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SPPI Mini Presentation

**SPPI for Freight Transport by Road  
in Germany**

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## 1. Definition of the service being priced

The NACE sector freight transport by road (60.24) includes all kinds of transporting cargo on the road, including renting of trucks with driver, furniture removal and animal-drawn transport. Post and courier activities as well as cargo handling operations are excluded. Therefore, the respondents are asked to state prices for road transports of cargo including toll and fuel surcharges, but excluding VAT and prices for additional services that can be billed separately, like customs clearance, loading/unloading etc.

The decisive feature whether a company is being surveyed is the offer of road transportation service to the customer. The respondents are all companies offering the service regardless whether they own trucks or not. For the customer, it is simply not relevant who transports his freight; he just needs the transportation service itself. Additionally, both type of companies – with or without an own truck fleet – operate on the same market: A survey conducted by the German Forwarders and Logistics Association (DSLVL) shows that 58% of the Freight Forwarders offering road transportation own a truck fleet.<sup>1</sup> Of those with own trucks, especially large companies, mostly freight forwarders, tend to use them for regularly transports and to buy in transportation services for additional jobs by subcontractors. For these companies, transports with own or foreign equipment cannot be separated; it depends on the circumstances whether to use an own or foreign truck for a certain transport. This is another reason why all companies offering freight road transportation services to customers were chosen as respondents.

The customer of a company offering freight transport by road can be a freight forwarder who resells the transportation service itself or anybody else demanding road transportation services; the problem of subcontracting has been excluded.<sup>2</sup>

## 2. Pricing unit of measure

There are many different factors determining the price for a freight transport by road service:

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<sup>1</sup> DSLVL (2005), p. 35.

<sup>2</sup> "Subcontracting is frequent within the road-freight industry. Output is made up of main contracts that may or may not include sub-contracts and of sub-contracts themselves, and in principle the same approach is required when collecting prices for SPPI purposes." OECD/Eurostat (2006), p. 67. The FSO Germany does not ask whether a transport includes subcontracting or is a sub-contract itself. Both are included in the index.

- Distance
- Type of vehicle
- National/international transport
- Type of cargo
- Weight/Volume
- Timing conditions

A further description of the factors and the pricing mechanism is given in ch. 7. Because so many factors have to be considered, the unit to be priced is the contract between the customer and the service provider. This ensures that conditions for which a price is paid remain stable or can be updated. A pricing just for a single transport would neglect important parts of the market, especially the short distance, construction and distribution traffic.

### 3. Market conditions and constraints

#### 3.1 Size of industry

By taking a look at the market it becomes obvious that two different players have to be considered: hauliers (those who do the physical transportation) and freight forwarders (those organising the transports). They are grouped into the NACE/WZ sectors 60.24 (freight transport by road) and 63.40.1 (freight forwarding).<sup>3</sup> It is not possible to make a sharp and accurate differentiation between both sectors. Especially providers of integrated logistic services offer both and even more activities, like storage, packing etc., and are mentioned in sector 63.40.1. Focusing only on sector 60.24 would eliminate most of the big market leaders. Chapter 3.2. is to clarify the circumstances why two sectors have to be asked for getting sufficient results for one sector. Table 1 shows important figures for both sectors for 2003. Generally speaking, companies from sector 63.40.1 tend to have more employees and a larger turnover per unit.

Sectors (NACE/WZ)	No. of companies	No. of employees	total turnover (1000 EUR)
60.24	34,038	275,207	23,380,576
63.40.1	8,851	203,422	35,993,122
Sum	42,889	478,629	59,373,698

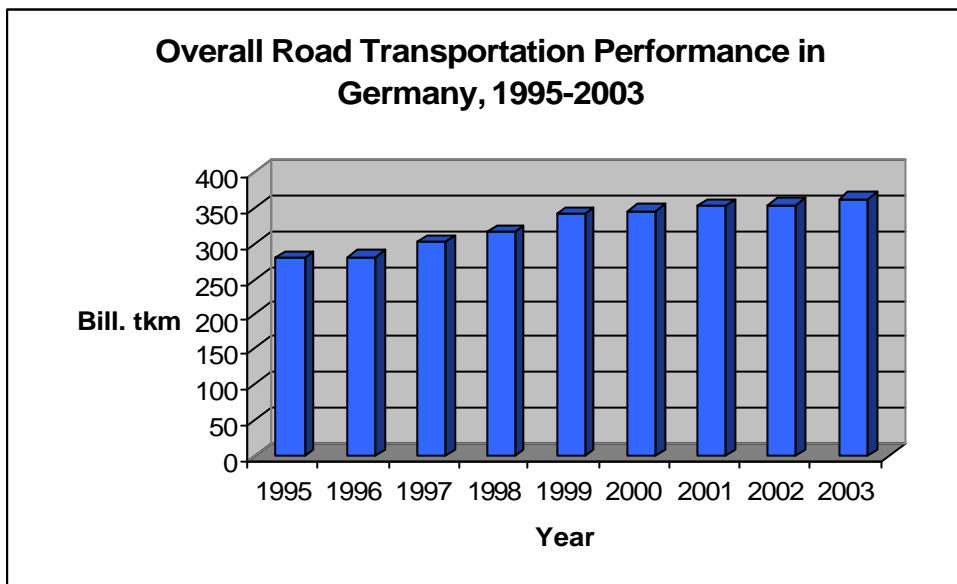
Source: Dienstleistungsstatistik 2003

Table 1: Central figures for sectors 60.24 and 63.40.1.

<sup>3</sup> 63.40.1 is a subclass of the German version of NACE, WZ; its figures differ from 63.40. SPPI for Freight Transport by Road in Germany (2006-07-07)

For showing the size of the industry, their importance and current market conditions, it is helpful to take a closer look on transportation statistics.

Freight transport by road has always been an expanding sector. The transportation performance (measured in tkm – tonne kilometre) has been growing steadily over the years. From 1995 to 2003, the transportation performance increased by 29.7%.<sup>4</sup>



**Figure 1: Road Transportation Performance 1995-2003.**

And the growth is to continue: The Federal Department of Transportation (BMVBS)<sup>5</sup> expects transportation performance of all modes of transport to grow by 64% until 2020 on a 1997 basis.<sup>6</sup> So, if the road participated in the growth on the average, transportation performance would emerge from 301.8 bill tkm in 1997 to 494.9 bill. tkm in 2020; in 2003, 362.9 bill. tkm were already reached.<sup>7</sup>

Despite the growth of the industry, German companies faced strong competition in the last years, especially by foreign companies. Their transportation performance rose by 71.2% between 1995 and 2003, compared to 32.9% growth by German companies. Both sides, how-

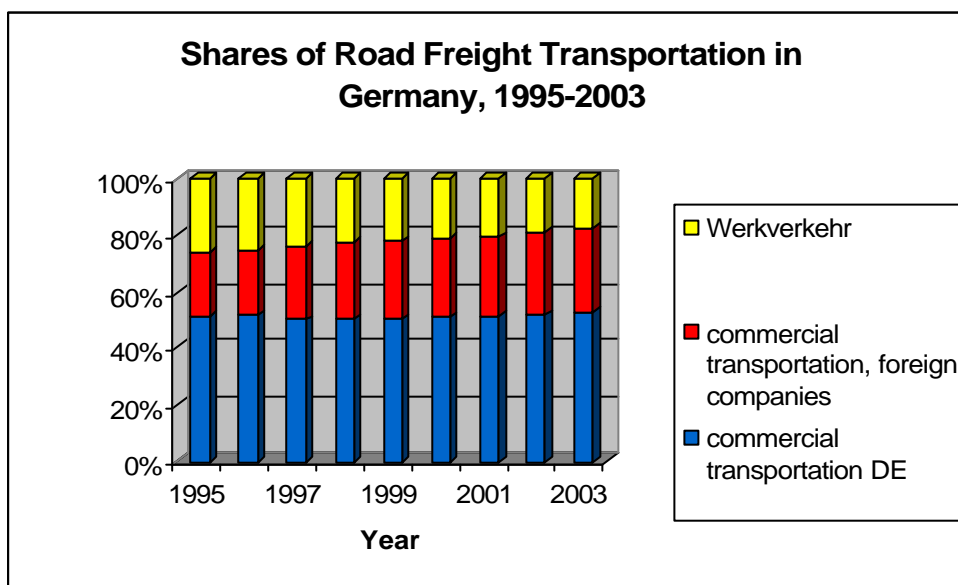
<sup>4</sup> Calculation based on the data by BMVBW (2004), p. 240; the data published by DESTATIS (2005), p. 415, suggests a growth of 27.8%.

<sup>5</sup> After the 2005 election, the BMVBW – *Bundesministerium für Verkehr, Bau- und Wohnungswesen* (Federal Department of Transportation, Construction and Housing) was renamed to BMVBS - *Bundesministerium für Verkehr, Bau und Stadtentwicklung* (Federal Department of Transportation, Construction and Urban Development).

<sup>6</sup> BMVBW (2000), p. 10.

<sup>7</sup> Figures for 1997 and 2003: BMVBW (2004); 2020: own calculation.

ever, capitalized on the trend of outsourcing the transportation and logistics activities of the manufacturing sector. In former times, manufacturing companies often maintained an own fleet of trucks for transporting goods for own purposes (so called *Werkverkehr*), for which they did not need a permission. Since the liberalisation of the road freight transportation market in 1994, they have been outsourcing these activities. The transportation performance of the *Werkverkehr* was reduced by 16.8% from 1998 to 2003.



**Figure 2: Shares of different players in the road freight transportation market in Germany.<sup>8</sup>**

In 2004 the joining of ten new members to the European Union reinforced pressure on German hauliers. The increase of traffic with the new member states by 30-40% was achieved exclusively by foreign hauliers; German companies did not participate because of higher costs and therefore prices.<sup>9</sup> Because of the margins that have been already low for years in the pure transportation sector, especially larger companies tend to diversify into various regions of the logistics sector.<sup>10</sup> Freight forwarders pulled out of the market, concentrated on organizing the transports and other logistic tasks, and bought in the transportation performance by pure hauliers. While in 1970, 70% of the freight forwarders had an own truck fleet, the number was reduced to 58% in 2005.<sup>11</sup>

<sup>8</sup> Source: BMVBW (2004).

<sup>9</sup> BAG (2005a), p. 19.

<sup>10</sup> BAG (2004) is a detailed report on this topic.

<sup>11</sup> DSLV (2005), p. 35.

In conclusion, despite growing demand for transportation, especially small and medium-sized German hauliers, who offer easy-to-substitute services and have not diversified into the field of special logistic services, have to fight for their existence.<sup>12</sup> Freight forwarders and larger hauliers use to play an important role in the market for freight transportation by road, but they have strengthened their economic position by moving into the wide and diversified field of logistic services.

### 3.2 Special conditions or restrictions

Several special conditions on the German logistics market complicate the development of an EPI for freight transport by road.

- A task the industry had to face was the introduction of distance-related motorway tolls in Germany from January 1<sup>st</sup> 2005 on. Most companies were able to bill the tolls for transports to their customers.<sup>13</sup> This means for an SPPI that the motorway tolls, often billed separately, have to be included into the SPPI.
- It was already pointed out that not only hauliers but also freight forwarders have to be considered as respondents. Due to German commercial law, both act on the same market for road freight transportations. The rules for freight forwarders are laid down in §§ 453-466 HGB;<sup>14</sup> for hauliers, the rules laid down in the *Güterkraftverkehrsgesetz* apply.<sup>15</sup> It is the freight forwarder's business to manage the consignment of goods as a commercial activity (§ 453 HGB). From a statistical point of view, these companies are grouped into the NACE sector 63.40. On the other hand, road haulage means the transportation of goods for money with vehicles over 3.5 t (§1 GüKG). Entrepreneurs need a permission to provide road haulage service. These companies are grouped into NACE 60.24. This seems to be a sharp differentiation: freight forwarders organise the transports, hauliers do the physical transportation. But there is §458 HGB which gets things more complicated: it states that freight forwarders have the right to run the

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<sup>12</sup> BAG (2005b), p. 13.

<sup>13</sup> BAG (2005b), p. 11.

<sup>14</sup> HGB: *Handelsgesetzbuch*, German Commercial Code; see Lorenz (2003), p. 46ff.

<sup>15</sup> GüKG: Road Haulage Act; the whole text with comments can be found in Lorenz (2003), p. 46ff.

- transportation themselves with own equipment (“Recht zum Selbsteintritt”).<sup>16</sup> So, companies from both sectors have to be asked to get the whole picture of the market.
- And there must be made a differentiation between two types of markets: the contract market and the spot market. The contract market is characterised by long-lasting contracts with repeated transports, e.g. transports of parts to a plant. Main actors on this market are the consignors and the freight forwarders; larger hauliers with own acquisition can be found there, too. The spot market is the market for one-time transportation contracts and is usually used by freight forwarders offering contracts and hauliers bidding for them. Internet cargo auctions are playing a more and more important role on the spot market; many hauliers visit them to get return loads and a higher degree of vehicle utilization.<sup>17</sup> But also freight forwarders with own truck fleet try to get contracts over the spot market, and loaders are placing offers there, too. Because neither prices nor transports are stable on the spot market (there are no long lasting contracts), problems for measuring price development occur. So, at the moment, the spot market (representing about 10% of the market according to our survey) is excluded from the survey.
  - Apart from freight forwarders and hauliers, a third category of companies has influence on the market: companies not belonging to the transportation sector with own vehicles for delivering their goods (so called *Werkverkehr*). Of course, they cannot be included in the SPPI because they do not sell a transportation service. Fig. 3 gives an overview of the different actors and markets in the freight road transportation sector.

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<sup>16</sup> Lorenz (2003), p. 48.

<sup>17</sup> Friedrich (2003), pp. 80ff.



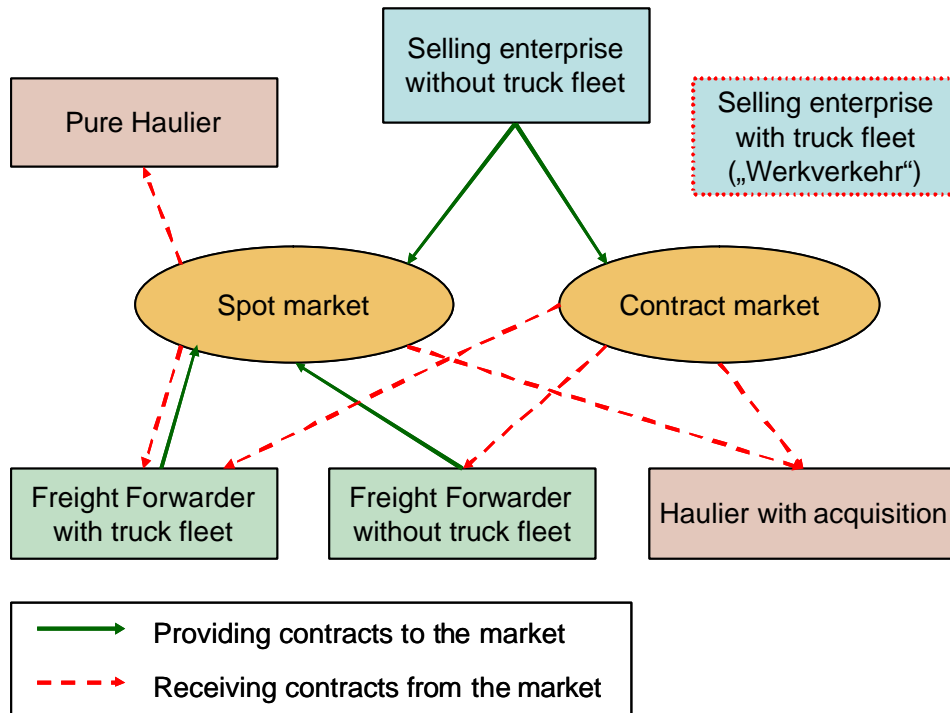


Figure 3: Actors and markets in the road freight transportation sector.<sup>18</sup>

### 3.3 Record keeping practices

Data needed for an SPPI for freight transport by road are prices for actual and tangible services. Under normal circumstances, they can be easily extracted from the normal financial accounting. Therefore, “this pricing mechanism tends to be one of the more reliable of all those within the scope ...in terms of continuity and quality...”<sup>19</sup> But there are some issues that need further attention.

Especially the associations often criticised that observing the price for pure transportation is not possible due to bundling of logistic services.<sup>20</sup> Practise showed no evidence for that charge. The companies are able to state separate prices for the transportation service. More complicated are framework contracts for a bundle of transportations, e.g. distribution services for supermarkets: goods, number of transported units and number of deliveries change every day.

<sup>18</sup> according to Friedrich (2003), p. 81.

<sup>19</sup> Palmer/Jones (2002), p. 11.

<sup>20</sup> DVZ (16/2006).

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However, the contract stays the same; under these circumstances, it is more accurate to link the price to a certain contract than to a specified transport.

The level of organisation at which data items are collected differs from the phases of the survey. Phase I (production of the weighting pattern) needs overall figures that are usually kept at corporate level; in contrast, the pricing records needed for phase II (current price observation) are normally kept at the operational level. In some cases, this includes asking several subsidiaries of the company. The contact person may vary between the two phases: During the first phase, accountants are the ones to question; during the second phase, the marketing department that sets the price is the better target for our questionnaires.

The survey is designed in a way that the respondent's burden is as low as possible. Only 1% of all companies is surveyed (about 400 units, among them all those with an annual turnover over 50 mill. €); the smaller the size of the company, the fewer the number of prices reported to the Federal Statistical Office. The questionnaires were developed with the help of associations and companies in order to secure that filling out imposes a burden as low as possible on the respondent. However, especially the questionnaire for the first phase needed some calculations to be done by the companies. To get more detailed data would be not feasible for most companies due to a lack of staff and time. Especially small companies tend to criticise the loss of time by completing the forms.

#### 4. Standard classification structure and detail

*... related to the area – does the standard include necessary product detail based on identified price determining characteristics?*

Different classification systems exist for freight transport by road.

- ISIC (sector 6023) and NACE (sector 60.24) just list “Freight Transport by Road” and do not offer more detailed subclasses. The German version of the NACE classification, Wz (*Klassifizierung der Wirtschaftszweige*), offers the 5-digit subclasses 60.24.5 („*Erlaubnispflichtiger gewerblicher Güterkraftverkehr*“ = freight transport by road for others for which a permission is required) and 60.24.6 („*Erlaubnisfreier und freigestellter Straßengüterverkehr*“ = freight transport by road for which no permission is needed). The permission is obligatory if the vehicle used weighs over 3.5 t and the transports are carried out on behalf of others – so 60.24.5 includes all companies relevant for the SPPI for freight transport by road. It is not a breakdown of the market by price characteristics, rather a concretion of the market of pure hauliers.
- More details are offered by the (international) classifications CPC and CPA. The classes CPC 6433 (Road transport services of freight) and CPA 60.24 (Freight transportation services by road) have several subclasses which group the transports according to vehicle and type of cargo. For the CPA, these are:

60.24 Freight transportation services by road

60.24.1 Freight transportation services by specialized road vehicles

60.24.11 Transportation by vehicles for frozen or refrigerated goods

60.24.12 Transportation by vehicles for petroleum products

60.24.13 Transportation by vehicles for other bulk liquids or gases

60.24.14 Transportation by vehicles for containerized freight

60.24.15 Transportation by vehicles for furniture removals

60.24.16 Transportation by vehicles for dry bulk goods

60.24.17 Transportation services by specialized vehicles, n.e.c.

60.24.2 Freight transportation services by non-specialized road vehicles

60.24.21 Transportation of mail by road

60.24.22 Transportation of other freight by road

60.24.3 Rental services of commercial freight vehicles with driver

Price determining characteristics are included in that classification; however, national statistics concerning turnover do not use this classifications but NACE/Wz.

- More details can be derived from transportation statistics. Germany uses the GVV (*Güterverzeichnis für die Verkehrsstatistik*) as classification, which is based on the Standard Goods Classification for Transport Statistics (NST/R). For every type of good, data about transportation volume and transportation performance is available. Additionally, transportation statistics offer data about the distance of transports, the type of vehicle being used, and about transports of containers and dangerous cargo. All these attributes influence the pricing of a transport, so it was decided to start with transportation statistics to get a weighting pattern.

## 5. Evaluation of standard vs. definition and market conditions

As pointed out above, turnover statistics are only of limited use for the construction of a SPPI. There is no breakdown into different market sub-segments available. Furthermore, freight forwarders with an own truck fleet who have a big share in the market for freight transport by road, are grouped in NACE sector 63.40 instead of 60.24. Adding the turnover of both sectors would give no satisfactory results, because not all freight forwarders offer freight transport by road.<sup>21</sup> So other ways have to be discovered to calculate the turnover. Transportation statistics are a good point to start with. It is possible to derive turnover figures by multiplying transportation performance (in tkm) with rates of average earnings per tkm, which the *Bundesamt für Güterverkehr* (BAG = Federal Office for Freight Transport) used to report to the national accounts for every transportation category of the GVV. In this way a weighting pattern can be derived. But, unfortunately, no data published at the moment really reflects the different sectors of the transportation market. E.g., the price for the transport of one loaded container is irrespective of the good being transported; however, those transports would be put into different categories if the GVV classification was applied - according to the type of good in the containers. By consultations with experts from the industry and relevant associations, the following segmentation of the market was identified:

- Transports of oil/oil products in tankers
- Special transports (e.g. dangerous goods, heavy load, living animals)
- Reefer cargo
- Container

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<sup>21</sup> 73% offer freight transport by road with subcontractors, 47% have their own truck fleet. DSLV (2005), p. 9.

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- Vehicles
- Other transports with tankers
- Agriculture; loose bulk freight
- Steel products
- Wrapped and general cargo

Additionally, distance has to be considered as a decisive factor for distinguishing the market sectors. Four categories could be identified:

- Short distance/distribution services (less than 50 km)
- Regional transportation (50-150 km)
- National long distance transportation (>150 km)
- International long distance transportation

All in all, there are  $4 \times 9 = 36$  subdivisions of the market. To get the weighting pattern, the data with more information about transportation performance including distance, type of vehicle and transported goods was provided by the KBA (*Kraftfahrtbundesamt*, Federal Motoring Office). Then it had to be regrouped to the new classification and factors had to be calculated to transform the rates of average earnings to the new classification. At the end, the following weighting pattern was achieved:

	Short distance	Regional distance	Domestic long distance	International long distance	Sum
Transports of oil/oil products in tankers	0,29%	0,93%	0,53%	0,13%	1,88%
Special transports	0,22%	0,67%	2,15%	1,70%	4,74%
Reefer cargo	0,19%	1,03%	5,64%	1,99%	8,85%
Container	0,31%	0,90%	2,68%	0,62%	4,50%
Vehicles	0,24%	0,58%	2,91%	1,71%	5,44%
Other transports with tankers	0,33%	1,36%	3,13%	2,17%	6,99%
Agriculture; loose bulk freight	4,56%	4,44%	6,37%	2,19%	17,56%
Steel products	0,29%	0,92%	4,29%	1,74%	7,24%
Wrapped and general cargo	1,45%	5,12%	26,54%	9,69%	42,80%
<b>Sum</b>	<b>7,89%</b>	<b>15,94%</b>	<b>54,24%</b>	<b>21,93%</b>	<b>100,00%</b>

So, all necessary data for calculating the weighting pattern was provided by KBA and BAG. However, it was the task of the phase I survey to get the weights for the strata within those 36 categories; all companies were asked about the percentages of distance categories and market segments of their turnover for this purpose.

## 6. National accounts concepts

*... and measurement issues for the area related to GDP measurement*

For all years under report up to the year 2004 a special calculation was carried out to obtain the price indices for road haulage services in German national accounts. The BAG provided freight rates (in € per tonne-kilometre) for traffic within Germany (divided into short distance and long distance transportation) and international transportation. The ten categories of freight mentioned in the GVV were distinguished. Their base-year averages were updated for subsequent reporting years using BAG publications, so developing a special price index for the changes in freight rates. Since the data about freight rates from the BAG is not available any longer, German national accounts need price indices for freight transport by road from price statistics urgently. Deflation of turnover is necessary for industries on a 2-digit-level of NACE, so different price indices for freight transport by road, conducted by enterprises of NACE 60.24 on the one and by enterprises of NACE 63.40 on the other hand would be preferred, if there is an important difference in price development. On the other hand freight transport by road is intermediate consumption of many different industries. If there are big differences in the price development of different freight services ordered in different industries, it would be appreciated to get partial indices as well. The new SPPI for freight transport by road based on prices for repeated services will be incorporated in national accounts as soon as the data is available. The method is full in line with the request of the Eurostat Handbook on price and volume measures in national accounts and it is classified as best practice.

## 7. Pricing method(s)

*... and criteria for choosing various pricing methods – depending on record keeping practices and billing practices, there may need to be a hierarchy of methods from actual to best proxy (discuss order and list prices, current or lagged prices, transaction, shipment, etc.) -- Refer to the categories in the PPI Quality Assessment Tool for guidance. (Note: these headings will include agreed upon methods developed by VG pricing experts as part of a paper referred to by Roman Numeral I on the first page of this proposal. This paper must be complete by February/March 2006 so as to provide guidance to the other presenters. It will be presented on Monday afternoon of the VG 2006 meeting.)*

Before talking about pricing methods, an overview should be given about the price mechanisms in Germany. Since the deregulation of the transportation sector in 1994, prices in the road freight transport sector are not legally regulated but run according to free price negotiations between the customer and the haulier. The customer's state determines to which extent he can influence the price. It depends on the fact whether the client is a regular or a rare client and on the client's annual turnover with the haulier. So, **customer relationship** has an important impact on the price.

Different price mechanisms can be stated for **short and long distance transports**. Short distance transports are often priced as a person/vehicle-hour rate or according to the number of loading stations served; distance is not a main criteria. Especially when the task is distribution, customers tend to pay a lump sum for every single day, no matter how many transports have been carried out. For long distance transports, it is mainly the **distance** that sets the price. The following categories can be identified: short distance transportation (up to 50 km), regional transportation (between 50 and 150 km), and long distance transportation (from 150 km upwards).

The difference between **national and international transports** is not of interest in the short distance sector, but it plays a major role in the long distance sector. For international transports, German carriers face strong competition from foreign companies (especially from the new EU member states), which are able to offer the service at lower prices. So the pressure on the prices has increased. Therefore, certain companies retired to the national

market which is still dominated by domestic hauliers.<sup>22</sup> So, different price settings can be observed for national and international transports.

A naturally given characteristic seems to be the **type of good**, which has always been of interest for transportation statistics: In Germany, transports are categorized by the GVV (*Güterverzeichnis für die Verkehrsstatistik*, a German version of the *Standard Goods Classification for Transport Statistics – NST/R*) according to the type of cargo (e.g. live animals, beverages).<sup>23</sup> However, different type of goods does not necessarily represent different price settings: e.g., dangerous goods for which a similar price development is expected are not only grouped into 13 of 175 GVV groups where they reach a share of 100%, but also with a certain percentage into other groups.<sup>24</sup>

**Time** matters as well. Carriers offer products (especially for the general cargo market) differentiated by the time frame: Delivery within 24 hours or longer, before 8, 10 or 12 a.m. the next day or delivery at a fixed time (especially just-in-time deliveries) are some of the conditions that can be observed in the market. And, of course, the **quantity** determines the price: is it a complete load or grouped freight, 40 t or just two pallets, one 20' container or 10 hl liquid? The quantity defines the degree of utilization of a vehicle. The larger a load, the smaller the price per kg. This criterion also helps to define different sub-markets: CTL (complete truck load), LTL (less than truck load) or single pallets are one idea of grouping an index.<sup>25</sup>

For many transports, **legal requirements** must be taken into consideration: e.g. transports of dangerous goods need drivers with special training and special car equipment. That affects the price, too.

Probably the major role in setting the price can be assigned to the **body of the vehicle**. Different goods need different vehicles, there are special requirements e.g. for transports of liquids, reefer cargo, cars and vehicles, containers, steel coils etc. Those special vehicles

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<sup>22</sup> BAG (2005a), p. 11.

<sup>23</sup> In Germany, the KBA offers transportation statistics regarding the type of cargo (following the GVV classification).

<sup>24</sup> Walter, K. (2004): Gefahrguttransporte 2002. In: *Wirtschaft und Statistik* 8/2004, Wiesbaden, p. 854ff.

<sup>25</sup> E.g., the German magazine "Verkehrsrundschau" publishes a quarterly index for Freight Transport by Road differentiated by CTL/STL/single pallets and distances. See Stölzle/Placzek (2005).



have a different availability on the market: the fewer the vehicles the more expensive the transport. And, of course, special vehicles have special prices that have to be paid by the haulier and have to be earned from his customer. An approximate categorization may include curtainsiders, tippers, tankers, vehicles for temperature controlled transports, box cars, container cars, and others.<sup>26</sup>

All these factors play their part in setting the price; but we should not forget about the market, which is – it was pointed out before - divided into a market for regular transportation – the **contract market** - and the **spot market**. Regular transportation is based on long-lasting contracts which take into consideration all the mentioned factors; prices are rather stable and easy to observe (of course, these contracts often incorporate price escalation clauses, especially for diesel prices). Transportation on the spot market, nowadays often negotiated through internet platforms, is more about getting a higher degree of utilization of the vehicles, from the haulier's point of view. So, here the price is rather volatile and hard to observe, because the contracts are basically unique and there is no repeated service. Because the spot market covers only a small portion of the total road transportation market (our survey suggests a share of approx. 10%), it will be excluded from the price observation until further considerations.

Bearing these price mechanisms in mind, the following pricing methods were chosen (the terminology complies with the thesaurus of SPPIs<sup>27</sup>):

### 7.1 Contract pricing

The companies are asked to give prices for transports they conduct on a regular basis, i.e. prices for repeated services for one company. So, real transactions are the target of measurement, and the respondent is asked to give **real transaction prices**. So, the pricing method used is what the thesaurus for SPPIs qualifies as **contract pricing**. This method is useful to be employed for companies with long-lasting contracts. Under normal circumstances, a transport is billed after being performed with the price specifications laid down in the contract; so, the accrual principle is kept. How many real transactions one piece of price information can cover depends on the contract: it can be a single transaction (especially in long distance transportation)

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<sup>26</sup> For this categorization, data about the transport performance are available at the *Kraftfahrtbundesamt* (KBA, Federal motoring office).

<sup>27</sup> According to the Content Development Framework for Service Sector Statistics – attachment D; Version of 13 May 2006  
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or more, e.g. by billing a project (especially in transports for the construction sector) or paying a daily rate e.g. for distribution service for supermarkets).

By taking account of the thesaurus and the PPI quality assessment, this pricing method can be classified as follows:

Data type in the survey:

Real transaction prices

Length of delivery and length of the survey period:

The following situations are possible:

- start and finish of delivery within one survey period (especially for transport of seasonal goods),
- delivery lasts longer than one survey period because one contract (transaction) covers a repeated service; each period the same or similar services are delivered. This is the normal situation for regular transportation; each transport within the contract is billed.

Relation between the moment of delivery and price recording in the index:

Different situations can occur:

- During delivery: As delivery progresses, or at the moment of (instantaneous) delivery. The companies are asked to quote the prices they achieved in the reporting period for a specific transport. The accrual principle is kept in this situation.
- Before delivery starts; when contract is signed (e.g. order prices). Some companies have long lasting contracts with fixed prices; so they can report the prices months in advance.
- After delivery is finished. Some are paid long after conducting the transport for accountancy reasons.

Number of real transactions covered in one piece of price information:

One.

Evaluation within the PPI Quality Assessment Tool for guidance:

1. Shipment price  
To b) The collected prices represent the completion of the transportation service
2. Representative of current period production

To a) The market for freight transport by road is under observation and there haven't been new services since the current base period.

To c) Substitution of a service occurs when this service becomes obsolete.

3. Transaction price

To a) Prices for real transports are measured. They represent real transaction prices.

4. Output price

To a) The price recorded is tied to a real transport i.e. to a real transaction.

5. Timely measure

To a) transaction prices reflect the service provision in the current period and are not lagged.

To b) However, price data can be lagged due to accounting reasons in the companies. Some are paid long after conducting the transport. But this seems to apply only for about 10% of the companies.

To c) Pricing reflects an average over the entire period.

6. Constant quality maintained

To a) Product changes can happen quite often (an old transportation service is cancelled and replaced by a new one; changes in weight etc.). Quality adjustment tools are in place.

## 7.2 Model pricing

There are some sectors of the market where real transaction prices are not applicable. This applies especially for smaller companies fighting for each transport with only few or no repeated services; for the market of grouped cargo, where customers and payment conditions are constant over time, but the quantity and type of cargo varies; and for transportation of heavy loads which are not repeated services. In such cases a **model pricing** approach is applied: The respondents give a real transaction in the base period, for which the price is updated over time. In the base period the price is a real transaction price; in the following periods, it can be considered as an **expert estimate**. However, model pricing is applied in only few cases; approx. 10% of the price recordings are model prices, the rest is done with contract pricing.

This method can be also classified according to the structure provided by both the thesaurus and the PPI quality assessment framework. The evaluation applies not for the base period which is similar to contract pricing, but for the following periods:

Data type in the survey:

Expert estimate.

Length of delivery and length of the survey period:

No delivery, model is priced.

Relation between the moment of delivery and price recording in the index:

Price recording at the moment of a possible delivery. Of course, no delivery takes place (model pricing).

Number of real transactions covered in one piece of price information:

Following periods: none.

Evaluation within the PPI Quality Assessment Tool for guidance:

1. Shipment price
  - To b) The collected prices represent a proxy measure for the transportation service.
2. Representative of current period production
  - To a) The market for freight transport by road is under observation and there haven't been new services since the current base period.
  - To c) The models are regularly updated to reflect changes.
3. Transaction price
  - To e) The price is a model price.
4. Output price
  - To c) Recorded price reflects a model transaction incorporating the pricing of only some of the features found in an actual transaction – the actual market conditions (e.g. negotiated discounts) are missing, of course.
5. Timely measure
  - To a) The price quotation reflects the expert estimate at that specific point in time and is not lagged.
  - To c) Pricing reflects an average over the entire period.
6. Constant quality maintained
  - To a) The model remains constant until the respondent qualifies it as outdated.

## 8. Quality adjustment methodology(s)<sup>28</sup>

... depending on the pricing mechanism and item substitution practices

Quality adjustment methodologies are needed when quality changes in the recorded transports occur. There are several variables that can be changed: different weights, different distances, different timing conditions. And not all contracts can be treated in the same way: Sometimes enterprises get the same fee regardless the weight of the transported good which can be different from time to time; sometimes the payment is subject to the weight. For distribution services, companies may get a flat rate for one day's distribution of goods regardless the number of loading stations or the time the service takes; or they may be paid according to the number of loading stations or the time. But all those modalities are laid down in the contracts. So, when payments are subject to weights or number of loading stations, it is a good solution to tackle this situation with model pricing. The model is a real transaction that has taken place; it is then calculated with the contract's conditions. The price quotation is not only an expert estimate, but a price that really would have applied if this special transportation case had taken place.

Another well-known subject for quality adjustment is the end of a contract from which a transportation price was recorded. Then a new, similar contract (i.e. from the same product group) has to be found, if possible from the same enterprise (*match-models method*).<sup>29</sup> To link price recordings of both contracts, several methods can be applied: The price change between the two periods can be imputed by the aggregate price change; or the prices of both transports are available in an overlap period.

Especially in transportation of agricultural goods, prices may be available only on a seasonal basis.<sup>30</sup> An example is the transportation of sugar beets which are harvested between Mid-September and Mid-November. So, price quotations of real transaction prices can only be given in November. For the other three quarters methods for price imputation have to be applied: The price development can be imputed with the development of the relevant elementary aggregate; or the price can remain constant until the next price quotation for that service. Another method

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<sup>28</sup> A detailed description of several methods for quality adjustment is given in IMF (2004), pp. 140ff.

<sup>29</sup> IMF (2004), p. 142ff.

<sup>30</sup> The case of *temporarily missing products*; IMF (2004), p. 146.

is the Rothwell price index which uses different weights for the reporting periods; so, a missing product gets the weight 0. "The month-to-month movements in this index, therefore, are a mixture of price and quantity changes."<sup>31</sup>

So, quality adjustment is a topic for SPPIs as well. Many different methods can be applied for the same situation. However, there is not the one and only correct method for all situations; which one is applied, always depends on the case.<sup>32</sup>

## 9. Evaluation of comparability with turnover/output measures

*...(including an assessment of the quality of turnover/output data and problems encountered in using classifications systems, especially for product line determination) (The purpose of Headings 8 and 9 is to help ensure that turnover/output and quality adjusted price data are adequate for use and provided in enough detail that major differences are not lost within the aggregates.)*

The German Service Statistics has produced results of turnover figures for freight transport by road and freight forwarding since 2000. During this period the accuracy of measurement of turnover figures has continuously increased. However, turnover figures are not detailed according to market segments.<sup>33</sup> So, only an impression of the market size can be derived from service statistics. To improve both service and price statistics, a matching of the companies with an annual turnover of over 10 mill. € will be conducted.

Output is measured in tonne kilometres and can be found in transportation statistics ("*Güterkraftverkehr deutscher Lastkraftfahrzeuge*", freight motor traffic of german lorries).<sup>34</sup> It uses a different system of classification as the SPPI.<sup>35</sup> However, it was no problem to get the data detailed in such a way that a re-grouping to reflect the product groups of the SPPI was possible.

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<sup>31</sup> IMF (2004), p. 584.

<sup>32</sup> Leifer (2006), p. 413.

<sup>33</sup> See ch. 4.

<sup>34</sup> Published by the BAG: Statistische Mitteilungen. Güterkraftverkehr deutscher Lastkraftfahrzeuge. (Series 8, issue 2). Flensburg, 2000ff.

<sup>35</sup> See ch. 5.

## 10. Summary and conclusion

During the implementation phase of the German SPPI for freight transport by road, political support turned out to be a major success factor, especially because of the strong opposition of the associations. Collaboration with the industry was another success factor; otherwise many issues concerning the segmentation of the markets as well as the design and wording of the questionnaire would have not arisen. Therefore, respectable response rates have been achieved.

The current classification system (ISIC/NACE/Wz, NST-R/GVV, CPA/CPC) was not suitable to determine sub-segments of the sector. So, another classification had to be developed together with companies and associations from the sector. It proved to fit very well to market conditions. A weighting pattern fitting to this classification can be derived from transportation statistics.

Transaction and model prices turned out to be suitable methods for price observation in the sector. As the logistics sector is expanding, the borders between the sectors are vanishing, so it is useful to include companies from the related sector of freight forwarding in the survey. In the future, efforts should be made to include the spot market as well, which has been disregarded until now due to its relatively small market share (our survey suggested 10%). Probably, the experiences of exchanges can help. E.g., for sea freight, the Baltic Exchange in London calculates indices for spot contracts traded at this exchange. Because many spot contracts for road transportation are traded at internet cargo auctions, a spot market index may be feasible in collaboration with these auctions.

In such an early stage of the development (first publishing of the index will be at the end of the first quarter 2007), quality issues concentrate on keeping close contact with the companies to get the data in the right quality. By completing the questionnaires, errors often occur when the respondent is not used to the new form. However, possible and actual topics for quality adjustment have been identified and will be tackled with the necessary tools.

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## 12. PPI Quality Assessment Framework

Points	Category and Questions	Score Real trans- action prices	Score Model pricing
	<b>1. Shipment Price (Weight = .10)</b>		
	<i>Select a. or b.</i>		
0	a. Price represents order pricing, actual price at shipment may well be different.	-	-
100	b. Price represents the completion of service or a proxy measure for the completed transaction.	100	100
	<b>2. Representative of current period production (Weight = .10)</b>		
	<i>Select a. or b.</i>		
50	a. Emergence of new product lines or critical new product features has not occurred since the index reference period or since sample augmentation last done.	50	50
0	b. Emergence of new product lines or critical new product features has occurred since the index reference period or since sample augmentation last done.	-	-
	<i>Select c. or d.</i>		
50	c. Product substitution usually occurs when an item becomes obsolete or, if model pricing applies, the models are regularly updated to reflect changes.	50	50
0	d. Product substitution usually does not occur when an item becomes obsolete or, if model pricing applies, the models are not regularly updated to reflect changes.	-	-
	<b>3. Transaction price (Weight = .25)</b>		
	<i>Select the one most prevalent in the industry</i>		
100	a. The price is the real transaction price or a list price that can always be assumed to be equal to the transaction price.	100	-
50	b. The price is a list price not equal to the transaction price.	-	-
100	c. The price is a unit value for a homogeneous group of products.	-	-
50	d. The price is a unit value for a non-homogeneous group of products.	-	-
75	e. The price is a model price.	-	75
50	f. The price is constructed from input cost plus profit and overhead mark-up.	-	-
	<b>4. Output price (Weight = .25)</b>		
	<i>Select the one most prevalent in the industry</i>		
100	a. Recorded price reflects an actual transaction or average of	100	-

	actual transactions.		
75	b. Recorded price reflects a model transaction incorporating the pricing of all features found in an actual transaction.	-	-
50	c. Recorded price reflects a model transaction incorporating the pricing of only some of the features found in an actual transaction.	-	50
50	d. Recorded price reflects some components of a transaction.	-	-
50	e. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of all features found in an actual transaction.	-	-
25	f. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of some of the features found in an actual transaction.	-	-
0	g. Recorded price reflects charge out rates for fixed labor inputs not directly tied to a specific quantity of output.	-	-
	<b>5. Timely measure (Weight = .10)</b>		
	<i>Select a. or b.</i>		
50	a. Pricing data reflect the service provision in the current period and are not lagged.	-	50
0	b. Pricing data are lagged.	0	-
	<i>Select c., d., or e.</i>		
50	c. Pricing data reflect an average over the entire period.	50	50
40	d. Pricing data reflect an average of multiple measurements over a portion of the period.	-	-
25	e. Pricing data reflect a single point in time.	-	-
	<b>6. Constant quality maintained (Weight = .20)</b>		
	<i>Select a. or b.</i>		
100	a. Rapid changes to product specification are not expected or, if they are, a good method to explicitly quality adjust is in use.	100	100
0	b. Rapid changes to product specification are expected and no explicit quality adjustment method is in use.	-	-
	<b>Total =</b>	<b>95</b>	<b>81.25</b>
	<b>Type A point range = over 90</b>	<b>95</b>	
	<b>Type B point range = 70 to 90</b>		<b>81.25</b>
	<b>Type C point range = less than 70</b>		