size are included in the sample. The criterion, on which PPS sampling is based, however, is not common sense: some NSIs use turnover, others number of employees. But PPS is not the only sampling technique commonly used. It is worth mentioning that some NSIs use stratified samples following the method of Neyman-allocation and many NSIs use purposive sampling (sometimes called judgemental sampling), especially those of smaller countries like Slovenia. Especially for smaller industries where only few entities exist this might be a feasible way.

The 2-digit industry in whole poses enormous challenges to the price statistics. As already mentioned one has to deal with the overlap with all kinds of transport industries. Secondly, it is – especially in the freight forwarding industry – usual to sell bundles of services. In addition, these bundles are very customer specific. This makes it hard to keep the quality of performance constant over the period of price monitoring and it is difficult to ensure the representativeness of the services and the homogeneity of services within the elementary aggregates.
In the branches "warehousing" and "cargo handling" we have found that in most cases model prices need to be collected. It is assumed that this also applies to other important parts of ISIC 52. As this is for reporting units a considerably higher calculation effort than e.g. the reporting of hourly rates, the respondent's burden is also an issue.

[4] OECD/Eurostat (2005), p. 23

Nevertheless the measuring of price development for freight forwarding, organizing of transport operations by rail, road, sea or air and the brokerage for ship and aircraft space needs to be treated in future.

4.1. Definition of the service being priced

4.1.1. Warehousing and storage

As stated in the introduction, before 2010, warehousing and storage services have been addressed by two papers of the Voorburg Group: USA (2004)[5] and New Zealand (2004)[6], which provide – besides explaining the national approach – insights into the characteristics of warehousing and storage services. Combined with the results of the survey conducted before the preparation of the 2010 revisited sector paper[7] and the mini-presentations on SPPIs for ISIC H52 in 2013 the characteristics of warehousing and storage services can be summarized as follows:

The primary output of warehousing and storage industry is the warehousing and storage of commercial, industrial and agricultural or forestry goods, machinery and equipment. Establishments classified in this industry primarily offer storage services, however there is a growing trend for such establishments to offer complete logistical solutions or bundled services. For example, the storage and warehousing service forms a component part of an end-to-end service which could include any of the following services:

- Logistics management
- Collection/delivery of goods
- Receiving, handling and dispatch services
- Storage services
- Picking service / freight consolidation
- Security services
- Labeling and stenciling
- Inspection
- Sorting, Weighing, Packing and Wrapping
- Import/export services / customs clearance
- Bill of lading

It is likely that a 'bundled' storage service will include any combination of the above services and obtaining a price for the specific 'storage' component only may prove to be a challenge. Given the type of service offered in this industry has close connections with the freight transport industries, it is expected that a number of establishments classified outside of the industry will also provide storage significant services. For example, the larger freight companies, freight forwarders, airports or harbors are likely to have their own storage and warehousing facilities.

4.1.2. Cargo handling[8]

Cargo handling concerns each freight transport which uses more than one mode of transport. So, the service occurs in harbors, airports and freight terminals and the service of transshipment differs according to the hub. Moreover the services offered depend on the goods handled and the way they are packed: containers, pallets or tanks. The treatment, palletizing or containerization may be included in the service of cargo handling.

[5] Lucier (2004),

[6] Parbhu (2004)

[7] Goldhammer (2010)

[8] Bachelart (2013)

4.1.4. Other transportation support services[9]

The main activity within "Other transportation support services" is organizing and arranging transports i.e. forwarding. In contrast to warehousing, that is a part of the logistic chain, freight forwarding is the hub. They organize the shipment for corporations to get goods from the producer to the market. The transport might involve multiple carrier types such as ships, airplanes, railroads and trucks. And consequently the goods might be repacked at terminals and stored at warehouses as parts of the total transport. The forwarders either handle the transport by themselves or use a third company. The price being measured doesn´t only include the arrangement of the transport, but the total transport. It implies that the price/index will largely depend on changes in other industries e.g. Freight transport by road 49.41.
Like many other services the freight forwarders sells a unique product that is individually tailored for each customer. It is therefore difficult to find services that are directly comparable to each other. Also, pricing depends on a number of different and continuously changing factors. It can be problematic to distinguish one service from another since they sell a package that actually consists of many services. The most important price depending factors are customer, type of freight, transport type and place of departure and destination.

4.2. Pricing methodology and quality adjustment

The main method to measure prices for transportation support activities is contract pricing. This is due to the fact that the services of these industries are mostly offered as a bundle. Nevertheless a closer look at the sub-industries makes sense.

4.2.1. Warehousing and storage

Bearing in mind the service description, it was not astonishing in the 2010 survey among the VG members that contract pricing was the dominant pricing method. But – as pure storage services are easily to describe – also the use of direct pricing of repeated services was a very common pricing methodology. Some NSIs stated to use model pricing. For this industry, it is a rather thin line between model pricing and direct pricing of repeated services. The company is asked for a price for a well-specified storage service. When it is offered and sold at this point of time it is direct pricing of repeated services; when it is currently not sold, it is model pricing. An example can be found in the New Zealand paper.[10] A few NSIs also used the unit value method. However, for storage services this method has some weaknesses[11] and can't be recommended.

In the 2013 session it was stated that the storage services themselves – without considering any ancillary services – are clearly specified as opposed to unique and one off.[12] However, there are a number of factors to consider regarding the derivation of a price for a service in this industry. As already noted, there is a growing trend for storage companies to provide an end-to-end service. Where this is the case, it can be difficult to separately identify and strip out the storage components.
For the price measurement of the pure storage service the basic unit of measure is the price per period of time for the storage of a specified quantity of a commodity. For example, this could be the daily storage rate per pallet of a commodity or the weekly storage of grain in a 40ft container/silo. There are a number of price determining characteristics that need to be assessed during the development of a specification of a repeated service in this industry to ensure a price is measured to constant quality. The following price determining characteristics typically need to be accounted for (and fixed):

- The commodity being stored (such as liquid, gas, dangerous material etc.)
- The unit of a commodity being stored (per tonne, pallet, silo etc.)

[9] Ingman (2013)
[10] Parbhu (2004), p. 3
[11] Goldhammer (2010), p. 13
[12] Jenkins (2013), p.

- The duration of the storage (per hour, day, week etc.)
- Any specific requirements for storage (such as temperature control)
- Any additional services such as receiving, handling, dispatch or picking

In case of storage of no standard goods – e.g. large sized goods – and long term contracts including ancillary services contract pricing or the definition of model transactions was judged to be more appropriate because of the uniqueness of the service. Nevertheless, if using contract pricing quality adjustment in case of renegotiation of contracts is more difficult. Sometimes changes in space can be used to make quantity adjustment. But the new contract could represent a completely different product that needs special care, e.g. another temperature and is hence more difficult to quality adjust.

Discounting is also an important factor to consider in the storage industry when developing a price index, particularly for the long-term storage of large amounts of goods. Given the conceptual requirement of a SPPI is to measure the transaction price, it is important that any discounts are reflected in the price measured for the SPPI.

Category	**Pricing method**	**Data type in the suvey**	**Quality and Accuracy**	**Cost**
Best	Contract Pricing	Data is based on real transaction prices	Detailed specifications allow time-consistent comparisons ancillary services can be included discounts can be reflected	expensive with high response burden Quality adjustment crucial for correct price measurement when contract expires
Good	Model pricing	Data is based on expert recalculations	Detailed specifications allow time-consistent comparisons ancillary services can be included Models should be reviewed from time to time to ensure that they are not outdated	expensive with high response burden difficult to understand for the respondents response burden may be higher than for contract pricing
Good	Direct use of prices of repeated services	Data is based on list and tariff prices offered or collected by survey	Good representation of pricing of the pure warehousing services Movements in price reflect those of the main products fairly accurately	Less need for respondent than for contract pricing; therefore less expensive

4.2.2. Cargo handling

In the 2013 session on warehousing and transportation support activities only one presentation addressed the pricing methodology of cargo handling. According to the experiences of INSEE (France)[13] the pricing method largely depends on the products which are handled. The price of handling of metallurgical products (iron sheet, iron roll) is set per ton; the price is different if the client is a big company. For car handling, the price collected is based on an hourly charge-out rate.

In the light of lack of experiences of other VG-members there is no basis for an evaluation table of pricing methods.

4.2.3. Other transportation support services

The only VG-member presenting its own pricing methods for other transportation support activities was Sweden. According to their paper[14] the main method being used to measure prices is contract pricing. The method is a quite natural choice since freight forwarders (like warehouses) make long-term contracts with clients to handle the transport for a certain period of time. The method is also appropriate because of the uniqueness of the service, as the contract and price is unique for a particular client. In order to fulfill the requirements for this method, i.e. to avoid different mixes, the services are well specified. The specification of a transport service often includes: client, carrier type, type and weight of goods and departure and destination of the transport.
The contract is often regulated with an index or a combination of indexes measuring currency, oil, rent and salary.
When the Swedish index for other transportation support services first was developed, in 2003, the aim was to use model pricing. The enterprises were asked to choose a representative contract that they had entered into with another enterprise during the 4th quarter 2002. They were then asked to quote in each period their price if the contract was renegotiated. Even though model pricing might be a better method, as it captures the price development when an old contract is replaced by a new, it was practically difficult to use. In many cases the respondents had difficulties to understand what is wanted and needed to put in a lot of effort to give accurate prices.

Currently the Federal Statistical Office of Germany works on concepts for the establishment of SPPIs beyond "warehousing and storage" and "cargo handling". In contact with business associations and very important freight forwarders their primary product – organizing of transports – was analyzed and fragmented into components. Beyond the transports themselves, the warehousing and storage and cargo handling the following components were identified:

- cargo insurance
- customs handling
- brokerage of transport, warehousing and storage, cargo handling
- notification
- swap of stillage

It remains to be assessed if the reporting entities will be able to decompose the prices or if the collection of contract prices is more appropriate.

Similar to cargo handling, for the other transportation support services the experiences of the VG-members seem to be insufficient for an evaluation table of pricing methods.

[13] Bachelart (2013), p. 10

[14] Ingman (2013), p. 6

4.3. Other considerations / challenges:
A main challenge in these industries is the bundling of services. If the NSIs aim to calculate product-based SPPIs it is necessary to specify services in such a way that e.g. only the price of storage is given, and not the price for storage and supplemental services. This requires close collaboration with the industry and the respondents.
Furthermore it's a challenge to collect prices for a constant quality of service over time. As we have seen, the market of transportation support services is in transition and thus the specifications of services change over time. This poses special requirements on specifications of contracts and models, on preserving the representativeness of the services and the homogeneity within the sample. On the other hand, detailed specifications may place significant burden on the providers to maintain the specifications and provide the data.

A further consideration when collecting price data in this industry is the prominence of non-market transactions. A number of the large retailers/manufacturers in the UK have set up their own warehousing and storage facilities, which provide these services to their parent companies at non-market prices. Where possible, these transactions should not be included in the development of a SPPI as they do not adequately reflect the market inflationary pressures.

Another challenge is the integration of transport services, transport support services, and warehousing and storage (bundling of the services together into the same contract/charge). We need to ask, for which components prices need to be measured for the deflation of turnover and the production of the real output figures.

5. Summary and further suggestions
Warehousing and transportation support activities are characterized by a large overlap in the provision of services among the sub-industries and with other industries in the transportation and logistics sector. This creates challenges for the survey of detailed turnover and for the production of appropriate deflators. The decision whether to produce industry-based or product-based SPPIs has a large impact on how weighting schemes have to be prepared and how price surveys need to be designed. In order to suit the needs of different purposes as best as possible one may think about a kind of modular construction system, i.e. calculating different custom-tailored indices from the same input data.

We have seen that warehousing and storage are already reasonably covered by SPPI surveys whereas the coverage of support activities for transportation is rather poor. With respect to the high importance of the 2-digit industry within the service sector and especially of freight forwarding companies within the transportation support activities the development of appropriate deflators seems to be essential.
The primary activity of these companies is the organization of transports irrespective of the mode of transport. Thus, the prices measured might include the transport itself. The turnover of the industry is supposed to be a gross turnover. Therefore the price development is expected to be influenced by the price development of the transportation industries. It might be subject of further researches to investigate, if parts of an SPPI for "other transportation support activities" could be estimated by the price development of the various transport industries.

In the last year the European Union subsidized the development of concepts for ISIC H52. The CBS of the Netherlands and the Federal Statistical Office of Germany are working on the development of SPPI surveys for the parts of the industry that are not yet covered. Besides the freight forwarding industry other parts of the transportation support activities also provide the producer price statistics with special challenges. E.g. this applies for the operations of airports and harbors. In Germany first researches discovered a high share of secondary activities among the services of the transport facilities' operators. These secondary activities are not restricted to

the transport sector but comprise real estate management, car parking services, facility management and so on.

In summary it should be noted that there is a lack of experiences in the production of SPPIs for ISIC 3-digit 522. This part of the 2-digit industry remains subject of further investigations.

Appendix 1 – Overview of international progress

Results of the 2013 detailed status reports of 25 VG-members:

ISIC code	Yes	No	number of answers
5210 Warehousing			
Producer Price Index Information	18	6	24
Turnover/Output Information	23	2	25
Product level detail	4	19	23
5221 Service activities incidental to land transport			
Producer Price Index Information	5	19	24
Turnover/Output Information	21	4	25
Product level detail	3	18	21
5222 Service industries incidental to water transport			
Producer Price Index Information	7	17	24
Turnover/Output Information	22	3	25
Product level detail	3	19	22
5223 Service indistries incidental to air transport			
Producer Price Index Information	5	19	24
Turnover/Output Information	22	3	25
Product level detail	3	19	22
5224 Cargo handling			
Producer Price Index Information	16	8	24
Turnover/Output Information	22	3	25
Product level detail	4	18	22
5229 Other transportation support activities			
Producer Price Index Information	8	16	24
Turnover/Output Information	22	3	25
Product level detail	3	19	22

Appendix 2 – Comparison of classifications

Table 1: Comparsison of Industry Classifications

ISIC	NACE	ANZSIC	NAICS	JSIC
General Level				
52 Warehousing and support activities for transportation	52 Warehousing and support activities for transportation	52 Transport support services 53 Warehousing and Storage	48/49 Transportation and Warehousing	47 Warehousing 48 Services incidental to transport
First main - Level of detail				
521 Warehousing and storage	521 Warehousing and storage	530 Warehousing and storage Services	493 Warehousing and Storage	471 Ordinary Warehousing 472 Refrigerated Warehousing
Second main - Level of detail				
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. - 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	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. - 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	5301 Grain Storage Services 5309 Other Warehousing and Storage Services	4931 *Warehousing and Storage* The sub-classes of this industry group comprise establishments primarily engaged in: - operating merchandise warehousing and storage facilities. These establishments generally handle goods in containers, such as boxes, barrels, and/or drums, using equipment, such as forklifts, pallets, and racks. They are not specialized in handling bulk products of any particular type, size, or quantity of goods or products. - operating refrigerated warehousing and storage facilities. Establishments primarily engaged in the storage of furs for the trade are included in this industry. The services provided by these establishments include blast freezing, tempering, and modified atmosphere storage services. - operating bulk farm product warehousing and storage facilities (except refrigerated). Grain elevators primarily engaged in storage are included in this industry. - operating warehousing and storage facilities (except general merchandise, refrigerated, and farm product warehousing and storage).	4711 *Ordinary Warehousing* This class comprises establishments engaged in warehouses (except refrigerated warehouses). 4721 *Refrigerated Warehousing* This class comprises establishments engaged in the storage of commodities in warehouses fitted with low-temperature equipment.

ISIC	NACE	ANZSIC	NAICS	JSIC
First main - Level of detail				
522 Support activities for transportation	522 Support activities for transportation	521 Water Transport Support Services 522 Air Transport Support Services 529 Other Transport Support Services	488 Support Activities for Transportation	480 Establishments engaged ind administrative or ancillary economic activities (48 Services incidental to transport) 481 Port Transport 482 Freight forwarding, except collect-and-Deliver Freight transport 483 Transport Agencies 484 Packing and crating 485 Tansport facilities services 489 Miscellaneous Services incidental to transport
Second main - Level of detail				
5221 incidental to land transportation This class includes: - activities related to land transport of passengers, animals or freight: International Standard Industrial Classification of All Economic Activities (200 ISIC), Revision 4 - operation of terminal facilities such as railway stations, bus stations, stations for the handling of goods - operation of railroad infrastructure - operation of roads, bridges, tunnels, car parks or garages, bicycle parkings - switching and shunting - towing and road side assistance - liquefaction of gas for transportation purposes This class excludes: - cargo handling, see 5224 5222 incidental to water transportation This class includes: - activities related to water transport of passengers, animals or freight: - operation of terminal facilities such as harbours and piers - operation of waterway locks etc. - navigation, pilotage and berthing activities - lighterage, salvage activities - lighthouse activities This class excludes: - cargo handling, see 5224 - operation of marinas, see 9329	5221 *incidental to land transportation* This class includes: - activities related to land transport of passengers, animals or freight: International Standard Industrial Classification of All Economic Activities (200 ISIC), Revision 4 - operation of terminal facilities such as railway stations, bus stations, stations for the handling of goods - operation of railroad infrastructure - operation of roads, bridges, tunnels, car parks or garages, bicycle parkings - switching and shunting - towing and road side assistance - liquefaction of gas for transportation purposes This class excludes: - cargo handling, see 5224 5222 *incidental to water transportation* This class includes: - activities related to water transport of passengers, animals or freight: - operation of terminal facilities such as harbours and piers - operation of waterway locks etc. - navigation, pilotage and berthing activities - lighterage, salvage activities - lighthouse activities This class excludes: - cargo handling, see 5224 - operation of marinas, see 9329	5211 *Stevedoring Services* 5212 *Port and Water Transport Terminal Operations* 5219 *Other Water Transport Support Services* 5220 *Airport Operations and Other Air Transport Support Services* 5291 *Customs Agency Services* 5292 *Freight Forwarding Services* 5299 *Other Transport Support Services n.e.c*	4881 *Support Activities for Air Transportation* This industry group comprises establishments primarily engaged in providing services to the air transportation industry. These services include airport operation, servicing, repairing (except factory conversion and overhaul of aircraft), maintaining and storing aircraft, and ferrying aircraft. 4882 *Support Activities for Rail Transportation* This industry comprises establishments primarily engaged in providing specialized services for railroad transportation including servicing, routine repairing (except factory conversion, overhaul or rebuilding of rolling stock), and maintaining rail cars; loading and unloading rail cars; and operating independent terminals. 4883 *Support Activities for Water Transportation* The sub-classes of this industry group comprise establishments primarily engaged in: - operating ports, harbors (including docking and pier facilities), or canals. - providing stevedoring and other marine cargo handling services (except warehousing). - providing navigational services to shipping. Marine salvage establishments are included in this industry. - providing services to water transportation (except port and harbor operations; marine cargo handling services; and navigational services to shipping).	4800 *Head offices primarily engaged in managerial operations* This refers to the establishments, as the head offices primarily engaged in controlling establishments of services incidental to transport, engaged in the operations except the work-site operations, personnel affairs, general affairs, financial affairs, accounting, public information, legal affairs, labor service, sales promotion to promote the management of its own enterprise. 4809 *Miscellaneous establishments engaged in administrative or ancillary economic activities* This refers to the establishments engaged in providing support operations of transportation, cleaning, repair/maintenance, preservation to other establishments belonging to the same enterprise, to primarily promote activities in the services incidental to transport. 4811 *Port transport* This class comprises establishments engaged in all or part of the work of on-board loading, barge transportation, on-shore loading and raft transportation in ports. 4821 *Deliver freight transport, except collect-and-deliver freight transport* This class comprises establishments engaged in the transport of freight using transportation undertaken by railway transporters, common motor trucking firms, shipping firms or air freight transporters.

ISIC	NACE	ANZSIC	NAICS	JSIC
5223 incidental to air transportation This class includes: - activities related to air transport of passengers, animals or freight: - operation of terminal facilities such as airway terminals etc. - airport and air-traffic-control activities - ground service activities on airfields etc. - firefighting and fire-prevention services at airports This class excludes: - cargo handling, see 5224 - operation of flying schools, see 8530, 8549 5224 Cargo handling This class includes: - loading and unloading of goods or passengers' luggage irrespective of the mode of transport used for transportation - stevedoring - loading and unloading of This class excludes: - operation of terminal facilities, see 5221, 5222 and 5223 5229 Other support acitivies This class includes: - forwarding of freight - arranging or organizing of transport operations by rail, road, sea or air - organization of group and individual consignments (including pickup and delivery of goods and grouping of consignments) - logistics activities, i.e. planning, designing and supporting operations of transportation, warehousing and distribution - issue and procurement of transport documents and waybills - activities of customs agents - activities of sea-freight forwarders and air-cargo agents - brokerage for ship and aircraft space - goods-handling operations, e.g. temporary crating for the sole purpose of protecting the goods during transit, uncrating, sampling, weighing of goods	5223 *incidental to air transportation* This class includes: - activities related to air transport of passengers, animals or freight: - operation of terminal facilities such as airway terminals etc. - airport and air-traffic-control activities - ground service activities on airfields etc. - firefighting and fire-prevention services at airports This class excludes: - cargo handling, see 5224 - operation of flying schools, see 8530, 8549 5224 *Cargo handling* This class includes: - loading and unloading of goods or passengers' luggage irrespective of the mode of transport used for transportation - stevedoring - loading and unloading of This class excludes: - operation of terminal facilities, see 5221, 5222 and 5223 5229 *Other support acitivies* This class includes: - forwarding of freight - arranging or organizing of transport operations by rail, road, sea or air - organization of group and individual consignments (including pickup and delivery of goods and grouping of consignments) - logistics activities, i.e. planning, designing and supporting operations of transportation, warehousing and distribution - issue and procurement of transport documents and waybills - activities of customs agents - activities of sea-freight forwarders and air-cargo agents - brokerage for ship and aircraft space - goods-handling operations, e.g. temporary crating for the sole purpose of protecting the goods during transit, uncrating, sampling, weighing of goods		4884 *Support Activities for Road Transportation* *Support Activities for Water Transportation* The sub-classes of this industry group comprise establishments primarily engaged in: - towing light or heavy motor vehicles, both local and long distance. These establishments may provide incidental services, such as storage and emergency road repair services. - providing services (except motor vehicle towing) to road network users. 4885 *Freight Transportation Arrangement* This industry comprises establishments primarily engaged in arranging transportation of freight between shippers and carriers. These establishments are usually known as freight forwarders, marine shipping agents, or customs brokers and offer a combination of services spanning transportation modes. 4889 *Other Support Activities for Transportation* This industry comprises establishments primarily engaged in providing support activities to transportation (except for air transportation; rail transportation; water transportation; road transportation; and freight transportation arrangement).	4822 *Forwarding agency* This class comprises establishments engaged in agency or entrustment of freight transportation by rail, motor vehicle, ship or air, or the acceptance of transported freight. 4831 *Transport agencies* This class comprises establishments principally engaged in entering transport contracts and conducting other work on behalf of transport organs. 4841 *Packing and crating, except packing and crating for ocean transport* This class comprises establishments principally engaged in undertaking packing or crating of commodities for transport. 4842 *Packing and crating for ocean transport* This class comprises establishments principally engaged in processing various packaging materials using equipped machinery, and packing industrial products by assembling packing containers for ocean transport. 4851 *Railway facilities services* This class comprises establishments engaged in providing railway facilities principally for the purpose of leasing them to commercial operators of railway facilities. 4852 *Fixed facilities for road transport* This class comprises establishments whose principal business is to provide roads, bridges or tunnels for use by road transport vehicles, etc., in exchange for fees. 4853 *Terminal facilities for motor vehicles* This class comprises establishments whose principal business is to provide general motor vehicle terminals for use by omnibuses and special group cargo motor trucking, in exchange for fees. 4854 *Terminal facilities for handling freight* This class comprises establishments whose principal business is to provide freight handling facilities, cargo loading pier equipment, etc. 4855 *Piers and docks* This class comprises establishments whose principal business is to provide ship berthing quays, freight sheds and other wharf facilities.

ISIC	NACE	ANZSIC	NAICS	JSIC
This class excludes: - courier activities, see 5320 - provision of motor, marine, aviation and transport insurance, see 6512 - activities of travel agencies, see 7911 - activities of tour operators, see 7912 - tourist assistance activities, see 7990	This class excludes: - courier activities, see 5320 - provision of motor, marine, aviation and transport insurance, see 6512 - activities of travel agencies, see 7911 - activities of tour operators, see 7912 - tourist assistance activities, see 7990			4856 *Airports and air fields, heliports* This class comprises establishments principally engaged in providing air fields for use by civil aircraft. 4891 *Shipping brokers* This class comprises establishments principally engaged in brokering the transport of freight by ships, the lease or sale of ships, or the entrustment of shipping. 4899 *Services incidental to transport, n.e.c.* This refers to the establishments engaged in providing services incidental to transportation which are not elsewhere classified.

Table 2: Comparsison of Product Classifications

CPC	CPA	NAPCS
General Level		
67 Supporting Transport services	52 Warehousing and support services for transportation	531 Transportation support services 541 Warehousing and storage
Details		
671 *Cargo handling services* 2 subclasses	521 *Warehousing and storage services* 4 sub-categories	54111 *Grain storage* 1 Product
672 *Storage and warehousing services* 3 subclasses	522 *Support services for transportation*	54112 *Warehousing and storage services (except grain storage)* 1 Product
673 Supporting services for	5221 *Services incidental to land transportation*	
railway transport 2 subclasses	52211 *Services incidental to railway transportation* 2 sub-categories	53111 *Road transportation support services* 5 Products
674 *Supporting services for*		53112 *Motor vehicle maintenance and repair*
road transport 5 subclasses	52212 *Services incidental to road transportation* 6 sub-categories	*services* 7 Products
675 *Supporting services for*	52213 *Services incidental to transportation*	53121 *Rail transportation support, maintenance*
water transport 7 subclasses	*via pipelines* 1 sub-category	*and repair services* 2 Products
676 *Supporting services for*	5222 *Services incidental to water transportation*	53131 *Water transportation support,*
air or space transport 4 subclasses	7 subcategories	*maintenance and repair sevices* 6 Products
	5223 *Services incidental to air transportation*	
679 *Other supporting transport*	4 sub-categories	53141 *Air transportation support sevices*
services 2 subclasses	5224 *Cargo handling services* 4 sub-categories	5 Products 53142 *Aircraft maintenance and repair services*
	5229 *Other transportation support services* 4 sub-categories	1 product 53151 *Freight transportation arrangement and customs brokering services* 2 products
		53152 *Other transportation support services* 5 Products

Appendix 3 – Bibliography

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