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SPPI Mini Presentation

**SPPI for Technical Testing and Analysis  
in Germany**

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The SPPI for technical testing and analysis was developed by the service producer prices division of the Federal Statistical Office Germany (FSO) in 2008. Parts of chapters 3 and 7 follow closely descriptions given in the Eurostat report on the development of this index by my colleague Manuel Wirsing in 2008 (Statistisches Bundesamt (2008a)). The structure of this paper follows the content development framework set out by the Voorburg Group on Service Statistics.

## 1. Definition of the Service

The service technical testing and analysis covers essentially the testing and inspection of physical goods. Usually, such tests are required to confirm minimum standard properties set by regulatory authorities concerning the safety and reliability of the tested good. In practice the services cover mainly testing and inspection of specific industrial materials and products, certification of products and periodic road safety testing of motor vehicles.

The service is defined by the property of the tested object (it has to be a physical good), the investigative approach (the properties of the tested object are not to be altered by the testing process) and by nature of the test (non medical, non veterinarian). Consequently, the service of technical testing and analysis does not cover certification of business processes (no physical good), damage assessments (not investigative) and blood analysis tests (medical).

## 2. Pricing Unit of Measure

The pricing unit of the service depends on the specific form and complexity of the test according to the definitions laid down in the previous section.

Relatively simple, standardized and recurring tests as periodic safety test (i.e. for elevators, motor vehicles or standardized chemical analyses) are well-specified. Here, the pricing unit typically represents the single test or analysis offered. They have administrative or list prices according to a defined service catalogue that specifies the price determining characteristics of the service.

Other services of technical testing and analysis are unique and cannot be exactly specified, i.e. the periodic safety testing of bridges or a test of an experimental prototype. According to our preparatory survey, the pricing unit is in this case one time unit (i.e. hour, month, etc.) of provision of trained staff and/or special machinery to conduct the test.

### 3. Market Conditions and Constraints

#### 3.1 Size of Industry

The most important market players for technical testing and analysis in Germany are the TÜVs, meaning Technische Überwachungs Vereine (“technical monitoring unions”). Traditionally these private organizations had the governmental mandate to conduct various technical tests, e.g. the periodic safety testing of cars and industry facilities. Their monopoly was partially ceased in the 80ies, when first licenses (for periodic car testing) were also given to competitors. During the last decades more and more testing monopolies of the TÜVs were brought down, i.e. on January 1st 2006, when the market for the monitoring of plants requiring special supervision was partly liberalized, or on January 1st 2008, when the testing of lifts and boilers became subject to market competition. Now, in almost all fields of technical testing the TÜVs are facing competition, but they still are the biggest market players.

In order to meet properly all industry specific aspects, sector experts have been contacted in 2006. As described in chapter 3.2 no association exists that focuses on a sector as diverse as described in NACE rev. 2 71.2. But VdTÜV, the association of the market leading TÜV-companies, could provide valuable information and helped us getting in contact with the single TÜVs. We also contacted Dekra, the TÜVs main competitor and consulted experts for services not provided by the TÜV, e.g. the testing of chemical characteristics of materials.

More liberalization efforts of the market are expected in Germany, meaning a further withdrawal of the state from the field of technical testing and analysis as well as an increased competition in the open markets. The latter will foster the search of new markets abroad of the established companies. This trend is already observable and is expected to intensify with the ongoing need for international certifications.

The following table shows data taken from FSO services statistics for NACE rev.2 71.2 and gives an overview of its market size:

**Table 1 –Turnover NACE rev.2 71.2 Technical testing and analysis**

NACE rev.2	Year	Turnover in bill. €	Number of enterprises	Number of employees (in k)
71.2 Technical testing and analysis	2008	7.02	5 540	68.6
71.2 Technical testing and analysis	2009	8.09	5 515	79.0

The biggest part of the market described in NACE rev.2 71.2 is technical inspection services of road vehicles, which was and still is the domain of the TÜVs and their newer but similarly

specialized competitors. Another important part of the market is the field of chemical testing, including the analyses of food, a field where other types of companies are found.

The importance of the TÜVs and its main competitor Dekra for the sector of technical testing and analysis is shown by the turnover figures for 2010 depicted in table 2. Both companies are engaged mainly in NACE rev.2 71.2 activities, but also offer some architectural and engineering services and consultancy services.

**Table 2 – Turnover by business field and firm according to business reports (2010)**

Unit / business field	Turnover in million €				
	<i>Dekra</i>	<i>TÜV Nord</i>	<i>TÜV Rhein</i>	<i>TÜV SÜD</i>	<i>Total</i>
“mobility” / “automotive”	987	288	311	499	<b>2,085</b>
“industry services”	402	328	377	599	<b>1,706</b>
other	321	307	615	455	<b>1,698</b>
<b>Total</b>	<b>1,710</b>	<b>923</b>	<b>1,303</b>	<b>1,553</b>	<b>5,489</b>
“mobility” / “automotive” (%)	57,7%	31,2%	23,9%	32,1%	<b>38,0%</b>
“industry” (%)	23,5%	35,5%	28,9%	38,6%	<b>31,1%</b>
Other (%)	18,8%	33,3%	47,2%	29,3%	<b>30,9%</b>
<b>Total (%)</b>	<b>100,0%</b>	<b>100,0%</b>	<b>100,0%</b>	<b>100,0%</b>	<b>100,0%</b>

Data sources: Business reports of Dekra, TÜV Nord, TÜV Rheinland and TÜV Süd for 2010.

The business fields include the following:

“Mobility” or “automotive” stands for periodic safety testing and other testing of motor vehicles, mainly of cars, but also of motorcycles, lorries and trains. The periodic testing of motor vehicles emissions is also included.

“Industry” comprises periodic safety testing and other testing of machines and technical installations, such as lifts and boilers. The testing of environmental aspects and the security of big industrial facilities and power plants is included in this business field as well.

Other services are business fields not falling in NACE rev.2 71.2, including training services, psychological tests and the certification of management systems.

The sector of technical testing is quite concentrated. According to FSO service statistics the 23 companies with turnovers above 25 million Euros achieved a market share of 42.4% in 2005. The 1141 companies with turnovers between 0.5 and 25 million Euros had a market share of 45.7%, while the 4396 companies with turnovers lower than 0.5 million Euros only had a market share of 11.9%. These figures even underestimate the importance of the big players, since many small companies are only subcontractors of bigger companies which again belong to a holding. Often in these holdings major business decisions, e.g. about prices, are made for all of the subordinated units.

### 3.2 Special Conditions or Restrictions

A major challenge in developing a SPPI for technical testing and analysis is the heterogeneity of the output of the sector: there are nuclear-technology experts checking power plants, laboratories examining the viscosity of crude oil, offices that check the eligibility of electric irons with EU-Norms, car-testing stations and many more. The task to design a set of questionnaires that allows the price measurement for all of them appeared as being quite difficult.

Due to the diversity of the sector no association represents the whole range of NACE rev.2 71.2. VdTÜV, the association of some market leading testing companies, gave some good markets insights, but it didn't have an overview of the whole market. So the development of the SPPI had also to rely on contacts to single companies – first without knowledge on representativity of the respective products they offered.

These problems were addressed by designing questionnaires in a very open way, leaving space for a lot of different types of services and ways of price quotations. This solution appears to be the adequate and only practical way to deal with the heterogeneity of the sector. But this increased the workload of the periodic price collection compared to working with standardized questionnaires.

It should be noted that the SPPI weighting pattern is highly sensitive to the decision on a B to B or B to All approach. In 2008, an analysis of official data on the amount of periodic safety tests conducted for companies and non-business owners, it was found that the weight in a hypothetical B to B index for safety tests on cars would be roughly half the size of that in the B to All approach. On the other hand, the share of tests on lorries and tractors would be three times higher in the B to B approach. Moreover, the weight of safety tests on road transport vehicles in the total index would be reduced by a factor of 5 relative to the weight in a B to All approach.<sup>1</sup> In line with Eurostat recommendations, the SPPI for technical testing and analysis was developed on the basis of a B to All approach.

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<sup>1</sup> See Statistisches Bundesamt (2008a) for details.

### 3.3 Record Keeping Practices

Regulated tests are under the authority of official boards and keep very detailed records of services conducted. Both gross and net prices for these services can be obtained online.

List prices for non-regulated but recurring tests are also often observed. Initially, it was not clear whether the list prices also represented transaction prices. Therefore, respondents had to identify their record keeping practices in the preparatory survey. In cases of non-recurring tests, individual record keeping practices are common across firms.

In the case of not-recurring tests, companies record either list price charge out rates, realized charge out rates or calculatory charge out rates. Sometimes travel-expenses are billed separately, but according to sector-experts, they only play a marginal role.

The following table gives an overview on the billing modalities in each activity field based on the results of the preparatory survey in 2008.

**Table 3 – Technical testing and analysis: business fields and billing modalities**

Business field	Billing modalities
Conduction of periodic car tests	Only fix prices per test
Technical testing of large-scale plants	Mainly charge-out-rates (for personnel and machinery)
Testing of machinery and small installations	Mainly fix prices per test
Technical testing for the certification of prototypes and products	Charge-out-rates for personnel and machinery as well as fix prices
Physical testing (if not part of the categories above)	Charge-out-rates for personnel and machinery as well as fix prices
Chemical testing (if not part of the categories above)	Charge-out-rates for personnel and machinery as well as fix prices
Other business fields	Charge-out-rates for personnel and machinery as well as fix prices

## 4. Standard Classification Structure and Details

The standard classification structure for technical testing is not further subdivided. The NACE rev.2 definition for technical testing relates directly to the classification ISIC rev.4 and states:

“Reference to ISIC Rev. 4: 7120

This item includes: This class includes the performance of physical, chemical and other analytical testing of all types of materials and products, such as:

- acoustics and vibration testing
- testing of composition and purity of minerals etc.
- testing activities in the field of food hygiene, including veterinary testing and control in relation to food production
- testing of physical characteristics and performance of materials, such as strength, thickness, durability, radioactivity etc.
- qualification and reliability testing
- performance testing of complete machinery: motors, automobiles, electronic equipment etc.
- radiographic testing of welds and joints
- failure analysis
- testing and measuring of environmental indicators: air and water pollution etc.
- certification of products, including consumer goods, motor vehicles, aircraft, pressurised containers, nuclear plants etc.
- periodic road-safety testing of motor vehicles
- testing with use of models or mock-ups (e.g. of aircraft, ships, dams etc.)
- operation of police laboratories

This class excludes:

- testing of animal specimens
- diagnostic imaging, testing and analysis of medical and dental specimens”<sup>2</sup>

To give another perspective, the North American Industry Classification System lists under NAICS (2007) 54.138 Testing Laboratories:

"This industry comprises establishments primarily engaged in providing physical, chemical and other analytical testing services. The testing activities may occur in a laboratory or on-site.

Exclusion(s): Establishments primarily engaged in:

- performing laboratory testing for the veterinary
- performing clinical laboratory testing for the medical profession
- auto emissions testing”<sup>3</sup>

It should be noted that NAICS (2007) and ISIC rev.4/NACE rev.2 do not fully coincide. The former excludes auto emissions testing, while the latter includes it. Both classifications do not identify subgroups.

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<sup>2</sup> Taken from Eurostat's Metadata Server (<http://ec.europa.eu/eurostat/ramon>).

<sup>3</sup> Information taken from Statistics Canada (<http://www.statcan.gc.ca/concepts>).

Table 4 – Overview on selected industry classifications

	Class	Label
ISIC rev.4 (2008)	71.20	Technical testing and analysis
NACE rev.2 (2008)	71.20	Technical testing and analysis
NAICS (2007)	54.138	Testing Laboratories <sup>*)</sup>

Notes: \*) NAICS (2007) excludes auto emission testing (included in NAICS (2007) 81.119, Other Automotive Repair and Maintenance)

The International Product Classification, CPC ver.2, in line with CPA (2008) identifies five product groups for technical testing and analysis<sup>4</sup>:

Table 5 – Overview of subgroups of CPC ver.2 and CPA (2008)

CPC ver.2	CPA (2008)	Label
83.44	71.20	Technical testing and analysis
83.44.1	71.20.11	Composition and purity testing and analyses services
83.44.2	71.20.12	Testing and analysis services of physical properties
83.44.3	71.20.13	Testing and analysis services of integrated mechanical and electrical systems
83.44.4	71.20.14	Technical inspection of road transport vehicles
83.44.9	71.20.15	Other technical testing and analyses services

CPA (2008) 71.20.11 Composition and purity testing and analyses services includes testing and analysis services for the chemical and biological properties of materials such as air, water, waste (municipal and industrial), fuels, metal, soil, minerals, food and chemicals as well as testing and analysis services in related scientific fields such as microbiology, biochemistry, bacteriology, etc.

CPA (2008) 71.20.12 Testing and analysis services of physical properties includes testing and analysis services of physical properties such as strength, ductility, electrical conductivity and radioactivity of materials such as metals, plastics, textiles, woods, glass, concrete and other materials as well as tests for tension, hardness, impact resistance, fatigue resistance and high-temperature effects.

CPA (2008) 71.20.13 Testing and analysis services of integrated mechanical and electrical systems includes testing and analysis services for the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances,

<sup>4</sup> Taken from Eurostat's Metadata Server (<http://ec.europa.eu/eurostat/ramon>).

communication equipment and other equipment incorporating mechanical and electrical components.

CPA (2008) 71.20.14 Technical inspection of road transport vehicles includes periodical technical inspection services for automobiles, motorcycles, buses, lorries, trucks and other road transport vehicles.

CPA (2008) 71.20.15 Other technical testing and analyses services includes testing and analysis services of a technical or scientific nature that do not alter the object being tested, either radiographic, magnetic and ultrasonic testing of machine parts and structures in order to identify defects. These tests are often conducted on site, certification of ships, aircraft, dams, etc., certification and authentication of works of art, radiological inspection of welds, analysis services of police laboratories or all other technical testing and analysis services not elsewhere classified.

## 5. Evaluation of Standard vs. Definition and Market Conditions

The Methodological Guide for Developing Producer Price Indices for Services (Eurostat/OECD (2005)) proposes direct use of prices of repeated services as pricing method for periodic road-safety testing of motor vehicles and contract or (preferably) model pricing for other testing and analysis services. Pricing based on working time is considered “(...) a poor price indicator because tests and analysis performed during an hour can vary extremely.” In order to keep the service constant, this method requires a complicated definition process of the collected service.

Based on the results of the preparatory survey in Germany, suitable pricing methods in the sector are pricing of repeated services, model pricing and charge-out rates of personnell and machinery. The former are in line with the methodological guide, while the latter is not clearly included as suitable method. Accordingly, the evaluation of a pricing method based on working time should be refined with respect to cases where the service is measured and billed in time units.

## 6. National Accounts Concepts

The Handbook of Price and Volume Measurement in National Accounts (Eurostat (2001)) does not define specific A-, B- and C-methods for the deflation of NACE rev.2 71.2 output. However, according to Eurostat (2001, p.30) every appropriate PPI qualifies as A-method deflator. An appropriate PPI “satisfies the following criteria (...):

- it is an index of the (domestic and export) price(s) of the output of exactly that (group of) product(s);
- it takes account of changes in quality of the product(s);
- it is valued at basic prices;

- its underlying concepts are consistent with the national accounts concepts”<sup>5</sup>

The calculated German SPPI for technical testing and analysis fulfils these requirements. The included charge out rates qualify as real transaction prices and not as input prices. Therefore, German National Accounts use the SPPI for technical testing and analysis as deflator for business generated output in sector NACE rev.2 71.2.

## 7. Pricing Methods

For the different types of services offered by this heterogeneous sector different types of prices exist. A major distinction can be made between prices that are administratively regulated and prices that are freely negotiated:

### 7.1 Administrative prices

For a lot of services of the sector the administration is stipulating prices. Usually, the Länder are the responsible authorities. The most important fields for administrative price setting are:

- periodic safety tests for motor vehicles
- periodic mission tests for motor vehicles

The services are legally defined including detailed descriptions of the type of service. The prices are published in publicly accessible lists and differ slightly among the 16 Länder.

The price for periodic vehicle tests is regulated as follows. A federal regulation sets a range of prices for periodic tests in Germany. The testing station licensees (called TP =“Technische Prüfstelle”) negotiate with authorities of the Länder yearly which exact prices are to be set in the Land. Tests can also be done by certified testers outside the certified testing stations (called ÜO =“Überwachungsorganisation”). These tests represent an important part of the market. They are not subject to the administrative price of the Land, but may not be cheaper than the lowest price described in the federal regulation. Normally, they do not differ from the prices of the testing stations at all, since the ÜOs belong to the same testing company like the TPs in most cases and these companies typically follow a uniform pricing policy.

Price information for this sub-sector can be obtained from online price information of main market players. These presented list prices are also real transaction prices. Since periodic tests for motor vehicles are also included in the CPI, data for the CPI (gross prices) and this SPPI (net prices) are collected simultaneously. List-prices for periodic car-tests, tests on tractors and lorries, as well as motorcycles are collected. The index-weights for these services are obtained from official data, which cover the number of tests conducted in each Land<sup>6</sup>.

<sup>5</sup> See Eurostat (2001, p. 30).

<sup>6</sup> See table 7 for the weighting pattern.

The services of periodic testing of motor vehicles are exactly defined and recurring. The pricing method applied will be the **pricing of repeated services**.

## 7.2 Freely negotiated prices

Most of the prices paid in the sector are the result of free market negotiations. Many services offered are unique and therefore not regulated in detail, since they cannot be exactly specified, e.g. the periodic safety testing of bridges. Other services are not the result of legal restrictions enforcing their conduction, but are demanded voluntarily by private companies, e.g. the certification of a product's high quality.

The group of testing services where free price setting is found is very heterogeneous. It covers services as different as the analysis of the constituents of mineral water and the testing of the resistance of a pipeline. However within the price setting of all these services, some similarities can be found:

- The price paid is often calculated as the sum of charge out rates for different qualifications of staff that had been occupied with the service. The positions found on the bills most often are engineers, natural scientists (of various subjects), publicly certificated surveyors, lab assistants and non-skilled employees.
- Sometimes, also charge out rates for special machinery and research inventory are billed. Depending on the machinery, the charge-out-rate may be the one for a minute, an hour or even a month.
- Sometimes the price is not connected to an amount of hours and machinery needed, but is negotiated as a price for a single, exactly defined service. This is the case when the test is relatively simple, standardized and recurring.

The measurement of the prices that are not regulated by government authorities is difficult, especially because the services provided are very heterogeneous and often unique. Therefore, we asked respondents for their major activity field and their billing modalities. According to the answers given different pricing methods were applied:

- **charge-out-rates** for machinery and personnel (either list-prices, realized charge-out-rates or calculative charge-out-rates)
- **model pricing** (real transaction prices that can be achieved with typical clients), in case of periodically offered tests the pricing method applied could also be described as **pricing of repeated services**.

### 7.3 Results for NACE rev.2 71.2 Technical testing and analysis in Germany

For the calculation of the SPPI for technical testing and analysis two types of surveys were necessary:

1. A preparatory survey in which respondents were asked about their turnover structure according to business fields and turnovers. This survey serves for acquiring weights for the weighting pattern and the validation of the sample. The weighting patterns of future rebasing will be based on the newly implemented service statistics for products.
2. A periodic survey in which respondents are asked about the prices of typical services they offer. This survey serves for acquiring the price information needed to calculate the elementary indices that constitute the SPPI for technical testing.

The random stratified sample for both surveys was drawn from the German business register according to companies' turnover figures given by the FSO *Dienstleistungsstatistik 2005*, which also covers service sectors throughout Germany and collects figures such as turnover, number of employees, etc. The strata above 25 million Euros turnover (containing respondents that are believed to dominate the market in Germany) is a complete census. Preparatory and price collection surveys are obligatory for all respondents.

To reduce the bureaucratic burden of respondents, information that can be obtained from other reliable sources is used if appropriate. In the case of the SPPI for technical testing this is the case for the prices of periodic motor vehicle testing that can be found at the homepages of the providers of this service.

To obtain the remaining price information, two types of questionnaires are sent to the respondents, one for fix prices and one for charge out rates<sup>7</sup>. Both have in common:

- the activity field, the questionnaire refers to, is predefined by FSO Germany (using the information obtained in the first survey)
- little less is predefined by FSO Germany, meaning that the questionnaires are kept quite open, which appears as the only practicable way to handle with the heterogeneous output of the sector

For the weighting pattern the turnover of the following activity fields was collected:

- Composition of purity testing and analysis services

Companies in this field do chemical tests, e.g. controlling the composition of food, oil, medicine, etc. Also included are connatural businesses like all environmental testing, water-

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<sup>7</sup> See questionnaires in the appendix at the end of this paper.

testing and biological tests. Chemical testing aligns with CPA (2008) 71.20.11 Composition and purity testing and analysis services.

- testing and analysis services of physical properties

To differentiate the tests in this field from testing and analysis services of integrated mechanical and electrical systems, only single tests on the basis of physical research are included here. The business field of physical testing contains X-ray-examinations, supersonic tests, tensile tests, electromagnetic compatibility tests, etc. Physical testing correspond to CPA (2008) 71.20.12 Testing and analysis services of physical properties.

- testing and analysis services of integrated mechanical and electrical systems

Tests conducted in this field were to heterogenous to treat them as one group. Therefore, we decided to account for size of systems specifically and looked seperately on tests on large-scale plants and machinery or small installations. Certification services were also included in this group, because their complexity resembles testing services of integrated systems. The overall field relates to the activity field “industry” of the TÜVs and Dekra and covers roughly CPA (2008) 71.20.13 Testing and analysis services of integrated mechanical and electrical systems.

- technical testing of large-scale plants

This field includes technical checks of large factories, power plants and other big industry facilities. Normally they are conducted by a team of experts that checks the working of the whole technical system.

- testing of machinery and small installations

Testing of machinery and small installations contains mainly smaller tests that are to be conducted regularly in offices and factories, e.g. the testing of lifts and boilers. The tests are usually done by one or two employees and are not very labor-intensive.

- technical testing for the certification of prototypes and products

This business field contains tests that are done for the accreditation of new products or product features before they enter the market. Also, quality of old products is tested i.e. for marketing purposes. Some companies in NACE rev.2 71.2 have a wide rage of certification services to offer (i.e. information content of travel guidebooks to the price stability of supermarket chains). But, no certification services that are not subject to technical testing are included in this field.

- technical inspection services of road vehicles

This activity field is assessed to be very important. A large part of the turnover is attained with testing cars of non-business customers. An analysis of official data showed that also testing of lorries, tractors and motorcycles play a significant role in this field. All other motor vehicle tests are not considered for the SPPI.

- other technical testing

Due to the heterogeneity of the sector, activities that cannot be classified to the above activity field are common in NACE rev.2 Technical testing and analysis. In the preparatory survey a range of various activities was summed up in this field.

The weights for each activity of NACE rev.2 Technical testing and analysis can be seen in table 7:

**Table 6 German weighting pattern for technical testing and analysis (based on 2006 data)**

<b>Business fields of Technical testing and analysis</b>	<b>Share</b>
Composition and purity testing and analysis services (i.e. biological tests, food and environmental analyses (if not already included above) etc.	25.1%
Testing and analysis services of physical properties (i.e. ultrasonic, tensile and bending tests (if not already included above), etc.)	4.3%
Technical testing of large-scale plants (i.e. inspection of chemical or power plants, etc.)	8.0%
Technical testing and analysis of machinery and small installations (i.e. inspection of pressure vessels or elevators, etc.)	13.0%
Technical testing and analysis for the certification of products and prototypes (i.e. GS/CE certifications, etc.)	7.6%
Technical inspection services of road vehicles (general inspections and emissions tests for cars, motorcycles, lorries, etc.)	35.5%
Other technical testing and analysis services	6.5%
<b>Total 71.2 Technical testing and analysis</b>	<b>100%</b>

Notes: Weights based on a preparatory survey on ca. 120 enterprises in 2006.

The weighting pattern for periodic vehicle tests can be derived from official KBA data. Within the *Länder* the market for these tests is oligopolistic. KBA tracks the number of tests done on different vehicle types in each *Land*<sup>8</sup>. Based on these data index weights can be derived.

The prices for periodic vehicle tests will not be obtained by survey since they are published on the web-sites of their providers. The price collection will concentrate on periodic tests of cars, lorries and tractors. For reconstructing the price development of 2006, older price lists were acquired from our colleagues of the FSO CPI section and from the mayor companies.

The following table shows the weights by *Land* and type of vehicle:

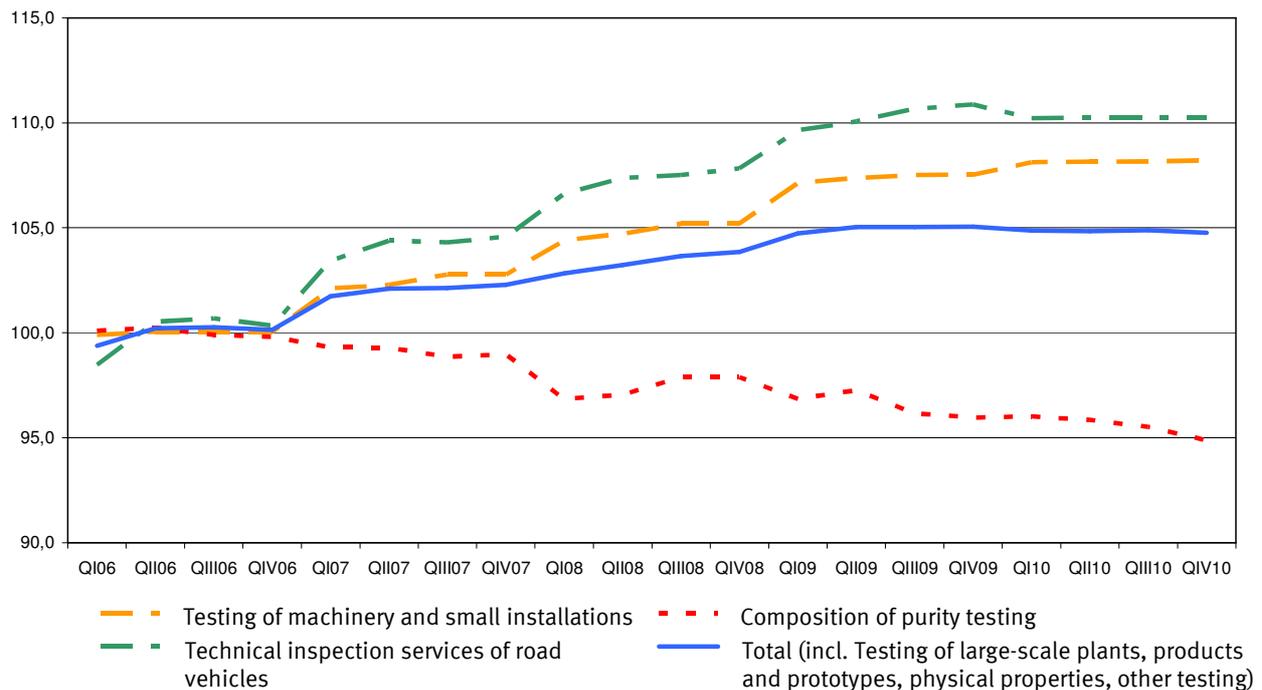
**Table 7 – Technical testing and analysis: weighting pattern for periodic vehicle tests**

<i>Land</i>	lorrie/tractor tests	motorcycle tests	car tests	total
Schleswig-Holstein	0.5%	0.2%	2.8%	<b>3.5%</b>
Hamburg	0.1%	0.1%	1.3%	<b>1.6%</b>
Niedersachsen	1.3%	0.7%	7.9%	<b>9.8%</b>
Bremen	0.1%	0.0%	0.5%	<b>0.6%</b>
Nordrhein-Westfalen	2.0%	1.5%	17.3%	<b>20.8%</b>
Hessen	0.8%	0.5%	6.2%	<b>7.5%</b>
Rheinland-Pfalz	0.7%	0.4%	4.4%	<b>5.5%</b>
Baden-Württemberg	1.7%	1.0%	11.1%	<b>13.8%</b>
Bayern	2.6%	1.3%	13.1%	<b>17.0%</b>
Saarland	0.1%	0.1%	1.1%	<b>1.4%</b>
Berlin/Brandenburg	0.7%	0.3%	4.8%	<b>5.8%</b>
Mecklenburg-Vorp.	0.3%	0.1%	1.6%	<b>2.0%</b>
Sachsen	0.6%	0.2%	4.2%	<b>5.0%</b>
Sachsen-Anhalt	0.4%	0.1%	2.3%	<b>2.8%</b>
Thüringen	0.4%	0.1%	2.3%	<b>2.8%</b>
<b>Germany / total</b>	<b>12.1%</b>	<b>6.8%</b>	<b>81.1%</b>	<b>100.0%</b>

<sup>8</sup> Kraftfahrtbundesamt (KBA), „Reihe 7 2005“.

The next figure shows the development of the producer price indices for the technical testing and analysis and three sub-indices in Germany from 2006 onwards.

### SPPI Technical Testing and Analysis (Ø2006=100)



During the whole period the general index rose moderately. This development was driven by the considerable raise of the sub-indices “inspection of road vehicles” and “inspection of machinery and small installations”. The downward slope of the “composition and purity testing” sub-index had a dampening effect.

## 8. Quality Adjustment and Methodology

In our questionnaire we ask respondents explicitly whether characteristics of the reported good changed relatively to the previous period. Since the implementation of the SPPI for technical testing and analysis, however, we observed quality change only rarely.

One example was a chemical test which was offered by the respondent with a different set-up and a more efficient output. Since we were not able to price the improved characteristic we treated the quality change by using the bridged overlap method.

We often observe prices of repeated services, of which components are exactly specified. In these cases, option pricing or alternatively indirect option pricing via expert judgement can

be applied to treat quality change<sup>9</sup>. Indirect option pricing via expert judgement will be the only way to account for quality change in the event of a change in official regulation (i.e. in-/exclusion of services to the obligatory annual car safety tests by the government). In this case no comparable prices of the previous period should be observable.

## 9. Evaluation of Comparability Regarding Turnover/Output Measures

When the SPPI technical testing and analysis was constructed, no data on the turnover distribution across products was available. Therefore, the price department had to conduct a preparatory survey to verify product groups predefined by the CPA (2008) and to identify their respective turnover. For Germany, we found a product portfolio that fits well to the CPA (2008) classification.

With the new basis 2010=100, the weighting pattern for the index calculation will be derived from service statistics on product levels (Dienstleistungsstatistik nach Arten). The service statistics on product levels inform about the turnover distribution of the industry across corresponding CPA-groups. As soon as the new weighting pattern is implemented price and turnover relate to the same group of respondents<sup>10</sup>.

The NACE rev.2 71.2 output derived from service statistics is basis for the calculation of the business generated CPA (2008) 71.2 output. In 2009, for instance, 91% of turnover in the industry was generated with technical testing and analysis services and 9% with other products. In National Accounts, the business generated output of CPA (2008) 71.2 is deflated by using the SPPI Technical testing and analysis in input-output tables. The deflation of product-based output with a product-based SPPI can be evaluated as a perfect match.

## 10. Summary

NACE rev.2 72.1 includes the testing and inspection of physical goods which can further be grouped into five subclasses: composition and purity testing and analysis services, testing and analysis services of physical properties, testing and analysis services of integrated mechanical and electrical systems, technical inspection services of road vehicles and other technical testing and analysis services. These groups follow the corresponding product classification CPA (2008). Additionally to that, Germany identified three fields of testing and analysis services of integrated mechanical and electrical systems: Technical testing of large-scale plants, technical testing and analysis of machinery and small installations, and technical testing and analysis for the certification of products and prototypes.

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<sup>9</sup> See Statistisches Bundesamt (2006, p. 38) for an elaborated definition of this quality adjustment method.

<sup>10</sup> With a small exception: for the structural service statistics (covering turnover) all companies with an annual turnover of more than EUR 17,500 are questioned, while the service statistics on product levels are additionally restricted on companies with more than 20 employees.

## Federal Statistical Office Germany

In Germany, prices which are observed for each of these fields are either fix prices (for repeated services or model cases) or charge our rates. Only technical inspection services of road vehicles which are still shaped by regulations display just prices of repeated services. The share of each billing method is based on a survey. Germany has made good experiences with openly designed questionnaires that make the heterogeneously of the industry manageable. This approach, however, comes at the cost of an increased workload in price collection. All enterprises with an annual turnover of more than 25 million Euros are included in the permanent price collection as well as a random stratified sample drawn on enterprises with an annual turnover up to 25 million Euros.

FSO Germany has introduced the SPPI for technical testing and analysis in 2008. They are in line with turnover measurement, National Accounts concepts and the requirements of the SPPI methodology.

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- Eurostat (2001): Handbook on price and volume measures in national accounts. Luxembourg.
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- Statistisches Bundesamt (2008b): Erzeugerpreisindizes für Dienstleistungen: Informationen zum Teilindex technische, physikalische und chemische Untersuchungen (WZ 2003 74.30/ WZ 2008 71.2). Wiesbaden.

## Appendix

The attached questionnaires are set up as follows:

- Questionnaire for fix prices

In this questionnaire respondents are asked to report prices for a typical recurring service of their company<sup>11</sup>. To secure the representativity of the service, respondents are explicitly asked whether the reporting service is still typical for their service portfolio. In the price collection area of the questionnaire, respondents have to answer whether price characteristics changed during the previous reporting period. If yes, also prices for a comparable service in the previous reporting period are collected. In cases of price change without change in characteristics, respondents are asked to give reasons for the price change.

- Questionnaire for charge out rates

The companies are asked to report prices of the 4 most important charge out rates for personnel and machinery they bill<sup>12</sup>. We ask specifically for realized charge out rates. However, we also collect list prices and calculative charge out rates if the former are not available.

Depending on size and range of activity fields of the companies surveyed, they will receive from one to ten of these questionnaires. They will be inserted in a sheet which explains the sense and working of the survey as well as its legal bases. The questionnaires follow on the next pages.

For the calculation of the SPPI the price information obtained will be weighted by the relative importance of the responding company in the business field. Elementary weights will be set according to strata and business field. A differentiation between “fixed price” information and “charge out rate”-information is also incorporated in the calculations.

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<sup>11</sup> Described by the respondent in the preparatory survey.

<sup>12</sup> Predefined by the preparatory survey.

**Statistik der Erzeugerpreise  
Dienstleistungen**

Technische Messungen

– Modellpreise – *- model prices -*

**Ep60**

**Bitte keine Eingangsstempel**

Rücksendung bitte bis zum  
15. des Folgemonats

Statistisches Bundesamt  
Referat D 305  
65180 Wiesbaden

Sie erreichen uns über

Telefon:  
Sven Klapper 0611 75-4665  
Patrick Werner 0611 75-4347

Telefax: 03018 10644-4591

E-Mail: dienstleistungspreise@destatis.de

Rechtsgrundlagen und weitere rechtliche Hinweise entnehmen Sie der Seite 2 dieses Fragebogens.

Statistisches Bundesamt, 65180 Wiesbaden

Ansprechpartner/-in für Rückfragen  
(freiwillige Angabe)

Name:

Telefon oder E-Mail:

Firmennummer  
(bei Rückfragen bitte angeben)

Verarbeitungsnummer

Falls Anschrift oder Firmierung nicht mehr zutreffen, bitte auf Seite 2 korrigieren.

Vielen Dank für Ihre Mitarbeit.

Mit diesem Fragebogen sollen die Preise für regelmäßig wiederkehrende Leistungen Ihres Unternehmens gemessen werden.

Bitte beziehen Sie Ihre Angaben auf das angegebene Leistungsfeld und die beschriebene typische Leistung Ihres Unternehmens. Sollte die vorgegebene Leistung nicht mehr typisch sein, notieren Sie dies bitte auf Seite 2.

**Please give prices for the given activity and the described typical service of your company. If the predefined service is no longer typical, please comment on page 2.**

Leistungsfeld:

*Activity:*

Typische Leistung:

*Typical service:*

**Preis der beschriebenen Leistung**

**Did description/ characteristics of described services change in the last month under report?**

Monatsmitte	Preis für die Leistungen ohne Umsatzsteuer <i>Service price without VAT</i>		Haben sich Beschreibung/Merkmale der beschriebenen Leistung gegenüber dem letzten Berichtsmonat geändert?		Falls ja: Bitte vergleichbaren Vormonatspreis für die neue Leistung angeben.		Gab es Preisänderungen ohne Änderungen im Leistungsumfang? Falls ja: Bitte hier kurz begründen, z. B. Tarifänderungen, Marktlage. <b>Did changes in prices occur without changes in the scope of service?</b> <b>If yes: Comment on the reasons i.e. standard wages, market conditions.</b>
	Euro	Cent	Nein	Ja	Euro	Cent	
November 2010	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	
Februar 2011	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	
Mai 2011	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	
August 2011	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	
November 2011	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	

Um Änderungen Ihrer Preise zu kommentieren, nutzen Sie bitte die Seite 2 dieses Fragebogens.  
**To further comment on changes in prices, use space on page 2.**

## Bemerkungen

Zur Vermeidung von Rückfragen unsererseits können Sie hier auf besondere Ereignisse und Umstände hinweisen, die Einfluss auf Ihre aktuellen Angaben haben.

Bitte zurücksenden an

Statistisches Bundesamt  
Referat D 305  
65180 Wiesbaden

## Unterrichtung nach § 17 Bundesstatistikgesetz

### Zweck, Art und Umfang der Erhebung

Die Preisstatistik wird als Repräsentativerhebung durchgeführt.

Nach § 4 des Gesetzes über die Preisstatistik werden bei höchstens 14 000 Berichtsstellen Preise für Werk- und Dienstleistungen vierteljährlich erhoben. Sie dienen der Berechnung von Erzeugerpreisindizes, die für das Bundesgebiet gelten und die Entwicklung der Preise für Werk- und Dienstleistungen verschiedener Branchen zum Ausdruck bringen. Die Erzeugerpreisindizes gehören zu den wichtigsten kurzfristigen Konjunkturindikatoren, ohne die eine wirkungsvolle Wirtschafts-, Finanz- und Währungspolitik nicht möglich wäre.

Darüber hinaus stellen die Erzeugerpreisindizes auch für Unternehmen und Verbände eine wichtige Informationsquelle dar und dienen der Erfüllung der Berichtspflicht im Rahmen der Verordnung (EG) Nr. 1165/98 des Rates vom 19. Mai 1998 über Konjunkturstatistiken (ABl. L 162 vom 19.5.1998, S. 1), zuletzt geändert durch Nr. 3.3 des Anhangs der Verordnung (EG) Nr. 596/2009 des Europäischen Parlaments und des Rates vom 18. Juni 2009 (ABl. L 188 vom 18.7.2009, S. 14).

### Rechtsgrundlagen

Gesetz über die Preisstatistik in der im Bundesgesetzblatt Teil III, Gliederungsnummer 720-9, veröffentlichten bereinigten Fassung, das zuletzt durch Artikel 20 des Gesetzes vom 7. September 2007 (BGBl. I S. 2246) geändert worden ist, Verordnung zur Durchführung des Gesetzes über die Preisstatistik vom 29. Mai 1959 (BAnz. Nr. 104 S. 1), die zuletzt durch Artikel 5 der Verordnung vom 20. November 1996 (BGBl. I S. 1804) geändert worden ist, in Verbindung mit dem Bundesstatistikgesetz (BStatG) vom 22. Januar 1987 (BGBl. I S. 462, 565), das zuletzt durch Artikel 3 des Gesetzes vom 7. September 2007 (BGBl. I S. 2246) geändert worden ist.

Erhoben werden die Angaben zu § 4 Absatz 1 des Gesetzes über die Preisstatistik.

Die **Auskunftsverpflichtung** ergibt sich aus § 4 Absatz 2 des Gesetzes über die Preisstatistik in Verbindung mit § 15 und § 26 Absatz 4 Satz 1 BStatG. Hiernach sind die Unternehmen und selbstständig tätigen Personen des Werk- und Dienstleistungsbereichs sowie Behörden und Einrichtungen

verpflichtet, wahrheitsgemäß, vollständig und fristgerecht Auskunft zu erteilen. Nach § 15 Absatz 6 BStatG haben Widerspruch und Anfechtungsklage gegen die Aufforderung zur Auskunftserteilung keine aufschiebende Wirkung.

### Geheimhaltung

Die erhobenen Einzelangaben unterliegen nach § 16 BStatG grundsätzlich der Geheimhaltung. Nur in ausdrücklich gesetzlich geregelten Ausnahmefällen dürfen Einzelangaben übermittelt werden.

Nach § 16 Absatz 6 BStatG ist es zulässig, den Hochschulen oder sonstigen Einrichtungen mit der Aufgabe unabhängiger wissenschaftlicher Forschung für die Durchführung wissenschaftlicher Vorhaben Einzelangaben dann zur Verfügung zu stellen, wenn diese so anonymisiert sind, dass sie nur mit einem unverhältnismäßig großen Aufwand an Zeit, Kosten und Arbeitskraft dem Befragten oder Betroffenen zugeordnet werden können. Die Pflicht zur Geheimhaltung besteht auch für die Personen, die Empfänger von Einzelangaben sind.

### Hilfsmerkmale, laufende Nummern/Ordnungsnummern, Löschung, Statistikregister

Name und Anschrift der Unternehmen und Selbstständigen sowie Behörden und Einrichtungen sind Hilfsmerkmale, die lediglich der technischen Durchführung der Erhebung dienen. Die Fragebogen mit den Hilfsmerkmalen werden nach Abschluss der Aufbereitung für den Monat gelöscht, der auf den letzten mit dem Erhebungsvordruck erfassten Monat folgt. Die Erhebung erfolgt über eine laufende frei vergebene Kennnummer, die der Unterscheidung der in die Erhebung einbezogenen Einheiten dient.

Name und Anschrift sowie Kennnummer werden zur Führung des Unternehmensregisters für statistische Verwendungszwecke (Statistikregister) verwendet. Rechtsgrundlagen hierfür sind § 13 BStatG und die Verordnung (EG) Nr. 177/2008 des Europäischen Parlaments und des Rates vom 20. Februar 2008 zur Schaffung eines gemeinsamen Rahmens für Unternehmensregister für statistische Zwecke und zur Aufhebung der Verordnung (EWG) Nr. 2186/93 des Rates (ABl. L 61 vom 5.3.2008, S. 6).



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