

# **The Methodological guide for developing producer price indices for services, issues and challenges**

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## **1 INTRODUCTION**

1. The objective of the paper is to present the main contributions of the new edition of the joint OECD Eurostat *Methodological guide for developing producer price indices for services* (SPPI Guide) which will be released in the fourth quarter of 2013. This new edition of the SPPI Guide is the product of a Task Force which aimed to revise and update the 2005 edition of the SPPI that was published in 2006 (section 2). Intending to enhance the methodology for measuring producer prices for services and to facilitate international comparison, the new SPPI Guide aims to propose a conceptual framework that eases the understanding of particular problems when tracking price changes of service due to the special nature of services: services are unique, they are not repeated, at least not in a fully comparable manner or they might be customer specific (section 3). It also aims to systematise efforts that have been made by price statisticians to develop an industry-by-industry approach for the measurement of prices for services, with the ambition to enhance the expertise on SPPI compilation according to the specificity of the service considered (Section 4). Finally, this paper also dwells upon difficulties in measuring prices for services and identifies issues and futures challenges related to the compilation of SPPI (section 5).

## **2 BACKGROUND**

2. From 2002 to 2004 the OECD and Eurostat worked together with experts from 19 OECD/EU member countries<sup>1</sup> in a joint expert group and produced in 2005 a first edition of the SPPI Guide. It provided more detailed conceptual guidance on the compilation of producer price indices for services along with documentation of country practices with the aim to enhance the development of services producer price indices and, in particular, to provide input to a common methodology prices for services that could motivate the development of indices in countries.

3. Since the first publication of the SPPI Guide, significant progress has been made in countries in enhancing SPPIs methodology and in developing new SPPIs in sectors not covered in the first edition of the Guide, providing strong motivation for an update and revision of the Guide; the case for which would in any case be strong because of the introduction of new classification systems (ISIC rev. 4) and accounting standards, in particular the 2008 SNA.

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1 . Austria, Belgium, Finland, France, Germany, Ireland, Italy, Japan, Korea, Malta, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

4. In 2011, a second joint OECD / Eurostat Task Force has been established bringing together experience from 13 OECD/EU member countries<sup>2</sup> with the objective to produce a new edition of the SPPI Guide aiming at:

1. The development of a global and comprehensive methodological framework to track changes in prices for services;
2. The enlargement of the scope of service sectors covered by improving and developing practical guidance by service industry;<sup>3</sup>
3. The identification of issues and futures challenges related to the compilation of SPPI.

5. At the time of writing this paper, the new SPPI Guide is expected to be released at the fourth quarter of 2013.

### 3 A GLOBAL AND COMPREHENSIVE FRAMEWORK OF PRICING METHODS

6. Give coherence to practical measurement issues, ease better understanding of the variety of methods used by countries and facilitate international comparability were the main motivations of price statisticians for constructing this global and comprehensive framework. It highlights the importance of linking *pricing methods* used to measure price change with the *price mechanisms* used by service providers when methodological choices on measuring producer prices for services have to be made.

#### 3.1.1 *Three types of pricing mechanisms*

7. Measuring prices of some types of services poses particular problems due to the special nature of services. Because of the frequent occurrence of unique products, standard price measurement methods designed for repeated products can be difficult to apply for some services. Price statisticians are then, in practice, forced to use a number of methods to track price changes in services, with methods typically varying across countries, depending on *pricing mechanisms*, and also on the producing industry or product.

8. The *pricing mechanism* refers to charging arrangements put in place by economic operators. In practice service providers used a variety of mechanisms to price their output but these can be characterised under three broad groups defined as follows:

1. No explicit price is charged and the payment for the service is not explicitly identifiable but is instead bundled within the price of another good or service. Two types of services are typically priced in this way. The first reflects the output of the

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2. Australia, Austria, Canada, France, Germany, Hungary, Israel, Japan, Korea, Mexico, Netherlands, the United Kingdom and the United States.

3. In this regard, the synergy with the Voorburg Group has been one important aspect of the work of the Task Force aiming to incorporate documentation from the Voorburg Group in the new Guide.

retail/wholesale/distribution activities and the second reflects financial intermediation services indirectly measured (FISIM). This mechanism is for convenience referred to as *margin-pricing*.

2. An explicit price for the service is charged and payable (excluding those services charged as a function of time-spent), and referred to, for convenience, as *explicit output charged mechanisms*; and
3. An explicit price for the service is charged and payable as a function of time-spent, referred to as *time-spent mechanisms*.

### 3.1.2 Three classes of pricing methods

9. Three classes of *pricing methods* are then considered by the SPPI Guide. According to the *price mechanisms* considered, pricing methods may result in either a *margin price*, a *price of final specified service output* or a *time based price*.

10. As a reminder, *pricing methods* concern the use of a specific type of information on prices to represent the evolution of price in the price index compilation. They are those that apply to the process before elementary index compilation and are solely concerned with data that are used as prices in an index. In other words, it is a procedure put in place by statisticians to make price data eligible to be entered in an index which is largely determined by the *pricing mechanism*.

#### 1. Margin price

11. The *margin pricing method* is used to measure price developments in services that are not separately invoiced and where the service is in relation to the transformation in space or time of an item, be that a product, such as a good purchased and sold by a retailer or a loan provided by a financial intermediary, and where the price of the service can be estimated as the difference in the price that would have to be paid by the service provider for the good or service they transformed and the price paid by the final consumer (at the same point in time).<sup>4</sup> The method assumes that the value of the service can be measured as the difference between observed *selling and acquisition prices* of a given product to which the margin service is related.

#### 2. Price of final service output

12. The second class of pricing methods covers various cases where price-determining factors of services are well-specified although not necessarily perfectly; they are fully defined in terms of all the characteristics that influence their transaction prices. Price observations that are applied in these pricing methods refer directly to specified service outputs and result in prices of final services output. This class includes six different pricing methods defined as follows:

- **Direct use of prices of repeated services** represents the ideal of using *real transaction prices* or, less preferably, *list prices*, of the same service product in successive survey periods. Adjustments will be needed to account for any changes that occur when the observed product is replaced or its quality changes. The use of data collected for the Consumer Price Index (CPI) is considered as a special case of direct use of prices of repeated services.

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4 . See, 2008 SNA, § 6.146.

- **Contract pricing** concerns the use of prices in long term contracts for the repeated delivery of the same (or a very similar) service. This is a special case of using *real transaction prices*.
- The **unit value method** constructs a price index based on observed *revenue and quantity data*. Note that the unit value method as defined here is limited to cases where price observations refer directly to service output.
- The **percentage fee method** calculates the value of the service as the product of the *percentage fee and value of the product to which the fee relates*.
- The **component pricing method** is particularly relevant when only information on total revenues and number of sales are typically available, but, where the products sold are relatively heterogeneous – thus invalidating the unit value approach. The approach specifies a representative product and estimates its price on the basis of the prices of identifiable components that determine the overall price.
- The **model pricing method** is typically applied in cases where the service provided is unique. The approach specifies a standardised product, that is sufficiently representative of the type of service provided, and survey respondents are asked to provide a price quote for this standardised product.

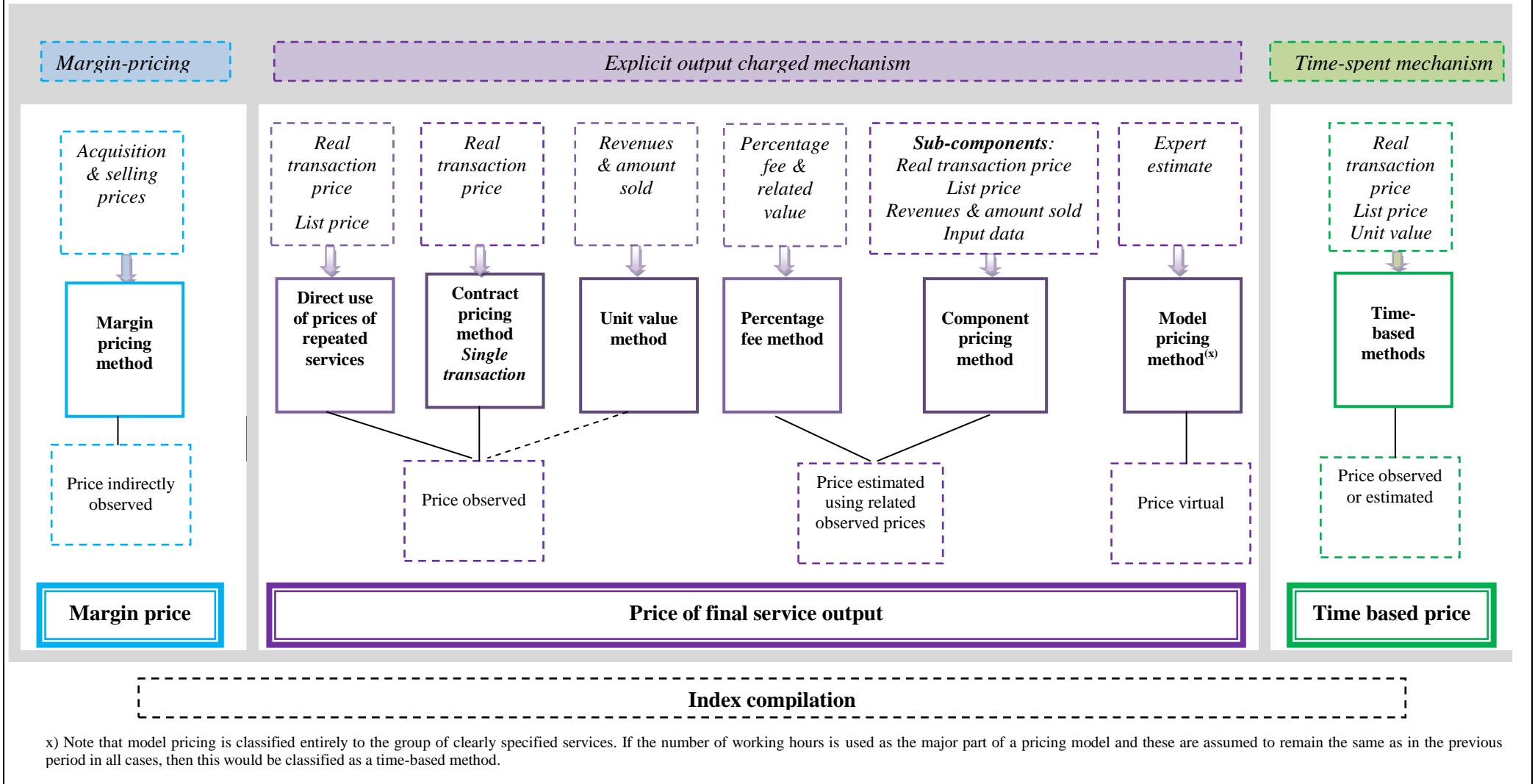
### 3. Time-based price

13. The third class of pricing methods refers to cases where a service is specified in terms of contents of service provision. Final price observations (that entered in SPPI compilation) refers to the time used for the provision of the service rather than the actual service provided. This class of method surveys the money amount charged to a buyer of a service, for a standard amount (e.g. one hour) of work by an employee of the producer contributing to the provision of that service. Note that the method has four variants depending on the availability of price data (*Hourly charge-out rate, hourly list rate, wages rate, or working days*).

14. How valid prices based on time-based pricing methods are for direct use in SPPI depends largely on the services concerned. The problems posed by the treatment of quality changes occurring in the output, or productivity changes impacting on the input needed (hours spent) to produce the output when analysing price and volume developments in countries need to be discussed further on a case-by-case basis.

15. The box 1 shows the conceptual framework for measuring service output prices as defined as a whole by the SPPI Guide.

**Box 1. Pricing methods**



x) Note that model pricing is classified entirely to the group of clearly specified services. If the number of working hours is used as the major part of a pricing model and these are assumed to remain the same as in the previous period in all cases, then this would be classified as a time-based method.

#### **4 DEVELOPMENT OF PRACTICAL GUIDANCE FOR SERVICES DIFFICULT TO MEASURE**

16. One of the major objectives of the SPPI Guide is to provide practical guidance for compiling SPPI for specific service sectors and to propose feasible solutions to implement SPPI in particular for services difficult to measure.

*An attempt to provide replicable and harmonized guidance*

17. Based on experience and expertise from countries, the practical guidance aims to provide an overview of key practices, experiences and issues in setting-up SPPIs for specific service industries with an emphasis on their applicability across countries. Also an effort has been made to harmonize as much as possible the guidance and to highlight the main issues that NSOs need to take on board when starting the compilation of a particular SPPI.

18. Keeping in mind the need to provide replicable and harmonized guidance, the following aspects are discussed for each individual service industries:

- **Coverage and classification aspects:**
  1. Industry description
  2. Classification aspects
  3. Scope of the survey
  4. Industry vs. Product based SPPI (*when relevant*)
- **Compilation issues:**
  5. Sample design
  6. Collection of information and specification of the services
  7. Pricing methods
  8. Quality issues
  9. Weighting and aggregation
  10. Specific aspects
- **Experience of individual countries:**
  11. Overview of national methods
- **Methodological sources available :**
  12. Bibliography

19. Box 2 shows an example for telecommunication services.

## Box 2. Telecommunication

### 1. Industry description

Dynamic industry susceptible to both rapid changes in technology and customer movement to new services. Traditionally, prices are determined based on the cost of using the service (such as cost per minute). However, as the industry develops and competition increases, providers are developing alternative pricing packages that aim to entice potential customers to their service. Bundling of telecommunications services is then an important challenge.

### 2. Classification aspects

*Industry classification:* great consistency across ISIC Rev.4, NACE Rev. 2, NAICS 2012. The commonality of telecommunication activities is the transmission of content without being involved in its creation. The breakdown is based on the type of infrastructure operated: 1) Wired telecommunication activities; 2) Wireless telecommunication activities; 3) Satellite telecommunication activities; 4) Other telecommunication activities.

*Product classification:* no full comparability of the 3 main products classification because of different level of detail. The CPC rev. 2 covers the 3 main following subclasses: 841 - Telephony and other telecommunications services; 842 - Internet communication services and 8463 - Broadcasting, programming and program distribution services covering 15 classes with a breakdown according to technical criteria.

### 3. Scope of the survey

The ideal survey would adequately cover the production of all resident telecommunication service providers in the economic territory. Households and business customers (including government) are both substantial clients: an ideal survey would be produced on a BtoAll basis, capturing separate price data for both sectors (BtoB and BtoC). The collection of price data for both sectors is likely to prove difficult and resource intensive for the statistical agency and providers. An alternative is to use CPI data adjusted to basic prices as proxies of the BtoC component of the BtoAll index. A suitable weighting scheme is then required to weight together the SPPI and CPI components.

### 4. Industry vs. Product based SPPI

Although product based SPPI would be preferable (as deflator of national accounts), development of industry based SPPI covering the primary output of telecommunications industry is more realistic. However, there is a potential to produce a biased price index in country where secondary activity is of notable size.

### 5. Sample design

Structure of market is generally characterized by a small number of large service providers dominating the market and ideal survey would use preferably the PPS method. Due to the rapid rate of technological development, updating the sample on an annual basis may be necessary.

### 6. Collection of information and specification of the services

It is necessary to accurately capture specifications, including the type of price, the unit of measure, the monthly price change and the breakdown of price change by reasons. A wide variety of data sources can be used including administrative data, survey data, prices collected from the internet and prices collected for the CPI.

### 7. Pricing methods

Two options are likely to be used: the *component pricing* (bill and rate methods) and the *unit value* methods. The *direct use of prices of repeated services* and the *use of CPI data as proxy* may also be considered as alternative methods. Each pricing method is assessed by articulating a series of pros and cons.

### 8. Quality issues

The method used for treating quality changes depends on the pricing methods chosen. It is essential that the initial price specification is as detailed as possible to ensure the price determining characteristics are identified and fixed. The subsequent collection of regular price updates should attempt to identify any price change occurring as a result to the change in the service offered.

### 9. Weighting and aggregation

The weighting and aggregation of a price index is constrained by the availability of reliable data (such as turnover) that need to be ideally updated annually. The two main sources of weight data are the collection of the information directly from the respondent (which is likely to prove burdensome, expensive and untimely) or from the industry regulator (this source of data is unlikely to be timely).

### 10. Specific aspects

Ideally, weights should be updated on an annual basis to capture rapid changes in service consumption; Improve treatment of bundled service products (with discounts) as a whole and considered how excludes hardware (phone, modem, etc) from bundled package; Consider what is classified as export (non-domestic) and international services; Consider how to capture the reselling of network capacity as part of other telecommunication activities.

### 11. Overview of national methods

National practice in Austria, Hungary, Japan, the United Kingdom, the United-States

*Source: SPPI Guide, Telecommunication, Christopher Jenkins (ONS) and Hina Kikegawa (Bank of Japan) – to be published*

### Industry by industry approach

20. Guidance provided by the new edition of the SPPI guide will be presented following an industry by industry approach (according to the ISIC rev. 4 classification system). As a whole, 30 service industries are separately treated on the SPPI guide. On the one hand, developments over the last ten years in the methodology for service industries already treated in the first edition of the Guide have been consolidated. Thus guidance for these service industries has been improved in light of these recent practical and methodological developments as well as literature from the Voorburg Group<sup>5</sup>. As shown in table 1, this mainly concerns a set of 19 service industries (as defined by ISIC rev. 4).

**Table 1. Revised sections of the SPPI Guide**

Section	ISIC Rev. 4	Title	Author
1	H 4923	Freight transport by road	Aspasia Papa (ONS)
2	H501X	Sea and coastal water transport	Anne-Sophie Fraisse (OECD)
3	H51XX	Air transport	Christian Puchter (Statistics Austria)
4	H5210	Warehousing and storage	Michael Morgan (ABS)
5	H5224	Cargo handling	Paul Boling (ABS)
6	H53XX	Postal and courier activities	Ildiko Holocsy (Statistics Hungary) & Denis Gac (INSEE)
7	J61XX	Telecommunication	Chris Jenkins (ONS) & Hina Kikegawa (Bank of Japan)
8	J62XX	Computer programming, consultancy and related activities	Ruth Vizner (Statistics Israel)
9	L6810	Real estate activities with own or leased property	Aspasia Papa (ONS)
10	M6910	Legal activities	Christopher Jenkins (ONS) & Maria Schuch (Statistics Austria)
11	M6920	Accounting, bookkeeping and auditing activities; tax consultancy	André Loranger (Statistics Canada)
12	M7020	Management consultancy activities	Denis Gac (INSEE)
13	M7110	<i>Architectural and engineering activities and related technical consultancy</i>	
13.1		Architects	Marcel Spanjaard (CBS Netherlands)
13.2		Engineers	Marcel Spanjaard (CBS Netherlands)
14	M7120	Technical testing and analysis	Ildiko Holocsy (Statistics Hungary)
15	M7310	Advertising	Johanna Von Borstel (Destatis)
16	M7320	Market research and public opinion polling	Aspasia papa (ONS)
17	N78	Employment activities	Dorothee Blang (Destatis)
18	N80	Security and investigation activities	Ruth Vizner (Statistics Israel)
19	N812	Cleaning activities	Marcel Spanjaard (CBS Netherlands)

21. Moreover, a new selection of service industries has been added, taking into consideration the practical experience of countries in compiling such indices, the size of industries, the speed of technical change that is likely to affect price measurement, the user needs of national accounts to have available accurate deflators (i.e. using an A-method instead of other methods) as soon as possible, and the economic trend in some service industries for which prices are less regulated nowadays. Practical guidelines have been developed for 11 additional services industries as shown in table 2.

5. <http://www.voorburggroup.org/>



**Table 2. New services industries**

Section	ISIC Rev. 4	Title	Author
I	E37 – E38	Waste management	Denis Gac (INSEE)
II	G46 – G47	Wholesale and retail trade	André Loranger (Statistics Canada)
<i>III</i>		<i>Food &amp; accommodation</i>	
III.a	I55	Food & beverage service activities	Anne-Sophie Fraisse (OECD)
III.b	I56	Accommodation services	Anne-Sophie Fraisse (OECD)
<i>IV.</i>		<i>Publishing activities</i>	
IV.a	J581	Publishing of books, periodicals and other publishing activities	Denis Gac (INSEE)
IV.b.	J5820	Software publishing	David Friedman (BLS)
<i>V.</i>		<i>Financial service activities</i>	
V.a.	K6419	Other monetary intermediation	David Friedman (BLS)
V.b	K6499	Security and commodity contracts brokerage	Hina Kikigawa (Bank of Japan)
V.c	K6612	Other financial service activities, except insurance and pension funding activities, n.e.c.	David Friedman (BLS)
VI.	K651	Insurance activities	David Friedman (BLS)
VII	Q86	Health service industries	Bonny Murphy (BLS)

## 5 DEVELOPING PRICE MEASUREMENT OF SERVICES: MAIN ISSUES AND CHALLENGES

22. This section presents briefly the main cross-cutting issues raised in the new edition of the SPPI Guide and considers futures challenges related to the compilation of SPPI.

### 5.1 Overview of the main cross-cutting issues raised in the new edition of the SPPI Guide

#### 5.1.1 Decompose SPPI by end use

23. The focus of the first edition of the SPPI Guide was primarily on BtoB transactions. However, there have been a number of developments in breaking down SPPIs by type of user; which is also an important requirement for the national accounts when price discrimination that feeds through into heterogeneous price change occurs.

24. European countries tend to give priority to BtoB indices while non-European countries prioritise indices that cover all users (BtoAll). In any case, the development of BtoC indices remains a challenging issue for National Statistical Offices. When relevant, feasible and useful, the new edition of the SPPI Guide provides guidance to compile SPPI by destination as follows:

- Domestic business-to-business (BtoB);
- Domestic business-to-consumer (BtoC);
- Domestic business-to-all (BtoAll);
- Domestic business-to-Export (BtoE).

### 5.1.2 Use of CPI data as proxies

25. Helping to minimize the burden of data collection for producer price units, the use of CPI data as proxies for SPPI compilation may prove to be an attractive solution to develop BtoC indices. This situation arises particularly for service industry where the vast share of output from the sector goes to final demand; e.g. when services are predominantly but not exclusively used for household consumption.

26. The use of CPI data can be done either exclusively (only CPI data are used as proxies for the SPPI) or conjointly with other producer price data not covered by the CPI, especially those relating to business users (collected by a dedicated SPPI survey). However, when using CPI data due attention should be paid on the two following issues:

- Any use of CPI data in the SPPI framework compilation needs to adjust CPI data, valued at purchasers' prices, to basic prices by deducting any taxes including VAT and trade margins<sup>6</sup>, as basic prices better align with the cash that producers actually receive to compensate them for expenditures on goods and services used as intermediate inputs, for labour costs and as a return to capital.
- When CPI data are used as a full proxy for the SPPI, special attention needs to be paid on the possibility of business prices displaying different trends to those of households. In other words, the use of CPIs as proxies for SPPI should assume that prices for business users and households move in a similar trend with a similar composition of consumption.

### 5.1.3 Treatment of quality changes

27. The same quality adjustment methods can in principle be used for goods and services. In practice, however, fewer options are available for services particularly because when collecting price data for services the products bought and sold change over time. Firstly, specific services exchanged between a provider and a client may change (e.g. a service is delivered in less time or by a better qualified employee of the service provider). Secondly, the structure of services that are exchanged in a certain service industry will vary from one period to the next. The first aspect is referred to as the problem of quality change, the second aspects is about finding representative service products for a certain service industry.

28. Obviously, how to deal with quality change need to be considered on an industry-by-industry approach.<sup>7</sup> In this respect, efforts have been made in the new SPPI Guide to consider both feasible approaches and those possible from a more philosophical perspective.

### 5.1.4 Treatment of bundled services

29. Statisticians frequently face cases where services are bundled with either another service or good. This is particularly true in the case of Transport and storage (Section H of ISIC rev. 4) and Information and communication (Section J ISIC 4).

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6. "The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, by the producer as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer", 2008 SNA, § 6.51.a.

7. In this respect, see André Loranger, *Quality change for Service Producer Price Indexes*, Group of Experts on Consumer Price Indices, Geneva, 2012.

30. When measuring the price of a bundle of services, two main alternatives are available to the price statistician: 1) break down the bundle into components and price these separately or 2) price bundled services together as a group.

- Under the first option, it is important to specify and price each component separately but also to measure the monetary or other benefits provided to customers who subscribe to bundled services. Monetary benefits are relatively easy to reflect in pricing bundled services; however, pricing the other benefits is complicated. In addition, breaking down the bundles and pricing each sub-component separately will translate into a heavy calculation and response burden. One suggestion to minimize the burden could be to let respondents choose the service bundles that are most representative of their business in terms of revenues and then price the sub-components of these bundles separately.
- For the second option, only the prices of the bundled services and their corresponding service specifications are required. Since the underlying services are not priced under this approach, the response and calculation burden is reduced. Keeping the bundles constant over time is a significant concern and two solutions to deal with this issue are apparent: 1) quality adjustment; 2) updating the selected bundled services regularly. It should be noted that quality adjustment is also required when pricing the service components of the bundle separately.

## 5.2 Future challenges

31. The new edition of the SPPI Guide, to be considered as a living document, provides a state of play of the considerable progress that has been made in the field of SPPI over the 10 last years. In this respect, it most probably will be amended and updated in the future, both to improve guidance on service industries treated in this second edition such as financial service activities, and to incorporate additional service industries that have not already be dealt with and for which methodology will certainly improve in the coming years (e.g. Research and development).

32. If it is clear that further improving methodology for individual service industries will still be needed in the future. In this respect, some more general future challenges need to be kept in mind, first and foremost the comparability of SPPI series across countries. Since its first edition, the SPPI Guide has been developed to promote the development of SPPI series comparable across countries. It is undeniable that progress has been made in the past. Eurostat, for example, is publishing since 2008 Service Producer Price indices for Member States and the EU on a quarterly basis as one of its Principal European Economic Indicators.

33. However, this progress should not obscure that comparability remains an issue. Indeed, when pricing the same service industries countries are likely to use a wide range of pricing methods. For example, the *direct use of prices of repeated services* and *contract pricing* are the most common methods used for freight transport by road; *model pricing* is also used by a few countries (Ireland, Netherlands and Norway) while there is an exceptional use of *time based methods* (Denmark), *component pricing* (Luxembourg) or *unit value* (Hungary and Poland)<sup>8</sup>. This diversity can be mainly explained by pricing mechanisms and pricing factors which are quite specific depending on the country.

34. The variety of the pricing methods applicable to one industry may hamper the reliability of the index and lead to comparability issues; this is particularly the case when countries use methods

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8. Source: Eurostat publication, *PEEIs in Focus, A summary for the services producer price index*, available at the following address: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-RA-12-005/EN/KS-RA-12-005-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-12-005/EN/KS-RA-12-005-EN.PDF)

resulting to either price of final service output or time-based price. Moreover, the treatment of quality changes is also likely to remain a challenge when considering the compilation of a reliable SPPI. In other words, although significant progress has been made to expand the availability of SPPI in OECD / EU countries, reliability and comparability of SPPIs remain a challenge when pricing services to constant quality. In this respect, special attention will also need to be paid to the following issues (albeit non-exhaustively): dealing with changes in productivity; dealing with globalization; and treatment of exports and international services.