

**Consumer goods and services**

**5**



## 5.1 Introduction

5.1 Individual consumption expenditure by households covers the actual and imputed final consumption expenditure incurred by households on the goods and services they require to satisfy their individual needs and wants. It accounts on average for over 60 per cent of GDP and over 85 per cent of actual individual consumption in EU Member States and OECD Member Countries. It is by far the most important of the seven main aggregates that constitute the Eurostat-OECD classification of GDP expenditures and, as such, it is central to the international price and volume comparisons organised by Eurostat and the OECD.

5.2 Households purchase a large and diverse assortment of individual goods and services, but only a subset of these are priced for the purpose of calculating purchasing power parities (PPPs). This chapter explains how the subset of consumer goods and services is selected and how the selected goods and services are specified for Eurostat and OECD comparisons. It also explains how prices for the specified products should be collected, how the prices collected are validated and how the validated prices are converted into national and annual purchasers' prices. The chapter begins with an overview of the survey process and then describes in detail each of its various stages.

5.3 The consumer services covered in this chapter do not include housing, in-patient hospital services and education. These services are covered respectively in Chapters 6, 7 and 8.

## 5.2 Survey process

5.4 An important feature of Eurostat and OECD comparisons is that prices for consumer goods and services are collected over a period of three years (see Chapter 3, Section 3.3). The basket of products comprising household final consumption expenditure is divided into six parts with prices for two parts being surveyed each year. This requires the organisation of six separate price surveys. The six surveys of the current cycle are listed in Box 5.1 together with a summary of the types of products each survey covers. The advantages of this rolling survey approach is that it lessens the response burden on participating countries and allows national statistical institutes (NSIs) to include the price surveys in their regular programme of data collection.

5.5 A second important feature of Eurostat and OECD comparisons is that there are too many participating countries for the six price surveys to be managed centrally by either Eurostat or the OECD. Organisation is therefore decentralised for operational reasons. Participating countries are divided into groups, each headed by a group leader. Members and leaders of the current country groups are listed in Chapter 3 Box 3.3. The responsibilities of the group leader include coordinating the establishment of a group product list for each survey and overseeing the validation of the prices collected by the group during each survey. Neither task can be accomplished without the active involvement of the group members. Eurostat and OECD oversee the co-ordination between group leaders and ensure a harmonised approach to the surveys between groups.

5.6 A generalised timetable of the survey cycle is outlined in Box 5.2. Two price surveys are conducted each year. For example, in year 2, prices are collected for survey 1 and survey 2, but preparations for the two surveys start in year 1 and the processing of the two surveys ends in year 3. Each survey takes around 24 months to complete and each has five phases: the preview and planning phase; the pre-survey and item list creation phase; the price collection and intra-country validation phase; the validation phase; and the evaluation phase. Within any calendar year, work is underway on all six surveys: the two surveys of the previous year are being finalised; the two surveys of the current year are being carried out; and the two surveys of the following year are being prepared.

**Box 5.1: Survey cycle**

Sequence	Survey	Coverage
<b>First year of cycle</b>	Survey 1: Food, drinks and tobacco	Food; non-alcoholic beverages; alcoholic beverages; tobacco.
	Survey 2: Personal appearance	Clothing; cleaning, repair and hire of clothing; footwear; goods and services for personal care; personal effects.
<b>Second year of cycle</b>	Survey 3: House and garden	Materials for the maintenance and repair of the dwelling; household appliances; glassware, tableware and household utensils; tools and equipment for house and garden; non-durable household goods such as products for routine cleaning and maintenance; audio-visual, photographic and information-processing equipment; games, toys, hobbies, gardens, plants, flowers and pets; newspapers, books, stationery and drawing materials; electrical appliances for personal care.
	Survey 4: Transport, restaurants and hotels	Personal transport equipment; spare parts and accessories, fuels and lubricants for the operation of personal transport equipment; equipment for sport, camping and open-air recreation; catering services; accommodation services.
<b>Third year of cycle</b>	Survey 5: Services	Maintenance and repair services for the dwelling; water supply; electricity, gas and other fuels; domestic and household services; maintenance and repair services for personal transport equipment; transport services; postal services; telephone and telefax services; maintenance and repair services for major durables; veterinary and other services for pets; recreational and cultural services; other services not specified elsewhere.
	Survey 6: Furniture and health	Furniture, furnishings, carpets and other floor coverings; household textiles; medical products, appliances and equipment; out-patient services.

Housing, hospital services and education are not included in the survey cycle as they are surveyed annually. Other consumer goods and services, such as narcotics, combined passenger transport, telephone and telefax equipment, major durables for outdoor and indoor recreation, games of chance, package holidays, prostitution, social protection, insurance, FISIM and other financial services, are also not included in the survey cycle either. This is because it is difficult to specify and price products for them that are comparable across countries. Reference PPPs are used for the basic headings containing these goods and services (see Chapter 12, Section 12.3.4).

5.7 Each phase consists of a number of steps. These are listed in Box 5.3 together with who carries out the step and the month, specified in relation to the month price collection starts, when the step is implemented. To understand the steps it is necessary to bear in mind that in any given calendar year there are two group leaders' meetings, one in early spring and the other in early autumn, and that these are followed some two to three weeks later by group meetings. Group leaders' meetings and the group meetings have a common standard agenda, namely: preview of the survey that will be carried out in a year's time; planning of the survey that will be carried out in half a year's time; finalising the product list for the next survey; validation of the survey that was carried out half a year ago; evaluation of the survey carried out one year ago.

5.8 The surveys require close collaboration and co-ordination between all parties involved: Eurostat, OECD, the NSIs and the group leaders. Also required is a high level of transparency because each country's PPPs depend on all countries' data. To enable this, the entire survey process is carried out with on-line tools that allow any participant to view other participants' data and to follow the entire process of list creation, price collection, validation and calculation.

5.9 This section describes briefly the various phases of the survey process. Each phase is subsequently described in more detail in the sections that follow.

**Box 5.2:** Generalised timetable for the survey cycle

Year	Half year	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
1	1 <sup>st</sup>	Preview		Evaluation	Validation	Creation of item list and price collection	Planning and pre-survey
	2 <sup>nd</sup>	Planning and pre-survey	Preview		Evaluation	Validation	Creation of item list and price collection
2	1 <sup>st</sup>	Creation of item list and price collection	Planning and pre-survey	Preview		Evaluation	Validation
	2 <sup>nd</sup>	Validation	Creation of item list and price collection	Planning and pre-survey	Preview		Evaluation
3	1 <sup>st</sup>	Evaluation	Validation	Creation of item list and price collection	Planning and pre-survey	Preview	
	2 <sup>nd</sup>		Evaluation	Validation	Creation of item list and price collection	Planning and pre-survey	Preview
4	1 <sup>st</sup>	Preview		Evaluation	Validation	Creation of item list and price collection	Planning and pre-survey
	2 <sup>nd</sup>	Planning and pre-survey	Preview		Evaluation	Validation	Creation of item list and price collection
5	1 <sup>st</sup>	Creation of item list and price collection	Planning and pre-survey	Preview		Evaluation	Validation
	2 <sup>nd</sup>	Validation	Creation of item list and price collection	Planning and pre-survey	Preview		Evaluation

5.10 The first phase of the survey process is the preview and planning phase. The aim of the phase is to review the methodology of the survey in question as well as its structure in terms of numbers of products to be priced. The process begins when the survey is first discussed at the group leaders' meeting of t-13. The starting point for the discussion is the evaluation report for the survey from the time it was last conducted. The discussion focuses on the principle features of the survey, its methodology and organisation, the problems specific to the products being surveyed, and the recommendations of the evaluation report. Other changes in methods and practices that may be necessary due to new market conditions or other developments since the previous survey are also considered. The conclusions reached at the group leaders' meeting are presented to the group meetings held later in the month to obtain initial feedback from participating countries.

5.11 Afterwards, in t-11, countries are sent a list of preview questions prepared by the group leaders. These have to be answered by t-8. The questions are designed to obtain information on the prevailing market situation and other associated topics. The responses received from countries will provide input into the planning discussion at the group leaders' meeting of t-7. During this meeting, decisions are taken on methodological issues, the target number of products to be priced for each of the basic headings covered by the survey and the definitions of the *structured product descriptions* (see Section 5.4.4) for the types of products being surveyed. These decisions are presented to the group meetings that follow the group leaders' meeting for approval by participating countries.

5.12 The next step is for group leaders to prepare the pre-survey product lists and make them available to countries through the *Item List Management Tool* (ILMT) by t-5. A pre-survey product list describes the products that are being proposed for pricing. The product descriptions include questions about the products and their markets. The proposals are based on decisions reached during the planning stage, on market research carried out by group leaders and on the product list from the last time the survey was held. The pre-survey list is an amended and updated version of the previous product list. Some products will have been discarded; others will have been redefined; and new products will have been added. It serves as a preliminary draft of the group product list for forthcoming price survey.

5.13 Participating countries carry out the pre-survey over two months in t-4 and t-3. This entails investigating the availability and importance of the products on the list, particularly the new products proposed by the group leader and later by other countries, proposing possible new products and answering the group leader's questions. Each country is expected to ensure that it can price a sufficient number of products for each of the basic headings being surveyed.

5.14 Subsequently, each group leader prepares a draft product list for their group on the basis of the results of the pre-survey. This involves selecting products whose availability and importance are found to be the highest among the countries in the group and adapting product specifications in line with the product parameters reported by countries. It also involves ensuring that the balance between branded and generic product specifications accommodates the different market situations of the countries in the group so that each country is able to price products that are representative of its consumption pattern. The draft lists are to be ready by the first week of t-2.

5.15 The draft group lists are then merged by Eurostat in the ILMT to produce the first draft of the *European product list* (see Section 5.4.3). The list is discussed in detail at the group leaders' meeting held at the beginning of t-1. The aim is to harmonise product definitions, to improve the overlap between group lists by increasing the number of products that appear on more than one group list, and to discuss the draft guidelines for the survey. The European product list is finalised at the group meetings held in the second half of t-1. The draft survey guidelines are also discussed at the group meetings. Immediately after the last group meeting, there is a follow up meeting of group leaders to decide any outstanding issues and to finalise the survey guidelines. The final European product list and the final survey guidelines are prepared by Eurostat and made available to countries at the end of t-1, just before the start of price collection.

5.16 Price collection and intra-country validation takes two and a half months from t to mid t+2. It is the responsibility of participating countries. On receipt of the final product list, countries select the

products for which prices will be collected. They are expected to price as many products on the product list as comparability and availability allow. To increase representativity and overlap, they are also allowed to price products that originally appeared on the lists of other groups.

5.17 Before reporting their prices to Eurostat, countries are expected to validate them. This is called *intra-country validation*. It is carried out without reference to the price data collected by other countries. (Prices are compared across countries during the *inter-country validation* phase discussed below.) The purpose of intra-country validation is to establish that price collectors within a country have priced comparable products and have reported the prices correctly. It involves editing the price observations for extreme values and checking the average prices for plausibility.

5.18 Countries are required to report their validated price observations and average prices to Eurostat by mid t+2. They are also expected to complete the sections of the *standard survey report* (see Section 5.5.8) that concern the pre-survey, the price collection and the intra-country validation and submit them to Eurostat at the same time.

### Box 5.3 Generalised survey timetable

Phase	Step	Who	When		
			Month vis-à-vis month of price collection	Survey 1 of year t	Survey 2 of year t
Preview and planning	01. First discussion of main issues at group leaders' meeting	Group leaders; Eurostat; OECD	t-13	Mar (t-1)	Sep (t-1)
	02. Main issues discussed at group meetings	NSIs; group leaders; Eurostat; OECD	t-13	Mar (t-1)	Sep (t-1)
	03. Preview questions sent to NSIs	Group leaders	t-11	May (t-1)	Nov (t-1)
	04. Preview answers sent to group leaders	NSIs	t-8	Aug (t-1)	Feb (t)
	05. Planning decisions prepared by group leaders' meeting	Group leaders; Eurostat; OECD	t-7	Sep (t-1)	Mar (t)
	06. Planning decisions agreed at group meetings	NSIs; group leaders; Eurostat; OECD	t-7	Sep (t-1)	Mar (t)
Pre-survey and product list creation	07. Pre-survey product list ready	Group leaders	t-5	Nov (t-1)	May (t)
	08. Pre-survey	NSIs	t-4 to t-3	Dec (t-1)-Jan (t)	Jun-Jul (t)
	09. Draft group product lists ready	Group leaders	t-2	Feb (t)	Aug (t)
	10. First draft of European product list ready	Eurostat	t-2	Feb (t)	Aug (t)
	11. First draft European product list discussed at group leaders' meeting	Group leaders; Eurostat; OECD	t-1	Mar (t)	Sep (t)
	12. Second draft European product list ready	Eurostat	t-1	Mar (t)	Sep (t)
	13. Second draft European Product list discussed at group meetings	NSIs; group leaders; Eurostat; OECD	t-1	Mar (t)	Sep (t)
	14. Follow up meeting of group leaders	Group leaders; Eurostat; OECD	t-1	Mar (t)	Sep (t)
	15. Final European product list ready	Group leaders; Eurostat	t-1	Mar (t)	Sep (t)

Phase	Step	Who	When		
			Month vis-à-vis month of price collection	Survey 1 of year t	Survey 2 of year t
Price collection and intra-country validation	16. Price collection and intra-country validation	NSIs	t to t+2	Apr-Jun (t)	Oct-Dec (t)
	17. Price file and sections 1,2, 3 and 5 of survey report sent to Eurostat	NSIs	t+2	Jun (t)	Dec (t)
Validation	18. Data cleaning and checking	NSIs; group leaders	t+2 to t+3	Jun-Jul (t)	Dec (t)-Jan (t+1)
	19. 1st European Quaranta table calculated	Eurostat	t+3	Jul (t)	Jan (t+1)
	20. Spatial adjustment factors sent to Eurostat	NSIs	t+3	Jul (t)	Jan (t+1)
	21. Analysis of 1st European Quaranta table	NSIs; group leaders	t+3 to t+4	Jul-Aug (t)	Jan-Feb (t+1)
	22. 1st European Quaranta table discussed at group leaders' meeting	Group leaders; Eurostat; OECD	t+5	Sep (t)	Mar (t+1)
	23. 1st European Quaranta table discussed at group meetings	NSIs; group leaders; Eurostat; OECD	t+5	Sep (t)	Mar (t+1)
	24. 2nd European Quaranta table calculated	Eurostat	t+6	Sep (t)	Mar (t+1)
	25. Continuation of validation	NSIs; group leaders; Eurostat	t+6	Oct (t)	Apr (t+1)
	26. Approval of survey results and closure of validation	NSIs; group leaders	t+6	Oct (t)	Apr (t+1)
	27. Section 4 of survey report sent to Eurostat	NSIs	t+7	Nov (t)	May (t+1)
Evaluation	28. Group leader survey reports to Eurostat	Group leaders	t+9	Jan (t+1)	Jul (t+1)
	29. Evaluation at group leaders' meeting	Group leaders; Eurostat; OECD	t+11	Mar (t+1)	Sep (t+1)
	30. Evaluation at group meetings	NSIs; group leaders; Eurostat; OECD	t+11	Mar (t+1)	Sep (t+1)

5.19 Inter-country validation by the group leaders starts immediately after the price data reported by countries have been uploaded to the central PPP database at Eurostat. The first step involves checking whether data have been entered correctly by countries. This takes until the beginning of t+3. By that time, most, if not all, data entry errors will have been identified and corrected and the average prices of the products surveyed should be sufficiently reliable for Eurostat to calculate the first version of the basic heading PPPs. These cover all participating countries and all basic headings surveyed. At the same time the *Quaranta table*, the main instrument for validation of the PPPs, is calculated. It is designed to screen average survey prices for possible errors and to assess the reliability of the PPPs they provide. It does this by comparing the prices for the same product in different countries and by analysing the dispersion of price ratios across countries and across products. A detailed description of the *Quaranta editing procedure* and the *Quaranta table* is available in Annex IV.

5.20 The group leaders and countries use the *Quaranta table* to carry out in-depth analysis of countries' data. The analysis focuses on the plausibility of the survey results, judged against previous survey results and overall price levels. It provides the means of verifying that countries have priced products that correspond to the product specifications, have followed the survey guidelines and have allocated the representativity indicators correctly. Countries are required to respond to all questions



raised by group leaders during the course of the validation. Even so, while group leaders can question or point to errors in a country's data, they cannot make any corrections. Only the country can change its data.

5.21 At the group leaders' meeting in the first half of t+5, the survey results are discussed in detail, the approaches to validation are harmonised and agreement is reached on any additional questions that need to be asked about the data of individual countries. The survey data are subsequently discussed with the countries in the group meetings that take place in the second half of t+5. This leads to further correction of data by countries following which a new Quaranta table is calculated by Eurostat. Validation continues on the basis of this table with group leaders and countries working together to resolve outstanding issues and to ensure correct and plausible results. Validation is complete when countries formally approve their data. This should be given during t+6.

5.22 In t+7, countries are expected to complete the section of the standard survey report that concerns inter-country validation and send it to Eurostat and their group leader. Later, in t+9, group leaders submit their own survey reports. These summarise the survey reports of the countries in their group, provide an overview of the advice given to countries during price collection and give a summary of the validation process. The reports should also contain proposals on how the organisation and methodology of the survey can be improved. In particular, they should clearly identify and explain the difficulties encountered during the preparation, execution and validation of the survey and propose solutions on how to overcome them the next time around.

5.23 Eurostat prepares a survey evaluation report based on the survey reports received from the group leaders. The report provides full documentation on the execution of the survey and gives recommendations for the next survey of its kind. It forms the input for the evaluation of the survey at the group leaders' meeting at the beginning of t+11. The conclusions reached by the group leaders are presented for adoption to the group meetings held in the second half of t+11. Twelve months later, in t+23, group leaders, Eurostat and the OECD will again consider the evaluation report when they preview the survey once again.

### 5.3 Preview and planning

5.24 Each survey starts with a review of the evaluation report on the survey the last time it was held (see Section 5.8). This report contains recommendations that were drafted after the closure of the survey. Each of the recommendations are considered again and taken on board in the preparation of the forthcoming survey. The first step in the preparation process is to draft a short preview questionnaire to collect from NSIs information on changes in the market, the importance of specific parameters in product definitions, the availability of international brands or to exchange views on potential methodological improvements. The aim of the preview questionnaire is to have the best possible basis for drafting the pre-survey lists (see next section).

5.25 Countries are requested to return the preview questionnaire in time for the group leaders to prepare themselves for a group leaders' meeting in which the planning of the survey takes place. Planning involves proposing target numbers of products per basic heading as well as any changes to the SPDs (see Section 5.4.4). Proposals on methodological issues are also made. The conclusions of the group leaders' meeting are presented to participating countries for endorsement at the group meetings that follow the group leaders' meeting.

5.26 The target number of products per basic heading is determined on the basis of the share in actual individual consumption of the basic heading as well as the price variation as measured in the survey previously. Besides these criteria, other considerations play a role as well. For example, services may have high shares in expenditures and high price variation, but it is much more difficult to define services that are comparable across countries than it is to define goods that are internationally comparable. Hence, for basic headings covering services, the number of products often falls somewhat below the theoretical targets. Also, some basic headings with high expenditure shares may only cover a few products. A case in point is automotive fuels, where the bulk of expenditure is on three or four products. It is obviously not necessary to include more than those products in the product list. There are as well cases where data sources allow the inclusion of more

products than theoretically would be required. Pharmaceutical products for which prices in many countries can be extracted from a central database are such a case.

5.27 Target numbers for basic headings are defined with a view to the resources available in participating countries. The target numbers are used by the group leaders in the development of their product lists (see the following section). Group leaders try to ensure that the final group product lists have a structure that is in line with agreed target numbers.

## 5.4 Pre-survey and product list creation

### 5.4.1 Requirements for product lists

5.28 Countries participating in the Eurostat and OECD comparisons collect prices for a sample of representative and comparable products. The prices are collected to calculate PPPs. PPPs are first calculated at the level of the basic heading. Prices, therefore, have to be collected with respect to a basic heading and the selection of products to be priced has also to be done at the level of the basic heading.

5.29 The objective is to select a sample of products that reflects the principal expenditures on the basic heading rather than the full coverage of the basic heading – that is, to select those products included under the basic heading that households are commonly buying.<sup>1</sup> There are two complications to be surmounted. One is the broad, if not heterogeneous, coverage of many basic headings. The other is that what consumers buy in one country is not necessarily the same as what they buy in another country. To some extent, these are compensatory difficulties. In general, the coverage of the basic headings, as defined in the Eurostat-OECD expenditure classification, is wide enough to accommodate the different consumption patterns of all participating countries. In other words, the coverage of most basic headings facilitates the selection of products that are available in more than one country even though the importance of the products with respect to expenditure on the basic heading is not the same for all countries in which they are found. Operationally, this requires participating countries to price not only products that reflect their own expenditure on the basic heading, but also products that reflect the expenditure of other countries on the basic heading.<sup>2</sup>

5.30 Individual consumption expenditure by households is broken down into 143 basic headings in the expenditure classification. Prices are currently collected for 123 of them and reference PPPs<sup>3</sup> are used for the remaining twenty. The majority of basic headings cover a wide range of products. Even when the products covered appear to be relatively homogeneous, the choice of products can still be large. For example, the basic heading *rice* covers “all forms [of rice] except flour”. It includes brown and white rice, long-grain, medium-grain and short-grain rice, aromatic rice such as basmati and jasmine rice, special rice such as arborio for risotto and calasparra for paella, parboiled and glutinous rice. In addition, all of them are sold under various brand names, in a variety of package types and sizes, and with varying percentages of broken rice.

5.31 Faced with such an array, selecting a subset of products for a basic heading that can be priced over a number of countries is clearly going to be difficult, much more difficult than it is to select the products to be priced at the elementary level of a consumer price index (CPI) within a single country. There, within broad guiding parameters, the selection can be left to the price collector whose choice may differ from outlet to outlet providing it does not change over time. This initiative cannot be allowed to price collectors collecting prices for Eurostat and OECD comparisons because they are

<sup>1</sup> For example, the basic heading *fresh and chilled fruit* covers all varieties of fruit. But if households mostly buy common varieties, such as apples, pears, oranges, lemons, grapefruit and bananas, and spend little on exotic varieties, like mangoes, guavas, papayas, pineapples and pomegranates, the sample of products selected for the basic heading would consist mainly, if not wholly, of common varieties.

<sup>2</sup> To continue with the example of footnote 1. If household expenditure on fruit is mainly on common varieties in some participating countries and mostly on exotic varieties in others, the sample of products chosen for the basic heading *fresh and chilled fruit* would be a balanced selection of common and exotic varieties. And countries, regardless of their preferences, would be expected to price both common and exotic varieties as available.

<sup>3</sup> Reference PPPs are PPPs that are used for basic headings for which no prices are collected. They are taken from elsewhere in the comparison to serve as proxies for the missing PPPs. See Chapter 12, Section 12.3.4.

spatial comparisons. The products priced must be comparable across all participating countries pricing them and at all outlets at which the products are priced. If they are not, quality differences will be disguised as price differences leading to biased price relatives. Price levels will be too high for countries pricing superior quality products and too low for countries pricing inferior quality products. To ensure this does not happen, each good and each service selected needs to be defined precisely so that price collectors in participating countries can identify and price a comparable good or service in their domestic markets. If a product cannot be defined precisely, it should not be selected. Product specification is discussed later in the section.

5.32 Not only do the products selected have to be comparable across participating countries, they also have to reflect the expenditures on the basic heading in each country – that is, they have to be representative of the price levels of participating countries for the basic heading. A representative product is generally defined as one that accounts for a significant share of a country's expenditure within a basic heading because this means its price level will be close to the country's average price level for all products in the basic heading. Representativity is specific to an individual country and a particular basic heading.<sup>4</sup> Patterns of consumption vary from country to country as the result of differences in tastes, cultures, climates, income levels, price structures and product availability. Products comparable across countries may be representative for some countries but not for others.

5.33 For a comparison to be based on the prices of products that are both comparable and representative, participating countries have to price both their own representative products and, according to availability, a selection of the representative products of others. Representative products normally have lower price levels than unrepresentative products. If the representativity of the products selected is unevenly distributed among participating countries, biased price relatives will arise. Price levels will be too high for countries pricing a smaller number of representative products and too low for countries pricing a larger number. To avoid this, the selection of comparable and representative products for a basic heading should be balanced or equally representative.

5.34 Equal representativity – or *equi-representativity* - does not require all participating countries to price the same number of representative products for a basic heading. As explained in Chapter 12, the method used by Eurostat and the OECD to calculate the PPPs for a basic heading ensures that any imbalance between countries in the number of representative products priced does not produce biased price relatives. The method requires that each participating country price at least one representative product per basic heading. This is a necessary condition to calculate unbiased PPPs, but it is not a sufficient condition to obtain robust PPPs. For this, each participating country should price that number of representative products which is commensurate with the heterogeneity of the products and price levels within the basic heading and with the importance of its own expenditure on the basic heading. To be able to do this, each participating country should make sure during product selection that it can price the required number of representative products from among those being chosen for the basic heading.

5.35 The issue of heterogeneity raised earlier is partly eased by the way basic headings are defined in the Eurostat-OECD expenditure classification. There, definitions list the products covered by the basic headings. For example, the basic heading *other bakery products* includes “crispbread, rusks, toasted bread, biscuits, gingerbread, wafers, waffles, crumpets, muffins, croissants, cakes, tarts, pies, quiches and pizzas”. The lists are not exhaustive, but they are sufficiently extensive to allow the more heterogeneous basic headings to be subdivided into smaller and more homogeneous product groups. Having broken down the basic heading in this way, it becomes easier to identify which subgroups and which products in the subgroups should be selected, providing that information is available on current market conditions.

<sup>4</sup> See Section 5.5.6 on assigning asterisks for a more complete explanation.

## 5.4.2 Pre-survey

5.36 Product selection starts with the pre-survey. During the pre-survey, information is collected from participating countries on the availability and importance of the set of products proposed for the survey as well as on the descriptions of these products. The aim is to have a solid basis for establishing a well-balanced and equi-representative product list for the survey.

5.37 Responsibility for the selection of products for the pre-survey rests with the group leaders. The selection is made on the basis of the information collected throughout the preview and planning phases. Consultation of participating countries during preview and planning is conducted by email. Thereafter, all exchange of information relating to the pre-survey and the subsequent creation of the final product list is carried out on-line through the ILMT.

5.38 The pre-survey list specifies the products that the group leader proposes the group prices for the price survey. The product specifications are accompanied by questions about the parameters specified and about the availability and importance of the products proposed as shown in Box 5.4. The starting point for the pre-survey list is the group product list used the last time the survey was conducted. The list is amended and updated to take account of the information provided by countries during the preview and planning stages, the decisions reached at group leaders' meeting during the planning stage, and the market research carried out by the group leader or by one of the other group leaders.

5.39 As a result, some products will have been deleted either because they are no longer available on the market or because they proved to be too difficult to specify the last time they were surveyed. Some products will have been proposed for deletion because either their availability or their importance to consumers is questioned. Other products will have had their specifications redefined either because a new model with different technical parameters has appeared on the market or because there is a need to tighten up the existing specification so as to reduce the price variation observed when it was previously priced. And new products that did not exist before or were just beginning to appear on the market at the time of the previous survey will have been added together with their specifications. The pre-survey product list is in effect an annotated preliminary draft of the group product list for forthcoming price survey.

5.40 The pre-survey product list is made available to countries through the ILMT. Participating countries are asked to determine whether the products can be found on their domestic markets, whether they can be found as specified and whether they are important for the country to have on the final product list. Countries collect the information in a variety of ways, including visiting some of the outlets where the actual price collection will be conducted.

5.41 For each product on the pre-survey list, countries are required to:

- Indicate the availability of the product on their market;
- Answer all the questions on basic headings, SPDs or items posed by the group leader in the ILMT.

In addition, they can:

- Indicate whether it is important for them to have the product on the final product list;
- Propose alternative definitions or parameters for products on the pre-survey list;
- Propose entirely new products.

5.42 Participating countries are expected to be proactive in the pre-survey by proposing products for those basic headings for which they cannot price the necessary number of representative products. For a product to be included on the final product list at least one other country, besides the proposing country, has to agree to price it. This is a minimum condition. It is preferable that more than one country agrees to price it. In practice, the products proposed usually have to be available and representative in a majority of countries in the group to be added to the list. Even then, compromises will have to be arbitrated by the group leaders to avoid the product list for the basic heading becoming too long or imbalanced. Not all proposals made by countries will be accepted.

Countries should not be deterred by this. Their product proposals are an important input into the pre-survey process so they should still take the initiative and make them.

5.43 Apart from outlet visits, possible sources of information used in the pre-survey include: the CPI; household budget surveys and retail trade surveys, though they may not be timely or detailed enough; market research companies, whose data can be expensive to acquire; chambers of commerce and consumer organisations; trade fairs and expositions; consumer magazines and trade magazines; marketing documentation such as brochures and catalogues; and the internet. Information can also be obtained by interviewing marketing experts, producers, importers, sales managers and shop buyers. By visiting outlets, looking at what they are selling and talking to owners and sales personnel, a clear picture of what is being sold and how it is being marketed can be established.

5.44 The pre-survey provides participating countries with the means to ensure that the final product list will be equi-representative. By being able to reject, modify and propose product specifications, countries can make sure that, for each basic heading, they are able to price during the price collection that number of representative products which the importance of the basic heading and the degree of price variation within the basic heading warrant. The importance of a basic heading is determined by its share of the total expenditure on the basic headings being surveyed. A measure of price variation within a basic heading can be found in the Quaranta table generated the last time prices were collected for the basic heading.<sup>5</sup> Countries are expected to submit their modifications to existing specifications and their proposals for new specifications within the framework of the structured product descriptions for the products affected.

5.45 A price survey, like any other statistical enquiry, requires thorough preparation if it is to obtain reliable results efficiently and cost effectively. From this perspective, the importance of the pre-survey to a successful price survey cannot be over-emphasised. Besides being the means by which the product list for the forthcoming price survey is shaped and finalised by establishing the availability and representativity of products proposed for the final product list, it also verifies whether they have been specified in a form that ensures that countries pricing them will be pricing comparable products. By doing this the pre-survey impacts on the quality of the results of the survey.

### 5.4.3 Establishment of the final product list

5.46 On the basis of the replies received from group members, the group leader revises the product list contained in the pre-survey questionnaire to produce the draft group product list.<sup>6</sup> The group leader will include the products with the highest availability, add newly proposed products if they are available in several countries, update the product definitions to the latest market developments and remove products that are no longer available.

5.47 On completion of the group lists, the first draft of the European product list is created by Eurostat merging the four group lists. Products that are included on two or more group lists are called *overlap products* and overlap products covering all four group lists can be seen as the core of the European product list. Overlap products ensure that the country groups can be combined in a single comparison. The share of overlap products varies from survey to survey.

<sup>5</sup> See Annex IV, Section IV.5.

<sup>6</sup> Whether the responses of a group member to the pre-survey questionnaire are partly or wholly reflected in the draft group product list depends on the responses of the other group members and how these are balanced by the group leader.

**Box 5.4: Example of pre-survey questionnaire for the basic heading *Rice***

Group Leader question(s):	Do we need all 4 items for Long-grain rice in the list? Which 3 do you prefer? Which one of the 4 other "rice" items are your favourites (round-grain, basmati, Thai rice, rice ready to eat)? Do you think it is important to specify the cooking time? Or just have it as an indication?
Other remarks from the Group Leader:	
Country answer(s):	Representative on our market is the SB item and the BL one (aa, ad). Round grain rice and Basmati are equal but Basmati becomes more popular. To specify cooking time is not important. Just as info in item description. No vacuum sold rice available beside some rice ready to eat.
Other remarks from the country:	

present item proposals	Enter here any suggestions for new values for parameters	Group leader question(s)	Other remarks from the Group Leader	Country answer(s)	Other remarks from the country
------------------------	--	--------------------------	-------------------------------------	-------------------	--------------------------------

**11.01.11.1.01.aa Long-grain rice, SB**

Available - (Y)es, (N)o :

Y

Important - (Y)es, (N)o, (U)ndefined :

Y

Picture: YES Brand: Y Brand Type: Single / multiple brand specified Reference Quantity: 1000 Reference Unit: g Type: long-grain, white rice Parboiled: yes Cooking time: 10 - 15 min Quantity: 500 - 1000 g Exclude: if in cooking bags Price for: 1 package Specify: Quantity		Cooking time: are there still several possibilities for this brand available on your market?		20 min and 10 min. No price influence. Brand Y is absolute number one.	
---	--	--	--	--	--

**11.01.11.1.01.ab Long-grain rice, WKB**

Available - (Y)es, (N)o :

Y

Important - (Y)es, (N)o, (U)ndefined :

N

Picture: NO Brand: Brand Type: Well Known Reference Quantity: 1000 Reference Unit: g Type: long-grain, white rice Parboiled: yes Cooking time: 15 - 20 min Quantity: 500 - 1000 g Exclude: Brand Y; if in cooking bags Price for: 1 package Specify: Brand   Cooking time   Quantity	400 - 1000 g	Cooking time: can we enlarge from 10 to 20 min?		Ok enlarge cooking time.	No need to specify cooking time Most sold quantity is 400 g
---	--------------	---	--	--------------------------	--

5.48 A code in the product description indicates the group lists on which the product is to be found. For example, products on the Northern group list will be coded with either “N”, “EN”, “NW”, “NS”, “ENW”, “ENS”, “NSW” or “ENSW” where “N” stands for the Northern group list, “E” for the Eastern group list, “W” for the Western group list and “S” for the Southern group list.

5.49 The draft European product list is first discussed at a group leaders’ meeting in order to harmonise product descriptions and to examine and, if needed, increase the overlap between the group lists. Overlap products can often be created by combining the specifications of products on different group product lists that have similar characteristics: for example, by increasing the range of a parameter such as package size or by identifying clusters of brands that are thought to have equivalent brand values. They can also be obtained by group leaders agreeing to include the products of other groups on their group product list. The process is one of negotiation between group leaders overseen by Eurostat and the OECD.

5.50 After the group leader’s meeting, a second draft European list is created which is presented, together with draft survey guidelines, to participating countries at the ensuing group meetings. Here, the countries have a last chance to comment on the list, to push for the inclusion of products that are important to them or to ask for modifications of the product specifications. Immediately after the group meetings, the group leaders meet again to decide the final outstanding issues and to finalise the survey guidelines. The European list, and thereby the four group lists that constitute it, is finalised just before price collection starts.

5.51 Group leaders ensure that their group list is representative for the countries in their group and reflects the availability of comparable products in the domestic markets of the countries in their group. Hence, for any particular group, the final group list embedded in the European list is the starting point for the price collection for the countries in the group. But countries may also choose to price products from the lists of other groups. This possibility may be useful for those countries that have neighbouring countries in other groups<sup>7</sup> or have very specific market structures for certain basic headings.

#### 5.4.4 Structured product descriptions

5.52 Countries participating in Eurostat-OECD comparisons are required to price products that are comparable. This is to ensure that differences in the prices of the products between countries are real prices differences and do not reflect differences in quality. Comparability is obtained by pricing products that have identical or equivalent physical and economic price determining properties. Each product on the European product list has a product specification that fully defines the product in terms of the principal characteristics that influence its market price.

5.53 Underlying these product specifications are structured product descriptions (SPDs). SPDs are designed to standardise the product specifications for different types of products so that all specifications for a particular type of product are defined in the same way and specifying the same parameters. Standardising product specifications helps to improve their precision making it easier for price collectors to determine whether or not the product in an outlet matches the product specified. Also, by identifying the parameters that need to be specified for different types of products, SPDs provide a framework within which product proposals can be presented uniformly across groups.

5.54 Examples of SPDs are given in Boxes 5.5A and 5.5B. From these it can be seen that SPDs cover a group of products such as pastas or haircuts. SPDs are broader than product specifications. All the parameters listed in a SPD are not necessarily repeated in a product specification because some of them may not be relevant to the product being specified. For example, the parameter filling in the SPD for pasta products is relevant for tortellini but not for spaghetti. SPDs are specific to the basic heading containing the product it delineates. Products such as fresh vegetables and fresh fruits which could share a common SPD do not because they are in different basic headings. The SPDs developed for Eurostat and OECD comparisons are based on the experience gained from specifying

<sup>7</sup> For example, Austria is a member of the Eastern group but its markets may have many similarities with those of Switzerland and Germany that are member of the Western group. By choosing to price some products of the Western group list, Austria would strengthen its comparison with those countries

products for previous surveys. But they are not fixed, they evolve. They are kept up to date through the feedback received from pre-surveys.

**Box 5.5A: SPD for pasta products**

Code:	11.01.11.5.01.aa	11.01.11.5.01.ac	11.01.11.5.01.ca	11.01.11.5.01.da	11.01.11.5.01.ea
<b>Name:</b>	<b>Spaghetti, SB</b>	<b>Spaghetti, BL</b>	<b>Tortellini or ravioli, fresh, WKB</b>	<b>Lasagne Bolognese, frozen, WKB</b>	<b>Noodles, instant, portion pack, WKB</b>
<b>Brand:</b>	BUITONI, BARILLA, DE CECCO, PANZANI (S)		(S)	(S)	(S)
<b>Brand Type:</b>	single / multiple brand specified	brandless	well-known	well-known	well-known
<b>Reference Quantity:</b>	1000	1000	200	500	100
<b>Reference Unit:</b>	g	g	g	g	G
<b>Type:</b>			fresh tortellini or ravioli	frozen lasagne Bolognese	dried instant noodles, with min. 1 spice mixture/oil sachet
<b>Made with:</b>	hard wheat (durum)	hard wheat (durum)			Wheat
<b>Eggs:</b>	no	no			No
<b>Length:</b>	approx. 30 cm	approx. 30 cm			
<b>Filling:</b>			any	tomatoes, minced meat	
<b>Package type:</b>			industrially packed (vacuum or gas preserved)		
<b>Quantity:</b>	400 - 600 g (S)	500 - 1000 g (S)	200 - 350 g (S)	300 - 600 g (S)	55 - 90 g (S)
<b>Exclude:</b>	quick cooking spaghettis	quick cooking spaghettis		low calories products	rice noodles, noodle pots
<b>Price for:</b>	1 package	1 package	1 package	1 package	1 package
<b>Label:</b>		(S)			

(S): parameter to be specified during the price collection



Box 5.5B: SPD for a hairdresser

Code:	11.12.11.1.01.aa	11.12.11.1.01.ac	11.12.11.1.01.ba	11.12.11.1.01.bb	11.12.11.1.01.bd
Name:	Men's scissors cut, dry, barber's shop	Men's scissors cut, wet	Ladies' haircut	Ladies' haircut and colouring	Ladies' hair setting with curlers
Brand Type:	brand not relevant	brand not relevant	brand not relevant	brand not relevant	brand not relevant
Reference Quantity:	1	1	1	1	1
Reference Unit:	service	service	service	service	service
Type:			cutting long hair to short + creating a new hairstyle	haircut + 1 permanent colour (single process)	
Type of establishment:	barber's shop (no advance booking)	common hairdresser	common hairdresser	common hairdresser	common hairdresser
Length of hair:	short	short	long	medium	Medium
Washing:	no	yes	yes	yes	Yes
Blow drying:		yes	yes	yes	Yes
Products applied:	none	normal shampoo, styling/fixing product	normal shampoo, styling/fixing product, VIP stylists	normal shampoo, colour, styling/fixing product	normal shampoo, setting lotion, styling/fixing product
Exclude:				bleach, foils, highlights, multi-colour, VIP stylists	permanent wave
Price for:	1 service	1 service	1 service	1 service	1 service

5.55 In principle, parameters are only included in a product specification if they have – or are assumed to have – an impact on the price of the product. Parameters that do not influence price do not need to be included because products that only differ in these parameters can be assumed to be comparable. Also, the more parameters included in a product specification, the more difficult it can be for a price collector to identify the product in an outlet and the fewer prices will be collected. In practice, a balance has to be struck between the tightness of a product specification and the need for collecting a sufficient number of prices.

#### 5.4.5 Product specifications

5.56 The product specifications used for Eurostat and OECD comparisons are either *brand and model specific* or *generic*. A brand and model specification designates the specific brand and model to be priced. A generic specification lists only the relevant technical parameters of the product to be priced. It does not identify any brand or model. A brand and model specification has a tight definition. Countries pricing a specification stipulating a particular brand and model are, in principle, pricing identical products. A generic specification has a looser definition. Countries pricing a generic specification are, in principle, pricing comparable products. In practice, models with the same identifiers in different countries are not necessarily identical or even comparable, while generic specifications, especially those that are too loose or too open-ended, are susceptible to variations in quality. As neither Eurostat nor the OECD adjust prices to accommodate quality differences, it is important that the product specifications, particularly the generic specifications, are sufficiently detailed to ensure that participating countries price products of the same or similar quality.

5.57 Box 5.6 lists the characteristics of the various types of product specifications used by Eurostat and the OECD for the price surveys of consumer goods and services. It can be seen that product specifications with brand specific definitions comprise either a single designated multinational brand and model or a cluster of designated multinational brands and, in some cases, models. In addition to specifying the brand and model, or the brands and models, the product specifications also include a comprehensive list of the relevant technical parameters (as defined by the SPD) that have to be matched to obtain comparability. Product specifications with generic definitions distinguish between products of international or national well-known - but unidentified - brands and products without a brand either because they are labelled with a brand name that is meaningless to the purchaser or because to specify a brand is meaningless as it is for most services. Generic definitions provide a detailed list of the technical parameters that have to be matched if the item priced is to be comparable with others priced under the same product specification. Examples of the different types of product specifications are provided in Box 5.7.

5.58 The product specifications give particular importance to brand. There are two reasons for this. The first is that brands provide tight specifications that make possible the identification and pricing of goods that are exactly the same in the countries pricing them. The second is that the brand itself may have a value. Consumers often perceive products with certain brand names as preferable to similar products sold under other brand names. Usually this is because some brands are considered to be of superior quality to others. For example, original or proprietary drugs are frequently regarded as more reliable than generic or non-proprietary drugs that have exactly the same composition and properties. Consumers' perception may have nothing to do with quality but is due to an image of uniqueness or desirability fostered by publicity, fashion or both. Whatever the reason, consumers are prepared to pay more for brand names with a brand value. A brand name with a brand value is a price determining characteristic and as such should be included in the product specification.

5.59 Product specifications that are brand and model specific have two possible disadvantages. The brand and model stipulated may not be available or, if available, the brand and model may not be representative. Specifying clusters of comparable brands and models partly addresses these issues, particularly that of availability. In many participating countries, the representative branded products are to be found among the *well-known brands* stratum under *generic definitions* in Box 5.6. This can be a broad stratum and not all the well-known brands in it can be expected to have a similar brand value. Hence, items with well-known brand names priced in different countries may match the technical parameters exactly but, if their brand names do not have a similar brand value, they are not necessarily comparable. Differences in prices will reflect not only pure price differences but also perceived quality differences.

**Box 5.6: Product specifications**

Type of specification	Brand specific definitions		Generic definitions		
	Single brand specified	Multiple brands specified	Specified as <i>well-known brands</i> but brands not named	Without a brand	
				Specified as <i>brandless</i>	<i>Brand not a relevant term</i>
<b>Refers to</b>	Specific brand(s) or shop chain(s), usually having a wide spread across countries		International or national brands or shop chains	Goods without a brand label or with a brand label that is meaningless to consumers <sup>1</sup>	Services and certain types of goods such as fresh food and furniture
<b>Brand value</b>	Yes		Yes	No	Not applicable
<b>Selling point</b>	Reputation of the producer(s) or shop chain(s) and assumed quality of the product		Reputation of the producers or shop chains and assumed quality of the product	Low price	
<b>Product description comprises</b>	Brand(s), model(s) and other technical parameters		Reference to <i>well-known brands</i> and a detailed list of relevant technical parameters	Reference to <i>brandless</i> and a detailed list of relevant technical parameters	No reference to brand and a detailed list of relevant technical parameters
<b>To be collected and reported</b>	Only prices of the designated brand(s) and model(s)		Prices for well-known branded goods meeting the technical parameters of the product description	Prices for products meeting the technical parameters of the product description	
		Names of brands priced	Names of brands priced	If labelled, names of "fantasy" brands priced	

<sup>1</sup> Often the brand labels will have fantasy names which sound like the name of an international brand or logos that mimic the logo of an international brand.

5.60 To overcome this, efforts are being made for those kinds of products for which brand value is important<sup>8</sup> to divide well-known international brands into three segments - high, medium and low - that reflect the brand value perceptions in participating countries. Group leaders and participating countries classify brands that are on the market in at least more than one country into these segments, for each group of products. This way, for each survey, lists of brands and their classification are produced that countries should use during the price collection. These lists are also useful as an aid in the classification of national brands, by comparing the quality and brand value of the national brands to the international brands.

5.61 It may be that brands have different brand value in different countries. For this reason, the classification of brands into high, medium and low segments is in principle only indicative and each country should make its own assessment of the value of a particular brand during the price collection. Nevertheless, countries should list and explain those cases in which they deviate from the agreed classification.

<sup>8</sup> Examples are clothing, footwear, furniture, household durables and consumer electronics.

**Box 5.7: Examples of product specifications**

Product	Technical parameters
11.01.11.5.01.aa Spaghetti, SB	<i>Brand:</i> BUITONI, BARILLA, DE CECCO, PANZANI <i>Reference quantity:</i> 1000 g <i>Made with:</i> hard wheat (durum) <i>Eggs:</i> no <i>Length:</i> approximately 30 cm <i>Quantity:</i> 400 - 600 g <i>Exclude:</i> quick cooking spaghetti <i>Price for:</i> 1 package <i>Specify:</i> brand, quantity
11.04.32.1.01.aa Plumber, hourly charge	<i>Reference quantity:</i> 1 hour <i>Service:</i> replacement of 1 old mixer tap by 1 new in a wash basin <i>Time:</i> on a regular working day and without urgency (ordered in advance) <i>Qualified worker:</i> yes <i>Any changes to the existing pipes:</i> no <i>Price excludes:</i> price of the tap, travel costs <i>Price for:</i> 1 h
11.05.31.1.03.ga Washing machine, top loader, 5.5 kg, AEG-ELECTROLUX LAVAMAT 46200	<i>Brand:</i> AEG-ELECTROLUX <i>Reference quantity:</i> 1 piece <i>Model:</i> LAVAMAT 46200 (indicative) <i>Type:</i> top loader <i>Wash capacity:</i> 5.5 kg <i>Spin speeds (max):</i> 1200 rpm <i>Display:</i> simple, LED (2 - 3 digits) <i>Energy efficiency class (EEC):</i> A or A+ <i>Wash performance class (WPC):</i> A <i>Spin drying class (SDC):</i> B <i>Time pre-selection:</i> no <i>Colour:</i> white <i>Dimensions (H x W x D):</i> approximately 85 x 40 x 60 cm <i>Price for:</i> 1 piece <i>Specify:</i> model
11.09.14.1.01.cb Music CD - Pop, Top 5	<i>Reference quantity:</i> 1 piece <i>Type:</i> in Top 5 of most sold pop music CDs at the time of the survey <i>Year of publishing:</i> <i>Exclude:</i> CD singles, doubles and boxes <i>Price for:</i> 1 CD <i>Specify:</i> artist, title of CD
11.12.11.1.01.ba Ladies' haircut	<i>Reference quantity:</i> 1 service <i>Type:</i> cutting long hair to short + creating a new hairstyle <i>Type of establishment:</i> common hairdresser <i>Length of hair:</i> long (cut to short) <i>Washing:</i> yes <i>Blow drying:</i> yes <i>Products applied:</i> normal shampoo, styling/fixing product, VIP stylists <i>Price for:</i> 1 service

5.62 Before each price survey, the pricing guidelines are reviewed and adapted to meet the needs of the survey. These and the group product lists are made available to participating countries at the same time. In general, the following practices have to be observed when pricing the different types of product specifications given in Box 5.6:

- When a single brand and model is specified, only the brand and model specified should be priced. No other brand may be priced. If the model specified is no longer available on the market, the replacement model – that is, the model with which the specified model has been replaced by the producer – should be priced instead.
- When multiple brands are specified, only the brands specified should be priced. No other brands may be priced. Prices may be collected for just one of the specified brands – the most representative – or for more than one of the specified brands. All the brands priced should be representative.
- When well-known brands are priced, prices may be collected for just one brand – the most representative – or for more than one brand. All the brands priced should be representative.
- When pricing a segment of well-known brands, only brands that have the required brand value should be priced. The indicative list of brands that is provided with the survey guidelines should be used as reference for deciding on the value of a particular brand. Prices may be collected for just one brand – the most representative – or for more than one brand. All the brands priced should be representative.
- When brandless products are priced, a range of the brandless items in the outlet that match the product specification should be priced.
- Fake brands – that is, brands that forge the products and name of an established brand – are not to be priced either as substitute for the brand they counterfeit or as a brandless product. (Note, brandless products with fantasy names or logos that mimic the name or logo of an established brand are not fake brands.)
- When a range is specified for a package size, such as 500 g to 1000 g or 0.75 l to 1.5 l, the package size within the range that is the most typical for the domestic market should be priced. When the typical size is not known, prices should be collected for all sizes within the range that are available on the domestic market.
- When pricing generic specifications, it is necessary to match the technical parameters of the product observed with those of the product specified to assess whether the two products are comparable. Such an assessment should not be done by just looking at the number of parameters not matching. Account also needs to be taken of the degree to which they do not match. A product observed with “near misses” on most, if not all, characteristics could still be an acceptable substitute for the product specified.
- In cases where different models of a product exist on the market that all match the product specification, the most basic model should be priced.

5.63 The majority of the product specifications on group product lists are supported by pictures of the products they specify. The pictures show price collectors what it is they are searching for, what it is they have to price. Price collectors do not always envisage the same product from a written description, particularly if they are reading it in translation.<sup>9</sup> Care is taken to ensure that pictures accompanying brand and model specifications depict the actual brands and models to be priced. Care is also taken that pictures illustrating generic specifications are also generic – that is, they do not show any brand name or logo which could be misunderstood by price collectors. When a product specification is updated, the picture is also updated.

<sup>9</sup> Product specifications are first drafted in English. They are subsequently translated, if needed, into the national language for price collectors in the short space of time between receipt of the final group product list and price collection.

## 5.5 Price collection and intra-country validation

5.64 Participating countries are responsible for price collection. They are required to collect prices at a sample of outlets chosen to reflect consumer purchasing patterns for the types of products being surveyed. They are expected to price as many products on the list as comparability and availability allow. After the price survey, countries are required to edit the prices collected for *outliers*<sup>10</sup> using the *Data Entry Tool* (DET) software supplied by Eurostat. After making the necessary corrections, they send the individual price observations and a report on the survey to Eurostat.

5.65 In order for each participating country to price a set of internationally comparable products across a representative sample of outlets, the price surveys need to be carefully planned and prepared by their national organisers. Before starting price collection, participating countries are expected to carry out a number of tasks. These involve:

- selecting the outlets that are to be visited by price collectors and contacting the outlets selected to explain why they are to be visited;
- preparing pricing materials and other documentation for price collectors (product specifications, survey guidelines, price reporting forms (including electronic versions if applicable), outlet codes and co-ordinates, schedule of visits, identification and letters of introduction, etc.), including the translation of product specifications and survey guidelines into the national language if necessary;
- identifying which specifications on the final product list are to be priced and, in the case of generic specifications, which brands are to be priced (if these tasks are not left for the price collectors to do themselves);
- convening a meeting with price collectors to clarify the pricing and supporting materials prepared and issues such as how many items to be priced per basic heading, how many prices to be collected per item, etc.

5.66 The tasks above are important because they prevent non-response and reduce non-sampling error. Participating countries will find that, by providing price collectors with clear and precise written instructions and by ensuring that they are adequately briefed, the subsequent validation of survey prices will be less burdensome. Products are more likely to have been priced to a constant quality across outlets and the number of atypical prices collected is also likely to be small.

---

<sup>10</sup> Outliers are unusually high or low prices that need to be checked to ensure that price collectors have not made mistakes in collecting or reporting prices. The Eurostat software identifies outliers by reference to the range and variance of the prices collected for each item.

### 5.5.1 Prices to be collected

5.67 The object of the price surveys is to collect the prices that purchasers actually pay to sellers to acquire the goods and services specified on the final product list at the time of the survey. In other words, the intention is to collect actual transaction prices. Experience shows that it is neither practical nor cost effective to collect such prices from purchasers. The prices are collected from sellers instead. Most sellers display the prices at which they are prepared to sell their products. But the prices at which products are offered for sale are not necessarily the prices at which they are actually sold. NSIs with access to scanner data can collect actual transaction prices. However, the majority of NSIs are without such access. Rather, they have to collect the prices that purchasers would have to pay if they were to actually purchase the goods and services specified at the time of the survey. In other words, price collectors observe *offer prices* but, before recording them as transaction prices, they have to establish whether or not the offer price includes delivery and installation costs, VAT and other indirect tax on products, discounts, surcharges and rebates, invoiced service charges and voluntary gratuities or tips, and adjust it accordingly.

- *Delivery and installation costs* should be included in purchasers' prices by definition. But, for reasons of comparability, they are not to be included in the transaction price reported by participating countries unless it is explicitly stipulated in the product specification that they should be. When goods, such as major household appliances, furniture and floor coverings, have unspecified "free" delivery and installation costs included in their offer price, this should be noted when recording the price observation.

There is an exception to this rule. Items obtained through mail order or through the internet should always include delivery charges.

- *VAT and other indirect taxes on products* should be included in the transaction price. Sometimes these taxes are included in the offer price, sometimes they are not. It depends on the country and on the product. When they are not included, the offer price should be adjusted by the precise rate(s) of tax(es) applicable and recorded as the price observation. Both the unadjusted offer price and the rate(s) of tax(es) applied should be noted when recording the price observation.
- *Discounts, surcharges and rebates* should be included in the transaction price if they are available to all purchasers throughout most of the year. Temporary price reductions, such as those available during seasonal sales and discount days or as "special offers", should be ignored. Discounts that are offered only to a selected group of purchasers, such as store account holders or holders of certain credit cards, should be ignored too. On the other hand, some kinds of goods, or the goods at some types of outlets, are offered at "permanent discounts". The reductions from the list price are openly stated and, usually, the goods have never been sold at the higher price. In this case, it is the discounted price that should be recorded as the price observation.

Exceptions to this rule are sales that last for longer than four weeks and products for which a substantial proportion of their sales occur at reduced prices during the sales season.

For some products, notably motor cars, discounts are generally available but not openly stated. Offer or list prices are available and purchasers attempt to negotiate a price below that level. The situation with motor cars is complicated further because of trade-ins, "free" extras and the inclusion of registration and other administrative costs in the package, but none of these should be included in the transaction price unless expressly stipulated in the product specification. In principle, the transaction price should include the negotiated discount, but participating countries are not expected to report transaction prices. Instead they are required to report list prices. The PPPs that Eurostat calculates for motor cars are based on these list prices.

Manufacturers sometimes offer rebates in the form of "cash-back" schemes where the purchaser is given a cash sum in exchange for vouchers available with the product. In general these schemes should be ignored because they usually impose some conditions on the purchaser and the proportion taken up is small. But, when the value of the cash returned is large and the scheme is open to all purchasers without conditions for a period longer than

four weeks, the offer price should be reduced accordingly and recorded as the price observation. The unadjusted price, the amount returned and the scheme's conditions and duration should be noted when recording the price observation.

Discounts are sometimes offered in the form of extra goods offered free. For example, "three for the price of two" or "20% free". This is common practice for long-running lines such as cornflakes, biscuits, chocolate, instant coffee, soft drinks, detergents, toothpaste, shampoo, paper handkerchiefs and the like. As these promotional offers are open to everyone usually for a period of over four weeks, they should, in principle, be taken into account. In practice, for reasons of comparability, the price of the standard size should be recorded. Only if the standard size is not available within the survey period, should the price of the special offer be recorded with an explanatory note quantifying what is being offered free.

- *Invoiced service charges and voluntary gratuities* should be included in the transaction price. Depending on the country, invoiced service charges in cafés and restaurants are not always included in the offer price. When they are not included, the offer price should be adjusted by the precise rate of service charge applicable and recorded as the price observation. Both the unadjusted offer price and the rate of service charge applied should be noted when recording the price observation.

Voluntary gratuities or tips are paid in cafés and restaurants and also in hairdressers and taxis. For these services, participating countries are required to collect and report offer prices. Subsequently, they are required to report the global tipping rates applied in their national accounts for cafés and restaurants and for hairdressers. Eurostat calculates the PPPs using the offer prices and later adjusts the PPPs to transaction price levels with the global tipping rates supplied by the countries. The adjustment is made at the basic heading level and not at the product level. The services provided by cafés, restaurants and hairdressers comprise separate basic headings. The service provided by taxis is just one product among others included in the basic heading covering passenger transport by road which is why global tipping rates are not collected for taxis and no adjustment is made.

### 5.5.2 Selection of outlets

5.68 Prices are to be collected from a range of outlets that includes markets, department stores, supermarkets, specialised shops, discount stores, corner shops, kiosks, mobile shops, mail order houses and the internet. A list of outlets classified by type is provided in Box 5.8. The classification has been developed by Eurostat in consultation with participating countries. It identifies and defines twelve outlet types. Among other considerations, it takes into account the level of service offered by the outlets.

5.69 The selection of outlets is of particular importance because of the effect it will have on the average prices of the products to be surveyed. Different products have different distribution profiles. Some products are sold mostly in supermarkets; other products are sold mainly in specialised shops. Prices for the same product can vary from outlet type to outlet type because it is being sold under varying conditions or circumstances.<sup>11</sup> For example, a restaurant meal provided with more attentive service in more pleasing surroundings is of a higher quality than exactly the same food and drink provided with less service in a less pleasant environment. And the higher quality will be reflected by a higher price. Conditions or circumstances of sale constitute a service element. If the service element changes from one outlet type to another, the product being purchased is not the same at both outlets even if it is physically identical. This is because what is actually being bought is a composite product – that is, the product itself plus the service element. The difference in the service element is a quality difference and contributes to the price difference. When the conditions or circumstances under which a product is sold are price determining, they should be included in the product specification. Eurostat and OECD product specifications for services provided by garages, restaurants, hotels and hairdressers usually specify the type of outlet and, if relevant, its location.

<sup>11</sup> This and other related points are explained and elaborated in paragraphs 16.105 to 16.109 of the SNA 93.



**Box 5.8:** Eurostat classification of outlet by type

Code	Outlet Type	Description
01	Department stores	<p>Non-specialised stores with a wide assortment of different types of products such as clothing, footwear, household textiles, consumer electronics, CDs, DVDs, household appliances, glassware and tableware. Every department or floor usually has its own cash desk. Department stores are often located in the city centre or in a shopping mall.</p> <p>In some cases it might be difficult to distinguish between a specialised shop and a department store. If the product types are related to each other, a shop should be seen as specialised. For example, a shop selling furniture, floor coverings, carpets, household textiles, glassware and tableware or clothing, footwear and household textiles or electric household appliances, consumer electronics, computer, software, CDs and DVDs should be classified as a specialised shop.</p> <p>If the shop offers products from different consumption areas, it should be seen as department store even if the number of departments is limited. For example: clothing, footwear, household textiles, cosmetics, glassware and tableware.</p> <p>"Shops-in-shops" can appear in department stores. They have their own area and own cash desk and are clearly identified by their own shop name. They should be treated as an independent shop and not be allocated to department stores.</p>
02	Hypermarkets, supermarkets	<p>Self-service stores offering a wide assortment of food and non-food products. Supermarkets offer a much smaller assortment of non-food products than hypermarkets. The cash desks for both hypermarkets and supermarkets are located centrally at the exit. Hypermarkets are often located outside of the city centre.</p>
03	Discount stores	<p>Self-service stores that sell food or non-food products at prices lower than traditional retail outlets, hypermarkets or supermarkets.</p> <p>Discount stores usually offer a minimum level of service. A consultation of shop assistants is not foreseen. Decoration and presentation of products is minimal. Open shipping boxes or pallets in the aisles may be used to display products. These shops usually have a high share of shop-own-brands and brandless products.</p>
04	Convenience stores, mini-markets, service station shops, neighbourhood shops, corner shops and kiosks	<p>Small non-specialised shops that sell mainly food, beverages and non-durable goods for daily needs.</p>
05	Specialised shop chains	<p>Branches of national or international specialised shop chains, mainly selling goods. Self-service is usual, but shop assistants are available for consultation.</p>
06	Specialised shops	<p>Specialised traditional retail outlets mainly selling goods. Usually no self-service. Full sales service available including consultation of shop assistants. Includes bakers, butchers, grocers and the like.</p> <p>Includes shops with a limited number of branches located only in one region, such as the metropolitan area of the capital city, and retailers' cooperatives.</p>
07	Markets	<p>Places where goods are bought and sold. Usually in the open air, but also in covered buildings. Generally with a number of different sellers. Some markets operate daily, others only on specific days.</p>
08	Private service providers	<p>Private companies that offer services.</p>
09	Public and semi public service providers	<p>Public and semi-public companies that offer services. A company is semi-public if at least 50 per cent is owned by the government, a municipality or another corporation under public law.</p>
10	Mail order, internet	<p>"Virtual" stores that sell goods or services only by mail order or via the internet. Websites of companies that also have a physical presence are to be included in their corresponding shop type.</p>
11	Other kinds of outlets	<p>For example: sales at the customer's premises, mobile shops</p>
12	Black market	<p>Transactions on which no (or not all) taxes that apply according to national law are paid regardless of the shop type.</p> <p>For example: smuggled or illegally produced cigarettes and alcohol; non licensed copies of CDs, DVDs and computer software; counterfeit products; unregistered domestic work.</p>
99	CPI data	<p>Average prices taken from the CPI, if no shop type can be identified.</p>

5.70 CPIs measure price changes over time by repeatedly pricing the same product at the same outlet, thereby keeping the service element constant. If this approach would be followed in international price comparisons, it would lead to a multiplication of products to be priced. For this reason, the so called potato is a potato rule is applied instead, which says that each product specified is treated as being homogeneous regardless of where it is priced. If, when averaging the prices collected for the product, no account is taken of the different service elements of the outlets at which they were observed, the average price is likely to be too high or too low. To avoid this, countries participating in Eurostat and OECD comparisons are required to select outlets so that the selection mirrors consumer purchasing patterns at various outlet types for the products being priced. If consumers buy 50 per cent of their clothing from departmental stores, 30 per cent from supermarkets and 20 per cent from specialist shops, then a sample of ten outlets would include five departmental stores, three supermarkets and two specialist shops. As the products being surveyed differ from price survey to price survey, the selection of outlets will also differ between surveys. By selecting outlets in this way, implicit weights are introduced to accommodate the varying service elements of outlets and their impact on price. Unbiased average prices are the result.<sup>12</sup>

5.71 The selection of outlets by type in proportion to the volume of their sales of the products to be surveyed is the first consideration. The second consideration is the variability of prices within outlet type. Such information may be obtained from the CPI. The greater the price variability within a given type of outlet, the larger is the number of outlets of that type that should be included. This may result in a selection of outlets that does not replicate exactly the distribution profiles of the products to be priced. Price variation between outlet types is generally greater than price variation within an outlet type. On balance, it is preferable in most cases to give the first consideration priority over the second and respect the distribution profiles of the products being surveyed. A third consideration is the location of outlets. The number of outlets selected in each location should be proportional to the area distribution of the volume of sales of the products in question. The location of selected outlets can be expected to differ from survey to survey. In the past, for example, suburban outlets for food were likely to have had a larger share of food sales than central outlets, while central outlets probably had a larger share of the sales of clothes than suburban outlets. But such distinctions are gradually being erased by the growth of shopping malls and commercial centres on the outskirts of cities and towns wherein can be found most types of outlets selling almost the entire range of consumer goods: food, beverages, clothing, footwear, household supplies, household appliances, furniture, floor coverings, audio-visual equipment, sports equipment, etc. The increase in the number of households purchasing a whole variety of goods through the internet also blurs the concept of location.

5.72 At basic heading level, household final consumption expenditure is measured according to the domestic concept, that is, it includes the expenditure of residents and non-residents on the domestic territory. For consistency reasons, prices must therefore be collected from domestic outlets only. It may not always be obvious, in particular for internet outlets, to determine whether or not an outlet is domestic.

5.73 It is not always necessary to collect prices from sales outlets or shops. Prices for certain goods and services are uniform throughout the country. This may be because there is only one supplier, typically a public or semi-public enterprise. Examples of such products are electricity, gas, postal services, telephone services and transport services. Prices for these products can be collected centrally, direct from the supplier. The move towards privatisation has increased the number of suppliers of some of these products, even so their prices can still be collected centrally. Prices that are regulated, such as those for pharmaceuticals, newspapers, magazines and books, can be collected centrally as well, but the trend towards deregulation has reduced the number of such products. Some supermarket chains and franchise networks operate, or claim to operate, nationwide uniform pricing policies. Their prices too can be collected centrally, but they should be verified by visits to one or two outlets. There is a tendency among such national retailers to allow price setting to be done locally within centrally established guidelines.

<sup>12</sup> Whether these average prices lead to unbiased price relatives depends on whether the products surveyed have similar distribution profiles in all the countries participating in the comparison and on whether the outlets selected have equivalent service elements in all countries.

5.74 Scanner data is another source for price data. It is mainly used for food products. Scanner data provide an exhaustive set of actual transaction prices for a particular outlet during a certain period. It may also include information on quantities being sold. It is thus a very rich source of data that can provide invaluable information during both the pre-survey and the survey and it would in theory remove the need for actual price collection in shops. However, due to the vastness of the data obtained, there are also many obstacles to overcome before scanner data can be efficiently used, as experience in a number of countries has shown.

5.75 A good starting point for the selection of outlets is the sample of outlets used for the CPI, but it is only a starting point. The final product lists for the price surveys will differ considerably from the product lists for the CPI. There will be products that are common to both lists. These will be mainly food items, such as fresh fruit and vegetables, but other products may be covered as well. Prices for such products will not need to be surveyed because the prices collected for the CPI can be used instead. In general, PPP product lists will be larger than CPI lists, specifying products not included in the CPI. The CPI sample may not be ideal to collect reliable prices for these products because the selection of outlets by type is not in proportion to the volume of their sales of the products. The imbalance of outlet types may be compounded if the CPI sample is designed to measure price change only at the national level and, as is the practice in the majority of participating countries, the price surveys are carried out in the capital city. In these circumstances, it will be necessary to augment the CPI sample with additional outlets. At the same time, because of the limited resources available for the price surveys, the CPI sample may be too large and will have to be reduced. By necessity, both the selection of outlets to augment the CPI sample and the selection of outlets to reduce the CPI sample will be purposive and not random.

5.76 Participating countries are expected to respect the classification in Box 5.8 when reporting the individual price observations collected from them. In addition to the twelve outlet types specified, the classification has a thirteenth category called *CPI data*. It is necessary because countries may extract prices from their CPI database without identifying the outlet type from which they were collected. If, however, the outlet type can be determined, then the prices extracted should be classified accordingly.

### 5.5.3 Number of products to be priced per basic heading

5.77 The number of products to be priced per basic heading will vary from basic heading to basic heading. It will depend on the heterogeneity of products covered by the basic heading and on the importance of the basic heading. These are the same considerations that participating countries had to take into account when proposing products for the final product list. Then, each country was required to ensure that for each basic heading it could price that number of representative products that were commensurate with the price variation within the basic heading and its expenditure on the basic heading. The final product list is of course a compromise that attempts to balance the conflicting needs of the different countries without the list becoming too long and unmanageable. Even so, as long as a country has participated actively in all stages of product selection, it should find that the final product list includes a number, if not all, of its representative products for each basic heading. And these it should price. Participating countries are required to price at least one representative product per basic heading as this provides for the calculation of unbiased PPPs. But they should actually price more than one representative product per basic heading as this facilitates the calculation of PPPs that are both unbiased and robust.

5.78 Besides pricing their own representative products, participating countries are also required to price the representative products of other participants, otherwise a comparison cannot be made. Which unrepresentative products a country should price depends on availability. A country cannot price what is not sold in its domestic market. There are degrees of availability. Price collectors should not be asked to waste resources tracking down products that are not easily found. Also, it is desirable that the prices collected for unrepresentative products provide relatively reliable average prices. In this context, availability should be defined in terms of the number of outlets at which the product can be observed. Defining availability in this way without specifying a number is not particularly helpful. This raises the question of whether a rigorous selection of unrepresentative products should be

made prior to price collection.<sup>13</sup> As every effort is made by group leaders to keep product lists manageable, a better approach would be for each country to prune the list of products it cannot price or cannot price without difficulty. Much of this information should be on hand from the pre-survey. It may also be known to the experienced price collectors. Price collectors would then attempt to price all products remaining on the list. The selection of unrepresentative products for which prices would be reported could then be made ex post based on the number of prices observed and their variation.

#### 5.5.4 Number of price observations per product

5.79 The number of prices to be collected for a product will differ from one basic heading to another. It will also differ from product to product within a basic heading. Normally, the number of prices collected for a product determines the reliability of its average price. The larger the number of price observations, the more accurate the average price. The actual number depends on the degree to which the prices of the product vary. The number of prices to be collected for each product could be decided using random sampling techniques. Providing the price variation (CV) of the product is known and the desired degree of accuracy (SE) is specified, sample size (N) is determined by  $[t^2CV^2/SE^2]$  where t is Student's t and which is here assumed to equal 2 at 0.95 probability. For example, if it is known from the last time the price survey was conducted that the coefficient of variation for the average price of a product is 20 per cent and the level of precision sought in the forthcoming survey is 10 per cent, the sample size should be 16. With the same price variation and a precision level of 5 per cent, the sample size should be 64. In other words, a twofold increase in accuracy requires a fourfold increase in sample size.

5.80 A coefficient of variation of 20 per cent is high. A coefficient of variation higher than 20 per cent may indicate that either the product description was too broad or that the price collection was faulty. In most cases, price differences for a product within a country are not more than 10 to 50 per cent, a coefficient of variation of approximately 5 to 15 per cent. Tight specifications usually have a lower coefficient of variation than loose specifications. On this basis, rough upper limits can be assigned to the coefficients of variation for specifications that are brand specific (10 per cent), specifications that cover well-known brands (15 per cent) and specifications that are brandless (20 per cent). Assuming a level of precision of 10 per cent, which is both reasonable and acceptable, application of  $[t^2CV^2/SE^2]$  gives sample sizes of around 5 for brand specific specifications, of around 10 for well-known brand specifications and between 15 to 20 for brandless specifications.

5.81 Participating countries are not expected to apply random sampling techniques when deciding on the number of prices to be collected for a product. Instead, each participating country should decide on the number of price observations to be collected per product by taking into account the type of specification being priced, the conditions prevailing in its market and experience gained from previous survey rounds. For example, experience shows that brand specific specifications usually require a smaller number of observations than well-known brand specifications and that well-known brand specifications generally require a smaller number of observations than brandless specifications. This suggests that the numbers of the previous paragraph provide a rough general rule of thumb, namely: 5 observations for brand specific specifications, 5 to 10 observations for well-known brand specifications, and 10 to 15 observations for brandless specifications. When deciding on the number of observations for a product, participating countries should bear in mind the following:

- More prices should be collected for products in basic headings with large expenditure weights because of the impact they will have on the PPPs for aggregation levels above them.
- More prices should be collected for products in basic headings with price variations larger than the average price variation for basic headings.
- More prices should be collected for representative products.

<sup>13</sup> If this approach is followed, priority should be given to retaining overlap products on the list.

- More prices should be collected for products in basic headings with a small number of product specifications.
- More prices should be collected for products with price dispersions greater than the average price dispersion for their basic heading, particularly if the product is representative. Products with generic specifications that cover a wide range of varieties or package sizes and products that are available in a broad range of outlet types usually fall into this category. More generally, products with generic definitions have larger price variations than products defined by brand and model and will require more price observations.

### 5.5.5 Assigning representativity indicators

5.82 For each basic heading, participating countries are required to price both representative products and unrepresentative products. Representative products normally have lower price levels than unrepresentative products. If this is not taken into account when calculating the PPPs for a basic heading, the PPPs will be biased. Either they will be too high and give volume indices that are too low. Or they will be too low and give volume indices that are too high. By definition, there are no expenditure weights below the basic heading level and other means are necessary to distinguish representative products from unrepresentative products when calculating PPPs at the basic heading level. As explained in Chapter 12, and demonstrated in Annex V, the method of calculation used by Eurostat and the OECD assigns quasi expenditure weights to representative and unrepresentative products. This requires participating countries to indicate which of the products they have priced are representative when reporting their prices. Representative products are designated by a representativity indicator. The indicator currently employed by Eurostat and the OECD is an asterisk (\*). So participating countries have to *assign asterisks* to representative products and representative products are called *asterisk products*.

5.83 Representativity is discussed in Chapter 2, Section 2.3.2, where the following points are made:

- Representativity is defined in terms of an individual country within a basic heading. A product is either representative or unrepresentative of the price level in country A for a given basic heading. It is representative, if in country A, it is among the most important items purchased, in terms of relative total expenditure within the basic heading.<sup>15</sup> Usually, this implies that its price level is close to the average for all products within the basic heading.
- Basic headings can cover a heterogeneous mixture of goods or services, but this only becomes a consideration if there are significant disparities in their price levels. In these circumstances, representativity is considered in two stages. First in terms of the product types comprising the basic heading – representative product types are those that account for the bulk of the expenditure on the basic heading. And then in terms of products within the representative product types – representative products are those whose price level is close to the average for all products of its type.
- The decision as to whether or not a product is representative of the price level of a basic heading is made independently of the relative importance of the basic heading with respect to other basic headings.<sup>16</sup>
- A distinction has to be made between the products in the universe covered by the basic heading and the products in the sample selected for its product list. The products in the sample represent a wider group of products in the universe. They have been chosen to represent the price level of the wider group. It is the wider group of products that need to have an important share of expenditures within the basic heading. It is not required that the individual products of the sample are among the volume sellers for the group, even

<sup>15</sup> See PPP Regulation, article 3(k), in Annex II.

<sup>16</sup> See the example in Chapter 2, paragraph 2.18.

though they often are. It is just necessary that they are sold in sufficient quantities for their price levels to be typical for the product group they represent. For this reason it is possible that they can appear to be unrepresentative when their volume of sales is compared to the volume of sales of other products in the sample.<sup>17</sup>

- Neither of the two criteria on which representativity is based, and which should be considered in parallel, is easy to apply in practice. The criterion - that the products price level is close to the average for all products within the basic heading - is difficult to apply unless the average price level for the basic heading is known. Usually it is not known until the PPPs for the basic heading are calculated. Yet representative products have to be identified before the PPPs are available. While the other criterion - that representative products are typically volume sellers and, depending on the product, generally available - requires information on market shares which is often not readily accessible.

5.84 Participating countries have problems identifying representative products and assigning asterisks to them. This is understandable because the reason why representative products have to be identified - namely, the lack of expenditure weights below the basic heading level - is also the reason why it is difficult to identify them. The problem is not with products that countries themselves have proposed for the final product list because these products are supposed to be representative. The problem lies with products that other countries have proposed. The openness of domestic markets, particularly in the European Union, has progressively increased the availability of many of these products. The question is: To what extent are they being purchased? Are they being sold in large enough numbers to be representative? The absence of reliable expenditure or sales data by product within basic headings makes it a difficult question to answer objectively. Other sources of data have to be investigated. If scanner data are available, these can provide high quality information on sales volumes. For motor cars, registration statistics detailing the brands and models registered can be consulted. There are as well a growing number of internet sites providing country-specific information on "best sellers" for a whole range of products and product types. Paragraph 5.43 lists other possible sources.

5.85 Two key sources are the pre-survey and the price survey itself. By interviewing experienced sales personnel at the outlets visited during the pre-survey, it should be possible to determine the representativity of the products specified on the pre-survey list. But not all these products will remain on the final product list. Some will have been discarded. Others will have been retained, but with their definitions altered. And new products, not on the pre-survey product list, will have been added. It will still be necessary to establish the representativity of many of the products on the final product list. This should be done, as it was done for products on the pre-survey list, by asking sales persons at the outlets visited during the price survey.

5.86 The price survey can also be used in other ways. Both the number of outlets at which a product is priced and the number of prices collected for the product are indicators of availability and possible representativity. Asterisks can be provisionally assigned using such criteria. Later, the allocation can be verified during validation by comparing the *price level indices* (PLIs) of the different products priced within a basic heading.<sup>18</sup> Products with PLIs that are significantly higher or lower than the PLIs of other products priced for the basic heading are probably not representative and should have their asterisk removed if one has been assigned. Conversely, products designated unrepresentative can be re-designated representative and assigned an asterisk if their PLIs are close to those of other products - specifically the representative products - priced for the basic heading. In this way, validation provides a general fallback position, making it possible to rectify any misallocation of asterisks, even those based on objective information. This is a particularly important consideration given that the decision on whether or not a product is representative has, in the absence of any relevant data or informed opinion, to be subjective. Opinions should be solicited from a number of different persons when the decision is subjective.

<sup>17</sup> See the example in Chapter 2, paragraph 2.20.

<sup>18</sup> That is, by comparing the PPP-Indices of the products priced in the Quaranta table for the basic heading. See Annex IV.

5.87 Countries have to ensure a proper balance between the numbers of representative and unrepresentative products priced. It is not possible to give a rule a-priori for the share of unrepresentative products, as the impact of the unrepresentative prices cannot be predicted in advance. As will be explained in Chapter 12, Section 12.2.3, the actual weight each price receives in the calculation of the PPPs between two countries depends on the number of representative products priced by each country and the size of the overlap between them. In basic headings with a large number of products, the impact of individual asterisks on the PPPs will usually be limited. In basic headings that contain only a few number of products, the precise allocation of asterisks can become decisive. The allocation of asterisks therefore needs to be carefully verified during validation in the way indicated above.

5.88 The asterisks introduce implicit weights into the calculation of PPPs. Representative products receive higher weights and their relative prices have thus a higher influence on the PPPs than unrepresentative products. Countries can also use this fact and reduce the impact of less reliable average prices - for example, those with few observations or high variation coefficients - by not allocating asterisks to them.

### 5.5.6 Intra-country validation

5.89 Once price collection is finished, participating countries are required to record and validate their price observations before they are dispatched to Eurostat. The Data Entry Tool (DET) is used for this. The DET is the software developed by Eurostat for the recording of price observations, the calculation of average survey prices, the validation of price observations and average survey prices, and the preparation of the data file that is to be transmitted to Eurostat via eDAMIS. The validation carried out by countries at this stage is referred to as intra-country validation as it involves countries checking their own price data separately without reference to the price data of other participating countries. Inter-country validation, when average survey prices are compared across countries, takes place during the second phase of validation and will be considered in Section 5.6.

5.90 Both intra-country validation and inter-country validation have the same aim and that is to identify and eliminate non-sampling errors from the survey price data. Both focus on two types of non-sampling error: product error and price error.

- *Product error* occurs when price collectors price products that do not match the product specification and neglect to report having done so. This can be because they are not aware of the mismatch, such as when the product specification is too loose<sup>19</sup>, or because they price a substitute product as required by the pricing guidelines but do not mention this on the price reporting form. Price collectors are instructed to collect the price of a substitute product if they are unable to find the product specified. They are further instructed to flag the substitution and to note the differences between the substitute product and the specified product. Flagging brings the substitution to the attention of the person in the country's NSI responsible for the survey who, together with the group leader, can then decide what to do with the price collected. If other countries report prices for the same substitute product<sup>20</sup>, price comparisons can be made for the substitute product as well as for the product originally specified. If this is not an option, the price will have to be discarded. Substitution does not in itself introduce error. It is the failure of price collectors to flag and document the substitution that gives rise to product error.

<sup>19</sup> With a product specification that is too loose the problem is not so much that the product priced does not match the product specified because it probably does, but that it is not comparable with the products that other price collectors, both within the country and in other countries, have matched and priced for the same specification. Within a country the problem can be ameliorated by the price collectors agreeing on how generic specifications are to be interpreted and what products are to be priced before starting price collection. This will not avoid differences in interpretation between countries which will only become apparent during inter-country validation.

<sup>20</sup> This can happen when the product specification refers to a specific model that is in the process of being replaced by a later model in a number of countries: not an infrequent occurrence in the case of household durables.

- *Price error* occurs when price collectors price products that do match the product specification but record the price incorrectly or they record the price correctly and error is introduced afterwards in the process of reporting and transmitting the price. Associated with each price is a quantity. There is the *specified quantity* - the quantity to be priced - and there is the *reference quantity* - the quantity to which the price collected is to be adjusted. Price error can also arise because, even though the price is correctly recorded, the quantity priced is recorded wrongly (or it is recorded correctly and error is introduced later during processing) so that the adjusted price for the reference quantity, which is the price that is validated, will be wrong as well.

5.91 Editing for product errors and price errors involves identifying prices that are outliers – that is, prices whose value is determined to be either too high or too low vis-à-vis the average according to given criteria. The price may score a value for a given test that exceeds a pre-determined critical value or its value may fall outside some pre-specified range of acceptable values. Both are standard ways of detecting errors in survey data and both are employed by Eurostat and the OECD. Prices that are outliers are not necessarily wrong. But the fact that they are outliers suggests that they could be wrong, that they are possible errors and need to be investigated. It is not Eurostat or OECD practice to reject outliers outright but to establish first whether or not they are genuine observations. Once this is known, it can be decided how to deal with them. Outliers that are found to be wrong are errors and should be corrected or dropped, while outliers that are shown to be accurate observations should be retained, at least in principle.

5.92 Intra-country validation is designed to establish that price collectors within the same country have priced products that match the product specifications and that the prices they have reported are correct. It does this by searching for outliers first among the individual prices that a country has collected for each product it has chosen to survey and then among the average survey prices for these products.

5.93 Before editing can commence, the price observations have to be recorded on the *price input screens* of the DET. An example of a price input screen is shown in Box 5.9. Each product has its own input screen which can be called up from a list detailing product codes and names. The price input screen for a product gives the product's specification (brand type, reference quantity, and the technical and economic parameters) in the top left-hand corner. The details of the price observations for the product are entered in the columns at the bottom of the screen. In addition, the rate of VAT on the product has to be provided, as this is used to calculate the net average price, and the question on representativity has to be answered, as this is taken into account when calculating basic heading PPPs. For each price observation, the price for the reference quantity and the *price ratio* - price of the observation divided by the current average price - are calculated in the last two columns to the right. *Item statistics* appear in the top right-hand corner of the screen.

5.94 The price input screen in Box 5.9 is self-explanatory, but two columns need some elaboration. The first is the second column from the left. In this column, the status of the price observation is flagged. Price observations with "O" are original price observations and those with "E" are observations that have been eliminated during validation. (Eliminated observations are not included in the calculation of average price or other item statistics, but remain on the price input sheet for the record.) When the price observations are first recorded, they are flagged with "O". In the example in Box 5.9, observation number 3 was eliminated because it did not comply with the item definition.

5.95 The second column requiring further explanation is the last column to the right. In this column, the prices for the reference quantity generated for the price observations are expressed as ratios of their average – that is, the average of the prices for the reference quantity in the second last column. The price ratio is the measure that determines whether or not a price observation is an outlier. There are two ranges of critical values. Price observations with price ratios that fall outside the range 0.75 to 1.25 are marked in orange and require verification. Price observations with price ratios that fall outside the range 0.5 to 1.5 are marked in red and need to be thoroughly scrutinized. In the example in Box 5.9, observations numbers 2 and 4 are marked in orange.



5.96 The average survey prices can be validated on the *Items screen tabs* in the DET. An example of this screen tab is shown in Box 5.10. All the columns are calculated by the DET. The example is self-explanatory. The measures used to identify outliers among the average survey prices are their variation coefficient and the ratio between their maximum and minimum price observations - called the *max-min price ratio*. There are two critical values for each measure. Average survey prices with variation coefficients of over 20 per cent or with a max-min price ratio larger than 2.0 are flagged with one question mark (?) as *questionable* and need to be checked – this is the case in the example in Box 5.10. Average prices with variation coefficients of over 40 per cent or with a max-min price ratio larger than 4.0 are flagged with three question marks (???) as *extremely questionable* and require to be investigated rigorously.

5.97 Participating countries are expected to: one, search the price data for price observations that have been flagged as outliers in the last column of the price input screen; two, search the *Items screen tabs* for products having average survey prices flagged as outliers in the column *Add. Check*; and three, to establish the reliability of the outliers identified. In the first instance, the prices will need to be checked against the prices as recorded by price collectors to establish that the prices and quantities observed have been entered correctly. If entries are wrong, they should be corrected. In many cases, verification will require revisiting the outlets where the prices were collected to see whether what was priced matches the product description and whether the correct price and quantity were recorded. Price observations that are found to be incorrect should be either eliminated or replaced by the correct observation. Price observations that are flagged as questionable and found to be correct should be retained. But price observations that are flagged as extremely questionable and found to be correct should probably be removed from the price input sheet.<sup>21</sup> It is to be expected that verification of outliers among price observations will introduce changes that will impact on the outlier status of average survey prices.

5.98 A high coefficient of variation can be due to a number of reasons. The price of the product may vary greatly between different types of outlet or the product may not have been priced consistently across outlets because either the product specification is too broad or it has been interpreted differently by different price collectors. Countries should establish which reason applies before deciding on a course of action. Providing the price observations are correct and a comparable product has been priced across outlets, price variation arising from different outlet types is an economic fact of life. The product should be retained and the reason for the variation explained to the group leader. It is possible that the outlet mix selected for the survey does not reflect the distribution profile of the product in question. This should be investigated and the mix adjusted as appropriate by suppressing prices of shop types that are over-represented or by duplicating the prices of shop types that are under-represented.

5.99 Products with price variation caused by too broad a specification or inconsistent pricing across outlets should be deleted if they are unrepresentative or if they are representative and the country already has enough representative items for the basic heading. But if the products are representative and the country does not have enough representative products for the basic heading, they should be retained. The circumstances should be carefully explained to the group leader. This will enable the group leader to advise whether the products should be dropped, retained or split on the basis of what other countries have reported, during inter-country validation.

5.100 Once all the outliers have been investigated, participating countries should transmit the validated price observations and average survey prices to Eurostat through eDAMIS. There will still be outliers among the prices reported. Participating countries are required to document the reliability of these outliers when submitting their prices to Eurostat.

<sup>21</sup> The product average prices are calculated as unweighted arithmetic means of the observed prices. This way of calculation is justifiable only if the price variation is moderate. If this is not the case, weights for price observations should be used. In principle, it is preferable to remove outliers that have been verified as correct because of the noise they introduce into the data set, but, in practice, there may be reasons for not doing so. Countries retaining extremely questionable observations should explain why they are keeping them to the group leader.

**Box 5.9:** Price input form in the PPP Data Entry Tool (DET)

PPP Data Entry Tool - Services/2011/default

Survey Dataset Edit View Export Settings Help

<< >> **11.03.22.1.01.aa - Shoe repair, men's classic shoes, leather half soles**

Hide Item Specs

**Brand Type** Brand not relevant

**Reference Quantity** 1 service

Service to be done on 2 shoes

re-heeling rubber (glued)

re-soleing leather half soles (glued)

Shoe type men's classic shoes

Price includes price of materials

Exclude while-you-wait service

**Price for** 1 service

Item Statistics

Average Price: 21.67

Min Price: 15.00

Max Price: 30.00

Var. Coef.: 28.78

Net Price: 18.36

No Of Observations: 3

No Of Eliminated Observations: 1

Add. Check: ?

VAT (%) 18 Is it representative?  Yes  No

+ - Clear All Eliminate/Restore Eliminate All Finalise

Obs No	Flag	Month	Shop Type	Shop Identifier	Observed Price	Observed Quantity in reference units	Comments	Price Collector	Other	Price	Price Ratio
1	O	5	8	shop w	20.00	1.00				20.00	0.92
2	O	5	8	shop x	30.00	1.00				30.00	1.38
3	E	5	8	shop y	10.00	1.00	1 shoe only			10.00	
4	O	5	8	shop z	15.00	1.00				15.00	0.69

**Box 5.10:** Items summary information in the DET

The screenshot shows a software window titled "PPP Data Entry Tool - Services/2011/default". The window has a menu bar with "Survey", "Dataset", "Edit", "View", "Export", "Settings", and "Help". Below the menu bar are three tabs: "Summary", "Items", and "Observations". The "Summary" tab is active, displaying a table with the following columns: Code, Name, \*, No of Obs., Ref Q., Ref Unit, Average Price, Euro Avg, Min Price, Max Price, Var. Coef., Add. Check, and Comments. The first row is highlighted in yellow and contains the following data: Code: 11.03.22.1.01.aa, Name: Shoe repair, men's classic shoes, lea..., \*: \*, No of Obs.: 3, Ref Q.: 1.00, Ref Unit: service, Average Price: 21.67, Euro Avg: (empty), Min Price: 15.00, Max Price: 30.00, Var. Coef.: 28.78?, Add. Check: (empty), and Comments: (empty). The other three rows have "No of Obs." and "Ref Q." values of 0, and "Add. Check" values of "OK".

Code	Name	*	No of Obs.	Ref Q.	Ref Unit	Average Price	Euro Avg	Min Price	Max Price	Var. Coef.	Add. Check	Comments
11.03.22.1.01.aa	Shoe repair, men's classic shoes, lea...	*	3	1.00	service	21.67		15.00	30.00	28.78?		
11.03.22.1.01.ab	Shoe repair, men's classic shoes, rub...	undefined	0	1.00	service						OK	
11.03.22.1.01.ba	Shoe repair, ladies' court shoes	undefined	0	1.00	service						OK	
11.03.22.1.01.bb	Shoe repair, ladies' court shoes, whil...	undefined	0	1.00	service						OK	

### 5.5.7 Survey report

5.101 At the same time as they send their price observations and average prices for a survey to Eurostat, participating countries are required to complete the survey report and send it to Eurostat. Like the prices, the report is transmitted via eDAMIS. The survey report template is available in Box 5.11 from which can be seen that the report has five sections. The first four sections cover survey phases: pre-survey, price collection, intra-country validation and inter-country validation. The fifth section contains questions relevant to the survey being reviewed. All sections, except section 5, have two questions in common: one on timing, organisation and resources used; the other on problems encountered. Otherwise the questions are specific to survey phase under consideration.

5.102 Only sections 1, 2, 3 and 5 – pre-survey, price collection, intra-country validation and questions specific to the survey – are to be completed and sent with the price data. These sections help Eurostat and the group leaders to assess the quality of the price data received. They will also assist group leaders with their review of the intra-country validations of their group members. Section 4 – inter-country validation – is to be completed and submitted to Eurostat through eDAMIS after the inter-country validation is finished and countries have approved the survey results. These sections will help Eurostat and the group leaders to assess the efficacy of the inter-country validation phase and to see how participating countries have handled problem areas particular to the survey.

## 5.6 Inter-country validation

### 5.6.1 Validation of prices

5.103 Inter-country validation involves editing and verifying the average survey prices reported by participating countries and assessing the reliability of the PPPs they produce. The object is to establish that the average survey prices are for comparable products, that the products have been correctly priced and the allocation of asterisks is correct. In other words, to ascertain whether countries have interpreted the product specifications the same way and whether their price collectors have priced them accurately. The Quaranta editing procedure is employed for this purpose. The procedure involves first converting the average survey prices - which are in national currencies - to a common currency using exchange rates and basic heading PPPs and then comparing the average survey prices for the same product across countries and analysing the dispersion across products and across countries of the price ratios that the average survey prices generate between countries. Outliers among the average survey prices are detected by identifying outliers among the corresponding price ratios.

5.104 Inter-country validation is carried out at the level of the basic heading. The Quaranta editing procedure entails compiling a Quaranta table for each of the basic headings surveyed. A Quaranta table has two parts: one providing measures with which to assess the quality of the PPPs for the participating countries included in the table and for the basic heading overall; the other providing measures with which to assess the quality of the average survey prices of the products that the countries covered by the table have priced for the basic heading. An example of a Quaranta table can be found in Annex IV which explains the Quaranta editing procedure in detail.

5.105 Quaranta tables are computed by the on-line *Validation Tool* (VT) developed by Eurostat. The VT software enables Eurostat, group leaders and participating countries to calculate Quaranta tables for all participating countries together, for the four country groups separately, and for subsets of countries that are either within a country group<sup>22</sup> or cross over country groups<sup>23</sup>. In other words, the average survey prices can be validated within the context of all participating countries, within the context of the country group or within the context of a subgroup of countries chosen, for example, because their price levels are expected to be similar or because they are neighbours.

<sup>22</sup> For example, the Nordic countries or the Scandinavian countries in the Northern group.

<sup>23</sup> For example, the Balkan countries or the Western Balkan countries in the Eastern group and the Southern group.

**Box 5.11:** Standard report form consumer goods price surveys

Country:

Survey:

Survey year:

**Note:** Please enter information in this survey report that is complementary to your PPP Inventory and describes specific aspects related to this survey, especially if they are different from what is in the Inventory. If the PPP Inventory describes accurately the procedures for a certain section, it suffices to make a reference.

### 1. PRE-SURVEY

*1.1 Timing, organisation and resources used* (Describe when and how the pre-survey (including the pre-view before the pre-survey) was carried out and how much (human or other) resources were spent.)

*1.2 Sources of information* (Describe the sources used to determine availability and importance of the products and to determine new products. How have you tried to ensure that the list will become sufficiently representative for your country?)

*1.3 Problems encountered and lessons learned* (Describe any problems encountered during the pre-survey, solutions found and lessons learned for the next survey (for individual basic headings, if needed).)

### 2. PRICE COLLECTION

*2.1 Timing, organisation and resources used* (Describe when and how the price collection was carried out and how much (human or other) resources were spent. Describe also the preparations for the price collection (translation, training of price collectors, etc.).)

*2.2 Sampling of outlets, locations, products and brands* (Describe how the outlets and locations to be visited were selected and how the selection of products and brands to be priced was made. Describe also how many price observations were collected on average per product and how this was determined (in relation to the recommended minimum number specified in the PPP Manual). Also comment on the variation of the prices observed per product.)

*2.3 Use of other sources than outlet visits* (Describe if any others sources of information than outlet visits were used (for example, CPI, scanner data, Internet, etc.).)

*2.4 Allocation of representativity indicators ("asterisks")* (Describe the sources and methods that were used to determine which products received an asterisk.)

*2.5 Problems encountered and lessons learned* (Describe any problems encountered during the price collection, solutions found and lessons learned for the next survey (for individual basic headings, if needed).)

### 3. INTRA-COUNTRY VALIDATION

*3.1 Timing, organisation and resources used* (Describe when and how the intra-country validation was carried out (before the submission of data to Eurostat) and how much (human or other) resources were spent. Provide the date of the first delivery of the data file (.xml file) through eDAMIS and any potential problems related to the transmission. Include the "Summary" table from the DET for the entire survey as it stands when the data are transmitted.)

*3.2 Checks performed* (Describe the validation checks performed before submitting the data file to Eurostat via eDAMIS. For example, how is it decided which prices to keep and which to delete? How is it checked that all input data (e.g. observed quantities) are correct? Are changes made to the asterisk allocation during this stage? How is it ensured that a representative average price results for each product? Also comment on the share of questionable ("?") and very questionable ("??") items.)

3.3 *Problems encountered and lessons learned* (Describe any problems encountered during the intra-country validation, solutions found and lessons learned for the next survey (for individual basic headings, if needed).)

#### 4. INTER-COUNTRY VALIDATION

**To be filled after the validation process as an update of the earlier version of the survey report.**

4.1 *Timing, organisation and resources used* (Describe when and how the inter-country validation was carried out (after the submission of data to Eurostat) and how much (human or other) resources were spent.)

4.2 *Checks performed and changes made* ([1] Describe the validation checks performed in the Validation Tool in analysing your country's data against those of other countries. List the countries you compare your prices against. [2] Describe the procedures followed in responding to your Group Leader's queries. [3] Describe the main changes (deletions, modifications or additions) made to your data and the reasons for these changes. [4] Include the "Summary" table from the VT for the entire survey as it stands when the data are fully validated and approved.)

4.3 *Problems encountered and lessons learned* (Describe any problems encountered during the inter-country validation, solutions found and lessons learned for the next survey (for individual basic headings, if needed).)

#### 5. SPECIFIC QUESTIONS RELATED TO THE SURVEY

[1] Please explain general deviations (if any) from the indicative shop type classification given in the survey guidelines. (Individual cases can be explained in the comment fields of the DET.) [2] etc. [3] etc.

5.106 Inter-country validation starts when Eurostat makes the first European Quaranta table available to group leaders and participating countries through the VT. This happens after the group leaders and the countries themselves have checked the price data supplied by group members through the VT for entry errors and reviewed the thoroughness of intra-country validation carried out by group members. Once the price data for the country groups are clean, the first European Quaranta table is computed. Thereafter inter-country validation is an iterative process that can involve several iterations or rounds before being completed. After each round, a new Quaranta table is produced and, as incorrect average survey prices are removed or corrected, the PPPs for the basic heading become more stable. Eventually, after a number of rounds, there is a rough convergence. At this point, group leaders and their group members will agree that the returns from further rounds would be marginal and not worth pursuing and sign off on the validation. In the timeline for the survey process in Box 5.3, it is indicated that the official European Quaranta table is calculated twice but, between and after these two official computations, a number of interim Quaranta tables are produced in keeping with the number of validation rounds carried out.

5.107 As explained in Annex IV, the measures used to identify outliers among the average survey prices for products are the *XR-Indices* and the *PPP-Indices*. These are *standardised price ratios*: the former based on the average survey prices for the product converted to a common currency with exchange rates; the latter based on average survey prices for the product converted to a common currency with the PPPs for the product's basic heading.<sup>24</sup> When validation begins, it is the outliers among XR-Indices that are verified initially. The PPP-Indices are preliminary as they are based on PPPs calculated with the average survey prices that are being edited and verified. As validation progresses, the PPPs and the PPP-Indices become more reliable and the search for outliers shifts from those among the XR-Indices to those among the PPP-Indices. The object is to remove, or at

<sup>24</sup> A standardised price ratio equals  $(CC-Price_{1A} / [CC-Price_{1A} \cdot CC-Price_{1B} \cdot \dots \cdot CC-Price_{1N}]^{1/N}) \cdot 100$  where  $CC-Price_{1A}$  is the average price for product 1 in country A in the common currency.  $CC-Price_{1A}$  is itself equal to  $NC-Price_{1A} / CC_A$  where  $NC-Price_{1A}$  is the average price for product 1 in country A in national currency and  $CC_A$  is the currency conversion rate between the national currency of A and the common currency. The currency conversion rate is either the exchange rate or the PPP:  $CC_A = XR_A$  or  $PPP_A$ .

least reduce, the outliers among the PPP-Indices. If this is achieved, the outliers remaining among the XR-Indices can be ignored. XR-Indices and PPP-Indices that fall outside the range 80 to 125 are flagged as outliers and require verification.

5.108 The average survey prices flagged as outliers in the Quaranta table are only possible errors. They are not errors by definition, no matter how well established are the criteria used to identify them. They cannot be removed automatically, they have to be referred back to the countries reporting them for verification. Participating countries are required to investigate the average survey prices flagged as outliers and to confirm whether they are correct or incorrect. When prices are found to be incorrect, participating countries are expected to correct them or to suppress them.

5.109 In principle, an outlier that is correct should be retained, but the lack of weights within a basic heading at the product level can make this impractical, particularly as the unweighted procedures applied at the basic heading level assume price variation within a basic heading to be moderate. The retention of an outlier that is correct can therefore create noise which impacts not only on the basic heading PPP for the participating country reporting the outlier but also on the basic heading PPPs for the other participating countries. If the outlier refers to a representative product, the effect of the noise can be reduced, at least for the reporting country, by suppressing the representativity indicator. The other option is to suppress the outlier. Neither of these actions would be justified if, within the context of the basic heading, the product is representative of the reporting country or if most of the other countries pricing the product have reported it as unrepresentative (which may explain why it is an outlier in the first place). But, if the outlier is unrepresentative, removing it is probably warranted. Whatever action is taken, it has to be decided jointly by the participating country and the group leader on a case-by-case basis.

5.110 The Quaranta editing procedure also involves analysing the dispersion among the PPP-Indices. For this purpose, three variation coefficients are calculated: the *product variation coefficient* that measures dispersion among the PPP-Indices for a product; the *country variation coefficient* that measures the dispersion among PPP-Indices for a country; and the *overall variation coefficient* that measures average dispersion of product dispersions. The higher a coefficient's value the less reliable are the PPP-Indices to which it refers. The critical value for all three variation coefficients is 33 per cent. Coefficients with values above 33 per cent are outliers requiring countries to investigate the PPP-Indices that are flagged among the PPP-Indices covered by the coefficient.

5.111 Besides being editing tools, the coefficients provide the means to monitor progress during validation and, at its conclusion, to assess how effective the whole process of editing and verification has been in reducing the incidence of non-sampling error among the price data. In a usual situation, coefficients should be smaller at the end of validation than they were at the beginning.

## 5.6.2 Validation of representativity indicators

5.112 In the analysis of the Quaranta tables, specific attention is paid to the allocation of the representativity indicators or asterisks. As explained in Section 5.4.1, the concept of representativity is used because it is expected that representative products have lower price levels than unrepresentative products. The use of asterisks avoids a potential bias due to countries pricing different numbers of representative and unrepresentative products as well as giving representative products a higher weight in the calculation of the basic heading PPPs than the unrepresentative products.

5.113 The PPP-Indices calculated in the Quaranta table help in identifying products that have price levels that are higher or lower than average for that basic heading. Those cases where either

- a product with a high PPP-index receives an asterisk, or
- a product with a low PPP-index receives no asterisk,

deserve to be investigated in detail.

5.114 The allocation of asterisks can have an important impact on the PPPs, in particular for those basic headings in which only a few products are priced. In such a basic heading, adding or removing one asterisk can change the PPPs significantly, not only for the country concerned but for all countries. It is therefore particularly important to carefully check the allocation of asterisk in such basic headings.

5.115 Another way of analysing the correctness of the allocation of asterisks is to calculate PPPs according to the *Country-Product-Representativity-Dummy* (CPRD) method. The CPRD method calculates an explicit coefficient that reflects the average ratio between the price levels of representative and unrepresentative products which is expected to be higher than 1. Comparing the results of the CPRD method with that of the EKS method gives insight into the robustness of the PPPs calculated, in particular as regards the allocation of asterisks.<sup>25</sup>

### 5.6.3 Comparison of results across surveys

5.116 Quaranta tables are the tool for inter-country validation, as explained in Section 5.6.1. However, there is one important drawback to using Quaranta tables: if errors exist that have the same systematic impact on all items within a basic heading for one country, the PPP-indices may show no outliers although the PPPs for the basic heading will be biased. In general, Quaranta tables help in identifying outliers and improving the robustness of the results but they do not provide an assessment of the plausibility of the resulting PPPs and PLIs. For that purpose, the results need to be compared with other indicators.

5.117 First of all, the PLIs can be generally assessed for their plausibility. For example, large price differences between neighbouring countries, or countries at the same level of economic development, should be checked. In addition, the PLIs can be checked against the results of the same survey of three years earlier and corresponding CPI information. For this purpose, two sets of comparison tables are produced during the validation:

- Tables that compare the PLIs of two different surveys at constant exchange rates.
- Tables that compare PLIs of the current survey with PLIs that are extrapolated from the previous survey using CPI indices at basic heading level.

5.118 As explained in Chapter 1, Section 1.3.3, PLIs are calculated as PPPs divided by the exchange rates. Hence, changes in PLIs can be due to either changes in the PPPs or changes in the exchange rates. Calculating PLIs at fixed exchange rate - for example, those of the latest survey year - enables an analyst to visualise the relative changes in PPPs. An increase in the PLI calculated this way for a country indicates that prices have increased faster than the average of all countries and, vice versa, a decrease of the PLI suggest that inflation was less than the average. Those results can then be checked against CPI data in the second type of tables.

5.119 Differences found between the current survey PLIs and the extrapolated PLIs from the previous survey point at instances where the PPP surveys show different price developments than the CPI. There can be many reasons for this:

- Changes in PLIs over time are affected by changes in the underlying structures of volumes.
- The two PPP surveys being compared may have had different product samples or otherwise different methods, these being designed to measure spatial rather than temporal price differences. For example, PPP surveys include unrepresentative products whereas CPIs do not.

<sup>25</sup> More generally, comparing EKS results with the results of other versions of the EKS, such as the classic EKS which does not take representativity into account or the EKS-S which does (see Chapter 12, Section 12.2.7), also provides useful information about the allocation of asterisks and the PPPs that the allocation gives rise to.



- The product sample of the PPP surveys may be different from those employed in the CPI, or more generally, there may be different concepts and methods. For example, CPI surveys apply quality adjustments whereas PPP surveys do not.
- There may be errors in either the previous PPP survey or the current PPP survey, or in the CPI indices that were used as extrapolators.

5.120 It is important to analyse each instance of incoherence between CPI and PPP and to determine the nature of its cause, in particular to see if any is due to identifiable error. It cannot be expected that PPPs and the CPI will be fully coherent, due to the first three sets of reasons listed above. But major discrepancies should be understood, to be able to explain them to users.

5.121 In order to reduce the magnitude of discrepancies between temporal and spatial price measures, it is attempted to keep methodologies and sampling constant between surveys to the extent possible. This should of course not be at the expense of updating product lists, since these need to remain representative for the time period surveyed, or of improvements in methodology. Another approach to improve coherence is to further strengthen the links between CPI and PPP data collections. This is discussed further in Section 5.10.

## 5.7 Evaluation

5.122 After the closure of each of the consumer price surveys - that is, after all countries have approved the final results - countries send the final version of the survey report to their group leaders and Eurostat. This final version includes section 4 on inter-country validation, describing the work done during this stage of this survey. The survey report thereby forms a complete description of the execution of the survey by the country. Countries are also invited to report the problems they encountered during the survey and to bring forward their suggestions for improvements.

5.123 The group leaders take the country survey reports as input to their own survey reports. They summarise the countries' experiences and add their own views and suggestions from the group leader perspective. Finally, Eurostat takes the group leader reports and develops them into a unified evaluation report. This report serves as documentation on the execution of the survey, describing stage by stage the steps taken, problems encountered and lessons learned. It also gives a general assessment of the quality of the results of the survey. It concludes with a set of suggestions and recommendations for the next similar survey.

5.124 When the survey is next being prepared, the evaluation report is an important input to decisions on survey methodology and product lists during the preview and planning stages.

## 5.8 Derivation of national annual prices

### 5.8.1 Survey prices to national prices

5.125 After each survey all countries are required to provide Eurostat with spatial adjustment factors in order to adjust average prices obtained from one or more locations within the economic territory of a participating country to national average prices.<sup>26</sup> Countries report spatial adjustment factors for each basic heading included in the respective survey. According to the PPP Regulation they are required to measure regional differences in price levels once every six years – that is, the spatial adjustment factors can be retained for two survey cycles after which they have to be re-surveyed.

5.126 Spatial adjustment factors are to be transmitted to Eurostat two months after data collection is completed – that is, in July for the survey held in the first half of the year and in January of the

<sup>26</sup> Countries that collect prices in a representative selection of locations across their territory do not need to provide spatial adjustment factors.

following year for the survey held in the second half of the year. Once the average prices for a survey have been approved by both Eurostat and the participating countries, Eurostat adjusts the average survey prices of the countries reporting capital city prices to national prices, basic heading by basic heading, using the spatial coefficients provided by those countries.

5.127 There are at least two main approaches that can be followed by the countries in the establishment of the spatial adjustment factors: they can be calculated on the basis of available CPI data or they can be derived from specific surveys aiming at measuring regional differences in consumer price levels.

5.128 The first approach is generally less resource demanding and it is therefore recommended to investigate its feasibility before undertaking specific surveys. If CPI data are used, the exercise should cover observations for one complete year in order to guarantee a consistent annual average. Furthermore, CPIs are also used in the PPP exercise as temporal adjustment factors (see next section). Within the CPI approach, there are again broadly two ways of proceeding:

- One can take the PPP product list and try to match it against CPI products. This method has the advantage that the prices are comparable to those collected for PPP purposes.
- Alternatively, one can search the CPI data for products that are comparable across regions and base the spatial adjustment factors on the prices for these products. This method is independent of the PPP product list but may yield more representative prices for the regions.

5.129 Should CPI sources prove to be insufficient, further specific price collections for this purpose can be taken into consideration. Such a price collection should aim to measure relative differences in regional consumer price levels and can provide a good basis for the calculation of the spatial adjustment factors. However, it is resource-intensive. In practice, a combination of using available CPI data with additional price collection for areas where comparable CPI data are lacking may be optimal. Basic headings with national pricing like tobacco, motor cars, fuels, etc. do not need to be considered in the research.

5.130 If regional average prices have been computed, the calculation of the spatial adjustment factors can proceed in the same way as PPPs are calculated at European level - that is, using the EKS method, including the assignment of representativity indicators at regional level. This would yield regional PPPs. If the regional PPPs are expressed with country = 1, the spatial adjustment factor would be the inverse of the PPP for the capital region. It is not necessary to calculate regional PPPs though. It is also possible to calculate national average prices and capital city average prices and take the unweighted geometric mean of the ratios between the two. This gives the spatial adjustment factor for the basic heading directly.

5.131 Account should be taken of the weights of each region within the country. Normally the capital city region will have the largest share of national expenditures among the regions. If regional PPPs are calculated, it should be ensured that the spatial adjustment factor is calculated as the difference between the weighted national average price and the capital city price. If national average prices are directly calculated, it should be ensured that the number of prices collected in each region reflect the importance of each region in the national expenditure. Regional consumption weights at basic heading level may be available from the household budget survey.

5.132 A number of countries participating in the PPP Programme assume a spatial adjustment factor of 1. These countries have markets with insignificant regional price differences for most of the products and consequently it is assumed that capital city price levels are close to the national average level. In some cases this is confirmed by data collected for the purposes of CPI. This is the case especially when national markets are dominated by chains following a national price policy and consequently it is reasonable to assume that capital prices represent national averages to a fair degree.

## 5.8.2 National prices to annual national prices

5.133 The national survey prices, irrespective of whether they are adjusted capital city prices or national prices supplied directly by countries, refer to the point in time when the survey was conducted. They are not annual prices and need to be adjusted accordingly. To this end, participating countries are required to provide Eurostat or the OECD with monthly temporal adjustment factors with which the national survey prices can be converted to national annual prices. The adjustment factors are to be monthly and to be transmitted once a year – or, more precisely, the adjustment factors for the twelve months of the year  $t$  are to be reported by the end of March of the year  $t+1$ . An adjustment factor is to be supplied for each basic heading comprising individual consumption expenditure by households. This is because temporal adjustment factors are not just used to convert national survey prices to national annual prices for the basic headings surveyed during the year, they are also used to extrapolate the PPPs of those basic headings that were not surveyed during the year – a requisite of the rolling survey approach.

5.134 At the beginning of each year, Eurostat sends participating countries an electronic reporting form which is partially completed with temporal adjustment factors that it has extracted from its CPI data base. There is a good correspondence between CPI sub-indices and the basic headings constituting household expenditure. This is because COICOP<sup>28</sup> is the classification underlying the CPI and, as explained in Chapter 4, Section 4.3.3, it is the classification underlying the breakdown of household individual consumption expenditure in the Eurostat-OECD classification of GDP expenditures. Even so, not all basic headings are covered or CPI data are not applicable for the PPP purposes due to different price concepts - for example, the full market price concept for medical goods and services<sup>29</sup> - and countries are required to provide temporal adjustment factors for these basic heading. They are expected to extract the temporal adjustment factors from their CPI database or another source. COICOP is also the classification underlying the CPIs of most participating countries and so the correspondence between CPI sub-indices and basic headings is generally high. But when there is no exact match, participating countries are expected to select a sub-index, or an aggregation of sub-indices, that closely approximates the basic heading in question. CPI sub-indices are usually more detailed than basic headings and often they can be aggregated specifically for a basic heading. Countries are required to return the completed reporting form to Eurostat via eDAMIS.

## 5.8.3 Seasonal products

5.135 Seasonal products are defined as those products for which both prices and the quantities sold vary considerably throughout the year. Typically, the patterns of variation are repeated from one year to the next. By this definition, certain fruits, vegetables, fish and flowers are obviously seasonal products. Various types of clothing are also seasonal products. So too are those goods that are sold in substantial amounts at prices well below normal prices during seasonal sales. For the purposes of Eurostat and OECD comparisons, only seasonal food products warrant special treatment.

5.136 The approach adopted by Eurostat for seasonal food products is to obtain annual prices by adjusting survey prices with weighted temporal adjustment factors.<sup>30</sup> This requires participating countries to provide weights in addition to an appropriate CPI sub-index for each seasonal food product they priced. The weights should be quantity weights reflecting the quantities of the item purchased throughout the survey year. If quantity weights are not available, expenditure weights based on the amounts spent on the item during the survey year should be provided instead. The weights should be monthly weights. If monthly weights do not exist, quarterly weights should be estimated by allocating a share of 100 per cent to each of the four quarters of the survey year. This assumes that, for most seasonal food products, participating countries are able to identify approximately the consumption pattern over a year and to attribute the major part of consumption to one or two quarters of the year accordingly. If a country is unable to supply weights, the annual

<sup>28</sup> "Classification of Individual Consumption According to Purpose (COICOP)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

<sup>29</sup> See Chapter 7, Section 7.3.1.

<sup>30</sup> Countries participating in OECD comparisons are required to provide annual prices for seasonal food products. It is left to the countries to decide how the annual prices are obtained.

average price will be calculated as an unweighted harmonic mean and not as an unweighted arithmetic mean.

5.137 Neither seasonal food products nor their seasonality are necessarily the same for all participating countries. It is left to the participating countries to decide which of the food items specified on the final product list for the food survey they regard as seasonal. Each country is required to mark those priced products deemed affected by seasonality. Eurostat then prepares an electronic reporting form including all the products that were marked by countries. The layout of the reporting form is set out in Box 5.12. The Box gives two examples. The first shows what the completed form looks like when actual monthly weights are provided. The second shows how the completed form appears when estimated quarterly weights are supplied.

5.138 Only seasonal products are listed on the reporting form. Their codes and descriptions are copied from the final product list for the food survey by Eurostat. For each seasonal product specified, the country is required to complete the shaded cells – that is, the cells covering:

- type of weights being provided: quantity weights or expenditure weights;
- coverage of the CPI sub-index chosen as temporal adjustment factor. The sub-index will refer either to the product itself or to the product group or basic heading to which it belongs;
- monthly values of the sub-index for the survey year  $t$  based on  $t-1$ , the year prior to the survey year;
- actual monthly weights or estimated quarterly weights.

The reporting form is programmed to complete the cells outlined in red - namely, the weighted annual average and the correction coefficients.

5.139 Participating countries are expected to return the completed reporting form to Eurostat via eDAMIS after the close of the survey year – that is, by end-January of  $t+1$ . Eurostat uses the correction coefficients for the survey month (or months) to adjust the average survey prices for the seasonal products to annual prices. In cases where the prices were surveyed over two months, the arithmetic average of the correction coefficients of the months in question will be used.

**Box 5.12: Reporting form for data required for seasonal food products**

 Country  Quantity weights  Expenditure weights 

Item	Code	Description	Closest CPI for t			Weights for t			Temporal adjustment factor (TAF)
			Survey month	CPI code and title	Monthly index (average of t-1 = 100)	Actual monthly CPI weight (%)	Quarter	Estimated quarterly weight (%)	Survey month price * TAF = annual price
<b>(a) Example with actual monthly weights</b>									
36	11.01.16.1.01.la	Fresh kiwis	Jan	123 Fresh fruit	59.10	14	I		1.335 <sup>(c)</sup>
			Feb		69.69	14			1.132
			Mar		76.14	12			1.036
			Apr		94.70	9	II		0.833
			<b>May</b>		95.65	7			<b>0.825</b>
			Jun		96.19	4			0.820
			Jul		128.25	3	III		0.615
			Aug		116.57	2			0.677
			Sep		121.32	4			0.650
			Oct		98.99	5	IV		0.797
			Nov		70.42	13			1.120
			Dec		57.80	13			1.365
						<b>Year</b>		<b>78.88<sup>(a)</sup></b>	100.0
<b>(b) Example with estimated quarterly weights</b>									
38	11.01.16.1.01.na	Fresh strawberries	Jan	150 Strawberries	118.89		I	10	0.697
			Feb		95.08				0.871
			Mar		73.69				1.124
			Apr		60.94		II	45	1.359
			<b>May</b>		60.37				<b>1.372</b>
			Jun		60.37				1.372
			Jul		70.78		III	30	1.170
			Aug		82.89				0.999
			Sep		112.43				0.737
			Oct		128.65		IV	15	0.644
			Nov		140.11				0.591
			Dec		119.05				0.696
						<b>Year</b>		<b>82.84<sup>(b)</sup></b>	

<sup>(a)</sup> Weighted annual average:  $[(59.10 \times 14) + (69.69 \times 14) + \dots + (57.80 \times 13)] / 100$

<sup>(b)</sup> Weighted annual average:  $[\{(118.89 + 95.08 + 73.69) / 3\} 10 + \dots + \{(128.65 + 140.11 + 119.05) / 3\} 15] / 100$

<sup>(c)</sup> Weighted annual average / monthly index:  $78.88 / 59.10$ ;  $78.88 / 69.69$ ; etc.

(For comparison: Fresh kiwis: unweighted arithmetic mean = 90.40; unweighted harmonic mean = 84.49.

Fresh strawberries: unweighted arithmetic mean = 93.60; unweighted harmonic mean = 85.45)

## 5.9 Estimation of PPPs for non-survey years

5.140 Following the rolling survey approach, each basic heading for consumer goods and services is priced only once every three years. PPPs for non-survey years are calculated by applying annual extrapolation factors to the PPPs of the survey years at basic heading level. The annual extrapolation factors are derived from the same set of data as provided for the temporal adjustment factors described in the previous section. They are calculated as the annual arithmetic average of the monthly temporal adjustment factors and would in most cases correspond to the annual CPI index.

5.141 If a basic heading is priced in year  $t$ , the PPP for that basic heading in year  $t+1$  is derived as:

$$PPP_{t+1} = EXT_{t+1} * PPP_t$$

with  $EXT_{t+1}$  being the extrapolation factor for year  $t+1$  - that is, a price index giving the change in prices between year  $t$  and  $t+1$  relative to the average change in prices for the European Union. For year  $t+2$ , the PPP will be retroplated from the PPPs derived in the survey of year  $t+3$ :

$$PPP_{t+2} = PPP_{t+3} / EXT_{t+3}$$

This can only be done after PPPs for year  $t+3$  have become available. Until then, the PPPs for year  $t+2$  are derived as:

$$PPP_{t+2} = EXT_{t+2} * PPP_{t+1} = EXT_{t+2} * EXT_{t+1} * PPP_t$$

5.142 The general use of CPI indices as extrapolation factors for the PPPs underlines the importance of checking the coherence of the PPP survey results with corresponding CPI data as described in Section 5.6.3. Suppose, for example, that the PPP surveys of years  $t$  and  $t+3$  show that, for a certain country, price levels have increased compared to the average of all countries, whereas the CPI shows the opposite. The above extrapolation scheme would then result in a large – and difficult to explain – jump in the PPPs between years  $t+1$  and  $t+2$ .

## 5.10 Synergies between PPP and CPI price collection

5.143 Because of the extensive use of CPI data to extrapolate PPPs, both from monthly survey prices to annual average prices as well as from survey years to non-survey years, it is desirable to achieve a high level of coherence at national level between the prices used for the calculation of CPIs and those used for the calculation of PPPs. However, CPIs and PPPs have different aims which require different approaches that are not always compatible.

5.144 CPIs aim at measuring the month-to-month price changes at national level. Each country has its own basket of goods and services that is to be as representative for that country as possible. Generally, product descriptions are wide because the main aim for price collectors is to find the same product in an outlet that was priced in the previous month. In some cases several hundreds of prices are collected nationwide per product each month.

5.145 PPPs aim at measuring price differences across countries at a given point in time. For this purpose, a product list is devised that aims to combine comparability across countries with representativity for each country (see Section 5.4.1). Product descriptions are detailed in order to obtain prices for comparable products across countries. The number of prices collected per product within a country can vary between 1 and a few dozen. Prices are often collected only in capital cities.

5.146 There is a potential gain in quality to be made if CPI price observations could be used for PPP purposes without compromising comparability across countries. It would give a much broader base of data - monthly prices, national coverage, a large number of observations - from which to calculate PPPs. In addition, it would lead to savings in costs since the separate price collection for PPPs could be reduced. Many countries already examine their CPI data to see if any of the products

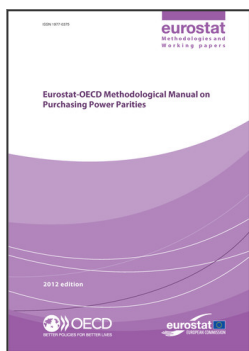
on the PPP product list also appear in the CPI sample so that no additional price collection for PPPs is necessary. This is already possible for some food categories like fresh fruit and vegetables. Due also to shrinking financial and human resources in NSIs, there is an increased interest in searching for further synergies in the price collection for CPI and PPP purposes. There are broadly two ways this can be explored:

- *Ex-post approach*: CPI price observations can be mined for products that match the PPP product descriptions. This requires that information is available on the characteristics of the products that were priced for the CPI. Increasing the collection of such metadata on CPI products would enable more of such matching. If characteristics of CPI products were collected in all countries in a standardised way - for example, by using SPDs - matching across countries would also be possible. Collecting such information is costly and there is a risk that it may be to the detriment of the number of prices being collected for the CPI. If this approach is followed it must be done with great care not to affect the quality of the CPI. On the other hand, there may be a benefit to the CPI process in having detailed information on the products being priced: it may be used to control for quality changes for example.
- *Ex-ante approach*: adapting CPI baskets to contain precisely-defined product specifications that can be used for purposes of PPP calculations. It would enable a monthly collection of the PPP prices so that a more reliable annual average price can be obtained. CPI price collectors will have to be trained to search for products according to a precise definition. Not all such precisely-defined products however will be representative for each country; normally such products should not enter the national CPI calculations. Again, any changes should be implemented carefully.

5.147 Another development that could benefit the quality of both CPI and PPP results and stimulate their integration is the increased use of scanner data. Some countries are already using scanner data as the main source for prices data for products that are typically purchased in supermarket, hypermarkets, and the like. Scanner data provide exhaustive information on transaction prices. They also provide information on sales volumes per bar code. Whereas scanner data have great potential as a data source there are also challenges, specifically in the processing of huge volumes of data on a monthly basis for the CPI, or for PPPs, and in identifying those bar codes that correspond to a particular product definition. Many countries are now researching the possibilities for obtaining scanner data from outlets and the most efficient ways of using them.







**From:**  
**Eurostat-OECD Methodological Manual on  
Purchasing Power Parities (2012 Edition)**

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264189232-en>

**Please cite this chapter as:**

OECD/Eurostat (2012), “Consumer goods and services”, in *Eurostat-OECD Methodological Manual on Purchasing Power Parities (2012 Edition)*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264189232-8-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).