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Eurostat-OECD Methodological Manual on Purchasing Power Parities

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FOREWORD

For the last twenty-five years, Eurostat and the OECD have worked together comparing the price and volume levels of the GDPs of EU Member States and OECD Member Countries. The comparisons are made with purchasing power parities or PPPs. This common programme is called the "Eurostat-OECD PPP Programme". The first joint comparison was for 1980. It covered 18 countries. Subsequently, joint comparisons have been made for 1985, 1990, 1993, 1996, 1999 and 2002. During this period, the number of countries covered grew from 22 to 43. The next joint comparison will be for 2005. It will cover 45 countries.

The methodology that Eurostat and the OECD employ in their comparisons has been described in various reports and papers. But these reports and papers have tended to be either too general in their description of the Programme or too focused on specific aspects of the Programme. There has been no single document covering the Programme in detail from start to finish. The absence of such a document has been particularly trying to those involved directly in the implementation of the Programme. To rectify this omission, Eurostat and the OECD have prepared this manual.

The manual has three aims: first, to explain to those engaged directly in the Programme - that is, to practitioners in Eurostat, the OECD and the national statistical institutes of participating countries - the why and the how and the when of the international price and volume comparisons of GDP organised by Eurostat and the OECD; second, to enable these practitioners to brief their senior management and significant users - such as politicians, journalists, academics and the like - on the why and how of the Programme and, more importantly, to advise them on the use and interpretation of comparison results; and third, to provide a point of reference accessible to teachers, students and other members of the general public interested in PPPs and related statistics.

Central to the Programme is the issue of whether GDP comparisons across countries should be made with exchange rates or with PPPs. Eurostat and the OECD Statistics Directorate maintain that they should be made with PPPs, although this view has still to gain general acceptance. However, as the manual demonstrates, exchange rates are usually misleading on the relative sizes of economies as measured by their GDP. Analyses or projections based on exchange rate converted GDP are in danger of being flawed from the outset because the relative GDP levels of countries being used are likely to be incorrect. It is to be hoped that the manual, by detailing the sources and methods of the Eurostat-OECD PPP Programme, will foster a better understanding of PPPs and, in doing so, a greater use of PPPs in international comparisons of GDP and associated macro-economic aggregates.

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Introduction

1. The executive summary provides an overview of the principal features of the Eurostat-OECD PPP Programme. More complete and detailed descriptions of these and other aspects of the Programme can be found in the relevant chapters and annexes of the manual.[1]

2. The Programme was started in the 1980s to compare the price and volume levels of GDP of the Member States of the European Union (EU) and the Member Countries of the OECD. This remains the Programme's purpose, even though its coverage has been broadened to include countries that are neither EU Member States nor OECD Member Countries.[2] Before the price and volume levels of the GDPs of different countries can be compared, it is first necessary to express their GDPs - which are in national currencies and valued at national price levels - in a common currency at a uniform price level. To do this, Eurostat and the OECD use purchasing power parities (PPPs).

BACKGROUND

Gross domestic product (GDP)

3. GDP is the sum of the value added generated by producers residing in the economic territory of a country during the accounting period. Its coverage and its usefulness as a summary measure of economic and social progress are continually being debated. Despite this, it is still the aggregate used most frequently to represent the economic size of countries and, when placed on a per capita basis, the economic welfare of their residents.

4. As a measure of economic welfare, GDP per head has its limitations. Besides covering the goods and services that resident households consume to satisfy their individual needs, it also includes services, such as defence and police, that government produces to meet the collective requirements of the community, as well as gross capital formation and net exports neither of which constitute final consumption.

5. An alternative measure is the aggregate "actual individual consumption". This comprises only the goods and services that households actually consume to satisfy their individual wants. It covers all such goods and services irrespective of whether they are purchased by the households themselves or are provided as social transfers in kind by government and non-profit institutions serving households (NPISHs). Eurostat-OECD comparisons are organised so that both the GDP and the actual individual consumption of participating countries can be compared.

6. GDP can be estimated from the production side, the expenditure side and the income side. All three approaches will yield the same result in theory. Price and volume comparisons of GDP are based on the identity: value = price x volume. The values of income aggregates, unlike the values of production and expenditure aggregates, cannot be split into meaningful price and volume components. Price and volume comparisons of GDP can be made only from the production side or the expenditure side.

Eurostat-OECD approach

7. Eurostat-OECD comparisons are made from the expenditure side. These have the advantage of enabling the levels and structures of the principal components of final demand to be compared. They are also relatively easy to organise having less onerous data requirements. Their disadvantage is that, because industries are not identified on the expenditure side, productivity comparisons can be made only at the level of the whole economy. To compare productivity at the industry level, international comparisons of GDP should be made from the production side. These are more difficult to organise as they require data for both intermediate consumption and gross output.

8. Comparing the values of the final expenditure that countries make on GDP will not provide a comparison of the volumes of goods and services purchased in the countries unless the differences in their price levels have been removed. Differences in price levels between countries can be removed either by observing the volumes directly or by deriving them indirectly using a measure of relative prices to place the expenditures of all the countries on the same price level. Prices are easier to observe than volumes and, as a rule, direct measures of relative prices have a smaller variability than direct measures of relative volumes. Eurostat-OECD comparisons estimate volumes indirectly.

9. International volume comparisons of GDP depend on four conditions being met, namely:

- the definition of GDP is the same;

- the measurement of GDP is the same;

- the currency unit in which GDP is expressed is the same; and

- the price level at which GDP is valued is the same.

10. GDP estimates of countries participating in Eurostat-OECD comparisons generally meet the first condition as they are compiled in line with one of the two complementary international systems of national accounts: the SNA 93[3] or the ESA 95[4]. But the measurement of GDP is not always equally

exhaustive across all participating countries to satisfy the second condition. In particular, the GDPs of countries with a large informal or underground sector may be underestimated, depending on how well the national accountants have been able to include these "non-observed" activities in their estimates of GDP.

11. The third condition of a common currency unit is not met except by countries in the Euro Zone. The GDP estimates of the majority of participating countries are expressed in different national currencies. Nor is the fourth condition met as the GDP estimates of participating countries are valued at national price levels. To meet these last two conditions it is necessary to have conversion rates that both convert to a common currency and equalise the purchasing power of different currencies in the process of conversion. Such conversion rates are called "purchasing power parities" or "PPPs". Eurostat and OECD comparisons are made using PPPs.

Exchange rates

12. Exchange rates had to be used to make international comparisons of GDP before PPPs became available. Exchange rates provide GDP estimates that are expressed in the same currency unit, but they do not provide GDP estimates that are valued at the same price level. To do this, exchange rates would have to reflect the relative purchasing powers of currencies in their national markets. And this they do not do. First, because exchange rates are determined by the supply and demand for different currencies and the supply and demand for currencies are influenced by factors such as capital flows between countries and currency speculation rather than by the needs of international trade. And second, because many goods and services, such as buildings and government services, are not traded internationally.

13. GDPs of countries converted to a common currency using exchange rates continue to be valued at national price levels. They reflect both differences in the volumes produced in the countries and differences in their price levels. They are, therefore, *nominal* measures and measures of value. PPPs, on the other hand, are conversion rates that are both currency converters and spatial price deflators. GDPs of countries converted to a common currency using PPPs are also valued at a uniform price level. They reflect only differences in the volumes produced in the countries. They are, therefore, *real* measures and measures of volume.[5]

14. The differences between GDPs converted with exchange rates and GDPs converted with PPPs can be significant. Comparisons between the two show that exchange rate converted GDPs are generally misleading on the relative sizes of economies.[6] Exchange rates overstate the size of economies with relatively high price levels and understate the size of economies with relatively low price levels.[7]

15. Exchange rates are subject to fluctuations. And countries may suddenly appear to become "richer" or "poorer" even though there has been no change in the relative volumes of goods and services produced. It is the volatility of exchange rates, and not that they do not correct for price level differences between countries, that is sometimes perceived as their weakness when making international comparisons of GDP. Fluctuations can be avoided by using moving averages of exchange rates to convert GDP to a common currency. Averaging exchange rates over several years does dampen their fluctuations, but it does not bring them any closer to PPPs.[8]

Purchasing power parities (PPPs)

16. In their simplest form PPPs are nothing more than price relatives that show the ratio of the prices in national currencies of the same good or service in different countries. For example, if the price of a hamburger in France is 2.84 euros and in the United States it is 2.20 dollars, the PPP for hamburgers between France and the United States is 2.84 euros to 2.20 dollars or 1.29 euros to the dollar. In other words, for every dollar spent on hamburgers in the United States, 1.29 euros would have to be spent in France in order to obtain the same quantity and quality – or volume – of hamburgers.

17. PPPs are calculated in three stages. The first is at the product level, where price relatives are calculated for individual goods and services. The second is at the product group level, where the price relatives calculated for the products in the group are averaged to obtain unweighted PPPs for the group. And the third is at the aggregation levels, where the PPPs for the product groups covered by the aggregation level are weighted and averaged to obtain weighted PPPs for the aggregation level. The weights used to aggregate the PPPs in the third stage are the expenditures on the product groups.

18. PPPs are still price relatives when they refer to a product group or to an aggregate. It is just that in moving up the levels of aggregation the price relatives refer to increasingly complex assortments of goods and services. Thus, if the PPP for GDP between France and the United States is 0.97 euros to the dollar, it means that 0.97 euros has to be spent in France to obtain the same volume of final goods and services that one dollar purchases in the United States. This does not imply that the baskets of goods and services purchased in both countries will be identical. The composition of the baskets will vary between countries reflecting their economic, social and cultural differences, but both baskets will, in principle, provide equivalent satisfaction or utility.

Price, volume and value measures

19. PPPs are used to convert national final expenditures on product groups, aggregates and GDP of

different countries into real final expenditures. The final expenditures are called "real" because they are valued at a uniform price level and so reflect only differences in the volumes purchased in countries. PPPs and real final expenditures provide the price and volume measures required for international comparisons. Those for GDP are the most important, but those for product groups and aggregates are also useful in their own right.

20. Three sets of indices are typically derived using data on PPPs, real final expenditures, population and exchange rates.[9]

- *Indices of real final expenditure*: These are volume measures that reflect the relative magnitudes of the product groups or aggregates being compared. At the level of GDP they are used to compare the economic size of countries.

- *Indices of real final expenditure per head*: These are standardised measures of volume that reflect the relative levels of the product groups or aggregates being compared after adjusting for differences in the size of populations between countries. At the level of GDP they are often used to compare the economic welfare of populations.

- *Comparative price levels*: These are the ratios of PPPs to exchange rates. They provide a measure of the differences in price levels between countries by indicating for a given product group or aggregate the number of units of common currency needed to buy the same volume of the product group or aggregate in each country. At the level of GDP they provide a measure of the differences in the general price levels of countries.

21. Final expenditures converted to a common currency with exchange rates are referred to as "nominal final expenditures". They are called "nominal" because they remain valued at national price levels and so reflect differences in both price levels and volume levels between countries. Nominal final expenditures give rise to two sets of indices, namely: *indices of nominal final expenditure* and *indices of nominal final expenditure per head*.[10] These indices are measures of value. They are not measures of volume and should not be used as such.

Users and use of PPPs

22. PPPs are of interest to an increasing number of international and national users. These include international organisations, government agencies, universities, research institutes, public enterprises, private firms, banks, journalists and individuals.

23. International organisations, government agencies, universities and research institutes use PPPs as inputs into economic research and policy analysis requiring comparisons between countries. PPPs are employed either as currency converters to generate volume measures with which to compare

levels of economic performance, economic welfare, consumption, investment, overall productivity and government expenditure on defence, health, etc., or as price measures with which to compare price levels, price structures, price convergence and competitiveness. Journalists use PPPs in both these ways in their commentaries on economic and social policy.

24. Public enterprises apply PPPs when comparing their prices and operating costs with those of similar public enterprises in other countries. Private firms operating in different countries apply PPPs for the purposes of comparative analysis involving prices, sales, market shares and production costs. Banks employ PPPs in economic analysis and in the monitoring of exchange rates. Individuals often refer to PPPs in salary negotiations when moving from one country to another (as do the personnel managers with whom they are negotiating).

25. International organisations also use the real final expenditures generated by PPPs for statistical purposes. The real final expenditures are used to sum GDP and its component expenditures over countries to provide totals for groups of countries, such as the European Union and the OECD. Country shares in these totals are used as weights when non-additive economic indicators, such as growth rates or consumer price indices, are combined to obtain averages for groups of countries.

26. With one exception, PPPs are not used by international organisations for calculating member countries' contributions nor for assessing their eligibility for aid grants or their access to loans on favourable terms. The exception is the European Commission. Some 30 per cent of its total budget is spent on the Structural Funds, the overall aim of which is to gradually reduce economic disparities between and within EU Member States. The allocation of the bulk of the funds is made on the basis of PPP-converted regional GDP per capita.

Limitations of price and volume indices

27. GDP and GDP per head are often used to rank countries by economic size and economic welfare. But neither the indices of real final expenditure on GDP nor the indices of real final expenditure per head on GDP should be used to establish a strict ranking of countries. Rather, it is recommended that they be used to establish groups of countries with similar GDP per head. Likewise, comparative price level indices for GDP can be used to rank countries by their general level of prices, but here too it is recommended that countries with similar price levels be grouped together rather than ranked strictly.[11]

28. PPPs are statistical constructs rather than precise measures. They are, like all statistics, point estimates lying within a range of estimates – the "error margin" – that includes the true value. The error margins surrounding PPPs depend on the reliability of the expenditure weights and the price data as

well as to the extent to which the particular goods and services selected for pricing by participating countries actually represent the price levels in each country. As with national accounts data in general, it is not possible to calculate precise error margins for PPPs or for the real final expenditure levels and comparative price levels derived from them.

29. Nonetheless, it is possible to provide some indications about the uses for which PPPs are recommended and the uses for which they are not recommended.[12] Recommended uses include volume comparisons of GDP and GDP per head as well as the comparison of price levels (providing countries are grouped rather than ranked). With some limitations, PPPs can be employed to trace changes in relative GDP per capita and in relative price levels over time.

30. Indices of real final expenditure on GDP provide a "snapshot" of the relative volume levels of GDP among participating countries for a given reference year. Indices of consecutive reference years appear to provide a "moving picture" of relative GDP volume levels over the years. This apparent time series of volume measures is actually a current price time series showing the combined effect of changes in both relative price levels and relative volume levels. The indices are at the same uniform price level within each reference year, but the uniform price level changes from one reference year to another. And so the rates of relative growth derived from the indices are not consistent with those obtained from the constant price estimates of GDP of countries.

31. To obtain a time series of volume indices at a constant uniform price level that replicates exactly the relative movements of GDP volume growth of each country, it is necessary to select one of the reference years as a base year and to extrapolate its relative GDP volume levels over the other years by applying the relative rates of GDP volume growth observed in the different countries. This assumes that price structures do not change over time. But relative prices do change over time and, if such changes are ignored over long periods, a biased picture of the relative economic performances of countries can result. The choice of base year can also influence the picture that emerges.

32. Comparative price levels provide a means of observing the movement of price levels over time, but they have to be used with caution. First, they are influenced by exchange rate fluctuations. Second, independently of exchange rates, they are volatile. This is generally so at lower levels of aggregation where sample sizes are small. Usually such volatility diminishes with aggregation.

33. More important is the volatility that arises when the basket of products to be priced changes from one benchmark survey to another in order to accommodate market developments. For benchmark surveys such as clothing and footwear, the changes can be substantial. Volatility of this type also diminishes with aggregation. Even so, comparative price levels at higher level aggregates can still appear to jump when there is a change in benchmark prices. Comparative price level indices should be used to monitor price convergence only at higher levels of aggregation and over long periods of time.

DATA REQUIREMENTS

Background

34. To calculate PPPs from the expenditure side, it is necessary for each country participating in the comparison to provide a set of national annual purchasers' prices and a detailed breakdown of final expenditure on GDP. The prices should refer to a selection of products chosen from a common basket of precisely-defined goods and services. The final expenditures should be broken down by product groups – called "basic headings" - according to a common classification. Both prices and expenditures should refer to the year of the comparison – that is, the "reference year". And both should cover the whole range of final goods and services included under GDP. Participating countries have also to provide annual average exchange rates and mid-year resident population for the reference year.

35. The prices reported by participating countries are used to calculate PPPs first at the product level, then at the basic heading level and finally at the various aggregation levels above the basic heading level. The PPPs at the aggregation levels are calculated using the final expenditures that participating countries have supplied on the constituent basic headings as weights. The PPPs are used to convert national final expenditures on GDP into real final expenditures on GDP. The exchange rates are used to derive comparative price levels. They are also used as proxy PPPs for exports and imports when calculating the PPPs for GDP. The population data are used to compute real final expenditures per head.

Consistency

36. PPPs are primarily price deflators. The prices supplied by participating countries should be *consistent* with the methods of valuation used to estimate final expenditure on GDP. The basis of a comparison is the identity: expenditure = price x volume. Volumes are obtained by dividing expenditures by prices. If the volumes are to be estimated correctly, the prices collected should be those used to derive the expenditures. Deflating with prices that are not consistent with those underlying the expenditure values will result in volumes being underestimated if the prices are too high or overestimated if the prices are too low.

37. In principle, the final expenditures on GDP that participating countries report for the reference year are estimated using national annual purchasers' prices of actual market transactions. Consistency requires participating countries to collect *national* prices that are also *annual* prices. The national annual prices have to be *purchasers'* prices – where a purchaser's price is defined as the amount paid by the purchaser in order to take delivery of a unit of a good or service at the time and place required by the purchaser. Finally, the national annual purchasers' prices have to be *market* or *transaction* prices - that is, the actual price for a transaction agreed on by the transactors.

38. Besides being consistent with the final expenditures on GDP, the prices participating countries report must be for items that are *representative* of their final expenditure on GDP and which are *comparable* between them.

Comparability

39. Products are considered to be comparable if they have identical or equivalent physical and economic characteristics. Equivalence between products is defined as meeting the same requirements with equal efficiency so that purchasers are indifferent between them and are not prepared to pay more for one than for the other. The pricing of comparable products ensures that differences in prices between countries for a product reflect "actual" price differences and are not influenced by differences in quality. Pricing goods and services of the same quality avoids quality differences being mistaken for "apparent" price differences and the consequent underestimation or overestimation of price levels.

40. Comparability is obtained in Eurostat-OECD comparisons by participating countries pricing product specifications that fully define the products in terms of the principal characteristics that influence their market prices. The approach is called "specification pricing" and requires the characteristics of both the product and the transaction to be specified. Product specifications can be brand and model specific – that is, a specification in which a particular brand and model, or a cluster of comparable brands, is stipulated. Or they can be generic – that is, a specification where only the relevant technical parameters and other price determining characteristics are given and no brand or cluster of brands is designated.

41. Ideally, all product specifications would be brand and model specific so that countries would price products of identical quality. In practice, this is not possible for reasons of availability and representativity. Generic specifications have also to be employed and inevitably some variability in quality between the products priced by countries will occur. Usually these differences are identified when the price data are edited. Neither Eurostat nor the OECD adjusts prices to compensate for differences in quality. Mismatches in quality are dealt with either by re-matching the prices reported or by discarding them.

Representativity

42. Representativity is a concept that relates to individual products within a basic heading. It has had to be introduced because there are no expenditure weights below the basic heading level with which to determine the relative importance of the various products priced within a basic heading. To ensure that there are enough prices to be compared between countries, participating countries are required to price both representative products and unrepresentative products within each basic heading. Representative products normally have a lower price level than unrepresentative products and, if this is not taken into account when calculating the PPPs for a basic heading, the PPPs will be biased. To avoid this, participating countries are required to identify which of the products they have priced within a basic heading are representative when reporting their prices.

43. 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, its price level is close to the average for all products within the basic heading. Generally, the purchases of the product will account for a significant proportion of the total purchases of all products covered by the basic heading. In any event, to count as representative, the product will at least be sold in sufficient quantities for its price level to be typical for the basic heading.

44. In practice, basic headings can cover a heterogeneous mixture of goods or services with significant disparities in their price levels. In such circumstances, representativity is defined in two stages. First in terms of the product types included in 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.

Equi-representativity

45. A comparison based on products that are not equally representative of all participating countries will result in biased price relatives. Price levels for countries pricing a smaller number of representative products will overestimated, while price levels for countries pricing a larger number of representative products will be underestimated. It is crucial to ensure that the product list for a comparison is "equi-representative" of all participating countries for each basic heading identified in the common expenditure classification.

46. This does not mean that all countries should price the same number of representative products for each basic heading because the method used by Eurostat and the OECD to calculate PPPs for a basic heading ensures that any imbalance between countries in the number of representative products priced does not produce biased PPPs. What it does mean is that each country should be able to price that number of representative products which is commensurate with the heterogeneity of the products and price levels covered by the basic heading and its expenditure on the basic heading. The objective is to obtain PPPs that are both unbiased and reliable.

Comparability and representativity

47. Comparability and representativity are not necessarily complementary requirements. Consumption patterns can vary from country to country for a variety of reasons. Products representative of one country are not necessarily representative of other countries, while products that are strictly comparable across countries are unlikely to be equally representative of them all. Even so, failure to observe either of these two requirements will result in either an overestimation or underestimation of price levels and a corresponding underestimation or overestimation of volumes. Eurostat and the OECD employ methods for selecting products and for calculating PPPs that are designed to respect both requirements. When compromises have to be made, comparability is favoured over representativity. A lack of representativity can lead to biased results that may compromise the comparison, but a loss of comparability negates the comparison.

Primacy of volume comparisons

48. Eurostat and OECD comparisons give priority to the volume comparison. The primary objective is to obtain comparable volume measures by deflating final expenditures with prices that are consistent with their valuation. Whether the prices employed as deflators also give comparable price measures is a secondary concern. Consistency requires participating countries to provide purchasers' prices because these are the prices that should be used to value final expenditures. Generally, this is not an issue. But there are occasions when a country is unable to use purchasers' prices to value a particular expenditure and uses other prices, such as list prices, instead. When this happens, the country is required to report prices that correspond to those actually used to value the expenditure. The prices, being consistent with the expenditure estimate, will give comparable volume measures. But they will not give comparable price measures, unless other countries have also reported the same type of price.[13]

Classification of final expenditures

49. The classification of final expenditure on GDP around which Eurostat and OECD comparisons are organised comprises seven main aggregates:

- Individual consumption expenditure by households,

- Individual consumption expenditure by NPISHs,

- Individual consumption expenditure by government,

- Collective consumption expenditure by government,

- Gross fixed capital formation,

- Change in inventories and acquisitions less disposals of valuables,

- Balance of exports and imports.

50. The seven main aggregates are broken down into 31 expenditure categories, 71 expenditure groups, 152 expenditure classes and 226 basic headings.[14] The most important of these aggregation levels is the basic heading level.

51. Basic headings are the building blocks of Eurostat-OECD comparisons. It is at the level of the basic heading that expenditures are defined, products selected, prices collected, prices edited and PPPs first calculated and averaged. In theory, a basic heading comprises a group of similar well-defined goods or services. In practice, coverage is determined by the lowest level of final expenditure for which explicit expenditure weights can be estimated. This means that an actual basic heading can include a broader range of products than is theoretically desirable. It also means that quasi expenditure weights have to be used to indicate the relative importance – or representativity - of the products covered.

52. The Eurostat-OECD classification is an expenditure classification. Individual consumption expenditure is clearly structured by "who pays" – households, NPISHs or general government. Participating countries are required to provide a breakdown of their final expenditure on GDP in line with this structure. But the results of Eurostat-OECD comparisons are presented by "who consumes" – households or general government. A principal aim of the comparisons is to compare actual individual consumption (by households)[15] at various levels of aggregation. The Eurostat-OECD classification is designed to allow the individual consumption expenditures of NPISHs and general government to be reclassified as actual individual consumption by combining them with the individual consumption expenditure of households at the lowest level of aggregation that

expenditure data from participating countries permit.

53. Government expenditure on market services is valued differently from government expenditure on non-market services and their PPPs have to be calculated differently. PPPs for government expenditure on market services are calculated with the purchasers' prices of outputs. PPPs for government expenditure on non-market services are calculated with the purchasers' prices of inputs. To do this, government expenditure on market services has to be clearly separated from government expenditure on non-market services. In addition, government expenditure on non-market services has to be broken down by cost components[16]. The Eurostat-OECD classification meets these two requirements.

Actual data requirements

54. The range of final goods and services included in GDP covers consumer goods and services, general government services, capital goods and services, inventories, valuables, exports and imports. Countries participating in Eurostat-OECD comparisons are required to price only consumer products, capital goods and general government services.

- *Consumer goods and services:* Participating countries are required to report purchasers' prices for all consumer products (with the possible exception of rents). The prices are to be collected from a variety of outlet types located in the capital city. This is the practice followed by the majority of countries. But some countries do not limit their price collections to capital cities and collect prices in other cities and towns as well. When averaged, these prices are considered to be national prices.

  To reduce the response burden that national statistical offices would have to shoulder if they were required to price the full set of consumer products in a single year, prices are collected over three years. The product list is divided into six parts. Two parts are surveyed each year: one part in the first half of the year, the other in the second half of the year. For the reference year t, one third of the prices that countries report for consumer products will refer to the year t-2, one third to the year t-1 and one third to the reference year t.

  In most cases, these prices are not national because they refer to the capital city. In all cases, they are not annual because they refer to a point in time. Those countries that collect capital city prices are required to provide spatial adjustment factors with which to convert their capital city prices to national prices. All countries are required to provide temporal adjustment factors with which to centre the prices collected in the years

t-2, t-1 and t on the reference year t. Spatial adjustment factors and temporal adjustment factors are to be supplied for each basic heading. Temporal adjustment factors are also to be supplied at the product level when the products are seasonal.

For rents, countries have to provide national annual purchasers' prices. But, if their rent market is small or unrepresentative, they provide instead data on the quality and quantity of their housing stock so that volume measures can be estimated directly.

- *Capital goods and services:* Participating countries are required to report national purchasers' prices for capital goods once every two years. There are two price surveys: one for equipment goods, the other for construction. April prices are collected because it is too costly to monitor prices over the whole year. Prices for equipment goods are to be obtained from producers, importers, distributors or actual purchasers. The prices collected can be for actual market transactions or for hypothetical market transactions. Prices for construction are to be compiled with a set of standard construction projects covering different types of buildings and civil engineering works. Prices for the projects are to be at the level of prevailing tender prices.

- *General government services:* Participating countries are required to report national annual purchasers' prices for general government services every year. The services produced by general government are non-market services and have no economically-significant market price. By convention, non-market services are valued in the national accounts at cost. And the prices that countries are to collect for general government services are the prices of the inputs used in their production. But not all inputs are priced. Only the most important input, labour, is priced. Participating countries are required to provide the annual compensation of employees that general government pays to a cross-section of occupations in general public services, public health services and public education services.

55. Participating countries also have to provide expenditure weights, annual average exchange rates and mid-year resident population for the reference year. Countries supply details of their final expenditure on GDP for the reference year, t, twice. Provisional estimates are returned in September of year t+1. These are used to calculate the preliminary PPPs for t that are released in December of t+1. Final, or near final, estimates are returned in September of t+2. These are used to calculate the final PPPs for t that are released in December of t+2. Countries report expenditures weights directly to Eurostat or the OECD. Data on exchange rates and population are extracted by Eurostat or the OECD from in-house data bases.

ORGANISATION OF COMPARISONS

Coverage and frequency

56. When the Programme was established during the 1980s, Eurostat-OECD comparisons covered only OECD Member Countries. Benchmark comparisons were made every five years and all data were collected over an 18 month period centred on the reference year. Each comparison was a combination of two comparisons. One, organised by Eurostat, covered OECD Member Countries that were either EU Member States or EU associated countries[17]. The other, organised by the OECD, covered OECD Member Countries that were neither EU Member States nor EU associated countries. Combining the two comparisons was the responsibility of the OECD.

57. The division of tasks remains essentially the same. Eurostat continues to organise comparisons for EU Member States and EU associated countries[18], but now there are 31 countries, instead of the original 14, and only 23 of them are OECD Member Countries.[19] The OECD continues to organise comparisons for non-European OECD Member Countries, but the comparisons also include a number of European countries that are neither EU Member States nor OECD Member Countries. OECD comparisons currently cover 14 countries, having covered ten countries initially.[20] The OECD also continues to be responsible for combining the two groups of countries in one comparison.

58. Since 1990, Eurostat and the OECD have used the "rolling benchmark approach" for their comparisons. With this approach, data collection is carried out in continuous cycles. Each cycle takes three years and comprises fifteen surveys: ten to collect prices and five to collect a miscellany of other data.[21] The advantages of the approach are that it reduces response burden on participating countries, it enables them to include the price surveys in their regular programme of data collection and it fosters continuity of expertise in their national statistical agencies.[22] Also, by "rolling" data collected in one year over to the next year, it is possible to make "benchmark" comparisons annually.[23]

59. Eurostat makes comparisons every year, while the OECD, to reduce the financial burden on participating countries, makes them every three years.[24] Joint comparisons are therefore every three years. The next joint comparison will be 2005 and it will cover 45 countries.[25] The cycle of price surveys for the 2005 comparison started in 2003 and will finish in 2005. But data collection will not be complete until the third quarter of 2007 when countries report their final detailed estimates of final expenditure on GDP for 2005. Preliminary results of the comparison will be released at the end of 2006. Final results will be released at the end of 2007.

Price surveys and country groups

60. There are ten price surveys to a cycle: the six surveys that cover consumer goods and services and take place once every three years; the two surveys that cover capital goods and take place once every two years; and the two surveys, one covering actual and imputed rents, the other covering compensation of employees paid to producers of government services, that take place every year.

61. Before each price survey for consumer products and each price survey for capital goods, there are meetings at which the participating countries, with Eurostat and the OECD, select the products to be priced during the survey. An essential input into the selection process is the pre-survey that participating countries are required to conduct before the meeting to familiarise themselves with the situation in their domestic markets regarding the products about to be surveyed. The meetings have a direct bearing on the quality of the price collections carried out by countries.

62. Experience shows that the effectiveness of these meetings depends on the number of products to be considered, the number of countries at the meeting and the thoroughness of the pre-survey carried out by countries prior to the meeting. The three variables interact. As the number of countries increases, the number of products increases. As the number of products increases, the quality of the pre-survey decreases. Experience shows too that this interaction can be a serious problem for meetings held to select consumer products where there are a large number of products to be considered. (It is much less of a problem for meetings held to select capital goods where the number of products to be discussed is much smaller.)

63. When the number of countries Eurostat co-ordinated rose from 21 to 31 in 1999, it was clear that meetings to select consumer products involving 31 countries discussing between four to five hundred products per survey would be unmanageable and detrimental to the quality of the comparison. For the purposes of organising the surveys of consumer prices, Eurostat divided the 31 countries into three groups with one of the countries in the group acting as group leader.[26] (In the OECD comparison, it is the OECD that acts as group leader for its dispersed, and mainly non-European, group of countries.)

64. Group leaders are responsible only for the six price surveys covering consumer goods and services. All other price surveys are the responsibility of Eurostat or the OECD.[27]

Linking country groups

65. The country groups are organised by the group leaders to conduct their own surveys of consumer prices. Although prices are collected according to a

common set of guidelines and following a common timetable, the products selected for pricing are not common to all groups. Each group is virtually a separate comparison. Their data sets need to be combined before a comparison covering all participating countries can be made. The groups are linked using "overlap products" – that is, products that are priced by two or more country groups.

66. To this end, Eurostat co-ordinates the surveys of consumer prices among its three country groups and the OECD co-ordinates the surveys between the OECD group and the Eurostat groups. This co-ordination is vital. Without it, price and volume comparisons of household final consumption expenditure could not be made between the three Eurostat groups or between European countries and non-European countries. Similar co-ordination is needed for the price surveys organised centrally by Eurostat or the OECD. It is the OECD's responsibility to ensure that the product lists for OECD countries for these surveys overlap sufficiently with those for Eurostat countries.

COLLECTION AND EDITING OF DATA

CONSUMER GOODS AND SERVICES

67. 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. It accounts on average for over 60 per cent of GDP in participating countries. This makes it the most important of the seven main aggregates comprising final expenditure on GDP and, as such, it is central to Eurostat-OECD comparisons.

68. One feature of Eurostat-OECD comparisons mentioned already is that prices for consumer goods and services are surveyed over three years. The basket of products comprising household final consumption expenditure is divided into six parts with prices for two parts being collected each year. This requires the organisation of six separate price surveys.[28] Each survey takes from 18 to 20 months to complete.[29] Hence, within any calendar year, work is underway on five surveys: the two surveys of the previous year are being finalised; the two surveys of the current year are being carried out; and the first survey of the following year is being prepared.

69. Another feature of Eurostat-OECD comparisons, also mentioned already, is that there are too many participating countries for the six price surveys for consumer goods and services to be managed centrally by either Eurostat or the OECD. Organisation is decentralised. Participating countries are divided into groups with one of the countries in the group acting as group leader.

Product selection

70. Households purchase a large and diverse assortment of individual goods and services, but only a

selection of these are priced for the purpose of calculating PPPs. The selection is made at the level of the basic heading. The object is to select a sample of products that reflects the principal expenditures on the basic heading - that is, to select from the products covered by the basic heading those that households are commonly buying.

71. Choosing a sample of products for a basic heading that can be priced over a number of countries is 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. Selection for a CPI 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 permitted to price collectors collecting prices for spatial comparisons such as Eurostat-OECD 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.

72. The products selected also have to be representative of each country's expenditure on the basic heading. But consumption patterns differ between countries. Products that are comparable across countries may be representative for some of them but not for others. For a comparison to be based on products that are both comparable and representative, participating countries have to price their own representative products and, as available, the representative products of others. Representative products normally have lower price levels than unrepresentative products and this will lead to biased price relatives if the representativity of the products selected for the basic heading is unevenly distributed among participating countries. To avoid this, the selection of representative products for a basic heading should be equi-representative.

73. Product selection is made for each price survey separately. The aim is to compile a product list for the survey that comprises an equi-representative selection of comparable products for each basic heading that is to be surveyed. To this end, countries participating in Eurostat-OECD comparisons are required to carry out a pre-survey beforehand. During the pre-survey, countries ascertain the availability and representativity of products proposed for the product list. They also verify whether the products have been specified sufficiently to ensure that countries pricing them will be pricing comparable products.

Group product lists

74. The selection of products for a price survey is organised by the group leaders in consultation with the other members of their group. The process begins with the group leaders attending the "planning meeting" convened by Eurostat and the OECD. The purpose of the meeting is to agree on a common approach to the pre-survey and the survey. The exchange and pooling of information between group leaders that begins at the planning meeting continues until the group product lists are finalised at the "overlap meeting".

75. Consultation with group members starts with the group leader sending them the "pre-survey questionnaire". The questionnaire is based on the product list used the last time the country group conducted the price survey and on market research carried out in the meantime by the group leader. The result is an amended and updated version of the previous product list. Some products will have been deleted, some will have been proposed for deletion, others will have had their specifications redefined, and new products, complete with their specifications, will have been added. The pre-survey questionnaire is an annotated first draft of the group product list for forthcoming price survey.[30]

76. On receipt of the questionnaire, the group members carry out the "pre-survey". This involves visiting outlets to ascertain the availability, the comparability and the representativity of the products specified in the questionnaire. Countries use the findings of the pre-survey to reply to the questionnaire. They have a number of options: to accept or reject (possibly with modifications) the deletions proposed; to accept, reject or modify the redefined specifications and the specifications of the proposed new products; and to propose precisely-defined new products themselves. Countries are expected to support their modifications and proposals with technical documentation and pictures.

77. 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". On completion, the draft product list is circulated to group members for them to review prior to the "group meeting". The group meeting is convened by the group leader. It is attended by the group members, the other group leaders, Eurostat and the OECD. Its principal object is to complete the process began with the pre-survey - namely, the establishment of the final group product list for the ensuing price survey.

78. The pre-survey and the group meeting provide the means whereby group members can ensure that the final group product list reflects the availability of comparable products in their domestic markets and is equally representative for all of them. The group product list agreed at the group meeting is not the final list however.

Overlap products

79. Group product lists can be expected to differ from one country group to the other. Some of the products specified will be common to more than one group, but comparisons across the country groups cannot be left to chance. Before the group product lists are finalised and countries begin price collection, Eurostat and the OECD convene a meeting with the group leaders. This is the "overlap meeting" at which the group product lists are merged and examined to make sure that, for each basic heading covered by the survey, there are enough overlap products to allow each country group to be compared with each of the other country groups.

80. When there are not enough overlap products for a basic heading, new ones have to be added. Overlap products can often be "created" by combining the specifications of two products with similar characteristics by widening the range of one or more parameters. The process of creating overlaps begins during the group meetings which are held one after another and are attended by all group leaders. Because group leaders know what products are specified in their own draft group product list, they are able to propose modified or new product specifications to another group as appropriate. At the same time, they learn what products are available in the countries of the other groups and, when necessary, can modify their own group product list accordingly.

81. When participating countries receive the final product list for their group prior to price collection, they will find that it has been altered to provide the necessary overlaps between the groups. New products will have been introduced, some products on the original list will have had their specifications modified, while other products agreed at the group meeting will have been omitted in order to accommodate the overlap products added and to avoid imbalances among the different types of products specified. Each overlap product has a code number that identifies with which of the other groups it provides an overlap.[31]

Product specifications

82. The product specifications used for Eurostat and OECD comparisons are either "brand and model specific" or "generic". A brand and model specification designates the particular 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. A brand and model specification has a tight definition. Countries pricing a specification stipulating a specific 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.[32]

83. Particular importance is given to brand for two reasons. First, brands provide tight specifications that make possible the identification and pricing of goods that are exactly the same in the countries pricing them. Second, 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 and are prepared to pay more for them. In such cases, the brand name is a price determining characteristic and should be included in the product specification.

84. Product specifications that are brand and model specific have two possible drawbacks. The brand and model stipulated may not be available or, if available, the brand and model may not be representative. Forming clusters of comparable brands and models partly addresses these issues, particularly that of availability.

85. Generic specifications, especially those with too loose or too open-ended definitions, are susceptible to variations in quality. As neither Eurostat nor the OECD adjust prices to accommodate quality differences, it is important that the generic specifications are sufficiently detailed – or tight - to make sure that participating countries price products of comparable quality.

86. Product specifications should be supported by pictures of the products they specify. Price collectors do not always envisage the same product from a written description. The pictures will show them what it is they have to price. Pictures are not necessary for all product specifications. They are less essential for brand and model specifications and more useful for generic specifications where they can help to reduce quality differences arising from misinterpretation. Countries participating in Eurostat-OECD comparisons are provided with pictures for a selection of product specifications.

Price collection

87. Price collection is the responsibility of the participating countries. Before they can begin price collection, they have to complete a number of tasks. These involve: selecting and contacting the outlets to be visited by price collectors; preparing the pricing materials and supplementary documentation for price collectors (including, if necessary, the translation of survey guidelines and product specifications into the national language); identifying which specifications on the final group product list are to be priced and, in the case of generic specifications, which brands are to be priced; and holding a meeting with price collectors to clarify issues such as how many items per basic heading, how many price observations per item, etc.

Selection of outlets

88. 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 specialist shops. Prices for the same product can vary from outlet type to outlet type because it is being sold under varying conditions.[33]

89. "Conditions of sale" – such as the availability of advice from shop assistants, the provision of after-sales service and the ability to return defective goods - 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. The difference in the service element is a quality difference and contributes to the price difference. 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.

90. To avoid this, countries participating in Eurostat-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 comprise 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.

91. Location is another consideration that participating countries need to take into account when selecting 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 also be expected to differ from survey to survey.

92. A common starting point for the selection of outlets is the sample of outlets used for the CPI, but it is only a starting point. The product lists for Eurostat and OECD price surveys are 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. In this case, it is necessary to augment the CPI sample with additional outlets. At the same time, because the resources available for the price surveys are limited, the CPI sample may be too large and has to be reduced.

Products per basic heading

93. The number of products to be priced per basic heading will differ 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. The minimum that countries participating in Eurostat-OECD comparisons have to price is one representative product per basic heading. This provides for the calculation of unbiased PPPs. But, as the object is to calculate PPPs that are also reliable, participating countries are expected to price more than one representative product per basic heading. In principle, they should price that number of representative products that are commensurate with the price variation within the basic heading and their expenditure on the basic heading.

94. Participating countries are also required to price the representative products of other participating countries, otherwise it may not be possible to make a comparison. Which unrepresentative products a country should price depends on availability. Price collectors should not be asked to waste resources tracking down products that are not easily found. Also, it is preferable that the prices collected for unrepresentative products provide relatively reliable average prices. In this respect, countries are advised to prune the product list of products they cannot price or cannot price without difficulty. Price collectors would then attempt to price all products left on the list.

Price observations per product

95. 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. In general, 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 extent to which the prices of the product vary and the degree of accuracy wanted. It also depends on the product specification, the tighter the specification the smaller the price variation.

96. On the assumptions that price variation is usually between 5 and 15 per cent and that the desired level of precision is 10 per cent, participating countries are advised that between 5 and 10 observations are required for brand specific specifications and between 15 to 20 observations are required for generic specifications.[34] These numbers refer to a single pricing location such as the capital city. They are indicative only. Each participating country has to decide on the number of price observations to be collected per product according to the type of specification being priced and the conditions prevailing in its market.

Prices to be collected

97. 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 group product list at the time of the survey. As it is not practical to collect prices from purchasers, the pric-

es are collected from sellers. 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. Price collectors observe offer prices but, before recording them as actual purchasers' prices, they have to establish whether the offer price includes all the relevant price components – such as delivery costs, VAT, discounts, service charges and gratuities - and, if not, adjust it accordingly.

Medical goods and services

98. Sales of most consumer goods and services entail a transaction between a seller and a single buyer. This is not always the situation with medical goods and services which can involve a transaction between a seller and two independent buyers. Such a situation arises when the medical products are paid for in part by a household and in part by the government. The purchasers' price that participating countries are required to report is the total price or the sum of the price paid by the household and the price paid by government. If total prices are not used to calculate PPPs when they should be, the volume of medical products purchased will be twice what it should be.[35] Usually there are regulations that determine what the household should pay and what the government will pay and this information can be obtained from the government office responsible.

Seasonal products

99. 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.

100. Annual prices for seasonal products, other than seasonal food products, are obtained as they are for non-seasonal products. Their survey prices are adjusted to annual averages using monthly temporal adjustment factors that participating countries extract from their CPI data bases. The temporal adjustment factors are unweighted – that is, they are not weighted by the quantity sold in the corresponding month.

101. Annual prices for seasonal food products are derived by adjusting survey prices with weighted temporal adjustment factors. This requires participating countries to provide monthly or quarterly weights as well as 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 expenditure on the item during the survey year should be provided instead.[36]

Assigning representativity indicators

102. So that representative products can be distinguished from unrepresentative products when PPPs are calculated for a basic heading, countries participating in Eurostat-OECD comparisons are required 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 is an asterisk (*) and representative products are called "asterisk products".

103. Participating countries have problems identifying representative products. The problem is not with products that they themselves have proposed for the product lists because they are supposed to be representative. The problem lies with the 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. And, without reliable expenditure data by product within basic headings, it is difficult to determine whether they are being sold in sufficiently large numbers to be representative.

104. The decision as to whether or not these products are representative has to be based on other data sources. Such sources include motor vehicle registration statistics, internet sites with country-specific information on a range of "best selling" products, and sales personnel at the outlets visited during the pre-survey and the price survey. The number of prices collected during the price survey can also be used as a measure of representativity. Finally, in the absence of any relevant data or informed opinion, the decision has to be subjective.

Housing services and the rent survey

105. Although housing services are part of individual consumption expenditure by households, they are not included in the survey cycle. They are covered instead by a special rent survey for which participating countries are not expected to collect data specifically but to extract them from existent statistical sources. The survey is held every benchmark year. It is organised by Eurostat or the OECD and not by the group leaders. Data are collected on the rents paid by tenants, and on the rents imputed to owner-occupiers, for a sample of precisely-defined dwellings.[37] Quantitative and qualitative data on the housing stock are also collected.[38]

106. The data on rents are used to calculate PPPs with which the final expenditures on actual and imputed rents are deflated to obtain volume measures on housing services indirectly. The quantitative and qualitative data on housing stock are used to compute volume measures on housing services direct-

ly.[39] These direct volume measures serve two purposes. They provide a check on the volume measures derived indirectly. And, more importantly, they can be used in place of the indirect measures for those participating countries that do not have a sufficiently developed and representative rent market and so are not able to supply the data required on actual and imputed rents.

The reporting and validation of prices

107. After finishing price collection, participating countries are required to enter their price observations on the electronic reporting form that Eurostat provides for each survey in the survey cycle. Countries send the completed reporting form to their group leader for validation.

108. Validation is an iterative process. Reporting forms go backwards and forwards with questions and answers between group leaders and group members. There are two phases. The first phase is the intra-country editing. During this phase, the price observations of each group member are checked separately without reference to the price data of other group members. The second phase is the inter-country editing within country groups. During this phase, the average survey prices of each group member are checked against the average survey prices of other group members. As soon as both phases have been concluded to the satisfaction of all members of the group, the group leader returns the validated reporting forms to Eurostat.

109. On receipt of the reporting forms, Eurostat starts the third and final phase of validation: the inter-country editing across country groups. Again it is an iterative process, but this time between countries and Eurostat. As with the second phase, it consists of checking the average survey prices of each country against the average survey prices of other countries, but this time all countries are involved and not just other group members. Validation finishes when both Eurostat and the countries agree on the average survey prices and the underlying price observations. Once approved, the average survey prices are considered final.

110. The reporting, validation and approval of a survey's prices takes place in the ten months that follow price collection.[40]

111. The three phases of validation have the same object: to identify and eliminate non-sampling errors from the survey price data. Editing involves identifying prices that are outliers – that is, prices that are determined to be either too high or too low according to given criteria. Prices that are outliers are not necessarily wrong. But the fact that they are outliers suggests that they could be wrong and that they need to be verified. Intra-country editing looks for outliers among the individual prices that a country has collected for each product it has chosen to survey. Inter-country editing looks for outliers among the average survey prices that countries have

reported for the same products within a basic heading.

112. Countries and group leaders are assisted in the identification of outliers by two software packages. The first package involves entering individual price observations on price input sheets and generating price output sheets. Outliers are flagged on both the price input sheets and the price output sheets following different criteria.[41] Besides being designed specifically for the intra-country editing of individual price observations, the price input and output sheets are also the means by which price data are transmitted between countries, group leaders and Eurostat during the three phases of validation. The second package involves the Quaranta editing procedure. This generates tables flagging outliers among average survey prices by applying various criteria. Quaranta tables are used in both phases of inter-country editing of average survey prices.[42]

113. Price input and output sheets are employed solely to edit the prices of consumer goods and services collected by the six surveys constituting the survey cycle. These six price surveys are the only surveys for which countries report individual price observations. The Quaranta editing procedure has a wider application than just editing the prices collected for consumer products. It is also used to edit the average survey prices for rents, compensation of employees, equipment goods and construction.

Conversion to national annual prices

114. The majority of participating countries conduct the six price surveys for consumer goods and services only in their capital city and so the average survey prices they report for consumer products are capital city prices. Two months after data collection for a survey is completed countries reporting capital city prices are required to provide Eurostat with spatial adjustment factors with which their capital city prices can be converted to national prices. A spatial adjustment factor is to be supplied for each basic heading surveyed. Eurostat adjusts the capital city prices to national prices, basic heading by basic heading, once the average prices for the survey have been validated. Participating countries obtain the spatial adjustment factors from the surveys of regional price differences that they are required to hold every six years.

115. The national survey prices, irrespective of whether they are capital city prices adjusted by Eurostat or national prices supplied directly by countries, refer to the point in time when the survey was held. They need to be converted to annual prices. At the close of each year, participating countries are required to provide Eurostat or the OECD monthly temporal adjustment factors for each basic heading under individual consumption expenditure by households. Those that refer to the basic headings that were surveyed during the year are used to adjust the national survey prices for these basic headings to national annual prices. Participating countries ex-

tract the temporal adjustment factors from their CPI data base.

116. Government services are the services provided to households by general government. They comprise individual services and collective services. Individual services are the services that general government provides to specific identifiable households: services, such as health and education, which benefit individual households. Collective services are those that general government provides simultaneously to all members of the community: services, such as defence and public order and safety, which benefit households collectively.

Market and non-market services

117. Collective services are produced by government. Individual services can be both produced by government and purchased by government from market producers. The individual services that government purchases from market producers are called "market services" because they are sold at prices that are economically significant – that is, at prices that determine the amounts producers supply and purchasers buy. Being economically significant, the prices are used to value the outputs of market producers by multiplying the quantities produced by the prices at which they are sold. Thus they are also the prices with which to calculate PPPs for market services.

118. The collective and individual services that government produces itself are referred to as "non-market services" because they are provided free or sold at prices that are not economically significant. Without economically-significant prices, it is not possible to value the outputs of non-market producers in the same way as the outputs of market producers are valued. National accountants value the outputs of non-market producers by summing the costs to produce them. To maintain consistency with the prices underlying these expenditures, it is necessary to use the purchasers' prices of inputs to calculate the PPPs for non-market services.

Treatment of market services

119. Collecting the economically-significant prices paid for market services is not as straight forward as it is for most consumer services. Purchases of individual services from market producers by government are financed differently from country to country. The government may buy the services, in full or in part, direct from the producers or it may reimburse households, either in full or in part, after the households themselves have made the purchase. When

both government and households pay the market producer, there are two purchasers and two prices.

120. The prices to be collected are "total prices". In countries where either government or households pay the whole purchasers' price direct to the market producer, the total price is the price that either government or households pay (irrespective of any subsequent reimbursement in the case of households). In countries where households pay only a portion of the purchasers' price to the market producer and the reminder is paid to the market producer by government, the total price is the composite price – that is, the sum of the non-reimbursable part paid by households and the part paid by government.

121. Although it is possible to collect total prices for individual services purchased by government from market producers in principle, it is difficult to collect internationally comparable total prices for health and education services in practice. For Eurostat-OECD comparisons, total prices are only collected for medical goods and services delivered to outpatients. Output prices are not collected for hospital services or for education services. Reference PPPs are used instead.[43]

Treatment of non-market services

122. Employing purchasers' prices of inputs to calculate PPPs for non-market services is called the "input-price approach". It requires a breakdown of the expenditure on non-market services by cost components. The cost components identified in the Eurostat-OECD expenditure classification are: compensation of employees, intermediate consumption, gross operating surplus (which is essentially consumption of fixed capital as net operating surplus is likely to be negligible), net taxes on production, and receipts from sales which is negative.

123. Eurostat and the OECD only apply the input-price approach for the three most important services produced by government: health, education and collective services. Reference PPPs are used for the remaining services: housing, recreation and culture, and social protection.

Survey of compensation of employees

124. Not all inputs are priced for Eurostat-OECD comparisons. Only the labour input is priced. Participating countries are required to provide the annual compensation of employees that general government pays to employees in selected occupations in general public services, public health services and public education services during the reference year.[44] The compensation of employees collected for an occupation is a purchaser's price for a hypothetical market transaction – that is, what general government would pay an employee of a specified seniority working in the occupation. In principle, the price is to be computed using general government

salary scales.[45] In practice, it is often extracted from payroll statistics.

125. Countries are also required to report for each selected occupation: the standard number of hours worked per week, the number of working days paid leave, the number of public holidays falling on working days during the reference year, and the percentage share of the occupation within the basic heading for which it has been selected. Eurostat and the OECD use the standard number of hours worked per week and the number of working days taken as holidays to normalise the compensation of employees across countries. The norm applied is 1710 hours worked per year.[46] The compensation of employees of selected occupations working less or more than the norm are increased or decreased proportionally.

126. The percentage shares of the selected occupations within their basic headings should refer to the wider groups of employees that the selected occupations represent and not just to the employees in the selected occupations. The selected occupations are a sample. Each selected occupation represents a stratum of employees that have comparable occupations and similar levels of compensation of employees. The percentage shares are to relate to these occupational strata.[47] Eurostat uses the percentage shares together with the standardised compensation of employees to obtain expenditure weights for each selected occupation that can be used when calculating PPPs for the basic heading to which it is assigned.

Validation of prices

127. Two edits should be carried out by participating countries before reporting the compensation of employees and related data to Eurostat or the OECD. The first edit is to look at the internal coherency of the data set. For example, it is normally the case that: doctors earn more than nurses; head teachers earn more than other teachers; officers in the army earn more than privates; etc. Income differentials between occupations that are contrary to expectations should be verified and the errors identified should be corrected.

128. The second edit is to check the consistency between the compensation of employees that are to be reported for the latest reference year and the compensation of employees that were reported for the previous reference year. Differences can be expected between the two data sets because either the salary scales have changed between the two periods or, but less likely, the modal categories have changed. Discrepancies that cannot be explained in this way should be verified and the errors discovered should be corrected.

129. Eurostat and the OECD will repeat these two edits and ask countries to explain or correct the discrepancies observed. They will also apply the Quaranta

editing procedure to compare the price levels of the compensation of employees reported for the occupations across countries. Outliers identified through this procedure will be returned to the countries reporting them for verification. Countries are required to either correct the compensation of employees originally reported or confirm that they are correct.

Productivity adjustments

130. The input-price approach as applied by Eurostat and the OECD does not take account of the differences in productivity between the producers of non-market services in different countries. Non-market producers are assumed to be equally efficient so that the same level of input yields the same volume of output regardless of the country in which the non-market producer is operating. Given the extent to which income levels vary among participating countries, this assumption is difficult to defend. Differences in productivity are being disguised as price differences with output volumes being overestimated for countries whose cost of inputs are relatively low and underestimated for countries whose cost of inputs are relatively high.

131. The failure to take account of productivity differences between the producers of non-market services in participating countries affects not only the PPPs and volume indices of health services, education services and collective services, but also the PPPs and volume indices of the main aggregates to which these expenditure categories belong: actual individual consumption, actual collective consumption and GDP. It is the effect on the volume indices of these aggregates – particularly the volume indices of GDP – that is the primary concern.[48]

132. The problem is not specific to international spatial comparisons, it is also a problem for national temporal comparisons. But it is a much more serious problem for international comparisons. Differences between countries in the productivity of producers of non-market services are significantly larger than the year-to-year changes in productivity of non-market producers of individual countries. Even so, EU Member States and OECD Member Countries have not been in favour of adjustments for productivity differences being employed in Eurostat and OECD comparisons. It is argued that productivity adjustments are inevitably based on assumptions that cannot be verified without a genuine measurement of output. And, if output could be measured, then input methods would not be necessary.

CAPITAL GOODS AND SERVICES

133. Gross fixed capital formation (GFCF) in the Eurostat-OECD expenditure classification comprises the following three expenditure categories: equipment goods, construction projects and other products[49]. Eurostat-OECD comparisons collect prices and calculate PPPs for equipment goods and construction projects. With the exception of software, prices are not collected for other products and, as PPPs cannot be calculated for these items, reference PPPs are used instead.

134. GFCF is one of the more difficult and costly aggregates for which to collect internationally comparable and representative prices. One reason for this is the complexity and variability of the products being priced. It is because of this that Eurostat-OECD product specifications for equipment goods and construction projects are drawn up by engineers and quantity surveyors and not by statisticians. Another reason is that the expertise needed to draw up the product specifications is also required to match and price them and this expertise is not normally available in most national statistical agencies. Typically the pricing of capital goods – particularly the pricing of construction projects - has to be contracted out to consultancy firms that specialise in engineering or in construction.

EQUIPMENT GOODS

135. The complexity of equipment goods, the variation in purchasing patterns among participating countries, the number of participating countries being compared and resource constraints requires the survey of equipment prices to focus on the pricing of comparable products. The approach adopted for the survey is the standard one of specification pricing. It involves the selection of a basket of precisely-defined products so that countries price to a constant quality and any price differences observed are "pure" price differences. The selection is made by Eurostat and the OECD in consultation with participating countries. The products are defined in terms of characteristics that influence their purchasers' price.

Product specifications

136. The characteristics specified cover both the product (performance, operation and quality) and the transaction (order size, discounts, delivery and installation).[50] The products priced by countries should be identical, but, if they are not, they should at least be equivalent. The products priced do not necessarily have to be the same make and model and deviation from the technical parameters is tolerated. Transaction characteristics have to be respected because countries are required to report actual transaction prices and not list or catalogue prices.

Second-hand assets

137. All the products specified for the survey are new. Second-hand equipment goods bought by resident producers are only recorded as GFCF if they are purchased from non-residents and imports of second-hand equipment goods are not typical for the majority of countries participating in Eurostat-OECD comparisons. Moreover, the quality of second-hand equipment goods varies considerably making it difficult to price comparable items without adjusting for quality differences. And quality adjustments are not

a feature of Eurostat-OECD methodology. Countries are required to price only new items even when imported second-hand items are more representative.

Representativity

138. Representativity is introduced into the survey by including in the product list a number of alternative specifications for the same product. This allows the different factors that can influence a country's purchasing patterns, such as domestic producers, traditional trade links or average size of farms and factories, to be accommodated. Representativity is also introduced by allowing countries some flexibility in the interpretation of product specifications. Besides, countries are expected to price representative products when it does not compromise comparability.

Flexibility in interpretation

139. To price products that are equivalent, countries have to match the technical parameters of the makes and models that are available in their market with the technical parameters of the make and model specified.[51] This requires flexibility in the interpretation of product specifications, but flexibility exercised with caution. Too liberal an interpretation will result in the loss of comparability, too strict an interpretation can mean that items cannot be priced. To avoid either of these extremes and to minimise quality differences, countries are provided with pricing guidelines. These usually allow a substitution when the parameter affected by the deviation contributes only a small share to the total price.

Sources of prices

140. Countries can obtain prices directly from producers, importers or distributors or from their catalogues. They may even obtain them from purchasers, if practical. The prices can be collected by whichever method, or combination of methods, countries find the most convenient – personal visit, telephone, letter, internet, etc. But whatever the source, whatever the method, strict conformity to the concept of purchasers' price is essential in all cases.

141. Some countries obtain prices through their producer price index (PPI). Either they are able to match the equipment good specifications directly with the specifications used for the PPI or they request the PPI respondents who are producers of the types of equipment goods being surveyed to price the equipment good specifications. As PPIs generally collect basic prices, these need to be adjusted to purchasers' prices.

Validation of prices

142. Countries report average national purchasers' prices for the reference month of the survey year. Eurostat and the OECD use the Quaranta editing procedure to validate these average prices. But, because of the complexity of the items priced, the prices of equipment goods cannot be verified on the basis of price alone. The fact that prices for an item appear consistent across countries does not mean that the items priced are comparable across countries. Before applying the Quaranta editing procedure, Eurostat and the OECD compare the technical parameters of the products priced first. Products are sorted into groups on the basis of the comparability of their technical parameters with those of their product specifications or with those of products priced by other countries.

143. Matched products have parameters that are either identical to those of their product specification or equivalent to those of their product specification or identical to those of a product priced by another country. (Unmatched products are discarded.) By grouping products in this way it is easier to interpret the Quaranta editing procedure. If the prices reported for a product specification are shown to be consistent across countries, it is reasonable to assume that they refer to comparable items. Whereas when outliers are identified, the mistake, if any, is more likely to be an incorrect price than an incorrect match. Outliers are returned to the reporting country. It is asked to confirm or to correct the price.

CONSTRUCTION PROJECTS

144. The approach used for Eurostat-OECD construction price comparisons emphasises comparability. Participating countries are required to price a number of standard construction projects covering different types of residential buildings, non-residential buildings and civil engineering works.[52] Countries are currently expected to price a total of nine projects – three residential buildings, three non-residential buildings and three civil engineering works.

Bills of quantities

145. The standard construction projects are not actual constructions, but they designed to be representative of actual constructions to be found in participating countries. Each standard project is defined by a "bill of quantities" and a set of technical drawings. The bill of quantities breaks down the project into a number of major components (earthworks, joinery, masonry, etc.) each of which comprises a number of elementary components (mechanical excavation of foundation trenches; supply, transport, dumping and compacting of crushed aggregate for foundation trenches; etc.).[53]

146. Each elementary component is specified by a quantity. The total price for the elementary component is computed by multiplying the quantity specified by a unit price. By summing the total prices of its elementary components, a total price can be obtained for each major component. And, by summing the total prices of the major components, an overall price for work done can be obtained. The overall price for work done is not the final price of the project. It needs to be augmented by architects' and engineers' fees and by non-deductible taxes on

products in order to arrive at the desired purchasers' price.[54]

Flexibility in interpretation

147. All countries pricing a particular standard project price the same bill of quantities so that, in principle, all of them are pricing a comparable product. In practice, this may not be so. Materials and methods of construction can vary among countries. National standards and regulations also vary between countries. Some flexibility in interpretation has to be allowed if countries are to provide representative prices.

148. Countries are provided with pricing guidelines to ensure that flexible interpretation does not become too liberal and result in marked differences in quality or in a different construction being priced. Usually, substitutions are acceptable when the components affected represent only a small share of the total price and the basic features of the construction remain unchanged. When substitutions are made, they should be clearly identified and explained in the bill of quantities.

Unit prices

149. The unit prices used in the bills of quantities must cover not only the contractor's direct cost for each of the specified elementary components (such as materials, labour, hire of equipment, sub-contractors' fees), but also the profits (or losses) of the contractor, general expenses (including a share of main office overheads), and preliminary expenses (including the cost of site preparation) connected with the construction.[55]

150. The unit prices do not include architects' and engineers' fees and non-deductible VAT. As mentioned already, these are added after the overall price of work has been established. Nor do the unit prices include the expenditure incurred for the purchase of the land. But in this case no addition is made to the overall price of work either for the cost of the land itself or for the costs associated with the transfer of ownership.

Source of prices

151. The unit prices with which to value the elementary components of the bills of quantities can be extracted either from actual bills of quantities that have been valued for tenders submitted by construction companies or from one of the computerised systems of unit costs that major consultancy firms and research institutes maintain for the construction industry. If the first source is adopted, only unit prices from tenders that have been successful - or from tenders that can be considered realistic because they would permit the carrying out of work in good condition - should be used to value the standard construction projects.

152. If the second source is employed, the standard construction projects will be valued at resource cost and not at purchasers' prices. It is necessary to adjust the underlying unit costs to unit prices using the total prices of successful tenders to establish the level to which the unit costs have to be raised.

Validation of prices

153. Countries report the average national purchasers' price for the reference month of the survey year for each standard construction project they price. Before doing so, they are required to compare the bills of quantities of the projects priced in the current survey with the bills of quantities for the same projects from the previous survey. This is possible because the standard construction projects and their bills of quantities do not change – or change only marginally - from one survey to the next. The object is to see whether the contribution to the total price of each major component is approximately the same in both surveys and, if it is not, to check the unit prices of its elementary components over the two surveys. Errors identified in this way are to be corrected.

154. Eurostat and the OECD apply the Quaranta editing procedure to detect outliers by comparing the total prices for the standard construction projects across countries. Editing bills of quantities by total price alone is not sufficient. Outliers do not necessarily mean that the projects priced are not comparable, while, conversely, the absence of outliers does not necessarily mean that the projects priced are comparable. Validation at lower levels of aggregation is also required.

155. The validation is carried out at the level of major components initially. An edit similar to the inter-temporal edit described above is employed. It involves matching the bills of quantities for the projects priced by countries and comparing them to establish whether the contribution of each major component to total price is approximately the same in each country. If it is not, the shares of the elementary components to the total price of the major component under review are then compared to see whether there are any questionable unit prices. Suspect unit prices are referred back to the countries reporting them for correction or confirmation that they are correct.

PPPS FOR GFCF IN INTERIM YEARS

156. Eurostat is required to calculate PPPs for GDP and its component final expenditures every year for EU Member States and EU associated countries. To do this, it needs PPPs for all basic headings, including those comprising GFCF, for the year in question. Even though the programme of price collection is continuous, not all goods and services are priced each year. Most consumer products are priced once every three years and capital goods are priced once every two years. PPPs cannot be calculated for all basic headings every year. Other

means have to be employed to obtain the PPPs for those basic headings for which PPPs cannot be calculated.

157. For consumer products that are priced every three years, the PPPs they generate are advanced over time with a corresponding sub-index from the CPI. This is not an option for capital goods because the majority of participating countries do not have the price indices required. Instead of extrapolation, Eurostat has decided to use interpolation to derive basic heading PPPs for GFCF for the interim years when prices of equipment goods and construction projects are not surveyed. Basic heading PPPs for GFCF for the interim year t are obtained by taking the geometric average of the basic heading PPPs for year t-1 and t+1.[56] This ensures that the PPPs for t are base country invariant.

COMPUTATION OF PPPS

The EKS method

158. The computation of PPPs for GDP is made in two stages. First, there is the calculation of unweighted PPPs at the basic heading level; then, there is the weighted aggregation of the basic heading PPPs up to the level of GDP. Eurostat and the OECD use the Èltetö-Köves-Szulc (EKS) method both to calculate basic heading PPPs and to aggregate them.[57]

159. Participating countries price both products that are representative of their national market and products that are representative of the national markets of others. Generally, representative products have a lower price level than unrepresentative products. This has to be taken into account when calculating the PPPs for a basic heading otherwise the PPPs will be biased. As there are no expenditure weights below the basic heading with which to determine the relative importance of the products priced for a basic heading, participating countries are required to indicate whether or not the products they priced are representative of their national markets when reporting their prices.

160. The information on representativeness, together with the prices to which it refers, is used to obtain unweighted PPPs at the basic heading level as follows:

- For each pair of countries, two PPPs are calculated. The first is the geometric mean of the price relatives for products representative of the first country; the second is the geometric mean of the price relatives for products representative of the second country. The geometric mean of these two PPPs is then taken to derive a single PPP between the two countries.

- By following this procedure each basic heading is provided with a matrix of binary PPPs. In some cases, the matrix is incomplete because it is not always possible to calculate a PPP directly between each pair of countries. In addition, the PPPs in the matrix are intransitive[58].

- The matrix is made complete by taking the geometric mean of all the available indirect PPPs[59] bridging the pairs of countries for which direct PPPs are missing. This procedure does not always work in which case it is necessary to take PPPs from elsewhere in the comparison to act as proxies for the missing PPPs.

- The matrix is made transitive by applying the EKS procedure. Transitivity is achieved by replacing the PPP between each pair of countries by the geometric mean of itself squared and all the corresponding indirect PPPs between the pair obtained using the other countries as a bridge. The resulting EKS PPPs differ as little as possible from the original binary PPPs.[60]

161. The aggregation of basic heading EKS PPPs is undertaken at each level of expenditure up to the level of GDP as follows:

- For each pair of countries, the basic heading EKS PPPs are weighted, summed and averaged using first the expenditures on the basic headings of the first country as weights and then the corresponding expenditures of the second country as weights. This provides two weighted PPPs which are referred to as a "Laspeyres type" PPP and a "Paasche type" PPP. The geometric mean of these two PPPs gives a single "Fisher type" PPP between the two countries.[61]

- By following this procedure each level of aggregation is provided with a matrix of intransitive Fisher PPPs. Application of the EKS procedure makes the matrix transitive. This involves replacing the Fisher PPP between each pair of countries by the geometric mean of itself squared and all the corresponding indirect Fisher PPPs between the pair obtained using each of the other countries as a bridge.

- The EKS PPPs that result are used to convert the national final expenditures in national currencies to real final expenditures in a common currency.

162. The EKS method provides PPPs for each pair of countries in the comparison that are close to the PPPs that would be obtained if each pair of countries had been compared separately. This is because the EKS procedure in making the Fisher PPPs transitive minimises the differences between them and the resulting EKS PPPs. It also provides real final expenditures that are neither additive[62] nor subject to the Gerschenkron effect[63].

PPPs for country groups

163. The EKS method just described generates PPPs and real final expenditures for individual countries. It does not provide PPPs and real final expenditures for groups of countries such as those used to present the results of Eurostat-OECD comparisons: EURO 12, EU 15, EU 25 and OECD 30. [64]

164. The PPPs and the real and nominal final expenditures for groups of countries are derived using the PPPs and the national expenditures in national currencies of their constituent countries. Before doing this, it is necessary to nominate a currency for each group. The euro is normally selected for EURO 12, EU 15 and EU 25 and the US dollar for OECD 30. It is also necessary to designate a reference country. Traditionally Germany is chosen for this purpose. It should be noted that neither the choice of currencies nor the choice of reference country influences the final results because the PPPs with which they are derived are base country invariant.

165. Having selected the currencies for the groups and the reference country, the PPPs and the real and nominal final expenditures are calculated for the groups as follows:

- First, the national expenditures in national currencies of the countries are converted to real final expenditures in the currency (the euro) of the reference country (Germany) using PPPs. Real final expenditures for the groups are obtained by summing the real final expenditures of their constituent countries.

- Next, the national expenditures in national currencies of the countries in each group are converted to nominal final expenditures in the currency nominated for the group (euros for EURO 12, EU 15 and EU 25, and US dollars for OECD 30) using exchange rates. Nominal final expenditures for the groups are then obtained by summing the nominal final expenditures of their constituent countries.

- Finally, the nominal final expenditures for the groups are divided by their real final expenditures to provide PPPs for each group in the currency (the euro) of the reference country (Germany). For example, euro per "German euro" for EU 25 and US dollar per "German euro" for OECD 30.

  The PPPs and the real and nominal final expenditures for the country groups are, like the PPPs and the real and nominal final expenditures for the individual countries, based on the reference country and its currency. For presentational purposes, the PPPs and the real and nominal final expenditures for both individual countries and country groups are subsequently rebased on the euro and the EU 25 and the US dollar and the OECD 30.[65]

Fixity

166. The relative position of countries can change as the composition of the group of countries being compared changes. Hence, as the results for the European Union are used for administrative purposes as well as for economic analysis, Eurostat requires that only one set of results be recognised as the official results for the European Union. Eurostat and the OECD have therefore agreed that the official re-sults for EU Member States will remain unchanged when these countries are included in comparisons with a wider group of countries such as the OECD. This is referred to as the "fixity convention". The convention has been observed since the 1980 comparison. It now covers all countries that participate in both Eurostat comparisons and OECD comparisons irrespective of whether or not they are EU Member States.

167. Fixity involves two groups of countries, one smaller than the other, with the smaller group being a sub-group of the larger group. For example, all countries covered in a Eurostat comparison are included in the larger Eurostat-OECD comparison. There are two sets of PPPs for the smaller group: the first set is that calculated for the group on its own, the second set is that calculated for the group as a sub-group of the larger group. Fixity requires that the first set replaces the second set in the larger comparison. This is achieved by taking the ratio of the geometric means of the two sets of PPPs and multiplying the first set of PPPs by the ratio so as to put them at the same overall level as the second set of PPPs. The procedure preserves the relationships between the countries in the sub-group and the relationships between the other countries in the larger group. It also preserves the relationship between the other countries and the sub-group as a whole.

PUBLICATION OF RESULTS

Presentation of Eurostat-OECD results

168. Eurostat and the OECD publish the results of common benchmark years jointly. This has required the adoption of a standard set of tables covering the same final expenditures, the same countries and the same country groups. Complete uniformity has not been possible. Eurostat results are presented at average EU price levels with the European Union (EU 25) as "reference country" and with the euro as numéraire[66]. OECD results are presented at average OECD price levels with the OECD (OECD 30) as "reference country" and with the US dollar as numéraire. The joint publication has two parts as a consequence.

169. There are eleven standard tables.[67] They show first the national expenditures and the PPPs on which the results are based, then the nominal final expenditures and the corresponding value indices, then

the real final expenditures and the corresponding volume indices and, finally, the price level indices. In the tables, final expenditure on GDP is broken down into 38 analytical categories[68] that are classified either in line with the SNA 93 and the ESA 95 or by type of product. In addition to the countries participating in the comparison, the tables cover four country groups: EURO 12, EU 15, EU 25 and OECD 30.

Purchasing power standards (PPS)

170. As neither the EU 25 nor the OECD 30 has an actual "national" currency, euros and US dollar are used instead. Euros based on the EU 25 are euros that have the same purchasing power over the whole of the EU 25. Their purchasing power is a weighted average of the purchasing power of the national currencies of EU Member States. They reflect the average price levels in the EU 25. Similarly, US dollars based on the OECD 30 are US dollars that have the same purchasing power over all the OECD 30 and reflect the average price levels of the OECD 30.

171. Eurostat has adopted the practice of calling the currency units in which the PPPs and real final expenditures for the EU 25 are expressed, "purchasing power standards" or "PPS". The OECD calls the currency units in which the PPPs and real expenditures for the OECD 30, "US dollars at average OECD prices". This is sometimes shortened to "OECD dollars".

Publication of annual results

172. Eurostat employs the rolling benchmark approach to make comparisons covering EU Member States and EU associated countries every year. The annual results produced are published in Eurostat's *Statistics in Focus* series. The publication calendar is synchronised with the timetable for the delivery of national accounts data. Countries are required to provide in September of the year t a first estimate of the detailed breakdown of final expenditure on GDP for the year t-1 and a final estimate of the detailed breakdown of final expenditure on GDP for the year t-2. Also available at this time are a provisional matrix of basic heading PPPs for the year t-1 and a final matrix of basic heading PPPs for the year t-2.

173. Eurostat uses the expenditure data and the matrices of basic heading PPPs to calculate preliminary results for the year t-1 and final results for the year t-2. Results at the level GDP for the two years are then published in *Statistics in Focus* in December of the year t. At the same time, the results are also loaded into Eurostat's public database which covers 50 analytical categories, twelve more than the joint publication.[69]

Publication of price level indices

174. Eurostat also publishes in the year t the comparative price level indices for the two price surveys of consumer goods and services that were held in the year t-1. Publication is twice a year, in May and December, in the *Statistics in Focus* series. The level of aggregation at which the price level indices are published varies from survey to survey. The level depends on the perceived reliability of the indices and on whether the level is analytically meaningful.

Access to data and confidentiality

175. The national statistical institutes (NSIs) of participating countries have access to all basic data necessary for the calculation of PPPs and real final expenditure including data from other participating countries. They also have access to results at the basic heading level. Such access is necessary both for the editing of the price data and for the assessment and approval of results. Even so, the NSIs of participating countries are not allowed to publish or disseminate results at a level below that given in Eurostat's public database.

176. More generally, government departments of participating countries have access to basic heading results and, on a selective basis, to the average prices of products. But this is on the understanding that they are to be used for internal purposes only and are not for publication. This access and the rules surrounding it also apply to services, other than Eurostat, of the European Commission and to directorates, other than the Statistics Directorate, of the OECD.

177. Academics and other researchers are interested in having access to PPPs at the basic heading level to further their research. Requests by the academic community for access are granted by Eurostat and OECD on two conditions. The first is that there is a clear scientific purpose for which the PPPs are to be applied. The second is that the researcher signs a written agreement of confidentiality specifying that the PPPs will be used only for research purposes and will not be published.

178. Eurostat and the OECD also provide PPPs and national expenditures at the basic heading level for the International Comparison Programme (ICP). This is on the understanding that fixity is respected when the ICP results are published; that the global results for countries participating in the Eurostat-OECD comparison are not published at a level of aggregation lower than that shown in Eurostat's public database; and that the basic heading PPPs and national expenditures supplied by Eurostat and the OECD are not disseminated without the prior agreement of Eurostat and the OECD.

UPDATING AND REVISING RESULTS

Global extrapolation

179. The OECD only makes benchmark calculations every three years. PPPs for GDP for the years between these benchmark calculations are obtained by extrapolation. The PPPs for GDP for the latest benchmark year are extrapolated by the relative rates of inflation in different countries as measured by the implicit price deflators for GDP.

180. Thus, a country's PPP for the year t+1 is obtained by multiplying its PPP for the benchmark year t by its GDP implicit price deflator for the year t+1 and then dividing by the GDP implicit price deflator for the year t+1 for the reference country[70] when both implicit price deflators are relative to the year t. The method produces robust estimates for intermediate years provided they are not too far from the benchmark year and there have been no significant changes in price or expenditure structures within countries.

181. This method of extrapolation only requires summary data at the level of GDP. For the year t+1, these data are usually available at the beginning of the year t+2. The GDP PPPs for the year t+1 that the OECD estimates for its Member Countries are disseminated in the first quarter of the year t+2.

182. Eurostat requires a detailed breakdown of GDP for its annual benchmark calculations. These data for the year t+1 usually do not become available before the third quarter of the year t+2 and Eurostat calculations are not completed until the end of the fourth quarter of that year. When Eurostat releases its preliminary results for the year t+1, the OECD links the PPPs for GDP that Eurostat has calculated for those EU Member States that are OECD Member Countries with the PPPs for GDP that it has estimated for non-EU OECD Member Countries. Linking takes take place at the level of GDP. It involves replacing the PPPs for EU OECD Member Countries obtained by global extrapolation by the PPPs calculated for them by Eurostat. This is done the same way as fixity is established.

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Nowcasting

183. For the year t, Eurostat makes a preliminary calculation of detailed results at t+12 months and a final calculation of detailed results at t+24 months. Eurostat also makes a "nowcast" for the year t at t+5 months. This is when Eurostat receives the first set of national accounts estimates for the year t from countries. The nowcast produces results at the level of GDP only. It involves the extrapolation of PPPs for t-1 using appropriate price indices or implicit price deflators. This is the same technique as that used by the OECD for global extrapolation except that the extrapolation is done at a lower level of aggregation and involves 20 analytical categories. The extrapolated PPPs for the analytical categories are aggregated by the EKS method to obtain the PPP for GDP.

Revision of PPPs

184. The final calculations that Eurostat and the OECD make two years after the close of the benchmark year are final in as much as the calculation will not be repeated to obtain new PPPs when countries subsequently revise their GDP estimates for the benchmark year. When this happens, the revisions are introduced into the original results without recalculating the PPPs. The revised national expenditures are converted to new real final expenditures using the original PPPs. This means that the relativities between countries' volume measures will change, but the relativities between countries' price measures – the PPPs and comparative price levels – will remain as they were.

185. Final calculations will be repeated in exceptional circumstances - namely: to accommodate major changes in the national accounts compilation system or if a mistake is discovered in either the basic data or the calculation. In 2004, Eurostat published revised results for the years 1995 to 2000 – the period when EU Member States and EU associated countries moved from ESA 79 to ESA 95. For a recalculation to take place because of a mistake, the mistake must be found within three months of publication of the final results. For the results of the recalculation to be published, and replace the results initially disseminated, the mistake must result in a change of at least 0.5 per cent in the real GDP per capita of at least one participating country.

[1] Eurostat and the OECD organise their parts of the Programme differently. Both apply the same methodology, but, because they follow different timetables, their data requirements are different. Eurostat's requirements are the more demanding. The executive summary, like the manual, focuses on the Eurostat approach. The differences between the Eurostat approach and the OECD approach are summarised in Annex VI.

[2] Annex I gives a brief history of the Programme.

[3] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[4] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[5] As shown in Box 1.1 of Chapter 1.

[6] As shown in Box 1.2 of Chapter 1.

[7] As shown in Box 1.3 of Chapter 1.

[8] As shown in Box 1.4 of Chapter 1.

[9] As shown in Box 1.5 of Chapter 1.

[10] As shown in Box 1.6 of Chapter 1.

[11] As shown in Box 1.7 of Chapter 1.

[12] See Box 1.8 of Chapter 1.

[13] This point is elaborated with examples in paragraphs 2.17 and 2.18 of Chapter 2.

[14] The classification is described and defined in Annex II.

[15] Actual individual consumption (by households) is the sum of the individual consumption expenditures of households, NPISHs and government.

[16] Compensation of employees, intermediate consumption, gross operating surplus, net taxes on production and receipts from sales.

[17] Austria and Switzerland.

[18] The EU Candidate Countries – Bulgaria, Croatia, Romania and Turkey – and EFTA countries – Iceland, Norway and Switzerland.

[19] Table I.A of Annex I shows the evolution of Eurostat comparisons from 1975 to 1999.

[20] Table I.B of Annex I shows the evolution of OECD comparisons from 1980 to 1999.

[21] Box 2.1 of Chapter 2 lists the surveys, their frequency and their organiser.

[22] The approach also has advantages for new countries joining the Programme. Either they can ease themselves in gradually over three years or they can adopt a "catch up" strategy by completing the survey cycle over a shorter period.

[23] The rolling benchmark approach is explained in Box 2.2 of Chapter 2.

[24] Price collections in countries, other than EFTA countries, participating in Eurostat comparisons are either partially of wholly funded by Eurostat. Price collections in countries participating in OECD comparisons are funded by the countries themselves.

[25] The countries are listed in Box 2.3 of Chapter 2.

[26] Box 2.4 of Chapter 2 gives the composition of the groups and the group leaders.

[27] Box 2.5 of Chapter 2 lists the respective responsibilities of the Centre, group leaders and participating countries.

[28] The coverage of the six surveys is summarised in Box 4.1 of Chapter 4 and given in detail in Annex III.

[29] See Box 4.2 of Chapter 4 for a generalised timetable listing the various phases and steps of a survey.

[30] Box 4.3 of Chapter 4 provides an example of a pre-survey questionnaire for a basic heading.

[31] The codes are listed in Box 4.4 of Chapter 4

[32] Box 4.5 of Chapter 4 gives descriptions of the types of product specifications used by Eurostat and the OECD. Box 4.6 of Chapter 4 provides examples of these different types of product specifications.

[33] A classification of outlet by type is given in Box 4.7 of Chapter 4.

[34] Sample size is determined by $[t^2CV^2/SE^2]$ where t is Student's t and which is assumed to equal 2 at 0.95 probability, CV, or coefficient of variation, is the product's price variation, and SE, or standard error, is the desired degree of accuracy.

[35] Suppose that the quantity of a pharmaceutical product purchased is 1000 units and that the price per unit is 10 € of which households pay 2 € and government 8 €. In the national accounts, 2000 € will be recorded as household expenditure and 8000 € will be recorded as government expenditure. If the amounts actually paid – that is, 2 € by households and 8 € by government – are used to deflate these expenditures, it will seem that both households and government have each purchased 1000 units or 2000 units in total. But if the total amount paid – that is 10 € – is used, households will appear to have purchased 200 units and government 800 units - a total of 1000 units.

[36] Box 4.9 of Chapter 4 provides an example of the reporting form for seasonal food products.

[37] See Box 4.10 of Chapter 4.

[38] See Box 4.11 of Chapter 4.

[39] As explained in the Annex to Chapter 4.

[40] See Box 4.12 of Chapter 4 for a generalised timetable for the reporting and validation of prices.

[41] The price input and output sheets are described in paragraphs 4.81 to 4.87 in Chapter 4.

[42] The Quaranta editing procedure is described in Annex IV.

[43] Reference PPPs are PPPs that are use for basic headings for which no prices are collected. They are based on prices collected for other basic headings. Reference PPPs serve as proxies for the PPPs that would have been calculated had prices been collected for the basic headings for which no prices were collected.

[44] Selected occupations are listed in Box 5.4 of Chapter 5.

[45] As explained in Box 5.6 of Chapter 5.

[46] 52 working weeks, each 38 hours duration, less 7 working weeks (or 35 working days) of paid leave and public holidays.

47   Derivation of percentage shares is explained in Box 5.7 of Chapter 5.

48   See Box B of the annex to Chapter 5.

49   Comprising: plantation, orchard and vineyard development; change in stocks of breeding stock, draught animals, dairy cattle, animals raised for wool clippings, etc.; computer software that a producer expects to use in production for more than one year; land improvement including dams and dikes which are part of flood control and irrigation projects; mineral exploration; acquisition of entertainment, literary or artistic originals; other intangible fixed assets.

50   See Box 6.1 of Chapter 6 for an example of a product specification for an equipment good.

51   When matching products and deciding whether or not the one observed is a close substitute to the one specified, it is not just the number of parameters not matching that needs to be taken into account, but also the degree to which they differ. Products observed with "near misses" on most, if not all, parameters could still be an acceptable substitute for the product specified.

52   The standard construction projects are listed in Box 6.3 of Chapter 6.

53   An example of a major component and its elementary components can be found in Box 6.4 of Chapter 6.

54   Box 6.5 of Chapter 6 shows an example of a summary sheet used to obtain the purchasers' price of a standard construction project.

55   The coverage of general and preliminary expenses is given in Box 6.6 of Chapter 6.

56   PPPs and not prices are interpolated because the products priced in t-1 and in t+1 will not necessarily be the same.

57   Some alternative methods to the EKS method are described in Chapter 7. A worked example of the EKS method can be found in Annex V.

58   This means that in the case of three countries A, B and C, the ratio of the PPP between A and C and the PPP between B and C is not equal to the PPP between A and B: $PPP_{AC} / PPP_{BC} \neq PPP_{AB}$.

59   An indirect PPP between two countries is one obtained by calculating it indirectly through a third country. Hence, in the case of three countries A, B and C, the indirect PPP for A on B via C is given as $_cPPP_{AB} = PPP_{AC} / PPP_{BC}$, where $_cPPP_{AB}$ is the indirect PPP and PPP_{AC} and PPP_{BC} are the direct PPPs for A and B on C.

60   In other words, the EKS method satisfies characteristicity. This is the property that requires the transitive multilateral comparisons between members of a group of countries to retain the essential features of the intransitive binary comparisons that existed between them before transitivity. A transitive multilateral comparison between a pair of countries is influenced by the price and quantity data of all other participating countries. Characteristicity requires that the impact of these influences should be kept to a minimum when they are introduced into the intransitive binary comparison. The extent to which the EKS PPP and the original binary PPP for a pair of countries differ depends on the degree of homogeneity among the price structures of the group of countries being compared.

61   The qualifier "type" is used because the terms "Laspeyres", "Paasche" and "Fisher" are traditionally used in the context of temporal comparisons. Yet, like traditional Laspeyres and Paasche indexes, the Laspeyres and the Paasche type PPPs are, respectively, weighted arithmetic means and weighted harmonic means.

62   This means that the real final expenditures for basic headings do not sum to the real final expenditures of the aggregates of which they are components. Similarly, the real final expenditures for the aggregates do not sum to real final expenditure on GDP.

63   The Gerschenkron effect applies to aggregation methods that use either a reference price structure or a reference volume structure to compare countries. For methods employing a reference price structure, a country's share of total GDP (that is, the total for the group of countries being compared) will rise as the reference price structure becomes less characteristic of its own price structure. For methods employing a reference volume structure, a country's share of total GDP will fall as the reference volume structure becomes less characteristic of its own volume structure. The EKS method does not use either a reference price structure or a reference volume structure when estimating real expenditures.

64   The composition of the country groups is given in Box 8.4 of Chapter 8.

65   Box 8.5 of Chapter 8 has a simple example of the whole procedure.

66   The common currency in which the PPPs and the real and nominal final expenditures are expressed.

67   The standard tables are listed and described in Box 8.1 of Chapter 8.

68   The analytical categories are listed in Box 8.2 of Chapter 8.

69   The additional analytical categories are shown in Box 8.6 of Chapter 8.

70   The choice of reference country does not influence the final results. In practice the OECD uses the United States.

CHAPTER 1: INTERNATIONAL COMPARISONS OF GDP

Introduction

1.1. The Eurostat-OECD PPP Programme was established in the early 1980s to compare on a regular and timely basis the GDPs of the Member States of the European Union and the Member Countries of the OECD. This remains the purpose of the Programme, although its coverage has been broadened to include countries that are not members of either the European Union or the OECD. These are either countries that have applied to join the European Union or countries of the former Soviet Union and the former Yugoslavia with which Eurostat and the OECD have programmes of technical cooperation in statistics. Annex I gives a brief history of the Programme.

1.2. The objective of the Programme is to compare the price and volume levels of GDP and its expenditure components across the countries participating in it. Before such comparisons can be made, it is first necessary to express the GDPs – which are in national currencies and valued at national price levels - in a common currency at a uniform price level. To do this, Eurostat and the OECD use purchasing power parities because, as will be demonstrated later, these, and not exchange rates, are the currency converters that provide the internationally comparable price and volume measures required.

1.3. This chapter sets out the background to the international comparisons of GDP organised by Eurostat and the OECD.

Gross domestic product (GDP)

1.4. GDP is the sum of the value added generated by producers residing in the economic territory of a country during the accounting period. By comparing a country's GDP over time, it is possible to measure changes in economic growth, overall productivity and, when placed on per capita basis, economic welfare or well-being. But it is a summary measure. For example, it says nothing about the distribution of income within a country. Nor does it show whether growth is the result of increased spending on defence or police or increased spending on education or health. In addition, the coverage of GDP is continually being debated. For instance, should it include housework and other forms of "household production" and should it be reduced because of environment deterioration and the depletion of sub-soil assets.

1.5. Still, there tends to be a strong positive correlation between what is measured by the GDP and other measures of economic and social welfare both over time and across socio-economic groups. Wealthier usually means healthier, better educated and a less inequitable income distribution. It is for this reason that GDP continues to receive the attention of politicians, policy-makers, economists, journalists and the general public. Arguments similar to those in the previous paragraph can be employed to question the usefulness of comparing the GDPs of different countries. Despite these, GDP is still the aggregate used most frequently to represent the economic size of countries and, on a per capita basis, the economic welfare of their residents.

1.6. GDP per head has its limitations as a summary measure of economic welfare. Not only does it cover the goods and services that resident households consume to satisfy their individual needs, it also includes services, such as defence, police and fire protection, that government produces to meet the collective requirements of the community, as well as gross capital formation and net exports neither of which constitute final consumption. An alternative measure is the aggregate called "actual individual consumption"[1]. This comprises only the goods and services that households actually consume to satisfy their individual needs. It covers all such goods and services irrespective of whether they are purchased by the households themselves or are provided as social transfers in kind by government and non-profit institutions serving households. Eurostat-OECD comparisons are organised so that both the GDP and the actual individual consumption of participating countries can be compared.

1.7. GDP can be estimated using three alternative approaches which, in theory, yield the same result. These can broadly be described as: the production approach – which sums all the value added generated by the country's resident institutional sectors[2] during the accounting period; the expenditure approach – which sums all the final expenditures incurred by the country's resident institutional sectors during the accounting period; and the income approach – which sums all the factor incomes paid by the country's resident institutional sectors engaged in domestic production during the accounting period. Price and volume comparisons of GDP are based on the identity: value = price x volume. The values of income aggregates, unlike the values of production and expenditure aggregates, cannot be split into meaningful price and volume components. Price and volume comparisons of GDP can only be made from the production side or the expenditure side.

Eurostat-OECD approach

1.8. Eurostat-OECD comparisons are made from the expenditure side which identifies the components of final demand: consumption, investment and net exports. The reasons for this are: the inherent usefulness of making comparisons from the expenditure or demand side; the difficulties of organising comparisons from the production or supply side which require data for both intermediate consumption and gross output; and the generally better comparability among countries of their detailed breakdowns of

final expenditure on GDP. The disadvantage of the expenditure approach is that, although it enables levels and structures of consumption and investment to be compared, productivity comparisons can be made only at the level of the whole economy. Individual industries are not identified on the expenditure side. To compare productivity at the industry level, international comparisons of GDP have to be made from the production side.[3]

1.9. Values of final expenditure on GDP are made up of two components: price and volume. Comparing the expenditure values of countries will not provide a comparison of the volumes of goods and services purchased in countries unless the price level differences that exist between them have been eliminated. This is exactly the same problem faced in making comparisons over time for a single country where changes in values due to price movements are removed by using a "constant" set of prices. Differences in price levels between countries can be removed either by observing the volumes directly or by deriving them indirectly using a measure of relative prices to place the expenditures of all the countries on the same price level. Prices are easier to observe than volumes and direct measures of relative prices usually have a smaller variability than direct measures of relative volumes. Eurostat-OECD comparisons estimate volumes indirectly.

1.10. International volume comparisons of GDP depend on four conditions being met. These are:

- the definition of GDP is the same;

- the measurement of GDP is the same;

- the currency unit in which GDP is expressed is the same; and

- the price level at which GDP is valued is the same.

GDP estimates of countries participating in Eurostat-OECD comparisons generally meet the first condition as they are compiled in line with one of the two complementary international systems of national accounts: the SNA 93[4] or the ESA 95[5].

1.11. The measurement of GDP is not sufficiently uniform over all participating countries to satisfy the second condition. In particular, the GDPs of countries with large non-observed economies[6] are underestimated. Obtaining exhaustive estimates of GDP from all participating countries has to be a long-term goal. To this end, Eurostat has worked successfully over the last twenty years with EU Member States to improve the comparability of their GDP estimates. While more recently, the OECD has published a handbook[7] that provides national accountants with

guidelines on how to measure the non-observed economy. It draws heavily on the experience of Eurostat among others.

1.12. The third condition of a common currency unit is not met other than by the twelve countries in the Euro Zone. The GDP estimates of the majority of participating countries are expressed in different national currencies. Nor is the fourth condition met as the GDP estimates of participating countries are valued at national price levels. To meet these last two conditions it is necessary to have conversion rates that both convert to a common currency and equalise the purchasing power of different currencies in the process of conversion. Such conversion rates are called "purchasing power parities" or "PPPs". Eurostat-OECD comparisons are made using PPPs.

Exchange rates

1.13. Exchange rates had to be used to make international comparisons of GDP before PPPs became available. Exchange rates provide GDP estimates that satisfy the third condition of being expressed in the same currency unit. But they do not provide GDP estimates that satisfy the fourth condition of being valued at the same price level.

1.14. Exchange rates are determined by the supply and demand for different currencies. And the supply and demand for currencies are influenced by factors such as currency speculation, interest rates, government intervention and capital flows between countries rather than by the currency requirements of international trade. Moreover, many goods and services, such as buildings, all government services and most market services, are not traded internationally. For these reasons, exchange rates do not reflect the relative purchasing powers of currencies in their national markets as has sometimes been postulated in international trade theory.[8]

1.15. Consequently, as explained in Box 1.1, GDPs of countries converted to a common currency using exchange rates reflect not only differences in the volumes produced in the countries, but also differences in the price levels of the countries. In other words, though shown in the same currency, they remain valued at national price levels. As such, they are *nominal* measures and measures of value. PPPs, on the other hand, are conversion rates that are both currency converters and price deflators. Therefore, as shown in Box 1.1, GDPs of countries converted to a common currency using PPPs are also valued at a uniform price level. They reflect only differences in the volumes of goods and services produced in countries. As such they are *real* measures and measures of volume.

Box 1.1: Exchange rates or PPPs

1. The ratio of the GDPs of two countries when both GDPs are valued at national price levels and expressed in national currencies has three component ratios:

    GDP ratio = price level ratio x volume ratio x currency ratio (or exchange rate)   (1)

2. When converting the GDP ratio in (1) to a common currency using exchange rates – that is, by dividing through by the currency ratio – the resulting GDP_{XR} ratio remains with two component ratios:

    GDP_{XR} ratio = price level ratio x volume ratio   (2)

    The GDP ratio in (2) is expressed in a common currency, but it reflects both the price level differences and the volume differences between the two countries.

3. A PPP is defined as both a currency converter and a spatial price deflator. It comprises two component ratios:

    PPP = price level ratio x currency ratio (or exchange rate)   (3)

4. When converting the GDP ratio in (1) to a common currency using a PPP – that is, by dividing through by (3) – the resulting GDP_{PPP} ratio has only one component ratio:

    GDP_{PPP} ratio = volume ratio   (4)

    The GDP ratio in (4) is expressed in a common currency, is valued at a uniform price level, and reflects only volume differences between the two countries.

5. When the GDPs of two countries are valued at national price levels but expressed in a common currency, as, for example, in the Euro Zone, the GDP ratio still has three component ratios one of which, the currency ratio, equals 1:

    GDP ratio = price level ratio x volume ratio x currency ratio or 1

    Similarly, the PPP still has two component ratios:

    PPP = price level ratio x currency ratio or 1

    But, as the currency ratio equals 1, the PPP is, in effect, simply a spatial price deflator.

1.16. Box 1.2 gives a clear example of why PPPs rather than exchange rates should be used for international comparisons of volume. It shows the GDPs of the United States and Japan expressed as a percentage of the GDP for the fifteen countries that were members of the European Union prior to 2004 – the "EU 15" - for the benchmark years 1985, 1990, 1993, 1996 and 1999. There are two sets of percentages: one based on exchange rate converted data, the other based on PPP converted data. It also gives the average annual volume growth rates for five periods: 1985-99, 1985-90, 1990-93, 1993-96 and 1996-99.

1.17. It appears from the exchange rate converted data that in 1985 the GDP of the United States was 44 per cent larger than that of the EU 15, whereas the PPP converted data indicate that the two economies were of comparable size. When comparing Japan and the EU 15, the exchange rate converted data suggest that the GDP of Japan was almost half that of the EU 15, while the PPP converted data show it to be just over a third. Similar large and mainly contrary differences between the two sets of percentages also exist for 1990, 1993, 1996 and 1999. Exchange rate converted data are generally misleading on the relative sizes of economies.

Box 1.2: GDPs of the United States and Japan as a percentage of the GDP of the EU 15 in 1985, 1990, 1993, 1996 and 1999; average annual volume growth rates for 1985-99, 1985-90, 1990-93, 1993-96 and 1996-99

Percentage with exchange rate converted GDPs	1985	1990	1993	1996	1999
- EU 15	100	100	100	100	100
- United States	144	84	93	88	108
- Japan	47	44	62	53	53
Percentage with PPP converted GDPs	**1985**	**1990**	**1993**	**1996**	**1999**
- EU 15	100	100	100	100	100
- United States	102	100	102	103	105
- Japan	36	39	41	41	36
Average annual volume growth rates	**1985-99**	**1985-90**	**1990-93**	**1993-96**	**1996-99**
- EU 15	2.3	3.1	0.7	2.2	2.7
- United States	3.2	3.2	1.7	3.5	4.3
- Japan	2.6	4.9	1.5	2.0	0.4

Exchange rates overstate the size of economies with relatively high price levels and understate the size of economies with relatively low price levels. This is demonstrated in Box 1.3.

1.18. The average annual volume growth rates for the period 1985-99 show that the economy of the United States grew faster than that of the EU 15. Yet from the exchange rate converted data, it appears that the GDP of the United States fell from being 44 per cent larger than that of the EU 15 in 1985 to being only 8 per cent larger in 1999. The PPP converted data show a change in the relative sizes of the two economies that broadly reflects their differing growth rates. For the period 1993-96, the average annual volume growth rates for Japan and the EU 15 were much the same. Yet the exchange rate converted data show Japan's GDP relative to that of the EU 15 as having fallen from 62 per cent to 53 per cent. The PPP converted data reflect the fact that the GDPs of Japan and the EU 15 grew at similar rates. The changes in the relative sizes of the three economies over the five periods as measured by exchange rate converted data are not consistent with their relative growths for the same periods, whereas the changes as measured by PPP converted data are.

1.19. An additional problem with exchange rates is that they are often subject to violent fluctuations. This means that countries may appear to become suddenly "richer" or "poorer" even though in reality there has been little or no change in the relative volumes of goods and services produced. It is the volatility of exchange rates, and not the fact that they do not correct for difference in price levels between countries, that is sometimes perceived as their weakness when making international comparisons of GDP. Fluctuations are avoided by using moving averages of exchange rates to convert GDP to a common currency.[9]

1.20. Box 1.4 illustrates that the use of moving averages will not provide a more credible picture. Like Box 1.2, it shows the GDPs of the United States and Japan expressed as a percentage of the GDP of the EU 15 for the benchmark years 1985, 1990, 1993, 1996 and 1999. There are two sets of percentages, both based on GDPs converted using moving averages of exchange rates – three-year moving averages and five-year moving averages. When compared with the average annual volume growth rates in Box 1.2, neither set seems any more economically plausible than the set of percentages derived using the exchange rates for a single year that is shown in Box 1.2. Averaging exchange rates over several years dampens their fluctuations, but does not bring them any closer to PPPs.

Box 1.3: Comparative price levels and indices of nominal and real GDP 1999

Country	Comparative price levels	Nominal GDP (%)	Real GDP (%)	Nominal GDP per head	Real GDP per head
Denmark	120	2.1	1.7	146	122
Sweden	119	2.9	2.4	121	102
Finland	108	1.5	1.4	110	101
Luxembourg	107	0.2	0.2	199	186
United Kingdom	107	17.1	15.9	108	101
Germany	106	24.6	23.1	113	107
France	105	16.8	15.9	105	100
Austria	103	2.4	2.4	114	111
Belgium	101	2.9	2.9	108	107
Ireland	100	1.1	1.1	112	112
Netherlands	97	4.7	4.8	111	115
Italy	87	13.8	15.8	90	104
Spain	81	7.1	8.6	67	82
Greece	77	1.5	1.9	52	69
Portugal	69	1.4	1.9	50	74
EU 15	100	100	100	100	100

1. Comparative price levels are the PPPs divided by exchange rates. The indices of nominal GDP and nominal GDP per capita are based on exchange rate converted data. The indices of real GDP and real GDP per capita are based on PPP converted data.

2. When the comparative price level is above 100, the indices of nominal GDP and nominal GDP per capita are higher than the indices of real GDP and real GDP per capita. When the comparative price level is below 100, the indices of nominal GDP and nominal GDP per capita are lower than the indices of real GDP and real GDP per capita. The indices of nominal GDP are especially misleading on the relative sizes of the economies of the United Kingdom, France and Italy.

3. The differences between the per capita indices of nominal and real GDP are even more marked. There are changes in ranking - some quite significant as in the case of Sweden and Italy. The relative difference between countries also changes. The gap between high income countries and low income countries is much smaller with the per capita indices of real GDP.

Box 1.4: GDPs of the United States and Japan as a percentage of the GDP of the EU 15 in 1985, 1990, 1993, 1996 and 1999

Percentage when three-year moving averages of exchange rates are used to convert the GDPs	1985	1990	1993	1996	1999
- EU 15	100	100	100	100	100
- United States	132	88	89	91	111
- Japan	48	49	58	56	53
Percentage when five-year moving averages of exchange rates are used to convert GDPs	1985	1990	1993	1996	1999
- EU 15	100	100	100	100	100
- United States	123	88	88	93	113
- Japan	47	50	57	55	53

Purchasing power parities (PPPs)

1.21. In their simplest form PPPs are nothing more than price relatives that show the ratio of the prices in national currencies of the same good or service in different countries.[10] For example, if the price of a hamburger in France is 2.84 euros and in the United States it is 2.20 dollars, the PPP for hamburgers between France and the United States is 2.84 euros to 2.20 dollars or 1.29 euros to the dollar. In other words, for every dollar spent on hamburgers in the United States, 1.29 euros would have to be spent in France to obtain the same quantity and quality – or volume - of hamburgers.[11] To compare the volumes of hamburgers purchased in the two countries, either the expenditure on hamburgers in France can be converted to dollars by dividing it by 1.29 or the expenditure on hamburgers in the United States can be converted to euros by multiplying it by 1.29.

1.22. PPPs are not only calculated for individual goods and services, they are also calculated for product groups and for each of the various levels of aggregation up to and including GDP.[12] The calculation is made in three stages. The first is at the product level, where price relatives are calculated for individual goods and services. The second is at the product group level, where the price relatives calculated for the products in the group are averaged to obtain unweighted PPPs for the group. And the third is at the aggregation levels, where the PPPs for the product groups covered by the aggregation level are weighted and averaged to obtain weighted PPPs for the aggregation level. The weights used to aggregate the PPPs in the third stage are the expenditures on the product groups. In principle, it would be desirable to weight the price relatives within product groups, but the expenditure data required to do this are not available generally.

1.23. PPPs are still price relatives whether they refer to a product group, an aggregation level or to GDP. It is just that in moving up the hierarchy of aggregation the price relatives refer to increasingly complex assortments of goods and services. Thus, if the PPP for GDP between France and the United States is 0.97 euros to the dollar, it can be inferred that for every dollar spent on the GDP in the United States, 0.97 euros would have to be spent in France to purchase the same volume of goods and services. Purchasing the "same volume of goods and services" does not mean that identical baskets of goods and services will be purchased in both countries. The composition of the baskets will vary between countries and reflect differences in tastes, cultures, climates, price structures, product availability and income levels, but both baskets will, in principle, provide equivalent satisfaction or utility.

1.24. PPPs are defined throughout this manual as being both currency converters and spatial price deflators as this is the definition that applies for the majority of countries participating in Eurostat-OECD comparisons. When countries share a common currency, as do the twelve countries of the Euro Zone, there is no need to convert to a common currency and, as explained in Box 1.1, PPPs can be defined simply as spatial price deflators. This definition also applies to PPPs calculated for regions within a country. It is important to recognise that having the same currency does not necessarily mean having the same price level. PPPs are still required. Whether or not they actually effect a currency conversion is secondary to their expressing expenditures of different countries (or different regions) at a uniform price level.

Price and volume measures

1.25. PPPs are used to convert national final expenditures[13] on product groups, aggregates and GDP of different countries into real final expenditures. The final expenditures are called "real" because, as explained earlier, in the process of being converted to a common currency, they are valued at a *uniform price level* and so reflect only differences in the volumes purchased in countries. They are the spatial equivalent of a time series of GDP for a single country expressed in *constant prices*. PPPs and real final expenditures provide the price and volume measures required for international comparisons. The PPPs and real final expenditures for GDP are undoubtedly the most important, but the PPPs and real final expenditures below the level of GDP are also useful in their own right. With them international comparisons of price and volume levels can be made for product groups and aggregates as well as for GDP

1.26. Box 1.5 shows estimates of final expenditure on GDP at national price levels in national currencies for the EU 15[14], the United States and Japan in 1999. It also shows the estimates after they have been converted to real final expenditures and the PPPs used to convert them.

1.27. Three sets of indices have been derived using these data, the population data and the exchange rates, namely:

- *Indices of real final expenditure*: These are measures of volume. They reflect the relative magnitudes of the product groups or aggregates being compared. At the level of GDP they are used to compare the economic size of countries.

- *Indices of real final expenditure per head*: These are standardised measures of volume. They reflect the relative levels of the product groups or aggregates being compared after adjusting for differences in the size of populations between countries. At the level of GDP they are often used to compare the economic well-being of populations.

- *Comparative price levels*: These are the ratios of PPPs to exchange rates. They provide a measure of the differences in price levels between countries by indicating for a given product group or aggregate the number of units of common currency needed to buy the same volume of the product group or aggregate in each country.[15] At the level of GDP they provide a measure of the differences in the general price levels of countries.

1.28. The indices have the EU 15 as reference or base country - that is, the EU 15 = 100. But they are not affected by the choice of reference country and can be rebased on the United States or on Japan. The method used by Eurostat and the OECD to calculate and aggregate PPPs provides PPPs that are invariant to the country, or group of countries, chosen as base country. The base country serves as a point of reference only. The PPPs are also transitive. Transitivity is the property where the direct PPP between each pair of countries is equal to the indirect PPP derived via any third country. For example, in the case of the three countries A, B and C, the ratio of the PPP between A and B and the PPP between C and B is equal to the PPP between A and C – or, $PPP_{A/B} / PPP_{C/B} = PPP_{A/C}$.

Nominal value measures

1.29. If exchange rates are used instead of PPPs, the estimates of final expenditure on GDP at national price levels in national currencies from Box 1.5 for the EU 15, the United States and Japan are converted to the nominal final expenditures in Box 1.6.

1.30. Although these nominal final expenditures are expressed in a common currency, the euro, they are still valued at *national price levels* and continue to reflect the differences in price levels between the EU 15, the United States and Japan. They are the spatial equivalent of a time series of GDP for a single country expressed in *current prices*. Nominal final expenditures give rise to two sets of indices, namely: *indices of nominal final expenditure* and *indices of nominal final expenditure per head*. The indices are measures of value. They are not measures of volume and should not be used as such.[16]

Users and uses of PPPs

1.31. The main users of PPPs are widely perceived to be the international organisations, such as Eurostat, the International Monetary Fund, the OECD, the United Nations and the World Bank. This was undoubtedly so when PPPs first became available. But now there is a growing demand for PPPs from a variety of national users. These include government agencies, universities, research institutes, public enterprises, private firms, banks, journalists and individuals.

Box 1.5: Price and volume measures for the EU 15, the United States and Japan, GDP, 1999

	EU 15	United States	Japan
Final expenditure on GDP at national price levels in national currencies (billions)	8018.5	9206.9	512530
Population (millions)	376.9	273.0	126.7
Exchange rate (1 euro = ... units of national currency)	1.00	1.07	121
PPPs for GDP (1 euro = ... units of national currency)	1.00	1.09	177
Real final expenditure on GDP at a uniform price level in euros (billions)	8018.5	8446.7	2895.7
Indices of real final expenditure on GDP (EU 15 = 100)	100	105	36
Real final expenditure per head on GDP at a uniform price level in euros	21275	30940	22855
Indices of real final expenditure per head on GDP (EU 15 = 100)	100	145	107
Comparative price levels of GDP (EU 15 = 100)	100	102	146

Figures have been rounded.

1.32. International organisations, government agencies, universities and research institutes use PPPs as inputs into economic research and policy analysis requiring comparisons between countries. In such studies, PPPs are employed either as currency converters to generate volume measures with which to compare levels of economic performance, economic welfare, consumption, investment, economic growth, overall productivity and government expenditure on defence, police, health, education, etc., or as price measures with which to compare price levels, price structures, price convergence and competitiveness. Journalists used PPPs in both these ways in their commentaries on economic and social policy.

1.33. Public enterprises apply PPPs when comparing their prices and operating costs with those of similar public enterprises in other countries. Private firms operating in different countries apply PPPs for the purposes of comparative analysis involving prices, sales, market shares and production costs. Banks employ PPPs in economic analysis and in the monitoring of exchange rates. Individuals often refer to PPPs in salary negotiations when moving from one country to another (as do the personnel managers with whom they are negotiating).

1.34. International organisations also use the real final expenditures generated by PPPs for statistical purposes. The real final expenditures on GDP and its component expenditures are aggregated across countries to provide totals for groups of countries, such as the Euro Zone, the European Union and the OECD. Country shares in these totals are used as weights when non-additive economic indicators, such as price indices or growth rates, are combined to obtain averages for groups of countries.

1.35. With one exception, PPPs are not used by international organisations to calculate member countries' contributions or to assess their eligibility for aid grants or access to loans on favourable terms. The exception is the European Commission. Some 30 per cent of its total budget is spent on the Structural Funds, the overall aim of which is to gradually reduce economic disparities between and within EU Member States. The allocation of the bulk of the funds is made on the basis of PPP-converted regional GDP per capita.[17]

Limitations of price and volume measures

1.36. GDP and GDP per head are often used to rank countries by economic size and economic welfare. But neither the indices of real final expenditure on GDP nor the indices of real final expenditure per head on GDP should be used to establish a strict ranking of countries. Instead, they are best used to assign countries to groups with similar GDP per head as, for example, those in Box 1.7. Likewise, comparative price level indices can be used to rank countries by their general level of prices, but here too countries with similar price levels should be grouped together, as they are in Box 1.7, rather than ranked strictly.

1.37. PPPs are statistical constructs rather than precise measures. While they provide the best available estimate of the size of a country's economy, of the economic well-being of its residents and of its general price level in relation to the other countries in the comparison, they are, like all statistics, point estimates lying within a range of estimates – the "error margin" – that includes the true value. The error margins surrounding PPPs depend on the reliability of the expenditure weights and the price data as well as to the extent to which the particular goods and services selected for pricing by participating countries actually represent the price levels in each country. As with national accounts data generally, it is not possible to calculate precise error margins for PPPs or for the real final expenditure levels and comparative price levels derived from them.

1.38. At the level of GDP, a broad - and arbitrary - rule of thumb is that differences between countries in their indices of real final expenditure, real final expenditure per head and comparative price levels need to be at least five percentage points to be considered as statistically significant. At the level of the main aggregates, error margins are larger and differences in indices of real final expenditure, real final

Box 1.6: Measures of nominal value for the EU 15, the United States and Japan, GDP, 1999

	EU 15	United States	Japan
Final expenditure on GDP at national price levels in national currencies (billions)	8018.5	9206.9	512530
Population (millions)	376.9	273.0	126.7
Exchange rate (1 euro = ... units of national currency)	1.00	1.07	121
Nominal final expenditure on GDP at national price levels in euros (billions)	8018.5	8604.6	4235.8
Indices of nominal final expenditure on GDP (EU 15 = 100)	100	107	53
Nominal final expenditure per head on GDP at national price levels in euros	21275	31519	33432
Indices of nominal final expenditure per head on GDP (EU 15 = 100)	100	148	157

Figures have been rounded.

expenditure per head and comparative price levels will also need to be larger to be statistically significant. Below the level of the main aggregates, error margins are compounded by differences in the national classifications used by participating countries in their national accounts. Because the margins of error increase as the level of aggregation gets lower, neither Eurostat nor the OECD publish results of their comparisons below a certain level of detail.

1.39. Comparative price levels at the level of GDP allow the general price levels of countries to be compared with that of a reference country. A value over 100 indicates a higher general price level, a value under 100 indicates a lower general price level. Comparative price levels at the level of GDP also indicate the degree to which a country's exchange rate reflects its general price level in relation to the general price level of the reference country. A value over 100 indicates that the exchange rate understates the general price level, a value under 100 indicates that the exchange rate overstates the general price level. This is not the same as saying a currency is undervalued or overvalued.

1.40. Although PPPs appear in international trade theory in the context of equilibrium exchange rates - that is, the underlying rates of exchange to which actual exchange rates are assumed to converge in the long term[18], the PPPs discussed here are not relevant for this purpose as they do not refer solely to domestically-produced tradable goods and services valued at export prices. They have been calculated specifically to enable international price and volume comparisons to be made for GDP and its component expenditures. As such, they refer to the entire range of *final* goods and services which make up

GDP as a whole including many items, such as buildings and government services, that are not traded internationally. In addition, except for net foreign trade, they are valued at *domestic* market prices and are calculated using expenditure weights that reflect *domestic* demand.

1.41. Indices of real final expenditure on GDP provide a "snapshot" of the relative volume levels of GDP among participating countries for a given point in time or reference year. When placed side by side, the indices of consecutive reference years appear to provide a "moving picture" of relative GDP volume levels over the years. This apparent time series of volume measures is actually a current price time series showing the combined effect of changes in relative price levels and changes in relative volume levels. Within each reference year, the indices are at a uniform price level, but the level of the uniform price level changes from reference year to reference year. As a result, the rates of relative growth derived from the indices are not consistent with those obtained from the constant price estimates of GDP of countries.

1.42. To trace the evolution of relative GDP volume levels between countries over time, it is necessary to select one of the reference years as a base year and to extrapolate its relative GDP volume levels over the other years. Extrapolation is done by applying the relative rates of GDP volume growth observed in the different countries. This provides a time series of volume indices at a constant uniform price level that replicates exactly the relative movements of GDP volume growth of each country. Underlying this method is the assumption that price structures do not change over time. But it is an economic fact of life that relative prices do change

Box 1.7: Summary results for the 43 countries covered in the 1999 Eurostat-OECD comparison

Indices of real GDP per head (EU 15 = 100)	
High income group (120 and above)	Denmark, Iceland, Luxembourg, Norway, Switzerland and United States
High middle-income group (100 - 119)	Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Sweden and United Kingdom
Low middle-income group (50 – 99)	Cyprus, Czech Republic, Greece, Hungary, Korea, Israel, Malta, New Zealand, Portugal, Slovak Republic, Slovenia, Spain
Low income group (less than 50)	Bulgaria, Croatia, Estonia, Latvia, Lithuania, FYROM, Mexico, Poland, Romania, Russian Federation, Ukraine and Turkey
Comparative price levels (EU 15 = 100)	
High price level group (110 and above)	Denmark, Iceland, Japan, Norway, Sweden and Switzerland
Medium-high price level group (90 – 109)	Austria, Belgium, Finland, France, Germany, Ireland, Luxembourg, Netherlands, United Kingdom and United States
Medium-low price level group (60 – 89)	Australia, Canada, Cyprus, Greece, Israel, Italy, Korea, Malta, Mexico, New Zealand, Portugal, Slovenia and Spain
Low price level group (less than 60)	Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, FYROM, Poland, Slovak Republic, Romania, Russian Federation, Turkey and Ukraine

over time and, if such changes are ignored over long periods, a biased picture of the relative economic developments of countries can result. The choice of base year can also influence the picture that emerges.

1.43. Price convergence among EU Member States is of special interest to the European Commission in the context of competition policy and consumer protection. Comparative price levels provide a means of observing the movement of price levels over time, but they have to be used with caution. First, except within the Euro Zone, they are influenced by exchange rate fluctuations. Second, independently of exchange rates, they are volatile. This is generally so at lower levels of aggregation where sample sizes are small. Usually such volatility diminishes, if not disappears, with aggregation. Volatility particularly arises when the basket of goods and services to be priced changes from one benchmark survey to another in order to accommodate market developments. For example, in this respect, the basket for food and non-alcoholic beverages is relatively stable, while that for clothing and footwear is altered substantially each time it is surveyed. Volatility of this type also diminishes with aggregation. Even so, comparative price levels for even higher level aggregates can still appear to jump when there is a change in benchmark prices. For these reasons, comparative price level indices should be used to monitor price convergence only at higher levels of aggregation and, then, only over periods

covering at least two survey cycles – that is, six or more years[19].

1.44. The comparative price levels of household final consumption expenditure are sometimes used to measure the differences in the cost of living between countries. This is correct to the extent that they indicate whether the overall price level for consumer goods and services faced by the average household in one country is higher or lower than the overall price level for consumer good and services faced by the average household in another country. Households or individuals considering moving from one country to another for reasons of employment, retirement or even a holiday should exercise caution when attempting to infer from these measures of overall price levels how the change of country will affect their cost of living. The comparative price levels of household final consumption expenditure reflect the expenditure pattern of the average household which in all likelihood is very different from that of the household or individual contemplating the move. Also, the comparative price levels are national averages and they do not reflect differences in the cost of living between specific locations such as London and Paris or the Côte d'Azur and the Costa del Sol.

1.45. The "dos and don'ts" with regard to the use of the PPPs, comparative price level indices and volume indices generated by Eurostat-OECD comparisons are summarised in Box 1.8.

Box 1.8: Using the results of Eurostat-OECD comparisons

Recommended uses	• To make spatial volume comparisons of GDP (size of economies), GDP per head (economic welfare), GDP per hour worked (labour productivity); • To make spatial comparisons of comparative price levels; • To group countries by their volume index of GDP per head and/or their comparative price levels of GDP.
Uses with limitations	• To analyse changes over time in relative GDP per capita and relative prices; • To analyse price convergence; • To make spatial comparisons of cost of living; • To use PPPs calculated for GDP and its component expenditures as deflators for other values as, for example, household income.
Not recommended uses	• As precise measures to establish strict rankings of countries; • As a means of constructing national growth rates; • As measures to generate output and productivity comparisons by industry; • As measures to undertake price level comparisons at low levels of aggregation; • As indicators of the undervaluation or overvaluation of currencies; • As equilibrium exchange rates.

[1]   This concept, or its equivalent, has been used in international comparisons of GDP based on PPPs since the 1950s. It was not until the 1990s that it was adopted by national accountants and included in the international system of national accounts.

[2]   These are non-financial corporations, financial corporations, general government, households and non-profit institutions serving households.

[3]   Paragraph I.3 of Annex I provides further information about international comparisons of GDP made from the production side.

[4]   *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[5]   *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[6]   The non-observed economy comprises activities that are hidden because they are illegal or because they are legal but carried out clandestinely or because they are undertaken by households for their own use. It also covers activities that are missed because of deficiencies in the statistical system. Such deficiencies include out-of-date survey registers, surveys having too high reporting thresholds or high rates of non-response, poor survey editing procedures, no surveying of informal activities such as street trading, etc.

[7]   *Measuring the Non-Observed Economy – A Handbook*, Organisation for Economic Co-operation and Development, International Labour Organisation, International Monetary Fund, Statistical Committee of the Commonwealth of Independent States, Paris, 2002.

[8]   The theory of purchasing power parity in international economics, at least in its simplest form, suggests that national price levels converted to a common currency using exchange rates should be equal. Arbitrage will ensure that the price of an individual good will be the same in all countries in which it is traded – the law of one price. Hence, when the individual goods are taken together, there will be high correlation in general price levels – at least in the medium and long term. Underlying the theory are the assumptions that all goods are internationally tradable; that the goods sold in one country, if not identical, are at least acceptable substitutes for the goods sold in other countries; that tariffs, VAT, transport costs, trade margins and the like do not create price differences between countries; and that the demand and supply for currency is driven entirely by international trade in goods.

[9]   The "World Bank Atlas method" consists of converting the gross national income (GNI) of countries to US dollars with a three-year average of exchange rates adjusted for inflation. As well as showing GNIs per capita converted to US dollars with exchange rates, the Atlas also shows GNIs per capita converted to US dollars with PPPs. It states that "PPPs are most appropriate for comparing levels of welfare, which is why they are used in measuring global poverty. Valuations based on exchange rates better measure the tradable value of a country's output and a country's relative importance in the global economy." *World Bank Atlas*, 36th edition, World Bank, Washington, 2004.

[10]   A well-known example of a one product PPP is that underlying the BigMacCurrency index of *The Economist*. Presented by the journal as "burgernomics", the BigMac PPP is defined as "the exchange rate that would mean hamburgers cost the same in America as abroad". The PPPs calculated by Eurostat and the OECD include hamburgers but also the prices of several hundred other goods and services. As might be expected, "burgernomics" provides a poor guide to overall price levels as measured by the Eurostat-OECD PPP Programme.

[11]   The link between quantity, quality and volume is explained in paragraphs 16.11 and 16.12 of the 1993 SNA.

[12]   For example, from *hamburgers* to *restaurant services,* from *restaurant services* to *catering services*, from *catering services* to *catering and accommodation services*, from *catering and accommodation services* to *individual consumption expenditure by households* and from *individual consumption expenditure by households* to *GDP*.

[13]   Final expenditures valued at national price levels and expressed in national currencies.

[14]   By convention the euro is the "national" currency for the EU 15. As only twelve Member States use the euro as their national currency, the GDPs of Denmark, Sweden and the United Kingdom, which are in kroner, kronor and pounds sterling respectively, have first to be converted into euros using exchange rates before being added to the GDPs of the other twelve countries to obtain GDP for the EU 15 in euros.

[15]   From the PPPs in Box 1.5, it can be seen that if a given volume of GDP costs 100 euros in the EU 15, it costs 109 US dollars in the United States and 17,700 yen in Japan. To compare these prices, it is first necessary to express them in a common currency by converting them to euros using the exchange rates in Box 1.5. The comparative price levels so derived show that if a given volume of GDP costs 100 euros in the EU 15, it costs 102 euros in the United States and 146 euros in Japan. In other words, the general price level of the EU 15 is only marginally lower than that of the United States, but considerably lower than that of Japan.

[16]   But still they are. Analysts, who, if comparing the GDP of a country in different time periods, would have no hesitation in first adjusting for price movements between the two periods before making the comparison, still persist in assuming that the GDPs of different countries converted at exchange rates provide volume measures directly without the need to make adjustments for price level differences between countries. Yet price level differences between countries can be considerably larger than changes in price levels between different time periods in the same country (as the comparative price levels in Box 1.7 indicate) and lead to flawed analysis and inappropriate policy recommendations. See, for example, "The IPCC Emission Scenarios: An Economic-Statistical Critique", I. Castles and D. Henderson, *Energy and Environment*, Vol. 14 No. 2 & 3, 2003.

[17]   A three-year average is used to limit the impact of single years.

[18]   "As long as anything like free movement of merchandise and a somewhat comprehensive trade between two countries take place, the actual rate of exchange cannot deviate very much from the purchasing power parity." Gustav Cassels in "Abnormal deviations in international exchanges", *Economic Journal 28*, 1918. Equilibrium exchange rates are also referred to as "absolute PPPs". See *International Economics: Theory and Policy,* Paul Krugman and Maurice Obstefeld, Pearson Higher Education, 2000.

[19]   As explained in Chapter 2, data collection for Eurostat-OECD comparisons takes place over a three-year survey cycle.

CHAPTER 2: DATA REQUIREMENTS AND ORGANISATION

Introduction

2.1. Eurostat and the OECD make international volume comparisons of GDP from the expenditure side. The volumes are estimated indirectly using purchasing power parities (PPPs). PPPs are used because they are measures of relative prices. Prices are easier to observe directly than are volumes and measures of relative prices usually have a smaller variation than measures of relative volumes. Eurostat-OECD comparisons start as price collecting exercises, though other data, such as data on final expenditures, have also to be collected before they can be concluded. This chapter identifies the price and other data needed by Eurostat and the OECD to make their comparisons and explains how countries participating in the comparisons are to obtain these data. The chapter has two parts. The first part defines price concepts and, given these concepts, data requirements. The second part describes how Eurostat-OECD comparisons are organised and how data identified in first part are collected by means of the "rolling benchmark approach".

2.2. Pricing guidelines are not included in the chapter. These are to be found in Chapters 4, 5 and 6 which cover respectively consumer goods and services, government services and capital goods and services. Nor are the details of the classification of final expenditure on GDP presented here. They are available in Chapter 3. For the moment, it is sufficient to know that the classification adheres to the definitions, concepts, classifications and accounting rules of the SNA 93[1] and the ESA 95[2], that it covers all final expenditure on GDP, and that it comprises 226 product groups or basic headings.

2.3. Note that, throughout this chapter and the rest of the manual, the term "product group", which was used extensively in Chapter 1, will be replaced by "basic heading". There is a close correspondence between the two terms in theory which defines a basic heading as covering "a group of similar well-defined goods or services". The correspondence is much weaker in practice where the coverage of a basic heading is determined by "the lowest level of final expenditure for which explicit expenditure weights can be estimated". Hence, a basic heading can comprise a cluster of diverse product groups instead of the theoretically-preferable group of similar products. In addition, the absence of weights below the basic heading level means that other ways have to be used to indicate the relative importance of the products priced for the basic heading.

PART I: DATA REQUIREMENTS

Background

2.4. To calculate PPPs from the expenditure side, it is necessary for each country participating in the comparison to provide a set of national annual purchasers' prices and a detailed breakdown of final expenditure on GDP. The prices should refer to a selection of products chosen from a common basket of precisely-defined goods and services. The final expenditures should be broken down by basic heading according to a common classification. Both prices and expenditures should refer to the year of the comparison – or "reference year". And both should cover the whole range of final goods and services included in GDP. Participating countries have also to provide annual average exchange rates and the mid-year resident population for the reference year.

2.5. The prices reported by participating countries are used to calculate price relatives, or PPPs, first at the product level, then at the basic heading level and finally at the various aggregation levels above the basic heading level. The PPPs at the aggregation levels are obtained using the final expenditures that participating countries have supplied on the constituent basic headings as weights.[3] The PPPs for basic headings and aggregates are used to convert national final expenditures on GDP into real final expenditures on GDP. The exchange rates are used to derive comparative price levels. They are also used as proxies for the PPPs for exports and imports when calculating the PPPs for GDP.[4] The population data are used to compute real final expenditures per head.

Consistency

2.6. National final expenditures are in national currencies at national price levels. Real final expenditures are in a common currency at a uniform price level. PPPs, besides being currency converters, are also price deflators. For this reason, the prices supplied by participating countries should be *consistent* with the methods of valuation used to estimate their final expenditures on GDP. Failure to observe this requirement will result in biased results. The basis of a comparison is the identity: expenditure = price x volume. Volumes are obtained by dividing expenditures by prices. If the volumes are to be estimated correctly, the prices collected should be those used to derive the expenditures. Deflating with prices that are not consistent with those underlying the expenditure values will result in volumes being underestimated if the prices are too high or overestimated if the prices are too low.

2.7. In principle, the final expenditures on GDP that participating countries report for the reference year are estimated using national annual purchasers' prices of actual market transactions. Consistency requires participating countries to collect *national* prices – that is, prices that have been averaged over all localities of a country so as to take account of regional variations in prices. The national prices have to be *annual* prices – that is, prices that have been averaged over the days, weeks, months or quarters of the reference year so as to allow for seasonal variations in prices as well as general inflation and

changes in price structures. The national annual prices have to be *purchasers'* prices – where a purchaser's price is defined as the amount paid by the purchaser in order to take delivery of a unit of a good or service at the time and place required by the purchaser. It includes supplier's retail and wholesale margins, separately invoiced transport and insurance charges, non-deductible tax on products and sometimes, as in the case of certain items of machinery and equipment, installation costs. Finally, the national annual purchasers' prices have to be *market* or *transaction* prices – where a market price is defined as the actual amount of money a willing buyer pays to acquire a good or service from a willing seller. In other words, it is the actual price for a transaction agreed on by the transactors[5]. As such, it is the net price inclusive of all discounts, surcharges, rebates and, in the case of certain services, invoiced service charges and voluntary gratuities.[6]

2.8. Besides being consistent with the final expenditures on GDP, the prices participating countries report must be for items that are *representative* of their final expenditure on GDP and which are *comparable* between them. These requirements are not necessarily complementary. Consumption patterns can vary from country to country because of differences in tastes, cultures, climates, price structures, product availability and income levels. Products representative of the final expenditure of one country are not necessarily representative of the final expenditures of other countries, while products that are strictly comparable across countries are unlikely to be equally representative of them all. Failure to observe either of these two requirements will result in either an overestimation or underestimation of price levels and a corresponding underestimation or overestimation of volumes. Eurostat-OECD comparisons employ methods for selecting products and for calculating PPPs that are designed to respect both requirements. Inevitably compromises have to be made and, in such cases, comparability is favoured over representativity.

Comparability

2.9. Comparability requires participating countries to price products that are identical or, if not identical, equivalent. Products are said to be comparable if they have identical or equivalent physical and economic characteristics – that is, if they have the same or similar technical parameters and price determining properties. In this context, equivalence or similarity between products is defined as meeting the same needs with equal efficiency so that purchasers are indifferent between them and are not prepared to pay more for one than for the other. The pricing of comparable products ensures that differences in prices between countries for a product reflect "actual" price differences and are not influenced by differences in quality.[7] Comparability involves pricing to constant quality to avoid quality differences being mistaken for "apparent" price differences and the consequent underestimation or overestimation of price levels.[8]

2.10. Comparability is obtained in Eurostat-OECD comparisons by participating countries pricing product specifications that fully define the products in terms of the principal characteristics that influence their market or transaction prices. The approach is called "specification pricing" and requires the characteristics of both the product and the transaction to be specified. Product specifications can be brand and model specific – that is, a specification in which a particular brand and model, or a cluster of comparable brands and models, is stipulated. Or they can be generic – that is, a specification where only the relevant technical parameters and other price determining characteristics are given and no brand or cluster of brands is designated. Generic specifications and, to a lesser extent, specifications with brand clusters are two of the ways of enabling countries to price items that are both comparable and representative. Another way is to permit countries to treat brand and model specifications as generic specifications – that is, countries price products that match all the characteristics specified other than those of brand and model which are considered to be indicative only.[9]

2.11. Ideally, all product specifications would be brand and model specific so that countries would price products of identical quality. In practice, this is not possible for reasons of availability and representativity. Generic specifications have to be employed as well and inevitably some variability in quality between the products priced by countries will occur. Quality differences can arise as a result of countries pricing items that do not match exactly the product specifications. Participating countries are required to state if the items they have priced deviate from the product specifications and how they deviate when reporting their prices.[10] Quality differences can also arise because, although the items priced appear to match the product specifications exactly, the product specifications are not precise enough to ensure that countries price items of the same quality. These differences are generally identified when the price data are edited. Neither Eurostat nor the OECD adjusts prices to compensate for differences in quality. Mismatches in quality are dealt with either by re-matching the prices reported - an ex post refining of the specifications - or by discarding them.

Representativity

2.12. Representativity is a concept that relates to individual products within a basic heading. It is a necessary concept because, by definition, there are no explicit expenditure weights below the basic heading level. Without such expenditure weights the relative importance of the various products priced for a basic heading cannot be determined. To make a comparison, participating countries have to price both representative products and unrepresentative products for a basic heading. Representative products generally have a lower price level than unrepresentative products. Unless this is taken into account when calculating the PPPs for a basic heading, the PPPs will be biased. To avoid this,

countries participating in Eurostat-OECD comparisons are required to do two things. The first is to ensure that there are representative products they can price in each basic heading when the product list[11] is being finalised prior to price collection. The second is to identify which of the products they have priced within a basic heading are representative when reporting their prices.

2.13. 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, its price level is close to the average for all products within the basic heading. Usually, though not necessarily, the purchases of the product will account for a significant proportion of the total purchases of all products covered by the basic heading. If not, the product will at least be sold in sufficient quantities for its price level to be typical for 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 defined 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.

2.14. 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. For example, assume that in country A the expenditure shares of the three basic headings that comprise the expenditure group "alcoholic beverages" are: "beer" 60 per cent, "wine" 35 per cent and "spirits" 5 per cent. The fact that beer and wine are considerably more representative of the type of alcoholic beverages consumed in country A than are spirits does not mean that all spirits sold in country A are to be treated as unrepresentative. If vodka has the largest market share of the spirits sold in country A, it is likely to representative of the price level for "spirits" in country A and this should be recognised when calculating the PPPs for "spirits". Vodka is probably not representative of the price level of "alcoholic beverages", but this is reflected by the 5 per cent expenditure share of "spirits" that will be used in the calculation of PPPs for "alcoholic beverages". If "alcoholic beverages" consisted of a single basic heading, with no breakdown into "beer", "wine" and "spirits", it is unlikely that vodka would be considered a representative product.

2.15. It has been mentioned already that the price levels of representative products are usually lower than the price levels of unrepresentative products. A comparison based on products that are not equally representative of all participating countries will result in biased price relatives. Price levels for countries pricing a smaller number of representative products will be overestimated, while price levels for countries pricing a larger number of representative products will be underestimated. When putting together the product list for a comparison, it is important to ensure that it is equally representative – or "equi-representative" - of all participating countries for each basic heading identified in the common expenditure classification. This does not mean that each country should have the same number of representative products for each basic heading because the method used by Eurostat and the OECD to calculate PPPs for a basic heading treats representative and unrepresentative products differently. What it does mean is that each country should be able to price that number of representative products which is commensurate with the heterogeneity of the products and price levels covered by the basic heading and its expenditure on the basic heading.

2.16. The responsibility that the product list is equi-representative is shared by participating countries on the one hand and by Eurostat and the OECD on the other. Each country has to ensure that it is able to price the appropriate number of representative products for each basic heading by proposing products it wishes to see added to the list. Products proposed by one country may not be available or, if available, not representative in other countries. At least one other country has to agree to price them if they are to be included on the list. Eurostat and the OECD have to oversee the "horse trading" that will be necessary between countries if the list is to be equi-representative. At the same time, they have to guard against the product list becoming too large and unmanageable. It is important that countries, when proposing products for the list, define them precisely so that other countries can identify them correctly in their markets and price comparable products.

Primacy of volume comparisons

2.17. Adherence to the consistency rule requires countries participating in Eurostat-OECD comparisons to provide national annual purchasers' prices of actual market transactions for the reference year. This is not an issue for most final expenditures, but there are two exceptions:

- The first exception concerns final expenditures for which it is not always feasible to collect the price actually paid by purchasers. Discounts received on motor vehicles, voluntary gratuities or tips (as opposed to invoiced service charges) left in cafés and restaurants or given to taxi drivers and hairdressers, and VAT actually paid on capital goods are particularly difficult for price

collectors to determine for individual transactions. To overcome this problem, participating countries are required to report the prices that purchasers pay for the transaction specified before allowing for discounts in the case of motor vehicles, tips in the case of cafés, restaurants, taxi drivers and hairdressers, and VAT in the case of capital goods. They are also required to report the global rates for discounts, tips and VAT that are applied by their national accountants when estimating final expenditures on motor vehicles, café and restaurant services, taxis and hairdressers, and capital goods. The global rates are used by Eurostat to adjust the prices reported by countries to make them consistent with the corresponding expenditure.[12]

- The second exception concerns final expenditures that include those social transfers in kind which involve two "purchasers" and two "market prices". This can occur with housing services and with medical goods and services when rents for dwellings and prices for medical products are paid partly by households and partly by government (or non-profit institutions serving households).

  For example, in many countries, payments for medical services are shared between households and government. Either households pay the medical practitioner in full and subsequently receive the government's share as a reimbursement or both households and government pay their share to the medical practitioner directly. Whatever the system, in the national accounts, the amounts actually paid by households (based on prices paid less any reimbursements) are recorded under household expenditure and the amounts actually paid by government (based on reimbursements paid to households and/or payments made directly to medical practitioners) are recorded under government expenditure. If households actually pay 20 euros per consultation and government actually pays 80 euros per consultation and 100 consultations take place, 2000 euros would be recorded under household expenditure and 8000 euros under government expenditure. To obtain the correct volume it is necessary to divide both household expenditure and government expenditure by the total or composite price of 100 euros ([2000 / 100] + [8000 / 100] = 100 consultations). Otherwise, if the expenditures are divided by the prices households and government actually paid, that is by 20 and 80 euros respectively, there would be double counting ([2000 / 20] + [8000 / 80] = 200 consultations). To avoid this, countries participating in Eurostat-OECD comparisons are required to report total or composite prices for all final expenditures to which they apply.

2.18. Both exceptions illustrate an important feature of Eurostat-OECD comparisons: the priority given to the volume comparison. The first objective is to obtain comparable volume measures by deflating final expenditures with prices that are consistent with those underlying the estimates being deflated. Whether the prices also give comparable price measures is of secondary importance. The prices for individual products derived by applying global adjustments are not strictly comparable because they are approximations of the actual prices paid by purchasers, but, when averaged, the price measures they give at aggregate levels probably are. This assumes that national accountants really do apply global rates. If, for example, a country uses list prices to estimate final expenditure on motor vehicles even though purchasers receive discounts, it will report a global discount rate of zero. This means that the motor vehicle prices reported by the country will not be adjusted. They will be consistent with the national accountant's expenditure estimate, but they will not be comparable with the prices of other countries which have been adjusted by a global rate. Likewise, the use of composite prices gives comparable price measures for actual individual consumption[13], but the measures are not suitable for comparisons of prices paid by households or for comparisons of prices paid by government.

Actual data requirements

2.19. The range of final goods and services included in GDP covers consumer goods and services, general government services, capital goods and services, inventories, valuables, exports and imports. Countries participating in Eurostat-OECD comparisons are only required to price consumer products, capital goods and general government services. They do not have to price inventories, valuables, exports and imports. As explained earlier, the prices that countries collect should be national annual purchasers' prices of actual market transactions in the reference year, but, in practice, they are not.

- *Consumer goods and services:* Participating countries are required to report purchasers' prices for consumer products.[14] The prices are to be collected from a variety of outlets - corner shops, markets, supermarkets, specialist shops, departmental stores, service establishments, etc. - located in the capital city. This is the practice followed by the majority of countries. But some countries do not limit their price collections to capital cities and collect prices in other cities and towns as well. When averaged, these prices are considered to be national prices.

  To reduce the response burden that national statistical offices would have to shoulder if they were required to price the full set of consumer products in a single year, prices are collected over a period of three years. The product list is divided into six parts. Two parts are surveyed each year: one part in the first half of the year, the other in the second half of the year. For the reference year t, one third of the prices that countries report for consumer products will refer to the year t-2, one third to the year t-1 and one third to the reference year t.

In most cases, these prices are not national because they refer to the capital city. In all cases, they are not annual because they refer to a point in time. Those countries that collect capital city prices are required to provide spatial adjustment factors with which to convert their capital city prices to national prices. All countries are required to provide temporal adjustment factors with which to centre the prices collected in the years t-2, t-1 and t on the reference year t.

Spatial adjustment factors and temporal adjustment factors are to be supplied for each basic heading. Temporal adjustment factors are also to be supplied at the product level when the products are seasonal. Countries are only required to determine spatial adjustment factors once every six years as usually a special survey needs to be conducted to establish regional differences in price levels. Countries report the spatial adjustment factors that are relevant for a particular price survey one month after reporting the prices for the survey. The temporal adjustment factors, which are monthly and which countries extract from their CPI[15] data bases, have to be reported after the end of each year.

- *Capital goods and services:* Participating countries are required to report national purchasers' prices for capital goods once every two years[16]. There are two price surveys: one for equipment goods, the other for construction. The prices collected should be mid-year (July) prices because it is too costly to monitor prices over the whole year. But for reasons of timeliness they are April prices[17].

  Prices for equipment goods are to be obtained from producers, importers, distributors or actual purchasers. The prices collected can be either purchasers' prices for actual market transactions or purchasers' prices for hypothetical market transactions – that is, what purchasers would pay if they made a purchase.

  Prices for construction are to be compiled using a set of standard construction projects covering different types of buildings and civil engineering works. Prices for the projects are to be at the level of prevailing tender prices – that is, the prices of tenders that have been accepted by purchasers.

- *General government services:* Participating countries are required to report national annual purchasers' prices for general government services every year[18]. The services produced by general government are non-market services and have no economically-significant market price. Because there are no market prices, the convention is to value non-market services in the national accounts at cost. The prices that countries are to collect for general government services are the prices of the inputs used in their production.

Not all inputs are priced. Only the most important – labour – is priced. Participating countries are required to provide the annual compensation of employees that general government pays to a cross-section of occupations in general public services, public health services and public education services. The compensation of employees collected for an occupation is a purchaser's price for a hypothetical market transaction – that is, what general government would pay an employee of a specified seniority working in the occupation. In principle, the price is to be computed using general government salary scales. In practice, it is often extracted from the payroll.

2.20. In addition to the prices and adjustment factors enumerated above, participating countries have to provide expenditure weights, annual average exchange rates and mid-year resident population for the reference year. The expenditure weights are discussed in Chapter 3. The exchange rates should be annual averages of daily market or central rates such as those published by the European Central Bank or the International Monetary Fund. The mid-year resident population should refer to the economic territories covered by the GDPs of the participating countries. Countries report their expenditure weights directly to Eurostat or the OECD. Data on their exchange rates and population are extracted by Eurostat or the OECD from in-house data bases.

2.21. The complete set of data that participating countries have to supply Eurostat or the OECD for a comparison is itemised in Box 2.1. Fifteen surveys are identified: ten to collect prices and five to collect a miscellany of data other than price data. The surveys are divided by frequency of collection and by organiser. These are explained in more detail in Part II.

PART II: ORGANISATION

Background

2.22. When the Eurostat-OECD PPP Programme was established in the early 1980s, only OECD Member Countries were covered, benchmark comparisons were made every five years and all data were collected over an 18 month period centred on the reference year. Organisation was straightforward. Eurostat was responsible for those OECD Member Countries that were also Members of the European Union (EU) and the OECD was responsible for those OECD Member Countries that were not. This division of responsibilities has changed with time mainly as the result of the enlargement of the European Union and the participation in the Programme of countries that are not members of either the European Union or the OECD. The evolution of Eurostat and OECD responsibilities is charted in Annex I. The Annex gives a brief history of the Programme.[19]

2.23. The frequency of data collections and comparisons has changed as well. After the 1990 comparison,

Box 2.1: Data requirements of Eurostat and OECD comparisons[1]

Data	Survey	Frequency of collection		Organised by
		Eurostat	**OECD**	
Prices	01. Food, drinks and tobacco	Every three years	Every three years	Group leader
	02. Personal appearance	..	..	..
	03. House and garden	..	..	..
	04. Transport, restaurants and hotels	..	..	..
	05. Services	..	..	..
	06. Furniture and health	..	..	..
	07. Equipment goods	Every two years	..	Centre[2]
	08. Construction projects	..	..	..
	09. Actual and imputed rents[3]	Every year	..	..
	10. Compensation of employees	..	..	..
Expenditure weights	11. Final expenditure on GDP	..	..	..
Other	12. Annual average exchange rates	..	..	..
	13. Mid-year resident population	..	..	..
	14. Temporal adjustment factors	..	Every year	..
	15. Spatial adjustment factors[4]	Every six years		..

[1] Eurostat comparisons are made every year; OECD comparisons every three years. [2] Eurostat and/or the OECD. [3] Countries with small or unrepresentative rent markets provide data on the housing stock instead of prices. [4] Not required for OECD comparisons as countries report national prices.

Eurostat and the OECD adopted the "rolling benchmark approach". With this approach, data collection is continuous, but cyclical, with each cycle taking three years. The advantages of the approach are that it reduces response burden on participating countries, it enables them to include the price surveys in their regular programme of data collection and it fosters continuity of expertise in their national statistical agencies.[20] Also, by "rolling" data collected in one year over to the next year, it is possible to make "benchmark" comparisons annually. Since 1990, Eurostat has been making comparisons every year, while the OECD, for reasons explained later, has been making comparisons every three years. The next joint comparison will be 2005.

Rolling benchmark approach

2.24. The rolling benchmark approach facilitates annual comparisons as follows. The starting point is the matrix of basic heading PPPs by participating country for the reference year, t. In the subsequent year, t+1, some of the basic heading PPPs are replaced by new PPPs calculated using prices collected during t+1, while the basic heading PPPs that have not been replaced are advanced to t+1 using temporal adjustment factors specific to these basic headings. All the basic heading PPPs in the matrix now refer to t+1. Aggregating the matrix with expenditure weights for t+1 gives PPPs and real final expenditures for each level of aggregation up to the level of GDP with which a comparison can be made for the new reference year, t+1. By continuing the cycle of replacement, extrapolation and aggregation through t+2, t+3, t+4, etc., comparisons can be made for the reference years t+2, t+3, t+4, etc. As over a third of all basic heading PPPs are recalculated each year, all the basic heading PPPs in the matrix for any given reference year have been replaced, at least once, during the 36 months prior to its close. The approach is described in more detail in Box 2.2

2.25. The rolling benchmark approach requires continuous price collection with part of the product lists being priced each year, regular reporting of temporal adjustment factors at the level of the basic heading and annual provision of expenditure weights. Participating countries generally have temporal adjustment factors of sufficient detail and reliability with which to extrapolate the PPPs for consumer goods and services. But most of them do not have suitable temporal adjustment factors with which to extrapolate the PPPs for actual and imputed rents, for government services and for capital goods. One solution is to price actual and imputed rents, government services and capital goods every year. This was the solution originally adopted by Eurostat. But pricing capital goods annually is expensive. It was to avoid this cost that the OECD decided to make its comparisons every three years – that is, each time there has been a complete turnover in basic heading PPPs. More recently, to reduce costs, Eurostat has adopted another solution – namely, the pricing of capital goods once every two years and estimating the PPPs for the interim year by interpolation.

The 2005 comparison

2.26. The Eurostat-OECD comparison for 2005 will cover the 45 countries listed in Box 2.3. Eurostat is co-ordinating the collection of data in 31 countries: 25 EU Member States, three Member Countries of the European Free Trade Area (EFTA) and three EU Candidate Countries. The OECD is co-ordinating

Box 2.2: Rolling benchmark approach

Data	Survey	Reference year			
		2005	**2006**	**2007**	**2008**
Prices	01. Food, drinks and tobacco	2003-1	*2006-1*	2006-1	2006-1
	02. Personal appearance	2003-2	*2006-2*	2006-2	2006-2
	03. House and garden	2004-1	2004-1	*2007-1*	2007-1
	04. Transport, restaurants and hotels	2004-2	2004-2	*2007-2*	2007-2
	05. Services	*2005-1*	2005-1	2005-1	*2008-1*
	06. Furniture and health	*2005-2*	2005-2	2005-2	*2008-2*
	07. Equipment goods	*2005*	2005, 2007	*2007*	2007, 2009
	08. Construction projects	*2005*	2005, 2007	*2007*	2007, 2009
	09. Actual and imputed rents	*2005*	*2006*	*2007*	*2008*
	10. Compensation of employees	*2005*	*2006*	*2007*	*2008*
Expenditure weights	11. Final expenditure on GDP	*2005*	*2006*	*2007*	*2008*
Other	12. Annual average exchange rates	*2005*	*2006*	*2007*	*2008*
	13. Mid-year resident population	*2005*	*2006*	*2007*	*2008*
	14. Temporal adjustment factors	2003, 2004, *2005*	2004, *2005*, *2006*	2005, 2006, *2007*	2006, 2007, *2008*
	15. Spatial adjustment factors	2003, 2004, *2005*	2004, *2005*, *2006*	2005, 2006, *2007*	2006, 2007, *2008*

Italics = data collected for the reference year. Shading = data from a previous or subsequent reference year.

1. The table shows the data on which the comparisons for 2005, 2006, 2007 and 2008 will be based. Each comparison uses either new data collected for the reference year or data "rolled over" from a previous or subsequent reference year. For example, the PPPs and real final expenditures for 2005 will be calculated using:

   - The national or capital city prices for the consumer products covered by surveys 01 and 02 that were collected respectively in the first and second halves of 2003. The capital city prices have been converted to national prices with the spatial adjustment factors reported in 2003 for the two surveys. The national prices have been converted to annual prices with the temporal adjustment factors for 2003. The annual prices have been used to calculate PPPs for 2003 for the basic headings covered by the two surveys. These basic heading PPPs for 2003 have been advanced to 2005 with the temporal adjustment factors for 2004 and 2005.

   - The national or capital city prices for the consumer products covered by surveys 03 and 04 that were collected respectively in the first and second halves of 2004. The capital city prices have been converted to national prices with the spatial adjustment factors reported in 2004 for the two surveys. The national prices have been converted to annual prices with the temporal adjustment factors for 2004. The annual prices have been used to calculate PPPs for 2004 for the basic headings covered by the two surveys. These basic heading PPPs for 2004 have been advanced to 2005 using the temporal adjustment factors for 2005.

   - The national or capital city prices for the consumer products covered by surveys 05 and 06 that were collected respectively in the first and second halves of 2005. The capital city prices have been converted to national prices with the spatial adjustment factors reported in 2005 for the two surveys. The national prices have been converted to annual prices using the temporal adjustment factors for 2005. The annual prices have been used to calculate PPPs for 2005 for the basic headings covered by the two surveys.

   - The national annual (April) 2005 prices of the capital goods covered by surveys 07 and 08 that were collected in Q2 2005.

   - The national annual (2005) prices for rents, or data on housing stock if rent market small or unrepresentative, from survey 09 that were reported in 2006. The national annual (2005) prices for compensation of employees from survey 10 that were reported in 2006.

   - The final expenditure on GDP (survey 11) for 2005 collected in Q3 2006 for the preliminary calculation and again in Q3 2007 for the final calculation. Average annual exchange rates (survey 12) and mid-year resident population (survey 13) for 2005 that were reported in 2006.

2. The PPPs and real final expenditures for 2006, 2007 and 2008 will be similarly calculated except that:

   - In 2006, new prices will be collected for the consumer products covered by surveys 01 and 02 and the basic heading PPPs calculated with these prices will replace the corresponding PPPs based on prices collected in 2003. The basic heading PPPs for capital goods will be estimated by interpolation using the basic heading PPPs for 2005 and the basic heading PPPs for 2007.

   - In 2007, new prices will be collected for the consumer products covered by surveys 03 and 04 and the basic heading PPPs calculated with these prices will replaced the corresponding PPPs based on prices collected in 2004. The basic heading PPPs for capital goods will be calculated using the prices collected by surveys 07and 08 in Q2 2007.

   - In 2008, new prices will be collected for the consumer products covered by surveys 05 and 06 and the basic heading PPPs calculated with these prices will replaced the corresponding PPPs based on prices collected in 2005. The basic heading PPPs for capital goods will be estimated by interpolation using the basic heading PPPs for 2007 and the basic heading PPPs for 2009.

the data collection in 14 countries: seven non-European OECD Member Countries and seven other countries that are mostly European. The cycle of price surveys for the 2005 comparison started in 2003 and will finish in 2005. But data collection will not be complete until the third quarter of 2007 when countries report their final detailed estimates of final expenditure on GDP for 2005. Preliminary results of the comparison will be released at the end of 2006. Final results will be released at the end of 2007.

2.27. There are ten price surveys to a cycle: the six surveys that cover consumer goods and services and take place once every three years; the two surveys that cover capital goods and take place once every two years; and the two surveys, one covering actual and imputed rents, the other covering compensation of employees paid to producers of government services, that take place every year.[21] Before each price survey for consumer products and each price survey for capital goods, there are meetings at which participating countries, together with Eurostat and the OECD, select the products to be priced during the survey. An essential input into the selection process is the pre-survey that participating countries are required to conduct before the meeting to familiarise themselves with the situation in their domestic markets with regard to the products about to be surveyed. The meetings have a direct bearing on the quality of the price collections carried out by countries.

2.28. Experience shows that the effectiveness of these meetings depends on the number of products to be considered, the number of countries at the meeting and the thoroughness of the pre-survey conducted by countries prior to the meeting. The three variables interact. As the number of countries increases, the number of products increases. As the number of products increases, the quality of pre-survey work decreases. Experience also shows that this interaction can be a serious problem for meetings held to select consumer products where there are a large number of items to be discussed. (It is much less of a problem for meetings held to select capital goods where the number of products to be considered is much smaller.)

2.29. When the number of countries Eurostat co-ordinated rose from 21 to 31 in 1999, it was clear that meetings to select consumer products involving 31 countries reviewing some four to five hundred products per survey would be unmanageable and detrimental to the quality of the comparison. For the purposes of organising the surveys of consumer prices, Eurostat divided the 31 countries into three groups with one of the countries in the group acting as group leader. Box 2.4 gives the composition of the groups and the group leaders for the 2005 comparison. The Box also shows that the 14 countries co-ordinated by the OECD are divided into two groups: one covering mainly its non-European Member Countries with the OECD as group leader, the other covering the countries of the Western Balkan Region with Slovenia as group leader. This second group is to all intents and purposes a subgroup of the Central group of which Slovenia is a member.

2.30. Group leaders are only responsible for the six price surveys dealing with consumer goods and services. Details of the coverage of each of these surveys can be found in Annex III. All other surveys are the responsibility of the "Centre" – that is, Eurostat and/or the OECD.

Linking groups

2.31 The country groups are organised by the group leaders to conduct their own surveys of consumer prices. Although prices are collected according to a common set of guidelines and following a common timetable, the products selected for pricing are not common to all groups. Each group is, essentially, a separate comparison. Their data sets need to be combined before a comparison covering all participating countries can be made. There are two standard means of doing this. Either they can be combined using "bridge countries" - that is, when groups of countries conducting separate comparisons are linked through countries that have participated in more than one of the comparisons. Or they can be combined using "core products" - that is,

Box 2.3: Countries participating in the 2005 round of price surveys

EUROSTAT (31 countries**)**	15 EU Member States (pre-May 2004)[1]	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom
	10 EU Member States (post-May 2004)	Cyprus, Czech Republic[1], Estonia, Hungary[1], Latvia, Lithuania, Malta, Poland[1], Slovak Republic[1], Slovenia
	3 Members of EFTA[1][2]	Iceland, Norway, Switzerland
	3 EU Candidate Countries[2]	Bulgaria, Romania, Turkey[1]
OECD (14 countries**)**	7 Non-European OECD Member Countries[1]	Australia, Canada, Japan, Korea, Mexico, New Zealand, United States
	7 Other countries	Albania, Bosnia and Herzegovina, Croatia[2][3], Israel, FYROM, Russian Federation, Serbia and Montenegro

[1] OECD Member Countries. [2] Referred to in the text as "EU associated countries". [3] Became an EU Candidate Country in June 2004.

when groups of countries conducting separate comparisons are linked through a compulsory minimum list of products common to all comparisons. Both these approaches have been employed by other comparisons programmes with varying degrees of success, but they are not without their limitations. Results of comparisons that have been linked by a bridge country are not "bridge country invariant" – in other words, they are influenced by the choice of bridge country. Results of comparisons that have been combined by a set of core products can be biased if the products are not equally representative of all countries participating in the comparisons.

2.32. Eurostat-OECD comparisons do not use the bridge country approach. Nor do they strictly apply the core product approach. A variant, one that allows the representativity of products to be taken into account, is used instead. As with the core product approach, the country groups are linked at the product level through products that "overlap" the groups, but with two important differences. First, an "overlap product" is not necessarily common to all groups. It is common to two groups as a minimum. Second, it is not compulsory for participating countries to price overlap products. Countries are free to choose which products they price. They are of course encouraged to price overlap products. For them to do so, it is essential that product lists include a sufficient number of representative and comparable products that overlap the country groups. This requires close collaboration between group leaders as discussed in Chapter 4.

Responsibilities

2.33. Eurostat-OECD comparisons are a co-operative endeavour between three parties: Eurostat and the OECD as the Centre, the national statistical institutes of the group leaders and the national statistical institutes of participating countries. Each party has its own set of tasks and responsibilities, but tasks and responsibilities are often shared. For example, the preparation of product lists for the price surveys covering consumer goods and services involves all three parties, while the validation of the prices collected by these surveys is an iterative process between group leaders and group members.

2.34 The responsibilities of the three parties are listed in Box 2.5. With one exception, the list does not distinguish between tasks that are actually carried out by the parties and tasks, such as the pricing of capital goods or the calculation of comparison results, that parties outsource (because it is the task and not the responsibility that is outsourced). The exception to this is the division of responsibilities between the Centre and the group leaders or, more specifically, between Eurostat and the leaders of the Northern, Central and Southern groups. Ultimately, it is Eurostat that is accountable for the tasks and responsibilities delegated to these group leaders. To a lesser degree, this also holds for the OECD and the leader of OECD group II. But not for OECD group I for which the OECD is both the Centre and group leader.

Box 2.4: Country groups and group leaders for 2005 comparison

EUROSTAT			OECD	
Northern group	Central group	Southern group	Group I	Group II
Denmark	Austria	Bulgaria	Australia	Albania
Estonia	Belgium	Cyprus	Canada	Bosnia and Herzegovina
Finland	Czech Republic	France	Israel	Croatia
Iceland	Germany	Greece	Japan	FYROM
Ireland	Hungary	Italy	Korea	Serbia and Montenegro
Latvia	Luxembourg	Malta	Mexico	
Lithuania	Netherlands	Portugal	New Zealand	
Norway	Poland	Romania	Russian Federation	
Sweden	Slovak Republic	Spain	United States	
United Kingdom	Slovenia	Turkey		
	Switzerland			
Group leader	Group leader	Group leader	Group leader	Group leader
Finland	Austria	Portugal[1]	OECD	Slovenia

[1] Italy was the leader of the Southern group from 1999 to 2003. Portugal took over from Italy in 2004.

Box 2.5: Division of responsibilities

Centre

1. General:
- Plan, organise and realise the Eurostat-OECD PPP Programme.
- Ensure the accuracy, relevance and timeliness of the price and volume comparisons.
- Prepare and update documentation on methods and procedures.
- Initiate and carry out methodological development.
- Develop and update the information technology tools used by the Centre, group leaders and participating countries.
- Calculate, aggregate and validate PPPs for GDP and its component expenditures for reference years.
- Disseminate comparison results (PPPs and volume and price level indices) through print and electronic media.
- Explain results, and the use and abuse of results, to users and potential users.
- Convene annual meetings with participating countries to discuss methodology, work programme, etc.

2. Price surveys for consumer goods and services (other than rents):
- Convene planning meetings with group leaders to ensure they follow a common approach to the surveys.
- Participate in group meetings convened by group leaders to ensure a uniform approach by country groups to the surveys.
- Convene overlap meetings with group leaders to ensure a sufficient number of overlap products on the final product lists.
- Prepare and dispatch to participating countries booklets with pictures of products specified in the final product lists.
- Validate average survey prices received from group leaders across country groups.
- Adjust average survey prices to national annual prices using the spatial and temporal adjustment factors supplied by participating countries.
- Calculate PPPs from the national annual prices and validate the PPPs calculated.

3. Prices surveys for capital goods:
- Convene meetings with participating countries to plan and organise the pre-surveys and the surveys.
- Prepare and dispatch to participating countries draft product lists for the pre-surveys.
- Prepare and dispatch to participating countries final product lists for the price surveys
- Validate national annual (April) average prices supplied by participating countries.
- Calculate PPPs from the national annual prices and, in consultation with participating countries, validate the PPPs calculated.

4. Other surveys (actual and imputed rents, government services, final expenditure on GDP):
- Prepare questionnaires and supporting documentation and send to participating countries.
- Validate the national annual average prices supplied by participating countries (housing services and government services).
- Calculate PPPs from the national annual prices and validate the PPPs calculated.
- Validate the detailed estimated of final expenditure on GDP supplied by participating countries.
- Extract data on exchange rates and mid-year resident population from in-house data bases

Group leaders

1. Preparation of the price surveys of consumer goods and services (other than rents):
- Participate in planning meetings convened by the Centre for group leaders.
- Prepare and dispatch to group members pre-survey questionnaires.
- Visit group members either before or during their pre-surveys to ensure uniformity of approach and understanding.
- Prepare draft group product lists for discussion, modification and approval at group meetings.

2. Finalisation of product lists:
- Convene group meetings with group members, other group leaders and the Centre.
- Prepare provisional group product lists as agreed at group meetings for review at overlap meetings.
- Participate in the group meetings convened by other group leaders.
- Participate in overlap meetings convened by the Centre for group leaders.
- Prepare final product lists for the group on the basis of discussions at overlap meetings.

3. Co-ordination of price surveys:
- Dispatch final group product list to group members together with survey-specific guidelines and survey timetables.
- Visit group members during their price surveys to ensure uniformity in price collecting procedures.

4. Validation of survey results:
- Together with the group members edit the individual price observations.
- Obtain written approval from group members of the edited individual price observations.
- Calculate average survey prices from the edited individual price observations.
- Submit validated individual price observations and the average survey prices to the Centre

Box 2.5: Division of responsibilities, contd.

Participating countries

1. Price surveys for consumer goods and services (other than rents):
- Participate in the preparation of product lists for the surveys:
  - o Conduct pre-surveys,
  - o Complete pre-survey questionnaires,
  - o Attend group meetings.
- Conduct the surveys in the capital city (and other pricing locations if national prices are reported).
- Carry out intra-country editing of the prices collected.
- Submit the individual price observed and their averages to the Group leader for validation.
- Participate in the validation of the price data at the country level, at the group level and at the overall level.
- Provide the Group leader with a summary report on each consumer price survey.
- Provide the Centre with spatial adjustment factors after each survey if capital city prices reported.
- Provide the Centre with temporal adjustment factor for all surveys after the close of each year.

2. Price survey for actual and imputed rents:
- Conduct national price surveys if rent market large and representative.
- Submit the national annual average prices collected to the Centre for validation.
- Participate in the validation of the price data at the country level and at the overall level.
- Provide quantitative and qualitative data on housing stock if rent market small and unrepresentative.

3. Price survey for compensation of employees paid to producers of government services:
- Conduct national price surveys.
- Submit the national annual average prices collected to the Centre for validation.
- Participate in the validation of the price data at the country level and at the overall level.

4. Prices surveys for capital goods:
- Participate in the preparation of product lists for the price surveys:
  - o Conduct pre-surveys,
  - o Attend meetings convened by the Centre.
- Conduct national price surveys.
- Submit the average prices collected to the centre for validation.
- Participate in the validation of the price data at the country level and at the overall level

5. Final expenditure on GDP:
- Provide the Centre with detailed expenditures for reference year t in t+1 (preliminary estimates) and t+2 (final estimates).

6. Other:
- Participate in the annual meetings convened by the Centre to discuss methodology, work programme, etc.

[1] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[2] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[3] The PPPs for basic headings are unweighted averages, there being no expenditure weights below the basic heading level.

[4] Prices are not collected for exports and imports of goods and services, nor are they collected for purchases made by households abroad.

[5] From the seller's point of view, the market price is the basic price because that is the amount he will actually receive. From the buyer's point of view, the market price is the purchaser's price because that is the amount he will actually pay. The prices required for Eurostat-OECD comparisons are those from the buyers' viewpoint – that is, purchasers' prices.

[6] For completeness it should be noted that market prices do not include the cost of, or interest on, any credit obtained by the purchaser to facilitate the purchase. This is still so even when the credit is provided by the seller.

[7] Actual or real price differences arise when identical or equivalent products are sold in the same market or in different markets at different prices. They are the differences in price that, among other things, are due to imperfections in the market with purchasers having neither the knowledge nor the mobility to buy at the lowest price.

[8] Apparent or false price differences arise when products that are neither identical nor equivalent are considered to be comparable and the differences in their prices are treated as actual price differences and not, as they should be, as price differences caused by differences in quality.

[9] Countries participating in Eurostat-OECD comparisons may treat specified bands and models as indicative when they price equipment goods. Otherwise, as a general rule, they are expected to price the brand and model specified.

[10] When matching products and deciding whether or not the one observed is a close substitute to the one specified, it is not just the number of parameters not matching that needs to be taken into account, but also the degree to which they differ.

[11] The common list of well-defined goods and services from which participating countries make a selection of products to price. The "common basket of precisely-defined goods and services" referred to in paragraph 2.4.

[12] The OECD follows a similar procedure for motor vehicles. Otherwise countries participating in OECD comparisons are required to report purchasers' prices that take account of discounts, tips and non-reimbursable VAT.

[13] All goods and services that households actually consume to satisfy their individual needs irrespective of purchaser. See paragraph 3.12 of Chapter 3.

[14] Except actual and imputed rents for which countries have to report either national annual purchasers' prices or, if their rent market is small or unrepresentative, details of their housing stock. The data on the quantity and quality of the housing stock are used to estimate volumes for housing services directly as explained in the Annex to Chapter 4.

[15] Consumer price index.

[16] Once every three years in OECD comparisons.

[17] See paragraph 6.48 in Chapter 6 for a fuller explanation. Mid-year (July) prices are collected for OECD comparisons.

[18] Once every three years in OECD comparisons.

[19] Since 1990, eight OECD Member Countries have left OECD comparisons for Eurostat comparisons, either because they became candidates for EU Membership - Finland, Sweden, Czech Republic, Hungary, Slovak Republic and Turkey - or because they decided to harmonise their statistics with those of the European Union – Norway and Iceland. Currently, 23 of the 30 Member Countries of OECD are co-ordinated by Eurostat. All but four – Iceland, Norway, Switzerland and Turkey - are EU Member States.

[20] The approach also has advantages for new countries joining the Programme. Either they can ease themselves in gradually over three years or they can adopt a "catch up" strategy by completing the survey cycle over a shorter period.

[21] Countries participating in OECD comparisons conduct the price surveys for capital goods, actual and imputed rents and compensation of employees paid to the producers of government services once every three years, in the last year of the survey cycle.

CHAPTER 3: FINAL EXPENDITURE ON GDP AND ITS CLASSIFICATION

Introduction

3.1. Eurostat-OECD comparisons of GDP are made from the expenditure side. Each country participating in a comparison is required to provide either Eurostat or the OECD with a detailed breakdown of final expenditure on GDP for the reference year. The detailed expenditures are used as weights in the calculation of PPPs and in the estimation of real final expenditures. For this they need to be harmonised across participating countries that are required to report their final expenditures according to a common classification. This chapter explains the definitions and concepts underlying the common classification used for Eurostat and OECD comparisons. It describes the structure and presentation of the classification. The classification itself can be found in Annex II. The chapter also covers the reporting of expenditure data by countries and the subsequent validation of reported data by Eurostat or the OECD.

Final expenditure on GDP

3.2. A prerequisite of international comparisons of final expenditure on GDP is that the definition of GDP and its component expenditures is the same for all participating countries. To this end, the Eurostat-OECD expenditure classification adheres to the definitions, concepts, classifications and accounting rules of the SNA 93[1] and the ESA 95[2]. Participating countries compile their estimates of final expenditure on GDP following one of these two international systems of national accounts. The two systems are fully consistent with each other. The ESA 95 is a version of the SNA 93 appropriate to the circumstances and needs of the European Union (EU). The SNA 93 provides guidelines and recommendations for global implementation. The ESA 95 specifies how the guidelines and the recommendations should be applied by EU Member States. It has legal status within the European Union.

3.3. The SNA 93 and the ESA 95 define GDP from the expenditure side as:

- total final expenditures at purchasers' prices[3]

- *plus* f.o.b. (free on board) value[4] of exports of goods and services

- *less* f.o.b. value of imports of goods and services.

3.4. Final expenditures are expenditures on goods and services purchased for final use - that is, for final consumption or for gross capital formation. Final consumption consists of the goods and services used up by individual households or the community to satisfy their individual or collective needs. Expenditures on final consumption are incurred by households, non-profit institutions serving households (NPISHs) and general government. Gross capital formation comprises gross fixed capital formation, change in inventories and acquisitions less disposals of valuables. Expenditures on gross capital formation are incurred by resident producers of goods and services: incorporated enterprises, unincorporated enterprises (including households engaged in own-account production), general government and non-profit institutions. Final expenditures do not include expenditures on intermediate consumption – that is, the goods and services, other than fixed assets[5], that are used or consumed as inputs by a production process.

3.5. The difference between the f.o.b. value of exports of goods and services and the f.o.b. value of imports of goods and services is called the "balance of exports and imports" (or "net exports").

3.6. Final expenditure on GDP is, therefore,

total final consumption expenditure:
- final consumption expenditure of households
- final consumption expenditure of NPISHs
- final consumption expenditure of general government

plus gross capital formation:
- gross fixed capital formation
- change in inventories
- acquisitions less disposals of valuables

plus balance of exports and imports.

Actual and imputed expenditures

3.7. Final expenditure includes actual expenditures and imputed expenditures. Actual expenditures cover monetary transactions. They can be measured directly because for each transaction there is a price agreed between buyer and seller that is stated in monetary units. Imputed expenditures are non-monetary transactions. They cannot be measured directly because either the transaction is explicit, as in barter trade, but the price agreed is not stated in monetary units, or the transaction is implicit, as, for example, owner-occupiers "purchasing" housing services from themselves, and no price is involved. Expenditures on non-monetary transactions are obtained by estimating or imputing a value to them - hence, "imputed expenditures".

3.8. Imputations are made for:

- *consumption of own-produced goods:* goods that households produce and consume themselves (agricultural produce, preserved foodstuffs, wine, spirits, clothing, furniture, etc.);

- *own-account production of fixed capital assets:* gross fixed capital formation carried out by producers on their own account (including own-account construction, improvement and extension of dwellings by households);

- *imputed rentals of owner-occupiers:* housing services that owner-occupiers "sell" to themselves;

- *income in kind:* goods and services that employees receive free, or at very low prices, from their employers (meals, drinks, transportation to and from work, recreation facilities, company cars for personal use, etc.);

- *financial intermediation services indirectly measured or FISIM:* financial intermediation services that banks provide clients but for which they do not charge explicitly;

- *imputed social contributions:* unfunded social insurance schemes operated by employers (such as pension schemes for government employees that are funded out of general revenue);

- *barter trade;*

- *consumption of fixed capital by non-market producers* – that is, by NPISHs and general government.

3.9. The values to be imputed are defined by national accounting conventions. These vary from case to case and are described in the SNA 93 and the ESA 95. Generally, goods and services produced for own final use should be valued at the basic prices[6] at which they could be sold if offered for sale on the market or, failing that, as the sum of their costs of production. For example, the imputed rentals of owner-occupiers should be valued at the estimated rental that a tenant pays for a dwelling of the same size and quality in a comparable location with similar neighbourhood amenities. To do this requires the existence of a well-organised market for rented accommodation. In the absence of such a market, the value of imputed rentals will have to be derived by some other objective procedure such as the user-cost method[7].

Individual and collective consumption expenditures

3.10. The SNA 93 and the ESA 95 describe the components of final consumption expenditure as either "individual" or "collective". Individual consumption expenditure comprises the expenditures made by households, NPISHs and general government on goods and services that benefit individual households. Such goods and services are called "individual goods and services". Collective consumption expenditure comprises the expenditures made by general government on services that benefit households collectively. Such services are called "collective services". Health, education and social protection are examples of individual services that households purchase for themselves and which NPISHs and general government provide to specific

identifiable households. Defence, public order and safety, and environment protection are examples of collective services that general government provides to the community as a whole.

3.11. On the basis of this differentiation, final consumption expenditure breaks down into the following four main aggregates:

- *Individual consumption expenditure by households:* The actual and imputed final consumption expenditure incurred by households on individual goods and services. By definition, all final consumption expenditures of households are for the benefit of individual households so all such expenditure is classified as individual. Household final consumption expenditure covers a broad range of goods and services that includes food, beverages, tobacco, clothing, footwear, housing, heating and lighting, furniture and furnishings, household appliances, medical goods and services, transport equipment, transport and communication services, recreation and sporting equipment, recreation and sporting services, cultural services, education services, the services of hotels and restaurants, personal care services, social protection, insurance and financial services, etc. Imputations for consumption of own-produced goods, "rentals" of owner-occupiers, income in kind, FISIM and, possibly, barter transactions can be important components of household expenditure.

- *Individual consumption expenditure by NPISHs:* The actual and imputed final consumption expenditure incurred by NPISHs on individual goods and services. In practice, nearly all final consumption expenditures of NPISHs are individual in nature and so, for simplicity, all final consumption expenditures of NPISHs are treated by convention as individual. Essentially, the final consumption expenditure of NPISHs relates to individual services – that is, housing, health, recreation, sport, culture, education and social protection. It also includes the "collective" services provided by religious and community organisations, political parties and political action groups, trade unions and professional associations operating as NPISHs.[8]

  Individual consumption expenditure by government: The actual and imputed final consumption expenditure incurred by general government on housing, health, recreation and culture, education, and social protection. Not all government expenditure on these services constitutes individual consumption expenditure. Expenditures on the overall policy-making, planning, budgetary, co-ordinating and monitoring responsibilities of ministries overseeing the services and on the research and development carried out for the services are classified as collective consumption expenditure because they cannot be identified with specific individual households and are considered to benefit households collectively.

Box 3.1: Moving from final consumption expenditure to actual final consumption

"Who pays"	Final consumption expenditure	Actual final consumption	"Who consumes"
Households	Individual consumption expenditure by households	Actual individual consumption	Households
NPISHs	Individual consumption expenditure by NPISHs		
General government	Individual consumption expenditure by government		
	Collective consumption expenditure by government	Actual collective consumption	General government

- *Collective consumption expenditure by government:* The actual and imputed final consumption expenditure incurred by general government on collective services. It covers all government final consumption expenditure on general public services, defence, public order and safety, economic affairs, environment protection, and housing and community amenities. It includes as well government expenditure on the collective features of individual services mentioned in the previous bullet point.

Actual individual and collective consumption

3.12. Each of the four aggregates defined above clearly indicates who is the beneficiary of the expenditure – individuals or the community - and who makes the expenditure – households, NPISHs or general government. The SNA 93 and the ESA 95 use the distinction between "who consumes" and "who pays" to derive two additional aggregates: actual individual consumption and actual collective consumption.

- *Actual individual consumption* is a measure of the goods and services that individual households actually consume as opposed to what they actually purchase. It is derived, as shown in Box 3.1, by adding individual consumption expenditure by NPISHs and individual consumption expenditure by government to individual consumption expenditure by households. In this context, the SNA 93 and the ESA 95 treat the individual consumption expenditures of NPISHs and government as "social transfers in kind".

- *Actual collective consumption* is a measure of the services that general government provides to the community as a whole and which households consume collectively. It is obtained, as shown in Box 3.1, by subtracting individual consumption expenditure by government from final consumption expenditure of general government. In other words, it is the same as collective consumption expenditure by government.

3.13. Countries following the SNA 93 or the ESA 95 estimate final expenditure on GDP by the "who pays" principle. Thus the concept of actual individual consumption is of particular relevance to comparisons of the economic well-being of households (when

well-being is measured by the volume of individual goods and services consumed) because of the different ways individual services, particularly health and education services, are financed in countries.

3.14. In some countries, government (and/or NPISHs) provide the greater part of health and education services and these expenditures are included in the individual consumption expenditure of government (and/or NPISHs). In other countries, households purchase nearly all health and education services from market producers and these expenditures are included in the individual consumption expenditure of households. Under these circumstances, individual consumption expenditure by households is not the correct measure with which to compare the volumes of individual goods and services actually consumed by households in different countries. Households in countries where government (and/or NPISHs) are the main providers of individual services will appear to consume a smaller volume of goods and services than households in countries where the households themselves pay directly for the bulk of these services. This is avoided by comparing the actual individual consumption (by households) of countries as illustrated by Box 3.2.

Market and non-market services

3.15. By definition, the collective services that government provides to households can only be produced by government. But the individual services that government provides to households can be either purchased by government from market producers or produced by government itself. The individual services that government purchases from market producers are "market services". The individual and collective services that general government produces itself are mainly "non-market services". The difference between market services and non-market services is that the former are sold at prices that are economically significant, while the latter are either provided free or sold at prices that are not economically significant. The SNA 93 defines economically-significant prices as prices that have a significant influence on the amounts producers are willing to supply and on the amounts purchasers wish to buy. The ESA 95 is more specific. It defines economically-significant prices as prices which cover over 50 per cent of the costs of production.

Box 3.2: Individual consumption expenditure by households and actual individual consumption (by households)

Country	Per capita volume indices in 1999	
	Individual consumption expenditure by households	Actual individual consumption (by households)
Denmark	59	77
Finland	46	58
Iceland	65	80
Norway	57	72
Sweden	48	64
United States	100	100

1. The table above gives the per capita volume indices from the 1999 Eurostat-OECD comparison for individual consumption expenditure by households and actual individual consumption (by households) for the five Nordic countries and the United States. The indices show that in 1999 households in the United States both spent and consumed more per head than did households in the Nordic countries. The differences are larger for individual consumption expenditure - 45 per cent on average – than they are for actual individual consumption – 30 per cent on average. But which measure better reflects relative economic well-being? Were households in the United States 30 per cent or 45 per cent "better off" than Nordic households in 1999?

2. In Nordic countries, individual services are mostly purchased by government and, following the "who pays" criterion, are included in government expenditure. In the United States, individual services are mainly purchased by households and, in accordance with the "who pays" principle, are recorded under household expenditure. A comparison of economic welfare based on the per capita volume indices of individual consumption expenditure by households is clearly misleading in this situation. The comparison has to be based on what households actually consumed – that is, on the value of the individual goods and services they purchased themselves plus the value of the individual goods and services provided to them by government. It is the per capita volume indices of actual consumption (by households) that provide a correct picture of relative economic well-being. Households in the United States were 30, not 45, per cent "better off" than Nordic households in 1999.

3.16. Because they are sold at economically-significant prices, expenditures on market services can be obtained by multiplying the quantities sold by the prices they are sold at. The same prices can also be used to calculate the PPPs for market services. The lack of economically-significant prices for non-market services precludes their expenditures and their PPPs being derived in the same manner as they are for market services. Instead, following the convention adopted by national accountants, expenditures on non-market services are estimated by summing up their costs of production. And, to maintain consistency with the prices underlying the expenditure estimates, PPPs for non-market services are calculated with the prices of inputs. This is referred to as the "input-price approach". To implement the input-price approach, the expenditures on non-market services need to be broken down by cost components, namely: compensation of employees, intermediate consumption, consumption of fixed capital, net operating surplus, net taxes on production and receipts from sales.

Gross capital formation

3.17. The SNA 93 and the ESA 95 define gross capital formation as comprising gross fixed capital formation, change in inventories, and acquisitions less disposals of valuables, of which gross fixed capital formation is the most important. These three aggregates are defined as follows:

- *Gross fixed capital formation:* The acquisitions less disposals of fixed assets plus major improvements to non-produced assets.

  Fixed assets are assets that are produced by a human production processes. They exclude land

and subsoil assets which are produced by nature. Fixed assets are used repeatedly, or continuously, in processes of production for more than one year. Fixed assets are either tangible, such as buildings, machinery, etc., or intangible, such as mineral exploration[9], computer software[10], etc. They may be new or existing – that is, used or second-hand. Sales and purchases of existing fixed assets between residents cancel out over the economy as a whole and, except for the transfer of ownership costs which do not cancel out, can be ignored. Sales and purchases of existing fixed assets between residents and non-residents do not cancel each other out and cannot be ignored. They are recorded as investment by the importer and disinvestment by the exporter. Imports of second-hand machinery and equipment can be a significant part of the gross fixed capital formation of some countries participating in Eurostat-OECD comparison. An important element of gross fixed capital formation is own-account production of fixed capital assets (including the construction of new dwellings and the extension and modification of existing dwellings carried out by households on own account).

Non-produced assets are assets that are needed for production and come into existence in ways other than through processes of production. Major improvements to non-produced assets must come about through productive activity. Land, for example, is a non-produced asset. Major improvements to land usually involve the

construction of dykes, drainage ditches, irriga-tion channels, etc. for the purpose of reclaiming land from the sea, marshes, deserts, etc. The clearance of land to bring it into production for the first time is also a major improvement. Non-produced assets, like fixed assets may be both tangible, such as subsoil assets, land, etc., and intangible, such as leases, patented entities, etc.

- *Change in inventories:* The acquisition less dis-posals of stocks of raw materials, semi-finished goods and finished goods that are held by pro-ducer units prior to their being further processed or sold or otherwise used. Inventories also cover all raw materials and goods stored by govern-ment as strategic reserves. Semi-finished goods include work-in-progress - that is, goods and services that are only partially completed and whose production process will be continued by the same producer in a period following the ac-counting period. Work-in-progress is particularly important for production processes with long gestation periods, such as the construction of large-scale civil engineering works, the manu-facture of ships and aeroplanes, and reforesta-tion. Also covered by work-in-progress is the natural growth prior to harvest of agricultural crops and the natural growth in livestock raised for slaughter.

- *Acquisitions less disposals of valuables:* Changes in the stocks of goods that have been acquired primarily as stores of value because they are expected to appreciate - or at least not to decline - in value and do not deteriorate over time under normal conditions. Valuables include gold (other than monetary gold) and other pre-cious metals, expensive jewellery and precious stones, works of art and antiques.

Structure of the classification

3.18. The Eurostat-OECD classification breaks down final expenditure on GDP into seven main aggregates:

- Individual consumption expenditure by households,

- Individual consumption expenditure by NPISHs,

- Individual consumption expenditure by government,

- Collective consumption expenditure by government,

- Gross fixed capital formation,

- Change in inventories and acquisitions less disposals of valuables,

- Balance of exports and imports.

3.19. These seven main aggregates are subsequently broken down first into expenditure categories, then into expenditure groups and expenditure classes

and finally into basic headings. There are 31 expen-diture categories, 71 expenditure groups, 152 ex-penditure classes and 226 basic headings. The dis-tribution of these aggregation levels by main aggre-gate is shown in Box 3.3.

3.20. The most important aggregation level is the lowest level, the basic heading level. Basic headings are the building blocks of Eurostat-OECD comparisons. It is at the level of the basic heading that expendi-tures are defined, products selected, prices col-lected, prices edited and PPPs first calculated and averaged. In theory, a basic heading covers a group of similar well-defined goods or services. In practice, coverage is determined by the lowest level of final expenditure for which explicit expenditure weights can be estimated. An actual basic heading can therefore include a broader range of products than is theoretically desirable. Examples of basic headings are given in Box 3.4. Their coverage var-ies. The basic headings for potatoes and men's footwear are relatively homogeneous, while those for major household appliances and maintenance and repair services for dwellings are distinctly heterogeneous with the latter being a mix of both goods and services.

Derivation of actual individual consumption

3.21. The Eurostat-OECD classification is first and fore-most an expenditure classification. Individual con-sumption expenditure is clearly structured by "who pays" – households, NPISHs or general govern-ment. Participating countries are required to provide a breakdown of their final expenditure on GDP in line with this structure. Yet, for the reason explained in Box 3.2, one of the principal aims of Eurostat-OECD comparisons is to compare actual individual consumption (by households) at various levels of aggregation. And the results of comparisons are presented by "who consumes" – households or general government. The Eurostat-OECD classifi-cation is designed to allow the final consumption expenditures of households, NPISHs and govern-ment to be reclassified according to whether they benefit households individually or collectively.

3.22. This is achieved by using three functional classi-fications from the SNA 93: COICOP[11], COPNI[12] and COFOG 98[13]. These classify respectively the expenditures of households, NPISHs and general government by purpose – that is, by the ends that they wish to achieve through these expenditures. COICOP is designed to classify only a single out-lay: individual consumption expenditure. COPNI and COFOG 98 are designed to classify a range of transactions of which the outlay on final consump-tion expenditure is one. In this respect, the main use of COPNI and COFOG 98 is to classify the indi-vidual consumption expenditures by NPISHs and government in a way that is consistent with the classification of individual consumption expenditure by households in COICOP.

Box 3.3: Number of categories, groups, classes and basic headings by main aggregates

Main aggregates Categories	Categories	Groups	Classes	Basic headings
11.00 Individual consumption expenditure by households	**13**	**48**	**109**	**148**
- .01 Food and non-alcoholic beverages		2	11	34
- .02 Alcoholic beverages, tobacco and narcotics		3	5	5
- .03 Clothing and footwear		2	6	10
- .04 Housing, water, electricity, gas and other fuels		5	11	11
- .05 Furnishings, household equipment and maintenance		6	12	16
- .06 Health		3	7	7
- .07 Transport		3	14	18
- .08 Communication		3	3	3
- .09 Recreation and culture		6	20	22
- .10 Education		5	5	5
- .11 Restaurants and hotels		2	3	4
- .12 Miscellaneous goods and services		7	11	11
- .13 Net purchases abroad		1	1	2
12.00 Individual consumption expenditure by NPISHs	**6**	**6**	**6**	**6**
- .01 Housing		1	1	1
- .02 Health		1	1	1
- .03 Recreation and culture		1	1	1
- .04 Education		1	1	1
- .05 Social protection		1	1	1
- .06 Other services		1	1	1
13.00 Individual consumption expenditure by government	**5**	**7**	**16**	**29**
- .01 Housing		1	1	1
- .02 Health		2	7	17
- .03 Recreation and culture		1	1	1
- .04 Education		2	6	9
- .05 Social protection		1	1	1
14.00 Collective consumption expenditure by government	**1**	**1**	**5**	**7**
15.00 Gross fixed capital formation	**3**	**6**	**13**	**32**
- .01 Machinery and equipment		2	7	20
- .02 Construction		3	3	9
- .03 Other products		1	3	3
16.00 Change in inventories and acquisitions less disposals of valuables	**2**	**2**	**2**	**2**
-.01 Change of inventories		1	1	1
-.02 Acquisitions less disposals of valuables		1	1	1
17.00 Balance of exports and imports	**1**	**1**	**1**	**2**
GDP	**31**	**71**	**152**	**226**

3.23. Together, COICOP, COPNI and COFOG 98 ensure the harmonised treatment of individual consumption expenditures of households, NPISHs and government that is central to the Eurostat-OECD classification. The correspondence with the three classifications as it is to be found in the Eurostat-OECD classification is summarised in Box 3.5. The table shows the correspondence between the expenditure categories of the classification and how these are summed to obtain actual individual consumption at the category level. This correspondence carries through to the lower levels of aggregation for households and for government, but not for NPISHs because participating countries generally do not have the detailed expenditure data required.

Treating market and non-market services

3.24. The different ways government expenditure on market services and government expenditure on non-market services are valued and the different ways their PPPs are calculated require the Eurostat-OECD classification to meet two conditions. First, government expenditure on individual services purchased from market producers has to be clearly separated from government expenditure on individual services produced by government. Second, government expenditures on government-produced individual services and on government-

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Box 3.4: Examples of basic heading definitions

11.01.17.2	**Fresh or chilled potatoes (ND)**
	Fresh or chilled potatoes; *includes* other tuber vegetables (manioc, arrowroot, cassava, sweet potatoes, etc.).

11.03.21.1	**Men's footwear (SD)**
	All footwear for men including sports footwear suitable for everyday or leisure wear (shoes for jogging, cross-training, tennis, basket ball, boating, etc.); *includes* gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves; *excludes* shoe-trees, shoehorns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1).

11.05.31.1	**Major household appliances whether electric or not (D)**
	Refrigerators, freezers and fridge-freezers; washing-machines, dryers, drying cabinets, dishwashers, ironing and pressing machines; cookers, spit roasters, hobs, ranges, ovens and micro-wave ovens; air conditioners, humidifiers, space heaters, water heaters, ventilators and extractor hoods; vacuum cleaners, steam-cleaning machines, carpet shampooing machines and machines for scrubbing, waxing and polishing floors; safes, sewing machines, knitting machines, water softeners, etc.; *includes* the delivery and installation of the appliances when applicable; *excludes* such appliances that are built into the structure of the building (capital formation).

11.04.32.1	**Services for the maintenance and repair of the dwelling (S)**
	Services of plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc. engaged for minor maintenance and repair of the dwelling; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchases of materials made by households with the intention of undertaking the maintenance or repair themselves (11.04.31.1); services engaged for major maintenance and repair (intermediate consumption) or for extension and conversion of the dwelling (capital formation).

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produced collective services have to be broken down by cost components: compensation of employees, intermediate consumption, gross operating surplus[14], net taxes on production and receipts from sales[15]. By these means, it is possible to apply PPPs based on purchasers' prices of outputs to government expenditure on market services and PPPs based on purchasers' prices of inputs to government expenditure on non-market services.

Main aggregates

3.25. The main aggregates have already been defined. This paragraph describes how they are dealt with in the expenditure classification.

- *Individual consumption expenditure by households* is broken down by purpose in line with COICOP into 148 basic headings. It refers – or is supposed to refer - to expenditures by resident households. This means that it is to include purchases of goods and services by resident households when travelling abroad and to exclude purchases of goods and services in the domestic market by non-resident households. In practice, most countries are unable to do this at the basic heading level and a global adjustment – called "net purchases abroad" – is made instead. This expenditure class is defined in the classification as the difference between two basic headings: purchases by residential households in the rest of the world _less_ purchases by non-residential households in the economic territory of the country.

Individual consumption expenditure by NPISHs is broken down by purpose according to COPNI into six categories, six groups, six classes and six basic headings. All cover the same six individual services: housing, health, recreation and culture, education, social protection, and other services. This is because data on NPISHs are not available uniformly across countries. Even so, a more detailed breakdown, in line with that applied for households and general government, would be desirable for health and education. "Other services" includes expenditure by NPISHs on religion, political parties, labour and professional organisations, environment protection, and research and development.

Individual consumption *expenditure by government* is broken down into five expenditure categories with each category covering an individual service - housing, health, recreation and culture, education, and social protection - as defined by COFOG 98. The five expenditure categories are subsequently broken down into the 29 basic headings listed in Box 3.6. From the Box it can be seen that housing, recreation and culture, and social protection are not broken down any further, each remains as a single basic heading. But health and education are first broken down by whether the expenditure is for the purchase of health or education services from market producers - referred to as "benefits and reimbursements" - or for the production of health and education services by government itself. The expenditures on government-produced health and education services are then broken down by

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Box 3.5: Derivation of actual individual consumption for expenditure categories

Purpose of expenditure	Households [COICOP]	NPISHs [COPNI]	Government [COFOG 98]	Actual individual Consumption
Food and non-alcoholic beverages	11.01			11.01
Alcoholic beverages, tobacco and narcotics	11.02			11.02
Clothing and footwear	11.03			11.03
Housing, water, electricity, gas and other fuels	11.04			11.04
of which Actual rentals for housing	11.04.1*	12.01	13.01	11.04.1*+ 12.01 + 13.01
Furnishings, household equipment & maintenance	11.05			11.05
Health	11.06	12.02	13.02	11.06 + 12.02 + 13.02
Transport	11.07			11.07
Communication	11.08			11.08
Recreation and culture	11.09	12.03	13.03	11.09 + 12.03 + 13.03
Education	11.10	12.04	13.04	11.10 + 12.04 + 13.04
Restaurants and hotels	11.11			11.11
Miscellaneous goods and services:	11.12			11.12
of which Social protection	11.12.4*	12.05	13.05	11.12.4*+ 12.05 + 13.05
Other services		12.06		12.06
Total individual consumption expenditure	11.00	12.00	13.00	11.00 + 12.00 + 13.00

* Expenditure group

cost components as required for the input-price approach. The cost components are shown in Box 3.6. Although broadly similar, they are not exactly the same for each service. For example, under health, compensation of employees is broken down by skill level of employee. Under education, it is broken down by level of education provided.

- *Collective consumption expenditure by government* is defined in line with COFOG 98. It is treated as a single aggregate and broken down by cost components as required for the input-price approach. The breakdown is given in Box 3.6. Compensation of employees and intermediate consumption are broken down by type of service – that is, by whether they relate to defence or to collective services other than defence.

- *Gross fixed capital formation* is broken down by type of product following CPA 96[16] into 26 basic headings: twenty for machinery and equipment, three for construction and three for other products. "Other products" include products of agriculture, forestry, fisheries and aquaculture; computer software; land improvement, mineral exploration and other intangible fixed assets.

- *Change in inventories and acquisitions less disposals of valuables* is broken down into two basic headings: change in inventories[17] and acquisitions less disposals of valuables.

- *Balance of exports and imports* comprises two basic headings: exports of goods and services (which is positive) and imports of goods and services (which is negative).[18] According to the SNA 93 and the ESA 95, both exports and imports should be valued at f.o.b. (free on board) prices – that is, the prices at the frontier of the exporting country. This is difficult to do in the case of imports, which are usually registered in customs records at the value at the frontier of the importing country – that is, at c.i.f. (cost, insurance and freight)[19] prices. If merchandise imports are adjusted to f.o.b. prices, the effect is to reduce the value of merchandise imports and to increase the value of net imports of freight and insurance services by exactly the same amount. Since only the balance – that is, the combined totals - of exports and imports of goods and services is required for the calculation of PPPs, the Eurostat-OECD classification, as a practical matter, calls for merchandised imports to be valued at c.i.f. prices.

Presentation of the classification

3.26. The classification is presented in Annex II. GDP, main aggregates, expenditure categories and expenditure groups are identified by capital letters and by one-, two-, four- and five-digit codes respectively. Expenditure classes are underlined and have six-digit codes. Basic headings have seven-digit codes. These distinctions are illustrated in Box 3.7.

3.27. Annex II provides a definition for each basic heading. Examples of these definitions are given in Box 3.4. From these it can be seen that a definition lists either the products or the product groups covered by the basic heading. For example, the definition of services for the maintenance and repair of the dwelling specifies products: *services of plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc.* The definition for major household appliances identifies six product groups: *refrigerators, freezers and fridge-freezers; washing-machines, dryers, drying cabinets, dishwashers, ironing and pressing machines; cookers, spit roasters, hobs, ranges, ovens and micro-wave ovens; air conditioners, humidifiers, space heaters, water heaters, ventilators and ex-*

Box 3.6: Government final consumption expenditure by basic heading

	INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	
13.01.11.1	Housing	
	Health benefits and reimbursements	
13.02.11.1	Pharmaceutical products	
13.02.11.2	Other medical products	
13.02.11.3	Therapeutic appliances and equipment	
13.02.12.1	Out-patient medical services	
13.02.12.2	Out-patient dental services	
13.02.12.3	Out-patient paramedical services	
13.02.12.4	Hospital services	
	Production of health services	
13.02.21.1	Compensation of employees: Physicians	
13.02.21.2	Compensation of employees: Nurses and other medical staff	
13.02.21.3	Compensation of employees: Non-medical staff	
13.02.22.1	Intermediate consumption: Pharmaceutical products	
13.02.22.2	Intermediate consumption: Other medical goods	
13.02.22.3	Intermediate consumption: Therapeutic appliances and equipment	
13.03.22.4	Intermediate consumption n.e.c.	
13.02.23.1	Gross operating surplus	
13.02.24.1	Net taxes on production	
13.02.25.1	*less* Receipts from sales	
13.03.11.1	Recreation and culture	
	Education benefits and reimbursements	
13.04.11.1	Education benefits and reimbursements	
	Production of education services	
13.04.21.1	Compensation of employees: Pre-primary and primary education	
13.04.21.2	Compensation of employees: Secondary education	
13.04.21.3	Compensation of employees: Post-secondary non-tertiary education	
13.04.21.4	Compensation of employees: Tertiary education	
13.04.22.1	Intermediate consumption	
13.04.23.1	Gross operating surplus	
13.04.24.1	Net taxes on production	
13.04.25.1	*less* Receipts from sales	
13.05.11.1	Social protection	
	COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	
14.01.11.1	Compensation of employees (collective services relating to defence)	
14.01.11.2	Compensation of employees (collective services other than defence)	
14.01.12.1	Intermediate consumption (collective services relating to defence)	
14.01.12.2	Intermediate consumption (collective services other than defence)	
14.01.13.1	Gross operating surplus	
14.01.14.1	Net taxes on production	
14.01.15.1	*less* Receipts from sales	

tractor hoods; vacuum cleaners, steam-cleaning machines, carpet shampooing machines and machines for scrubbing, waxing and polishing floors; safes, sewing machines, knitting machines, water softeners, etc.

3.28. The lists are not comprehensive, but they are complete enough to demarcate the boundaries of the basic headings and to distinguish between them. In addition, there are clarifications, when possible ambiguities may arise, of what is to be specifically included and what is to be specifically excluded. In the case of exclusions, the correct basic heading for the excluded product is identified. From the definition of men's footwear in Box 3.4, it can be seen that the expenditure on the basic heading should include expenditure on *gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves* and should exclude expenditure on *shoe-trees, shoe-horns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots,*

Box 3.7: Levels of aggregation

10.00.00.0 GROSS DOMESTIC PRODUCT	
11.00.00.0 INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	= main aggregate
11.01.00.0 FOOD AND NON-ALCOHOLIC BEVERAGES	= expenditure category
11.01.10.0 FOOD	= expenditure group
11.01.11.0 Bread and cereals [COICOP 01.1.1]*	= expenditure class
11.01.11.1 Rice (ND)**	= basic heading
11.01.11.2 Other cereals (ND)**	= basic heading
11.01.11.3 Bread (ND)**	= basic heading
11.01.11.4 Other bakery products (ND)**	= basic heading
11.01.11.5 Pasta products (ND)**	= basic heading
11.01.12.0 Meat [COICOP 01.1.2]*	= expenditure class
11.01.12.1 Beef and veal (ND)**	= basic heading
11.01.12.2 Pork (ND)**	= basic heading

* classification correspondence
** classification by type of product

football boots, golfing shoes, other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1). Excluded expenditures should be assigned to the basic heading stipulated: 11.05.61.1, 11.06.13.1, 11.09.32.1 or 11.09.32.1.

Correspondence with COICOP, COPNI, COFOG 98 and CPA 96

3.29. The individual consumption expenditures of households, NPISHs and government are classified by purpose using COICOP, COPNI and COFOG 98. Gross fixed capital formation is classified according to CPA 96 which classifies products by activity in line with NACE Rev. 1[20].

3.30. In Annex II, the correspondence with COICOP, COPNI and CPA 96 is specified in square brackets [ ] at the level of the expenditure class. From Box 3.7, it can be seen that expenditure class 11.01.11 Bread and cereals corresponds to COICOP class 01.1.1 and that expenditure class 11.01.12 Meat corresponds to COICOP class 01.1.2. Usually there is a one-to-one correspondence between the expenditure classes of individual consumption expenditure by households and COICOP classes. This is not the case with the expenditure classes of individual consumption by NPISHs and the classes of COPNI. Nor is it so with the expenditure classes of gross fixed capital formation and the classes of CPA 96. In both cases, the correspondence is between an expenditure class and a range of classes of the underlying classification. For example, it can be seen in Annex II that expenditure class 12.02.11 Health corresponds to COPNI classes 02.1.1 to 02.6.0 and that expenditure class 15.01.12 General purpose machinery corresponds to CPA 96 classes 29.11 to 29.24.

3.31. The correspondence with COFOG 98 is defined two aggregation levels higher, at the expenditure category level. The correspondence is broad, generally at the level of COFOG divisions (or two-digit level). For example, in Annex II, the correspondence between expenditure category 13.02.00.0 HEALTH and COFOG 98 is defined as follows:

"COFOG 07 Health covers government outlays on health services provided to individual persons and health services provided on a collective basis. Only expenditures on individual services - COFOG 07.1.1 to 07.4.0 - are allocated here *(that is, to 13.02.00.0 HEALTH)*. Expenditures on collective services - COFOG 07.5.0 and 07.6.0 - are assigned to 14.01.10.0 *(that is, to collective services).*"

A clear distinction is made between those expenditures that are individual and those that are collective as required by COFOG 98.

Classification by type of product

3.32. Each basic heading in Annex II is classified by type of product – that is, whether the products it covers are goods or services. For example, in Box 3.7, all the basic headings are designated (ND). This indicates that they contain non-durable consumer goods as explained below.

3.33. Under individual consumption expenditure by households, basic headings containing goods are denoted by either (ND), (SD) or (D) indicating "non-durable", "semi-durable" or "durable" respectively, while those containing services are denoted by (S). Most of these basic headings comprise either goods or services, but, for practical reasons, some basic headings contain both goods and services. Similarly, there are basic headings which contain either both non-durable and semi-durable goods or both semi-durable and durable goods. Such basic headings are assigned a (ND), (SD), (D) or (S) according to which type of product is considered to be predominant.

3.34. The distinction between non-durable goods and durable goods is based on whether the goods can be used only once or whether they can be used repeatedly or continuously over a period of considerably more than one year.[21] Durables have as well a relatively high purchasers' price. Semi-durable goods differ from durable goods in that their expected lifetime of use, though more than one year, is often significantly shorter and that their purchasers' price is substantially less.[22] These differentiations are the same as those applied to classify COICOP classes by type of product.

3.35. All basic headings under individual consumption expenditure by NPISHs and individual consumption expenditure by government are classified as individual services (IS). Likewise, all basic headings under collective consumption expenditure by government are classified as collective services (CS) and all basic headings under gross fixed capital formation are classified as investment goods (IG).

Reporting and validation of expenditure data

3.36. Participating countries are required to report details of their final expenditure on GDP for a reference year, t, twice: first in the September of year t+1 and then in the September of year t+2.

3.37. The detailed expenditures reported in t+1 are used to calculate the preliminary PPPs for t that are released in the December of t+1. Countries are expected to report the best estimates for the various levels of aggregation that are available for t at that time. Being provisional, the extent to which the breakdowns, particularly at the lower levels of aggregation, will reflect that of a previous year rather than t will vary from country to country. As a minimum, GDP, the main aggregates and the expenditure categories should be current estimates for t, but the structure of expenditure below these levels may be that of t-1 or even t-2

3.38. The detailed expenditures reported in t+2 are used to calculate the final PPPs for t that are released in the December of t+2. Countries are expected to report breakdowns that refer to t at all levels of aggregation. It is also expected that the breakdowns will be final, or almost so, as most countries will have introduced the major revisions to their estimates of GDP and its component expenditures for t by September of t+2.

3.39. Participating countries are required to report their detailed expenditures on the electronic reporting form supplied by Eurostat or by the OECD. An example of the first page of the reporting form is provided in Box 3.8. The various levels of aggregation are listed in descending order - GDP, main aggregates, expenditure categories, expenditure groups, expenditure classes, basic headings – with each aggregation level being nested under the aggregation level immediately above it. The reporting form is programmed to be completed from the bottom up – that is, from the basic heading upwards. For example, once the expenditures on the basic headings "rice", "other cereals, flour and other cereal products", "bread", "other bakery products" and "pasta" have been entered, expenditure on the expenditure class "bread and cereals" will be calculated automatically. This expenditure will be carried through to all the higher levels of aggregation - "food", "food and non-alcoholic beverages", "individual consumption expenditure by households" and, finally, "GDP" - as shown in Box 3.8. Of course, as the expenditures for the other basic headings are introduced, the higher levels of aggregation will change. They will keep on accumulating until the expenditures for all their constituent basic headings have been included.

3.40. The shaded cells on the reporting form indicate basic headings. They are not programmed – that is, they do not contain an aggregation formula. The unshaded cells indicate aggregation levels above the basic heading level. They are programmed for automatic aggregation. In principle, participating countries should complete the form by entering only the expenditures on the 226 basic headings listed. Automatic aggregation will complete the reporting form and provide a data set that is internally consistent – that is, each aggregate is the sum of its components. In practice, it is unlikely that countries will apply this bottom up approach throughout. For certain expenditure classes, and even, perhaps, for some expenditure groups, countries will follow a top down approach. The reporting form facilitates this by allowing the aggregation formula for the unshaded cells to be overridden.

3.41. As an example of top down reporting, a country may have firm information about expenditures on the expenditure class "fruit", but no direct information on the two basic headings – "fresh or chilled fruit" and "frozen, preserved, processed fruit and fruit products" - that make up the expenditure class. In this case, the country can enter the expenditure on fruit directly into the unshaded cell, return later to this expenditure class and use their best judgement (see next paragraph) about the split between the two basic headings. When a top down approach is used, the internal consistency of the data set is no longer guaranteed. For this reason, participating countries are expected to check the internal consistency of the expenditures reported at each aggregation level before returning the completed form to Eurostat or the OECD.

3.42. Participating countries should make sure that the reporting form is complete and that there is an entry for each basic heading. If the form is not complete, countries should attempt to fill the gaps themselves otherwise it will be done for them by Eurostat or the OECD. As countries are generally in a better position to estimate missing expenditures, it is preferable that they, and not Eurostat or the OECD, do the estimations. Possible ways of doing this include referring back to the expenditure data of former

Box 3.8: Expenditure reporting form

Main aggregates, categories, groups, classes and basic headings	Reference year (t)
10.00.00.0 GROSS DOMESTIC PRODUCT	100
11.00.00.0 INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	100
11.01.00.0 FOOD AND NON-ALCOHOLIC BEVERAGES	100
11.01.10.0 FOOD	100
11.01.11.0 <u>Bread and cereals</u>	100
11.01.11.1 Rice	15
11.01.11.2 Other cereals, flour and other cereal products	5
11.01.11.3 Bread	35
11.01.11.4 Other bakery products	20
11.01.11.5 Pasta products	25
11.01.12.0 <u>Meat</u>	
11.01.12.1 Beef and veal	
11.01.12.2 Pork	
11.01.12.3 Lamb, mutton and goat	
11.01.12.4 Poultry	
11.01.12.5 Other meats and edible offal	
11.01.12.6 Delicatessen and other meat preparations	
11.01.13.0 <u>Fish and seafood</u>	
11.01.13.1 Fresh, chilled or frozen fish and seafood	
11.01.13.2 Preserved and processed fish and seafood	
11.01.14.0 <u>Milk, cheese and eggs</u>	
11.01.14.1 Fresh milk	
11.01.14.2 Preserved milk and other milk products	
11.01.14.3 Cheese	
11.01.14.4 Eggs and egg-based products	
11.01.15.0 <u>Oil and fats</u>	
11.01.15.1 Butter	
11.01.15.2 Margarine	
11.01.15.3 Other edible oils and fats	
11.01.16.0 <u>Fruit</u>	
11.01.16.1 Fresh or chilled fruit	
11.01.16.2 Frozen/preserved/processed fruit/fruit products	
11.01.17.0 <u>Vegetables</u>	
11.01.17.1 Fresh or chilled vegetables other than potatoes	
11.01.17.2 Fresh or chilled potatoes	
11.01.17.3 Frozen/preserved/processed vegetables/vegetable products	
11.01.18.0 <u>Sugar, jam, honey and confectionery</u>	
11.01.18.1 Sugar	
11.01.18.2 Jams, marmalades and honey	
11.01.18.3 Confectionery, chocolate & other cocoa preparations	
11.01.18.4 Edible ice, ice cream and sorbet	
11.01.19.0 <u>Food products n.e.c.</u>	
11.01.19.1 Food, products n.e.c.	
11.01.20.0 NON-ALCOHOLIC BEVERAGES	
11.01.21.0 <u>Coffee, tea and cocoa</u>	
11.01.21.1 Coffee, tea and cocoa	
11.01.22.0 <u>Mineral waters, soft drinks, fruit and vegetable juices</u>	
11.01.22.1 Mineral waters	
11.01.22.2 Soft drinks and concentrates	
11.01.22.3 Fruit and vegetable juices	

reference years, searching for a data source which, while not consulted during regular compilations of the national accounts, could be used for PPP purposes, and soliciting experts for "guesstimates". If none of these options are effective, the reporting form should be returned incomplete. On no account should completeness be obtained by distributing the expenditure on an expenditure class equally over its constituent basic headings.

3.43. Participating countries should also verify the temporal consistency of the expenditures they report. The shares of the component expenditures of all levels of aggregation should be compared with their respective shares in previous reference years. Conspicuous shifts in shares that cannot be readily explained should be investigated and corrected when necessary. Otherwise they should be flagged and endorsed either on the reporting form or in a covering note. This will avoid needless queries when either Eurostat or the OECD repeats the edit.

3.44. On receipt of the reporting forms, Eurostat and the OECD will repeat the checks for completeness, internal consistency and temporal consistency. They will verify as well the spatial consistency of the reported expenditures by comparing the shares of component expenditures of each level of aggregation across countries. Even though the expenditure patterns of participating countries can vary considerable, this edit allows inconsistencies arising from differences in interpretation and implementation to be identified. Unless a country has changed its practice between reference years, such inconsistencies are unlikely to be found when checking temporal consistency. For example, in the past, some countries included the cost of food purchased in restaurants under food, while others included it under restaurants. This discrepancy was discovered by comparing the expenditure shares of countries. Another example concerns rentals for housing. Rentals, as defined in the SNA 93 and the ESA 95, should not include charges for heating or for miscellaneous services relating to the dwelling such as refuse collection or co-proprietor charges in multi-occupied dwellings. Not all countries observe this definition and countries not doing so can be identified when their expenditure shares are compared with countries that do.

3.45. When reporting forms are incomplete because countries have not been able to apportion the expenditures on expenditure classes over their constituent basic headings, the allocations will be made by Eurostat or the OECD. The preferred method is to follow the allocations made for the expenditure classes in question by a country or a group of countries having a "similar" expenditure pattern. There is no precise definition of "similar" and "similarity" can be partial. For example, two countries could have similar patterns of household expenditure on food, clothing, transport services, etc. and dissimilar patterns of government expenditure on individual and collective services. The verification of spatial consistency provides useful input into the identification of countries with similar expenditure patterns, but

the selection of countries is often subjective and influenced by factors such as geographic proximity, common history, social policy and income level.

3.46. Because there is no rigorous definition of similarity and because there is a greater possibility of error if only one country is chosen, Eurostat and the OECD prefer to apply average allocations of groups of similar countries. When this is not an option, allocations of single countries will be employed. When there is neither a group of countries nor a single country, average allocations of all participating countries may be applied. When this is done outliers are eliminated before calculating the averages. Distributing the expenditure on an expenditure class equally over its constituent basic headings is rarely used and then only as a last resort. The estimates made by Eurostat and the OECD will be sent to countries. They are required either to approve them or to propose alternatives.

3.47. Once verification is concluded, the expenditure breakdowns that participating countries report for t in September t+2 will be complete and internally consistent. Their temporal and spatial consistency will have been validated. They will also be final – that is, the shares of components for all aggregation levels up to the main aggregate level are fixed. They will not be changed to take account of revisions to GDP estimates that take place below the main aggregate level after September t+2. Revisions to GDP and the main aggregates that are made between September t+2 and December t+2 when the PPPs are calculated will be accommodated however. Changes to the main aggregates will be distributed proportionally over their component expenditures in line with each component's share in the finalised expenditure breakdown.

3.48. The PPPs for t that are calculated and disseminated in December t+2 are final. They will not be recalculated to take account of revisions to the GDP for t that occur after December t+2. Instead the revised estimates of GDP and its component expenditures will be converted to real final expenditures using the PPPs of December t+2. The final PPPs for t will only be recalculated if:

- a mistake[23] has been made by either a participating country, Eurostat or the OECD;

- the mistake is discovered within three months of their publication; and

- the mistake results in a change of at least 0.5 per cent in real GDP per capita of any participating country.

In the long term, the final PPPs for t and for other reference years may be recalculated when changes to the definitions, concepts, classifications and accounting rules of the SNA 93 and the ESA 95 are introduced in 2008.

Statistical discrepancy

3.49. Neither the reporting form nor the expenditure classification on which it is based makes provision for the statistical discrepancy that may arise when countries use two independent approaches to esti-mate GDP. For the purposes of Eurostat-OECD comparisons, participating countries that report a statistical discrepancy in their estimates of final expenditure on GDP should include the discrepancy under the basic heading "change in inventories" on the reporting form.

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1   *System of National Accounts 1993*, Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

2   *European System of Accounts 1995*, Eurostat, Luxembourg, 1996.

3   The purchaser's price is the amount paid by the purchaser in order to take delivery of a unit of a good or service at the time and place required by the purchaser. It includes supplier's retail and wholesale margins, separately invoiced transport and insurance charges, non-deductible tax on products and sometimes, as in the case of certain items of machinery and equipment, installation costs.

4   The f.o.b. (free on board) price is the price of a good delivered at the customs frontier of the exporting country. It includes the freight and insurance charges incurred to that point (including, when applicable, the cost of loading onto a carrier for onward transportation from that point) and any export duties or other taxes on exports levied by the exporting country.

5   Fixed assets provide capital services that are "consumed" over a number of years. Their consumption is recorded as consumption of fixed capital.

6   The amount received by the producer from the purchaser for a unit of good or service produced as output. It includes subsidies on products and other taxes on production. It excludes taxes on products, other subsidies on production, supplier's retail and wholesale margins and separately invoiced transport and insurance charges.

7   This consists of summing the relevant cost items: intermediate consumption (current maintenance and repairs, insurance services), consumption of fixed capital, other taxes on production and net operating surplus (nominal rate of return on the capital invested in the dwelling and land).

8   Had these services been provided by government they would normally be considered to be collective and not individual services.

9   Covers all expenditures on such exploration irrespective of whether or not new discoveries are made.

10   Covers both purchases of ready-made software and the cost of software developed "in house".

11   "Classification of Individual Consumption According to Purpose (COICOP)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

12   "Classification of the Purposes of Non-Profit Institutions Serving Households (COPNI)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

13   "Classification of the Functions of Government (COFOG)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

14   Gross operating surplus is consumption of fixed capital plus net operating surplus. In practice, for non-market producers, it will be equal to consumption of fixed capital as net operating surplus is likely to be negligible.

15   Receipts from sales are recorded as a negative value. They are subtracted from the gross output of government non-market production to obtain government final consumption expenditure on government-produced individual and collective services.

16   *Statistical Classification of Products by Activity in the European Economic Community (CPA 1996)*, Eurostat, Luxembourg, 1998.

17   For the purposes of Eurostat-OECD comparisons, change in inventories also includes the statistical discrepancies of those participating countries that report them in their estimates of final expenditure on GDP.

18   The Eurostat reporting form requires a further breakdown of these two basic headings by destination (for exports) and by origin (for imports). These data are required for purposes other than the calculation of PPPs. See footnotes 9 and 10 of Annex II for details.

19   The c.i.f. (cost, insurance and freight) price is the price of a good delivered at the customs frontier of the importing country. It includes any insurance and freight charges incurred to that point. It excludes any import duties or other taxes on imports and trade and transport margins within the importing country.

20   *Statistical Classification of Economic Activities in the European Community (NACE Rev.1)*, Eurostat, Luxembourg, 1996.

21   Paragraph 9.38, SNA 93.

22   Paragraph 6.93, SNA 68.

23   Defined as a use of incorrect basic information or an inappropriate application of a calculation procedure.

CHAPTER 4: CONSUMER GOODS AND SERVICES

Introduction

4.1. 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 make up the Eurostat-OECD classification of final expenditure on GDP and, as such, it is central to the international price and volume comparisons organised by Eurostat and the OECD.

4.2. 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 are selected and how the selected goods and services are specified for Eurostat-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.

Background

4.3. An important feature of Eurostat and OECD comparisons is that prices for consumer goods and services are collected over a period of three years. 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 4.1 together with a summary of the types of products each survey covers. More detailed and comprehensive inventories of their coverage are given in Annex III. Housing services are not included in the survey cycle because, as explained later, these are surveyed annually. The advantages of the survey cycle is that it lessens the response burden on participating countries and allows national statistical institutes to include the price surveys in their regular programme of data collection. It also facilitates the rolling benchmark approach to annual comparisons described in Chapter 2.[1]

Box 4.1: Survey cycle

Sequence	Survey	Coverage
First year of cycle	Survey 1: Food, drinks and tobacco	Food; non-alcoholic beverages; alcoholic beverages; tobacco.
	Survey 2: Personal appearance	Clothing; footwear; goods and services for personal care; personal effects.
Second year of cycle	Survey 1: 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; goods for routine household maintenance; audio-visual, photographic and information-processing equipment; games, toys, hobbies, gardens, plants, flowers and pets; newspapers, books and stationery.
	Survey 2: 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.
Third year of cycle	Survey 1: Services	Cleaning, repair and hire of clothing and footwear; maintenance and repair services for the dwelling; water supply and miscellaneous services relating to the dwelling; 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; education services; financial and other services not specified elsewhere.
	Survey 2: Furniture and health	Furniture, furnishings, carpets and other floor coverings; household textiles; medical products, appliances and equipment; out-patient services.

4.4. 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. Organisa-

tion is decentralised. Participating countries are divided into groups with one of the countries in the group acting as group leader. Members and leaders of the current country groups are listed in Chapter 2 Box 2.4. Their responsibilities and those of Eurostat and the OECD are detailed in Chapter 2 Box 2.5. The responsibilities of the group leader include co-ordinating 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 other group members. Dividing participating countries into groups entails measures to make certain that countries in different groups

Box 4.2: Generalised timetable for the two price surveys of consumer goods and services held in the year t

Phase	Step		Survey 1	Survey 2	Organiser	Others involved
Product selection and preparation of final product list	01.	Planning meeting	Nov (t-1)	Apr (t)	Eurostat, OECD	Group leaders
	02.	Preparation and dispatch of pre-survey questionnaire	Nov/Dec (t-1)	May (t)	Group leaders	
	03.	Pre-survey	Nov/Dec (t-1) to Jan (t)	May to Jun (t)	Countries	
	04.	Reply to pre-survey questionnaire with definition proposals	Jan (t)	Jul (t)	Countries	
	05.	Preparation and dispatch of draft group product list	Feb (t)	Aug (t)	Group leaders	
	06.	Group meeting	Feb/Mar (t)	Sep (t)	Group leaders	Countries, other group leaders, Eurostat, OECD
	07.	Overlap meeting	Mar (t)	Oct (t)	Eurostat, OECD	Group leaders
	08.	Preparation and dispatch of final group product list	Apr (t)	Oct (t)	Group leaders	
Collection and validation of prices	09.	Price collection and intra-country editing of prices collected	Apr to May (t)	Oct to Nov (t)	Countries	
	10.	Reporting of prices to group leader	Jun (t)	Dec (t)	Countries	
	11.	Reporting of spatial adjustment factors to Eurostat	Jul (t)	Jan (t+1)	Countries	
	12.	Validation of average survey prices	Aug to Nov (t)	Feb to May (t+1)	Group leaders	Countries
	13.	Reporting of validated average survey prices & asterisks to Eurostat	Dec (t)	Jun (t+1)	Group leaders	
Calculation and publication of national annual survey results	14.	Calculation of overall survey results	Jan (t+1)	Oct (t+1)	Eurostat	
	15.	Approval of overall survey results	Jan/Feb (t+1)	Oct (t+1)	Countries	
	16.	Calculation of national annual (t) survey results after spatial and temporal adjustment	Feb (t+1)	Nov (t+1)	Eurostat	
	17.	Approval of national annual (t) survey results and publication detail	Mar (t+1)	Nov (t+1)	Countries	
	18.	Publication of national annual (t) survey results	Apr (t+1)	Dec (t+1)	Eurostat	

can be compared with each other. Ensuring that the groups can be combined in a single comparison is the responsibility of Eurostat and the OECD, but it cannot be done without the assistance of the group leaders.

4.5. Two price surveys are conducted each year. An understanding of how the two surveys are programmed can be gathered from the generalised time-table in Box 4.2. Each survey has three phases. The first covers the selection of products and the preparation of the final product list. The second covers the collection and validation of prices. And the third covers the calculation and publication of survey results. Each phase consists of a number of steps. For example, the first phase, product selection and preparation of final product list, has eight steps starting with the planning meeting and finishing with the preparation and dispatch of the final group product list. Each step has an organiser who is responsible for its implementation. Typically it is either the participating countries or the group leader or Eurostat and the OECD. A few times responsibilities are shared as in the case of the group meeting. The group leader is responsible for convening the meeting, but the other group members, the other group leaders, Eurostat and the OECD are all required to attend. Surveys take between 18 to 20 months to complete. Within any calendar year, work is underway on five surveys: the two surveys of the previous year are being finalised; the two surveys of the current year are being carried out; and the first survey of the following year is being prepared.

Product selection

4.6. Eurostat and the OECD estimate indirectly the real final expenditures on which the volume comparisons are based. Prices are collected to calculate PPPs and the PPPs are used to convert the final expenditures of participating countries valued at national price levels into real final expenditures valued at a uniform price level. The lowest level of aggregation for which final expenditures are estimated by participating countries is the basic heading and so it is at the level of the basic heading that PPPs have to be calculated initially. Prices are collected with respect to a basic heading and the selection of the products to be priced has to be done at the level of the basic heading.

4.7. 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.[2] 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 accommo-

date 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.[3] 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 on the basic heading in other countries.[4]

4.8. Individual consumption expenditure by households is broken down into 148 basic headings in the expenditure classification. Prices are currently collected for 126 of them and reference PPPs[5] are used for the remaining twenty-two. 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 for 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.

4.9. 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 board 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 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 chapter.

4.10. 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.[6] 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.

4.11. 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.

4.12. Equal representativity – or "equi-representativity" - does not require all participating country to price the same number of representative products for a basic heading. As explained in Chapter 7, 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 reliable 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.

4.13. Participating countries are expected to be proactive in this respect during the selection process by proposing products for those basic headings they cannot price the necessary number of representative products. For a product to be included on the 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. Some bargaining may be required "I will price yours, if you will price mine". Compromises will have to be arbitrated by the group leader to avoid the product list for the basic heading becoming too long or imbalanced. Not all proposals made by countries will be accepted. But this is not sufficient reason for failing to take the initiative and to make them.

4.14. The division of participating countries into groups for the purpose of collecting prices of consumer goods and services adds a further dimension to product selection. At the start, each country group makes its product selection independently of the other groups and the same products will not necessarily be selected by all groups. Eurostat and the OECD cover all participating countries in a single comparison irrespective of group. It is necessary to make sure before prices are collected that countries can be compared not only with countries in their group but also with countries in the other groups. This is achieved with overlap products - that is, products that are common to more than one group. Overlap products are identified and included after the group product lists have been finalised. The process is described later in the chapter.

4.15. The issue of heterogeneity raised earlier is partly eased by the way basic headings are defined in the Eurostat-OECD expenditure classification. Definitions list the products covered by the basic headings. For example, "other bakery products" include "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. Breaking a basic heading down into a more manageable framework facilitates both product selection and coverage. In anticipation of this, the lists for the more heterogeneous basic headings arrange products in sets. For example, the list for the basic headings covering clothing identifies four sets or subgroups:

- capes, overcoats, raincoats, anoraks, parkas, blousons, jackets, trousers, waistcoats, suits, costumes, dresses, skirts, etc.;

- shirts, blouses, pullovers, sweaters, cardigans, shorts, swimsuits, tracksuits, jogging suits, sweatshirts, T-shirts, leotards, etc.;

- vests, underpants, socks, stockings, tights, petticoats, brassières, knickers, slips, girdles, corsets, body stockings, etc.;

- pyjamas, night-shirts, night dresses, housecoats, dressing gowns, bathrobes, etc.

4.16. 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. Possible sources of such information include: the CPI basket, particularly in countries which revise their basket frequently; 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; trade fairs and expositions; consumer magazines and trade magazines; and marketing documentation such as brochures and catalogues. The most obvious sources are the sales outlets. By visiting outlets, looking at what they are selling and talking to sales personnel, a clear picture of what is being sold and how it is being marketed can be established. Countries participating in Eurostat-OECD comparisons are expected to follow this approach during the pre-survey that they are required to carry out prior to each price survey.

Group product lists

4.17. Responsibility for organising the selection of products for the price survey rests with the group leader. The selection is made in consultation with the other countries in the group and with the other group leaders, Eurostat and the OECD. The process begins with the group leader together with the other group leaders, attending a meeting – the "planning meeting" - convened by Eurostat and the OECD. The purpose of the planning meeting is to agree on a common approach to the pre-survey and to the survey itself. Typically, this involves reviewing the coverage of the survey, evaluating experience from earlier price surveys, identifying problems specific to the products being surveyed, adopting common solutions to the problems identified, developing new approaches and establishing product specification target numbers for the basic headings covered. The exchange and pooling of information by group leaders that starts at the planning meeting continues, by email and telephone, until product lists are finalised at the "overlap meeting" described below.

4.18. Dialogue with group members is initiated by the group leader sending them a questionnaire – the "pre-survey questionnaire". The pre-survey questionnaire is based on the product list used the last time the country group conducted the price survey. It is also based on market research carried out by the group leader (or by another group leader). The result is an amended and updated version of the previous product list. 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 questionnaire is in effect an annotated preliminary draft of the group product list for forthcoming price survey.

4.19. The pre-survey questionnaire is sent to group members in electronic format similar to that shown in Box 4.3. On receipt of the questionnaire, the group members are required to carry out a survey – the "pre-survey" - of outlets, including those that will be visited during the actual price collection. The object of the pre-survey is to ascertain the availability, the comparability and the representativity of the products specified in the questionnaire. During the pre-survey, 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 their price levels are typical of their product types. The findings of the pre-survey are used to reply to the questionnaire. In their replies, countries have a number of options. They can accept or reject the deletions proposed – if the latter, possibly suggesting revisions to the product specifications. They can accept, reject or modify the redefined specifications. They can accept, reject or modify the specifications of the new products. And they can propose precisely-defined new products. The cells shaded grey in Box 4.3 contain examples of the types of responses received from countries.

4.20. The pre-survey provides participating countries with the means to ensure that the product list for their group will be equi-representative of the countries in the group. By being able to reject, modify and propose product specifications, countries can make sure that, for each basic heading included in the pre-survey questionnaire, they are able to price 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 table generated by the Quaranta editing procedure the last time prices were collected for the basic heading.[7] Countries are expected to support their modifications to existing specifications and their proposals for new specifications with technical documentation and, if appropriate, pictures.

4.21. 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".[8] On completion, the draft product list is circulated to group members for them to review prior to the "group meeting". The group meeting is convened by the group leader. It is attended by the countries in the group, the other group leaders, Eurostat and the OECD. Its principal object is to complete the process started with the pre-survey - namely, the establishment of the final group product list for the ensuing price survey.[9] The final list should satisfy two requirements. It should reflect the availability of comparable products in the domestic markets of group members and it should be equi-representative for all group members. This it will do providing group members have conducted their pre-surveys thoroughly and the group leader

has synthesised the results of these pre-surveys accurately. Failure on the part of group members or group leader to meet their responsibilities will lead to protracted discussion at the group meeting and the product list that results will be less than optimal.

Overlap products

4.22. The group product list agreed at the group meeting is still not final. Group product lists can be expected to differ from one country group to the other. Some of the products specified will be common to more than one group, but comparisons across country groups cannot be left to chance. Before the group product lists are finalised and price collection begins, Eurostat and the OECD convene a meeting with the group leaders - the "overlap meeting" - at which the group product lists are placed side by side and examined to make sure that the number of overlap products is sufficient to allow each country group to be compared either directly, or indirectly through another group, with each of the other country groups.

4.23. Overlaps are established at the basic heading level. When there are not enough overlap products for a basic heading, new ones have to be added. Overlap products can often be "created" by combining the specifications of products with 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. Because the group meetings are held one after another and are attended by all group leaders, the process of creating overlaps also takes place during the group meetings. Group leaders know what products are specified in their own draft group product list. This allows them to propose modified or new product specifications to another group which, if accepted, will provide overlaps between the two groups. Also by participating in the group meetings of the other country groups, group leaders learn what products, in addition to those chosen by countries for their group product list, are available in the markets of the other groups. With this information they are able to develop overlaps at their own group meeting, if not already convened, and at the overlap meeting.

Box 4.3: Pre-survey questionnaire for a basic heading

11.01.11.1 Rice	State below any general remarks on this basic heading. For example the particularities of your market.
Please check package sizes	*Rice is sold mainly in supermarkets as "own brand". Package sizes are small (500 g). Round-grain rice is more representative than long-grain rice.*

Please check the following proposals for basic heading 11.01.11.1					
			Your comments and answers to		
Positions	**Proposed parameters**	**Special remarks**	**Proposed parameters**	**Special remarks**	**Availability and representativity**
A Rice	*Brand:* brandless *Type:* long-grain (Patna Rice) *Parboiled:* no *Cooking time:* 20 min. *Quantity:* 500 - 1000 g	What is more relevant for your market brandless products or well-known branded products?	*Quantity: 500 g*	*A brandless product is more relevant to our market.*	*Representative.*
B Rice	*Brand:* to be determined *Type:* long-grain (Patna Rice) in cooking bags *Parboiled:* yes *Cooking time:* 20 min. *Quantity:* 4 x 125 g +/- 25 g *Specify:* brands	New proposal	*Quantity: 500 g (4 x 125 g)*	*A brandless product is more relevant to our market.*	*Available, growing in popularity, but not yet representative.*
C Rice	*Brand:* to be determined *Type:* wholegrain rice *Parboiled:* no *Cooking time:* 30 min. *Quantity:* 500 - 1000 g *Specify:* brands	New proposal	*Wholegrain rice is in our market. Also known as "brown rice". Confusion with wild rice should be avoided.*	*We do not support this proposal.*	*Limited availability, mainly in health food stores, not representative.*
D Rice	*Brand:* Uncle Ben's *Type:* long-grain (Patna Rice) *Parboiled:* yes *Cooking time:* 10 min. *Quantity:* 500 - 1000 g	There is also rice with a cooking time of 20 min. Which one is preferred in your market?	*Quantity: 500 g*	*We have both.*	*Available but not representative.*
Your additional proposal(s)			*We propose a brandless, round-grain rice, not parboiled, 20 minutes cooking time, 500 g.*		

4.24. When participating countries receive the final product list for their group prior to price collection, they will find that it has been amended to provide the necessary overlaps between the groups. New products will have been added, some products on the original list will have had their specifications modified, while other products agreed to at the group meeting will have been omitted in order to accommodate the overlap products included and to avoid imbalances among the different types of products specified. Each overlap product is identified by being linked with the other group or groups with which it provides an overlap. The code number for each product is followed by a suffix. The suffix indicates the group lists on which the product is to be found. For example, product codes numbers on the Northern group list will be suffixed with either "N", "NC", "NS" or "NCS". These and the other suffixes used are explained in Box 4.4.[10]

Product specifications

4.25. 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 overemphasised. It is the means by which the product list for the forthcoming price survey is shaped and finalised. Not only does the pre-survey establish the availability and representativity of products proposed for the final group product list, it also verifies whether they have been specified in a form that ensures that countries pricing them will at least be pricing comparable products. By doing this the pre-survey also impacts on the price validation process. Successful pricing of comparable products by countries during price collection will reduce the number of iterations needed during validation to finalise the average prices for the price survey.

4.26. The product specifications used for Eurostat-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.

4.27. Box 4.5 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. Those for a single brand and model also specify some technical parameters, but usually not enough to ensure the pricing of comparable products if the brand names and model identifiers are not specified.[11] Those for multiple brands include a comprehensive list of the technical parameters that have to be matched to obtain comparability. Product specifications with generic definitions distinguish between products of regional 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 4.6.

4.28. 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

Box 4.4: Product code suffixes and the inclusion of products on product lists

Type of product	Suffix	Indicates that the product is included on the product list for the:		
		Northern group	Central group	Southern group
Non-overlap products (on one list only)	N	X		
	C		X	
	S			X
Overlap products (on at least two lists)	NC	X	X	
	NS	X		X
	CS		X	X
	NCS	X	X	X

Box 4.5: Product specifications

Type of specification	Brand specific definitions		Generic definitions		
	Single brand specified	Multiple brands specified	Described as "**well-known brands**" but brands not specified	Without a brand	
				Described as "**brandless**"	"**Brand**" not a **relevant** term
Refers to	Multinational[1] or regional[2] brand(s) or shop chain(s)		Multinational or regional or national[3] brands or shop chains	Goods without a brand label or with a "pseudo-brand" label that is meaningless to consumers[4]	Most services and certain types of goods such as fresh food
Brand value	Yes		Yes	No	Not applicable
Selling argument	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[5]	Not applicable
Product description comprises	Brand, model and some technical parameters	Brands, (models) and a detailed list of relevant technical parameters	Reference to "well-known brands" and a detailed list of relevant technical parameters	Reference to "brandless" and a detailed list of relevant technical parameters	A detailed list of relevant technical parameters but no reference to brand
To be collected and reported	Only prices of the specified 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	
	Name of model priced	Names of brands and models priced	Names of brands and models priced	If labelled, names of "pseudo-brands" priced	Not applicable

[1] Brands that are available in the majority of participating countries and are internationally well known. [2] Brands that are available and well known in a number of neighbouring countries. [3] Brands that are available and well known in a single country. [4] Often the "pseudo-brand" labels will have fantasy names which sound like the name of an established brand or logos that mimic the logo of an established brand. Also includes "own brands" of shops when the selling argument is the low price. (Note, that products with names and logos that imitate those of established brands are not the same as fake brands that pirate the products and names of established brands and which have no place in the typology above.) [5] The selling argument is that the good has a low price and not that it has the lowest price.

similar products sold under other brand names. Usually this is because some brands are considered to be of superior quality to others. For example, proprietary drugs are frequently regarded as more reliable than 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.

4.29. 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" stra-

tum under *Generic definitions* in Box 4.5. 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.

4.30. To overcome this, efforts are being made on a survey by survey basis to divide well-known brands into subgroups or clusters that better reflect the brand value perceptions in participating countries. The grouping of well-known brands into clusters is not an objective exercise. Initially, the clusters are defined by group leaders following the advice of experienced sales personnel about which brands produce goods of an equivalent quality. These

Box 4.6: Examples of product specifications

Product	Technical parameters
11.01.11.5 Spaghetti	*Brand:* Buitoni, Barilla, Panzani *Made from:* hard wheat (durum) *With eggs:* no *Length:* approximately 30 cm *Cooking time:* approximately 11 minutes *Quantity:* 500 g +/- 100 g *Specify:* brand(s) *Reference quantity:* 500 g
11.01.12.4 Chicken for roasting	*Fresh or frozen:* fresh *Free range:* yes *With head and feet:* no *With heart, liver and gizzard:* yes *Weight:* 1.1 kg +/- 0.1 kg *Reference quantity:* 1 kg
11.03.12.2 Women's trousers	*Brand:* upper cluster of well-known brands *Type:* jeans *Composition:* 95% cotton and 5% elasthane *Style:* low waisted; straight leg, bootcut or flared; no tucks or pleats; with belt loops *Colour:* single *Lining:* no *Fastener:* buttons in front *Pockets:* three front pockets, two back pockets *Finishing:* well-finished button holes and seams *Specify:* brand(s) *Reference quantity:* one pair
11.04.32.1 Plumber	*Service:* replacement of two old taps by two new taps (one for hot water, the other for cold water) in a wash basin of a bathroom by a qualified worker; no changes to existing pipes required *Time:* during the working day *Include:* any travel cost charge, 30 minutes each way *Exclude:* cost of materials *Specify:* price for the complete service and travel costs *Reference quantity:* one service
11.05.11.1 Kitchen chair	*Brand:* well-known brand *Type:* straight back chair, backrest with slats *Made from:* solid pine, lacquered *Dimensions (H x W x D):* approximately 90 x 45 x 40 cm *With:* struts *Without:* arms and upholstery *Specify:* brand or shop (see guidelines) *Reference quantity:* one chair
11.05.31.1 Cooker	*Brand:* lower cluster of well-known brands *Energy source:* gas *Cooking surface:* four burners with safety system *Covering hood:* yes *Oven heating:* conventional *Grill in the oven:* no *Dimensions (H x W x D):* 85 x 50-60 x 60 cm *Pull-out system:* conventional *Easy to clean:* no *Timer:* no *Colour:* white *Specify:* brand(s), model, parameters and energy efficiency if available *Reference quantity:* one cooker
11.07.31.1 Rail travel	*Class:* second class ("regular" or "standard" if not rated) *Fare/ticket:* basic full fare for single ticket for one adult *Time:* Wednesday *Validity:* one day *Distance:* 60 km *Starting from:* pricing location *Without:* seat booking *Exclude:* reductions, return tickets *Reference quantity:* one journey

Box 4.6: Examples of product specifications, contd.

Product	Technical parameters
11.09.11.1 Television	*Brand:* SONY *Model:* SY-42T3S (indicative) *Screen size:* 42 in. / 107 cm *Display technology:* plasma panel *Sound:* ZVEI *Teletext:* yes *With:* 3 scart *Specify:* model *Reference quantity:* one set
11.09.14.1 Pop music CDs	*Price:* top 5 CDs in the national pop chart at the time of the survey *Exclude:* CD singles, CD doubles and box sets *Specify:* name and price of each CD separately *Reference quantity:* one CD
11.11.11.1 Restaurant	*Establishment:* sushi restaurant *Location:* central (near town centre not in the suburbs) *Type of meal:* à la carte in the evening *Portion:* small, 8 pieces maximum *Content:* mixed sushi and maki with soja sauce (dip), gari (ginger) and wasabi (green horseradish) *Include:* invoiced service charge *Reference quantity:* one portion
11.12.11.1 Women's haircut	*Location:* central (near town centre not in the suburbs) *Salon:* standard women's hairdresser requiring advanced booking *Length of hair:* short to long *Washing:* yes *Shampoo:* normal *Blow drying:* yes *Hair foam:* yes *Styling/fixing products:* yes *Exclude:* special treatments *Reference quantity:* one haircut

clusters are subsequently modified to take account of the views of consumers in participating countries whose perceptions may well differ from those of the sales personnel as well as from those of consumers in other countries. The task is complicated further because brands that are well known to more than one country group have to be put in the same cluster by all country groups both to ensure comparability across the groups and to facilitate the pricing of overlap products.

4.31. To date, group leaders and participating countries have been able to reach a consensus with regard to the placement of most well-known brands being surveyed. Irresolvable differences of opinion about the cluster to which a particular well-known brand should be allocated are accommodated by accepting the opinion of the majority on the understanding that those in the minority are not required to price the brand in question. This solution is satisfactory unless the brand is representative to one or more minority country. Brand clusters are not exhaustive and countries may find one or more of their well-known brands omitted. In such cases, countries may assign brands to clusters in line with the consensus reached with regard to the brands already listed in the clusters. Once added to a cluster list, the brands have to be priced in line with the rules laid down in the next paragraph.

4.32. Before each price survey, the pricing guidelines are reviewed and adapted to meet the needs of the survey at the overlap meeting. Pricing guidelines specific to the survey are then drawn up by Eurostat and these are forwarded to participating countries by their group leader either at the same time as the final product list for the group is sent or soon afterwards. In general, the following practices have to be observed when pricing the different types of product specifications given in Box 4.5:

• 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. The specified brand may not be priced as a well-known brand for a generic specification that refers to the same type of product.[12]

• 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. The specified brands may

not be priced as well-known brands for a generic specification that refers to the same type of product.

- When well-known brands are priced, only brands that have not been identified for a brand specific definition should be 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 cluster of well-known brands, only the brands listed under the cluster should be priced. No other brands may be priced unless a country finds that one or more of its well-known brands that qualify for the cluster are not listed. In these circumstances, the country may add the brand or brands to the list and price them. Prices may be collected for just one of the listed brands - the most representative - or for more than one of the listed brands. All the brands priced should be representative.

- When well-known brands are divided into clusters, brands listed under one cluster may not be priced under another cluster.

- 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.

4.33. In principle, product specifications should be supported by pictures of the products they specify. The pictures will 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.[13] Pictures are not necessary for all product specifications. They are probably less essential for brand and model specifications and more useful for generic specifications where they can help to reduce quality differences arising from misinterpretation. Nor do pictures have to be of the whole product. A picture of an essential parameter can be sufficient.

4.34. In practice, the cost of supplying pictures in paper copy to countries participating in Eurostat-OECD comparisons has proved to be expensive. Countries are provided with pictures, but only for a selection of product specifications. At the overlap meeting, group leaders pool their electronic pictures of products and, together with Eurostat and the OECD, decide on which of the specifications need pictures and which of the pictures will be used. 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 the more literal-minded price collector. After the overlap meeting, a booklet of the selected pictures is prepared and dispatched to participating countries by Eurostat.

Price collection

4.35. Price collection is the responsibility of the participating countries. On receipt of the final product list for their group, countries are required to price it at a sample of outlets which, even if selected purposively, reflects the purchasing patterns of households. They are expected to price as many items on the product list as comparability and availability allow. After the price survey, countries are required to edit the prices collected for outliers using the software supplied by Eurostat.[14] After making the necessary corrections, they report the individual price observations, the average survey prices and a report on the survey to their group leader. The country reports on the survey, together with the individual price observations, assist the group leader with the editing of the average survey prices. The survey reports also provide institutional memory that can be recalled the next time the price survey is to be held.

4.36. The goods and services to be priced may differ from survey to survey, but all the surveys share a common objective – namely, that each participating country prices a set of internationally comparable products across a representative sample of outlets. Clearly, if this objective is to be met, 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[15] 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, 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 group 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);

- holding a meeting with price collectors to clarify the pricing and supporting materials prepared and issues such as how many items per basic heading, how many prices per item, etc.

The tasks are important because they avoid 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.

Selection of outlets

4.37. 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 specialist shops. Prices for the same product can vary from outlet type to outlet type because it is being sold under varying conditions or circumstances.[16] 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-OECD product specifications for services provided by garages, restaurants, hotels and hairdressers usually specify the type of outlet and, if relevant, its location.

4.38. CPIs measure price changes over time by repeatedly pricing the same product at the same outlet, thereby keeping the service element constant. For practical reasons this approach has not been followed in international comparisons of GDP. The "potato is a potato" rule is applied instead. 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.[17]

4.39. 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 can 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.[18]

Box 4.7: Eurostat classification of retail outlet by type

Type 1:	Department stores and specialist superstores (such as hardware stores, Do-It-Yourself stores, garden centres)
Type 2:	Supermarkets and hypermarkets (including supermarket-type food sections of departmental stores)
Type 3:	Cash and carry outlets
Type 4:	Mini-markets, service station shops, neighbourhood shops and kiosks
Type 5:	Specialised shops (traditional retail outlets)
Type 6:	Markets[1]
Type 7:	Private service enterprises
Type 8:	Public or semi-public service enterprises
Type 9:	Other kinds of outlets (such as mail order, sales at the customer's premises, mobile shops, internet)

[1] 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.

4.40. It is not always necessary to collect prices from outlets. 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 growing tendency among such national retailers to allow price setting to be done locally within centrally established guidelines.

4.41. 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 group 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, final group 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.

4.42. A classification of outlets has been developed by Eurostat in consultation with EU Member States. Among other considerations, it takes into account the level of service offered. Nine outlet types have been identified. They are listed in Box 4.7. Participating countries are expected to respect the classification when reporting the individual price observations collected from them.

Number of products to be priced per basic heading

4.43. 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 group 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 group product list is of course a compromise that attempts to balance the conflicting needs of the different countries in the group without the list becoming too long and unmanageable. It also contains overlap products that the group leader accepted without consulting the group. Even so, as long as a country has participated actively in all stages of product selection, it should find that the final group 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 reliable.

4.44. 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.[19] As every effort is made by group leaders to keep final group 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 prices observed and their variation.

Number of price observations per product

4.45. 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 $[t^2 CV^2/SE^2]$ 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.

4.46. A coefficient of variation of 20 per cent is high. A coefficient of variation higher than 20 per cent indi-

cates that either the product description was too broad or that the price collection was faulty. In general, price differences for a product within a country should not be 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 $[t^2 CV^2/SE^2]$ 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.

4.47. Participating countries are not expected to apply random sampling techniques when deciding on the number of prices to be collected for a product. A more pragmatic approach is proposed. The experience gained from previous survey rounds has been pooled to establish the table in Box 4.8. The table lists the recommended minimum number of price observations per product specification by expenditure group. Unless indicated otherwise, the minimum number is for all basic headings constituting the expenditure group. It refers to a single pricing location such as the capital city.

4.48. The minimum numbers in the table are indicative only. Each participating country will have to decide on the number of price observations to be collected per product according to the type of specification being priced and the conditions prevailing in its market. For example, brand specific specifications usually require a smaller number of observations than well-known brands specifications. This is just as well because it may only be possible to price brand specific specifications at a limited number of outlets, whereas it should be possible to price well-known brands specifications at greater number of outlets since the pricing of more than one brand is allowed when they are representative. Participating countries should bear in mind the following when deciding on the number of observations for a product:

- More prices should be collected for products in basic headings that have 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 that have price variations larger than the average price variation for basic headings.

- More prices should be collected for products in basic headings that have a small number of product specifications.

Box 4.8: Recommended minimum number of price observations per product specification by expenditure group

Expenditure group		Minimum number of observations
11.01.00.0	Food	10
11.01.20.0	Non-alcoholic beverages	10
11.02.10.0	Alcoholic beverages	1 or 5
11.02.20.0	Tobacco	1 or 5
11.02.30.0	Narcotics	**
11.03.10.0	Clothing	10 to 20
*11.03.14.1	Cleaning, repair and hire of clothing	10
11.03.20.1	Footwear	10 to 20
*11.03.22.0	Repair and hire of footwear	10
11.04.10.0	Actual rentals for housing	**
11.04.20.0	Imputed rentals for housing	**
11.04.30.0	Maintenance and repair of the dwelling	10
11.04.40.0	Water supply and miscellaneous service relating to the dwelling	1 or 5
11.04.50.0	Electricity, gas and other fuels	1 or 5
11.05.10.0	Furniture and furnishings, carpets and other floor coverings	10 to 20
11.05.20.0	Household textiles	10 to 20
11.05.30.0	Household appliances	10
11.05.40.0	Glassware, tableware and household utensils	10
11.05.50.0	Tools and equipment for house and garden	10
11.05.60.0	Goods and services for routine household maintenance	10
*11.05.62.1	Domestic services	5
11.06.10.0	Medical products, appliances and equipment	1 or 10
11.06.20.0	Out-patient services	1 or 10
11.06.30.0	Hospital services	**
11.07.10.0	Purchase of vehicles	1 or 10
11.07.20.0	Operation of personal transport equipment	10
11.07.30.0	Transport services	1 or 5
11.08.10.0	Postal services	1 or 5
11.08.20.0	Telephone and telefax equipment	10
11.08.30 0	Telephone and telefax services	1 or 5
11.09.10.0	Audio-visual, photographic and information processing equipment	10
11.09.20.0	Other major durables for recreation and culture	10
11.09.30.0	Other recreational items and equipment, gardens and pets	10
11.09.40.0	Recreational and cultural services	10
11.09.50.0	Newspapers, books and stationery	10
11.09.52.1	Newspapers	1 or 10
11.09.60.0	Package holidays	10
11.10.10.0	Pre-primary and primary education	**
11.10.20.0	Secondary education	**
11.10.30.0	Post-secondary non-tertiary education	**
11.10.40.0	Tertiary education	**
11.10.50.0	Education not definable by level	5 to 10
11.11.10.0	Catering services	10
11.11.20.0	Accommodation	10
11.12.10.0	Personal care	10
11.12.20.0	Prostitution	**
11.12.30.0	Personal effects n.e.c.	10
11.12.40.0	Social protection	**
11.12.50.0	Insurance	**
11.12.60.0	Financial services n.e.c.	10
11.12.70.0	Other services n.e.c.	10

* Basic heading with minimum number of observations different from its expenditure group.
** Expenditure group not covered by the cycle of price surveys.

- More prices should be collected for products within a basic heading that have price dispersions greater than the average price dispersion for the 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.

Prices to be collected

4.49. 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 group 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. Unless price collectors have access to scanner data, they cannot collect actual transaction prices. 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. Products in the second category should be treated as seasonal products.

   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. The transaction price should include the negotiated discount. But participating countries are not expected to report transaction prices. They are required to report list prices and the global discount rates applied in their national accounts. Eurostat adjusts the list prices to transaction prices using the global discount rates supplied by the countries.[20]

   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 corn-

flakes, 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 to 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 paid in cafés and restaurants are treated in the same way as discounts for motor cars are treated. Participating countries report offer prices and the global tipping rates applied in their national accounts. Eurostat adjusts the offer prices to transaction prices using the global tipping rates supplied by the countries.

Medical goods and services

4.50. Most consumer goods and services when they are sold involve a transaction between a seller and a single buyer. The seller's offer price – adjusted, if necessary, to include discounts, taxes, etc. - is the purchasers' price that the buyer will have to pay. It is a price that price collectors can readily observe. This is not always the situation with medical goods and services which can entail a transaction involving a seller and two independent buyers when they are sold. There are three possible ways – none of which are mutually exclusive - that medical products can be purchased from market producers: they can be purchased and paid for in full by a household (either with or without subsequent reimbursement by the government); they can be purchased and paid for in full by the government; or they can be purchased and paid for in part by a household and in part by the government. Participating countries are required to report purchasers' prices for medical products whichever way or ways they are sold in their domestic market.

4.51. The first possibility is straightforward. As with most consumer products, there is one buyer involved - the household - and purchasers' prices can be collected by visiting a sample of outlets. That the purchase may be partially or fully reimbursed by the government is immaterial since the price required to calculate PPPs is the price before reimbursement. The second possibility is also straightforward. It too

involves one buyer - the government. Normally, the purchasers' prices paid by the government for medical goods and services are regulated and can be obtained from the appropriate government authority. The third and last possibility is more complicated since it involves two purchasers and two payments. For PPP purposes, the purchasers' price needed is the total or composite price – that is, the sum of the price paid by the household and the price paid by government. If composite prices are not used to calculate PPPs when they should be, the volume of medical products purchased will be twice what it should be.[21] Usually there are regulations that determine what the household should pay and what the government will pay. And, as with the second possibility, information on composite prices can be obtained from the government office responsible.

Seasonal products

4.52. 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-OECD comparisons, only seasonal food products warrant special treatment. Other seasonal products are priced either at the time of the survey or subsequently by a special mini-survey. The survey prices are adjusted to annual averages using monthly temporal adjustment factors that participating countries extract from their CPI data bases. The temporal adjustment factors are unweighted – that is, they are not weighted by the quantity sold in the corresponding month. This approach is in line with that employed to adjust survey prices for non-seasonal products to annual prices.

4.53. The approach adopted by Eurostat for seasonal food products is to obtain annual prices by adjusting survey prices with weighted temporal adjustment factors.[22] 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 average price will be calculated as an unweighted

harmonic mean and not as an unweighted arithmetic mean.

4.54. 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 group product list for the food survey they regard as seasonal. Each country is required to send Eurostat a list of its seasonal items at around the same time as it reports its price observations for the food survey to the group leader. (This will be June because food products are currently surveyed during the first half of the first year of the survey cycle.) Eurostat uses the list to prepare an electronic reporting form specific to the country. The layout of the reporting form is set out in Box 4.9. 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.

4.55. Only the seasonal products identified by the country are listed on the reporting form. Their codes and descriptions are copied from the final group product list for the food survey by Eurostat. For each seasonal product specified, the country is required to complete the cells shaded in grey – 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;

- month(s) when the price for the product was surveyed. This will be the month(s) when the food survey was conducted unless the product was not available at that time. In which case it will be some subsequent month.

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

4.56. Participating countries are expected to return the completed reporting form to Eurostat 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.

Assigning representativity indicators

4.57. 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 8, 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".

4.58. Representativity is defined in terms of a product's share of the expenditure on the basic heading. In Chapter 2, paragraph 2.13, it is written that:

"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, its price level is close to the average for all products within the basic heading. Usually, though not necessarily, the purchases of the product will account for a significant proportion of the total purchases of all products covered by the basic heading. If not, the product will at least be sold in sufficient quantities for its price level to be typical for 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 defined in two stages. First in terms of the product types included in 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."

4.59. When applying this definition, 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 not required that they are among the volume sellers for the group, even 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. For example, take the basic heading "wine". It consists of three product groups - still wine, sparkling wine and fortified wine. Assume that the shares of household expenditure on these three product groups in a country are 75 per cent, 20 per cent and 5 per cent respectively. Assume as well that the country has elected to price two still

wines and one sparkling wine from the sample of wines selected for the basic heading's product list. It is not inconceivable that the sparkling wine priced could have considerably larger sales than either of the two still wines priced, thereby suggesting that it, and not the still wines, should be assigned an asterisk. Clearly this is incorrect when the universe of the basic heading is considered. Still wine accounts for 75 per cent of household expenditure on the basic heading, and providing the price levels of the

Box 4.9: Reporting form for data required for seasonal food products

Item		Closest CPI for t			Weights for t			Correction coefficient	Survey month
Code	Description	Month	CPI for:	Unweighted monthly index (t-1 = 100)	Actual monthly CPI weight (%)	Quarter	Estimated quarterly weight (%)		
(a) Example with actual monthly weights									
Type of weights provided: Quantity weights									
11.01.16.1ac NCS	Fresh apples / Best quality; Variety typical of the country; / *Exclude:* Red Delicious, Golden Delicious and Granny Smith varieties; / *Specify:* Variety; / *Reference quantity:* 1 kg	Jan		103.3	5.0	I		0.977[c]	
		Feb		102.0	5.0			0.988	
		Mar		105.5	5.0			0.956	
		Apr		112.2	3.0	II		0.899	
		May		122.4	2.0			**0.824**	**X**
		Jun		117.7	2.0			0.857	
		Jul	Fresh fruit	107.4	4.0	III		0.939	
		Aug		98.1	15.0			1.028	
		Sep		97.3	17.0			1.036	
		Oct		100.0	15.0	IV		1.009	
		Nov		96.2	16.0			1.048	
		Dec		101.7	11.0			0.991	
		Year		100.85[a]	100.0	**Year**			
(b) Example with estimated quarterly weights									
Type of weights provided: Expenditure weights									
11.01.16.1ac NCS	Fresh apples / Best quality; Variety typical of the country; / *Exclude:* Red Delicious, Golden Delicious and Granny Smith varieties; / *Specify:* Variety; / *Reference quantity:* 1 kg	Jan		103.3		I	10	0.981	
		Feb		102.0				0.993	
		Mar		105.5				0.960	
		Apr		112.2		II	5	**0.903**	**X**
		May		122.4				**0.828**	**X**
		Jun		117.7				0.860	
		Jul	Fresh fruit	107.4		III	40	0.943	
		Aug		98.1				1.033	
		Sep		97.3				1.041	
		Oct		100.0		IV	45	1.013	
		Nov		96.2				1.053	
		Dec		101.7				0.996	
		Year		101.31[b]		**Year**	100		

[a] Weighted annual average: [(103.3 x 5.0) + (102.0 x 5.0) + ………………… + (101.7 x 11.00)] / 100
[b] Weighted annual average: [(103.3 + 102.0 + 105.5) 10 + ………………… + (100.0 + 96.2 + 101.7) 45] / 300
[c] Unweighted monthly index / weighted annual average: 100.85 / 103.3; 100.85 / 102.0; etc.

still wines selected are representative of the average price level for still wine, it is the still wines and not the sparkling wine that should be assigned asterisks. The sparkling wine priced could also be representative, but that is not the point being made here. Asterisks should be assigned within the wider perspective of the basic heading's universe and not within the narrower context of the sample selected for its product list.

4.60. Participating countries have problems identifying representative products and assigning asterisks to them. This is 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 group 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. For motor cars, registration statistics detailing the brands and models registered can be consulted. For products such as major household appliances, audio-visual equipment, and the like, detailed market research is available from various organisations. There are also a growing number of internet sites providing country-specific information on "best sellers" for a whole range of products and product types.

4.61. Two other 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 questionnaire. But not all these products will remain on the final group 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 questionnaire, such as overlap products, will have been added. It will still be necessary to establish the representativity of many of the products on the final group product list. As for products on the pre-survey questionnaire, this should be done by asking sales persons at the outlets visited during the price survey.

4.62. 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 of the different products priced within a basic heading.[23] Products with price level indices that are significantly higher or lower than the price level indices 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 price level indices are close to those of other products, specifically the representative products, priced for the basic heading. In this way, validation provides a general fall back 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,

Housing services and the rent survey[24]

4.63. Although housing services are part of individual consumption expenditure by households, they are not included in the survey cycle. Instead they are covered by a special rent survey for which participating countries are not expected to collect data specifically but to extract them from existent statistical sources. The survey is held every year.[25] It is organised by the Centre – that is, by Eurostat or the OECD – and not by the group leaders. Data are collected on the rents paid by tenants, and on the rents imputed to owner-occupiers, for a set of precisely-defined dwellings. Quantitative and qualitative data on the housing stock are also collected. The data on rents are used to calculate PPPs with which the final expenditures on actual and imputed rents are deflated to derive volume measures on housing services indirectly. The data on housing stock are used to compute volume measures on housing services directly. The direct volume measures serve two purposes. They provide a check on the volume measures obtained indirectly. And, more importantly, they can be used in place of the indirect measures for those participating countries that do not have a large organised rent market and so are not able to supply the data required on actual and imputed rents.

4.64. Most participating countries estimate final expenditure on housing services in line with the SNA 93[26] or the ESA 95[27], namely:

- Household expenditure on actual rents is obtained by summing the rents paid by households that rent their accommodation. Rents are defined as payments for the use of the land on which the property stands, the dwelling occupied, the fixtures and fittings for heating, plumbing, lighting, etc., the furniture in the case of a dwelling let furnished, and the garage if providing parking for the dwelling. Rents do not cover payments for water supply, refuse and sewage collection, electricity and gas, and heating and hot water supplied by district heating plants. Nor do rents cover co-proprietor charges for caretaking, gardening, stairwell cleaning, maintenance of lifts

and refuse disposal chutes, heating and lighting, etc., in multi-occupied buildings.

- Household expenditure on imputed rents is obtained by summing the rents imputed to households that own and occupy their accommodation. Imputed rents are defined as the estimated rent that a tenant would pay for identical accommodation let unfurnished, taking into consideration factors such as the type of dwelling (single family or multi-family), its size (useable surface area, number of rooms), its facilities (running water, indoor toilet, electricity, central heating, etc.), its location (city centre, suburban or rural) and neighbourhood amenities.

4.65. The two expenditures are treated as separate basic headings in Eurostat-OECD comparisons. Their PPPs are obtained by the standard price approach. Market prices – the rents actually paid and the rents actually imputed - are collected by means of a price survey - the rent survey - for a selection of well-defined products – or dwellings – and the PPPs are calculated from the prices collected. The one refinement is that the rent survey also collects expenditure weights for each dwelling specified within the basic headings.

4.66. Box 4.10 contains a simplified version of the electronic reporting form used for the rent survey. It lists 48 dwellings, 24 are rented and 24 are owner-occupied. The definitions for the 24 rented dwellings are the same as the definitions for the 24 owner-occupied dwellings. They first distinguish between flats in multi-family dwellings and houses for single families. The flats and houses are then classified by age (less than 24 years, between 24 and 49 years and over 49 years), by size (useable floor space and number of rooms), and by whether or not they have central heating or air conditioning. All the dwellings specified have hot and cold running water, electricity and, if applicable, gas. The rented dwellings specified refer to all rented dwellings irrespective of whether they are rented furnished or unfurnished. But the owner-occupied dwellings specified refer only to dwellings that are unfurnished.[28]

4.67. For each definition listed on the reporting form, participating countries are required to identify those dwellings in their rent data bases that match the dwelling specified. For dwellings selected as matches, they have to report the average age and size, the average monthly rent paid (or imputed) per square metre and a weight that reflects their relative importance within the basic heading in terms of the total expenditure on the basic heading. The rents that countries report should be national averages and not capital city prices. They should also be monthly averages for the reference year and not month-of-survey prices. And, further, they should be consistent with the internationally agreed definitions of actual and imputed rents given above.

4.68. Providing expenditure weights for actual and imputed rents below the basic heading level can be a problem for countries. Participating countries unable to provide expenditure weights should report weights based on useable surface or on number of rooms as an alternative. In the absence of weights, all dwellings specified under a basic heading are treated as having the same representativity when calculating PPPs for the basic heading.

4.69. Not all countries have national definitions that comply with those of the SNA 93 and the ESA 95. For example, some national definitions include heating and hot water. Participating countries with such national definitions are still required to report rents that conform to the international definitions – that is, they are expected to adjust their national rent data accordingly. To preserve consistency between prices and final expenditures, they are also required to adjust their expenditures on the basic headings covering actual and imputed rents in their detailed estimates of final expenditure on GDP. This calls for close collaboration between price statisticians and national accountants.

4.70. Consistency also requires participating countries to supply prices for imputed rents that correspond to the prices underlying the estimated expenditure on imputed rents. According to the SNA 93 and the ESA 95, expenditure on imputed rents for owner-occupied dwellings should be estimated using actual rents paid for comparable unfurnished dwellings. But, if the renting of furnished dwellings is widespread, actual rents paid for comparable furnished dwellings may also be used providing a deduction is made first for the rent differential between furnished and unfurnished dwellings. When this is the case, consistency requires that price statisticians and national accountants adjust actual rents for furnished dwellings by the same furnished-unfurnished rent differential. Similarly any other adjustments that national accountants may make to the actual rents used to estimate expenditure on imputed rents should be applied by the price statisticians. This too calls for close collaborate between price statisticians and national accountants.

4.71. The actual rents reported by participating countries should be a weighted average of the rents paid by households for dwellings rented from the private sector and dwellings rented from government. Generally, when a dwelling is rented from the private sector, the full market rent is paid by the household. But if a household pays a reduced rent because of the social benefits it receives from government, the full market rent - that is, the part paid by the household plus the part paid by government - should still be used when calculating the average.[29] A household renting a dwelling from government may pay a rent that does not cover total costs – where total costs are defined as including compensation of employees, intermediate consumption, consumption of fixed capital and other taxes on production. When this is the case, the rent of a dwelling rented from government should be valued at total cost when calculating the average.

Box 4.10: Rent survey reporting form

N°	Item definition						Data collection			
	Type	Age (years)	Rooms	Size (m^2)	Reference size (m^2)	Central heating	Average age (years)	Average size (m^2)	Monthly rent / m^2	Weight (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Actual rents										
01	Flat	> 49	1 – 2	25 - 75	50	No				
02	Flat	> 49	1 – 2	25 - 75	50	Yes				
03	Flat	> 49	3+	70 - 150	110	No				
04	Flat	> 49	3+	70 - 150	110	Yes				
05	Flat	24 - 49	1 – 2	25 - 75	50	No				
06	Flat	24 - 49	1 – 2	25 - 75	50	Yes				
07	Flat	24 - 49	3+	70 - 150	110	No				
08	Flat	24 - 49	3+	70 - 150	110	Yes				
09	Flat	< 24	1 – 2	25 - 75	50	No				
10	Flat	< 24	1 – 2	25 - 75	50	Yes				
11	Flat	< 24	3+	70 - 150	110	No				
12	Flat	< 24	3+	70 - 150	110	Yes				
13	House	> 49	3	70 - 120	95	No				
14	House	> 49	3	70 - 120	95	Yes				
15	House	> 49	4 – 5	80 - 150	115	No				
16	House	> 49	4 – 5	80 - 150	115	Yes				
17	House	24 - 49	3	70 - 120	95	No				
18	House	24 - 49	3	70 - 120	95	Yes				
19	House	24 - 49	4 – 5	80 - 150	115	No				
20	House	24 - 49	4 – 5	80 - 150	115	Yes				
21	House	< 24	3	70 - 120	95	No				
22	House	< 24	3	70 - 120	95	Yes				
23	House	< 24	4 – 5	80 - 150	115	No				
24	House	< 24	4 – 5	80 - 150	115	Yes				
Imputed rents										
25	Flat	> 49	1 – 2	25 - 75	50	No				
26	Flat	> 49	1 – 2	25 - 75	50	Yes				
27	Flat	> 49	3+	70 - 150	110	No				
28	Flat	> 49	3+	70 - 150	110	Yes				
29	Flat	24 - 49	1 – 2	25 - 75	50	No				
30	Flat	24 - 49	1 – 2	25 - 75	50	Yes				
31	Flat	24 - 49	3+	70 - 150	110	No				
32	Flat	24 - 49	3+	70 - 150	110	Yes				
33	Flat	< 24	1 – 2	25 - 75	50	No				
34	Flat	< 24	1 – 2	25 - 75	50	Yes				
35	Flat	< 24	3+	70 - 150	110	No				
36	Flat	< 24	3+	70 - 150	110	Yes				
37	House	> 49	3	70 - 120	95	No				
38	House	> 49	3	70 - 120	95	Yes				
39	House	> 49	4 – 5	80 - 150	115	No				
40	House	> 49	4 – 5	80 - 150	115	Yes				
41	House	24 - 49	3	70 - 120	95	No				
42	House	24 - 49	3	70 - 120	95	Yes				
43	House	24 - 49	4 – 5	80 - 150	115	No				
44	House	24 - 49	4 – 5	80 - 150	115	Yes				
45	House	< 24	3	70 - 120	95	No				
46	House	< 24	3	70 - 120	95	Yes				
47	House	< 24	4 – 5	80 - 150	115	No				
48	House	< 24	4 – 5	80 - 150	115	Yes				

Box 4.10: Rent survey reporting form, contd.

Explanatory notes:
(4) Rooms other than kitchens, halls, bath rooms and toilets. (5), (6) and (9) Useable surface – that is, the floor area of the living room, kitchen, hall, bathroom and all adjoining rooms. Includes floor area taken up by fixtures and fittings. (7) Or air conditioning. (10) National average monthly rent per square metre in national currency for the reference year. (11) Weight to reflect the relative importance of the specified dwelling within the basic heading in terms of expenditure on the basic heading. If expenditure weights are not available weights based on useable surface, number of rooms, etc. should be provided instead. Specify the basis of the weights reported.

4.72. Participating countries are also required to supply data on the quantity and the quality of their housing stock. The data that are to be reported are listed in Box 4.11. Data are required for flats and houses separately. Quantity data – the number of dwellings and total useable surface area – are ordered by size of dwelling, where size is defined by number of rooms. Quality data relate to the number of dwellings in the housing stock having electricity, running water, inside toilet and central heating or air conditioning. The quantity data are combined in a single quantity indicator and the quality data are combined in a single quality indicator. The quantity and quality indicators are used to compute a volume indicator. This method of calculating volume measures is called the "quantity approach". It is described in greater detail in the Annex to this chapter. As mentioned earlier, the volume measures obtained directly by applying the quantity approach serve as a check on the volume measures obtained indirectly using the price approach. But their principal use is to serve as substitutes when volume measures cannot be derived indirectly due to a lack of price data.

4.73. The quantity approach is employed in Eurostat and OECD comparisons for those participating countries that are not able to supply price data for actual and imputed rents because their rent market is not sufficiently developed and representative. For the same reason, these countries are not able to estimate household expenditure on housing services as recommended by the SNA 93 and the ESA 95 and they have to use another method. Participating countries that are EU Member States or EU Candidate Countries are required to apply the user cost method. If they are not EU Member States or EU Candidate Countries, they are encouraged to apply it.

4.74. The user cost method consists of estimating each of the costs that the owners of the dwelling would need to take into account in fixing the market rent if they decided to rent their dwellings. These costs are intermediate consumption - comprising current maintenance and repair and insurance services, consumption of fixed capital, other taxes on production and net operating surplus - defined as the nominal rate of return on capital invested in the dwellings and the land. The method provides realistic estimates of final expenditure on housing services. This is an important consideration because with the quantity approach it is the PPPs that are derived indirectly. Realistic final expenditures give meaningful PPPs. Similarly, realistic final expenditures provide

Box 4.11: Quantity and quality of the dwelling stock

	Data for the quantity indicator			
Rooms	**Flats**		**Houses**	
	Number of dwellings	**Total useable surface (m^2)**	**Number of dwellings**	**Total useable surface (m^2)**
1				
2				
3				
4+				
4				
5				
6+				
Total				

	Data for the quality indicator			
Facilities	**Flats**		**Houses**	
	Number of dwellings	**Share of dwellings with facility (%)**	**Number of dwellings**	**Share of dwellings with facility (%)**
With electricity				
With running water[1]				
With inside toilet				
With central heating[2]				
Total				

[1] Not necessarily drinking water. [2] Or air conditioning.

realistic weights when the PPPs for housing services are aggregated to obtain PPPs for individual consumption expenditure by households and GDP.

4.75. To effect a comparison of housing services across all participating countries, the volume indices of countries that follow the quantity approach have to be linked with the volume indices of countries that follow the price approach. Overlaps between the two groups of countries can be established through countries that supply data for both approaches and this practice will be introduced in the future. Currently, only one of the countries providing both sets of data serves as a bridge between the two groups because the data sets of the other countries are of uneven quality. The country is Austria.[30]

Reporting and validation of prices

4.76. Once price collection is finished, participating countries are required to enter their price observations on the electronic reporting form that Eurostat provides for each survey in the survey cycle. Countries send the completed reporting form to their group leader for validation. Validation is an iterative process with reporting forms going backwards and forwards with questions and answers between group leaders and their group members. It has two distinct phases. The first phase is the intra-country editing. During this phase, the price observations of each group member are checked separately without reference to the price data of other group members. The second phase is the inter-country editing within country groups. During this phase, the average survey prices of each group member (including the average survey prices of the group leader) are checked against the average survey prices of other group members. Once both phases have been concluded to the satisfaction of all members of the group, the group leader returns the validated reporting forms to Eurostat.

4.77. On receipt of the reporting forms, Eurostat starts the third and final phase of validation. This is the inter-country editing across country groups. Again it is an iterative process, but this time between countries and Eurostat. Like the second phase, it consists of checking the average survey prices of each country against the average survey prices of other countries, but this time all countries are involved and not just other group members. Validation ends when both Eurostat and the countries agree on the average prices and the underlying price observations. Once approved, the average survey prices are considered final and ready for publication after they have been adjusted first to national prices, if they were capital city prices, and then to annual prices for the year the survey was conducted.[31] The reporting, validation and approval of a survey's prices takes place in the ten months following price collection.

4.78. The three phases of validation have the same aim. This is to identify and eliminate non-sampling errors from the survey price data. Non-sampling errors arise because:

- Price collectors price products that do not match the product specification and fail to report that they have done so. This can be because they are not aware of the mismatch – perhaps the specification is too loose - or because, following the pricing guidelines, they price a replacement but do not mention this on the price collection sheet.

- Price collectors price products that do match the product specification but record the wrong price. Or they record the correct price but, afterwards, it is entered incorrectly on the reporting form.

In both cases, editing involves identifying prices that are outliers – that is, prices that are determined to be either too high or too low according to given criteria. Prices that are outliers are not necessarily wrong. But the fact that they are outliers suggests that they could be wrong and that they need to be verified. Intra-country editing searches for outliers among the individual prices that a country has collected for each product it has chosen to survey. Inter-country editing looks for outliers among the average survey prices that countries have reported for the same products within a basic heading.

4.79. Box 4.12 breaks down the validation phases into steps. It shows when each step is to be implemented, who is responsible for the implementation and which software package is to be used. For example, in t+1, the month following price collection, participating countries have to enter their price observations on the price input sheet, pre-check their entries with the aid of the programmed price input and output sheets, and transmit the pre-checked price input and output sheets to the group leader. The steps detail the iterative process of each phase. Iteration for intra-country validation begins at step 5 when the group leaders first react to the price data that their group members transmitted to them. It finishes at step 8 when, after two rounds of checking, re-checking and correction, countries send the group leaders their revised data. The process takes two months, the same time that it takes to complete the inter-country validation across country groups. Iteration for inter-country validation within country groups takes longer, around six months. But this is to be expected because of the interactions that arise during editing between the data sets of countries. Revisions introduced by one country can alter the outcome of the checks made on the prices of other countries.[32]

4.80. Two software packages are identified in Box 4.12. The first package covers data entry on price input sheets and the generation of price output sheets. Price input and output sheets are designed specifically for intra-country editing of individual price observations. They are also the means by which prices are transmitted between countries, group leaders and Eurostat during the three phases of

Box 4.12: Generalised timetable for the reporting and validation of prices

Phase	Step		Month	Who is responsible	Software package
Pre-validation	01.	Price collection	t	Countries	
Intra-country validation	02.	Entering price observations	t+1	Countries	Price input sheet
	03.	Pre-check of preliminary data	t+1	Countries	Price input and output sheets
	04.	Transmission of price input and output sheets to group leader	t+1	Countries	As above
	05.	Reaction by group leader to price input and output sheets sent to countries	t+1 t+2	Group leaders	As above
	06.	Revision of price input and output sheets in response to 05; transmission of revised price input and output sheets to group leader	t+2 t+3	Countries	As above
	07.	Reaction by group leader to revised price input and output sheets (including the introduction of splittings) sent to countries	t+2 t+3	Group leaders	As above
	08.	Revision of price input and output sheets in response to 07; transmission of revised price input and output sheets to group leader	t+2 t+3	Countries	As above
Inter-country validation within country group	09.	Calculation of Quaranta table; distribution of Quaranta table to countries	t+3	Group leaders	Quaranta tables
	10.	Analysis of Quaranta table by group leader and countries; group leader's questions sent to countries	t+3 t+4	Group leaders; countries	As above
	11	Checks on price data as required by 10; price input and output sheets revised accordingly; transmission of revised price input and output sheets to group leader	t+4 t+5	Countries	Price input and output sheets
	12.	Calculation of revised Quaranta table; distribution of revised Quaranta table to countries	t+5	Group leaders	Quaranta tables
	13.	Analysis of revised Quaranta table by group leader and countries; group leader's questions sent to countries	t+6	Group leaders; countries	As above
	14.	Checks on price data as required by 13; price input and output sheets revised accordingly; transmission of revised price input and output sheets to group leader	t+6	Countries	Price input and output sheets
	15.	Repetition of steps 12, 13, 14 until price data agreed by group leader and countries	t+6 t+7	Group leaders; countries	Price input and output sheets; Quaranta tables
	16.	Transmission of price data to Eurostat	t+7	Group leaders	As above
Inter-country validation across country groups	17.	Calculation of overall Quaranta table across country groups; distribution of overall Quaranta table to countries	t+8	Eurostat	Quaranta tables
	18.	Analysis of overall Quaranta table by Eurostat and countries; Eurostat's questions sent to countries	t+8	Eurostat; countries	As above
	19.	Checks on price data as required by 18; price input and output sheets revised accordingly; transmission of revised price input and output sheets to Eurostat	t+8	Countries	Price input and output sheets
	20.	Repetition of steps 17, 18, 19 until overall Quaranta table and price data agreed by Eurostat and countries	t+9 t+10	Eurostat; countries	Price input and output sheets; Quaranta tables

Box 4.13: Price input sheet

COUNTRY: EXCHANGE RATE: DATE:

Flag	MMYY (Survey date)	Item code	Item description	*	Type of Outlet	Shop identifier	Reference quantity	Unit	Quantity observed	Price observed	Price for reference quantity	Price/ average price ratio	t-value	Brand and model	Comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
O		01.1.1aa=cns	Rice, long grain, not parboiled				1000	g							
O		01.1.1ac=cn	Rice, whole grain, long grain				1000	g							
O		01.1.2aa=cns	Wheat flour				1000	g							
O		01.1.2ac=c	Wheat semolina				1000	g							

Box 4.14: Price output sheet

COUNTRY: XXXXX   EXCHANGE RATE: XX.XXXX   DATE: DD.MM.YY

Sequence number of item	Item code	Item description	Reference quantity	Unit	No. of price quotes	No. of quotes with *	Average survey price	Maximum price	Minimum price	Var. coeff. (%)	Further checking required (? or ???)	Average survey price in Euros	VAT (% of net price)	Average net price (w/o VAT)
(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
1	01.1.1aa=cns	Rice, long grain, not parboiled	1000	g										
2	01.1.1ab=n	Rice, long grain, parboiled	1000	g										
3	01.1.1ac=cn	Rice, whole grain, long grain	1000	g										
4	01.1.1ad=ns	Rice, round grain	1000	g										

Box 4.15: Columns on price input and output sheets requiring further explanation

Column 1 flags the price observation as being either the original observation entered by the country (O), a version of the original observation that has been modified during editing (M), a new observation that has been inserted during editing (I), or an observation that has been eliminated during editing (E). Price observations flagged with E remain on the price input sheet. But they are not used in the calculation of the average survey price (column 24). Nor are they used in the calculation of the checking indicators (columns 13, 14, 25, 26 and 27).

Column 5 is for the representativity indicator. If the product is representative, an asterisk (*) is entered in the column. If the product is not representative, the column is left blank. An asterisk must be entered for each and every price observation recorded for a representative product. Failure to do this will be flagged by a discrepancy between columns 22 and 23.

Column 6 is for the code of the type of outlet at which the price observation was made. Outlets are classified and coded as shown in Box 4.7.

Column 7 is optional. Participating countries may use it to identify the actual shop from which the price was collected.

Column 12 is for the price for the reference quantity. It is filled automatically providing the observed quantity recorded in column 10 is the same unit as the reference quantity in column 8. If it is not, for example 1 litre instead of 1 kilogram, the quantity observed has to be converted to the reference unit required. This is the responsibility of the participating country.

Column 13 is programmed to express the price of the observation as a ratio of the average survey price for the product. A value less than 0.75 or greater than 1.25 is questionable. A test value less than 0.5 or greater than 1.5 is flagged as extremely questionable.

Column 14, or t-value, is programmed to express the deviation of the price of the observation from the average survey price for the product as a ratio of the standard deviation for the product. A t-value greater than 2.0 is questionable. A t-value is greater than 3.0 is extremely questionable.

Column 27, or variation coefficient, is programmed to express the standard deviation for the product as a percentage of the average survey price for product. A variation coefficient greater than 20 per cent is questionable. A variation coefficient greater than 40 per cent is extremely questionable.

Column 28 is programmed to identify those products that are either questionable or extremely questionable. Products that have maximum/minimum price ratios greater than 2.0 or variation coefficients greater than 20 per cent are flagged by one question mark (?). Products that have maximum/minimum price ratios greater than 4.0 or variation coefficients greater than 40 per cent are flagged by three question marks (???).

Column 30 is the only column on the price output sheet that is not generated from the entries made on the price input sheet. Participating countries are required to enter the rate of VAT to be paid on each product they have priced. VAT is to be expressed as a percentage of the net price - that is, the price before VAT.

Column 31 is for the net price. It is obtained by dividing the average survey price in column 24 by (1 + [%VAT / 100]) where the %VAT is that in column 30.

validation. The second package has to do with the Quaranta editing procedure and the generation of Quaranta tables. Quaranta tables are used in both phases of inter-country editing of average survey prices. The procedure has a broader application than editing the prices collected for consumer products. Quaranta tables are also used to edit rents, compensation of employees, equipment good prices and construction prices. For this reason, the Quaranta editing procedure is described separately in Annex IV. Price input and output sheets are used solely to edit the prices of consumer goods and services collected by the six surveys constituting the survey cycle. These surveys are the only surveys for which countries report individual price observations. The price input and output sheets are described in the following paragraphs.

4.81. Examples of a price input sheet and a price output sheet are given in Box 4.13 and Box 4.14. Except for the column numbers that have been introduced for ease of reference, the two sheets are reproduced as participating countries receive them from Eurostat before any price observations have been entered. Before sending them to countries, Eurostat completes the columns detailing the item code, the item description, the reference quantity and the reference unit on both sheets – that is, columns 3, 4, 8 and 9 on the price input sheet and columns 18, 19, 20 and 21 on the price output sheet. The price input sheet is country group specific. It lists only the products that are to be surveyed by the country group to which the country receiving it belongs. The price output sheet is not country group specific. It lists all the products specified for the survey for all country groups. Participating countries are required to complete the areas shaded in grey. The areas framed in black are programmed to be completed from the entries that countries make on the price input sheet. For example, on the price input sheet, the price for the reference quantity in column 12 will be calculated automatically from the quantity observed and the price observed recorded in columns 10 and 11. Most columns on the two sheets are self-explanatory. For those that are not, further clarification can be found in Box 4.15.

4.82. Intra-country editing begins by identifying price observations and products that are outliers. Outliers are defined as price observations or products that score a value for a given test which falls outside a predetermined critical value. The price input sheet is programmed to compute two test values with which to detect outliers among price observations.

The price output sheet is programmed to compute two test values with which to detect outliers among products. Each test has two critical values. The first flags outliers that are "questionable" and need to be checked. The second flags outliers that are "extremely questionable" and require thorough investigation. The measures and critical values used to test for outliers are described in Box 4.16.

4.83. Before editing can commence, participating countries have first to complete the price input sheet. As products are only specified once on the price input sheet, there is only one row per product. Extra rows have to be introduced to accommodate the prices collected for each product surveyed. For example, if ten prices have been observed for a product, then the row on which it is specified will have to be reproduced nine times. Rows specifying products for which no prices were collected may be deleted. For each price observation, countries have to enter the date of the survey (column 2), an asterisk if the product is representative (column 5), the code for the outlet where the price was observed (column 6), the quantity observed (column 10), and the price observed (column 11). Once all the price observations have been entered and before generating the entries that will be derived from them, countries should verify that there are no false item codes, that no codes (and therefore price observations) have been entered out of sequence, that an asterisk has been entered for all price observations for representative products, that there are only numeric entries for type of outlet, reference quantity, quantity observed and price observed, that the quantity observed is in the same unit as the reference quantity and that there are no empty rows.[33]

4.84. After verifying that their entries on the price input sheet are "clean", participating countries should generate the programmed entries for columns 12 to 14 on the price input sheet and for columns 18 to 29 on the price output sheet. They should then search the price input sheet for price observations that have been flagged as outliers in columns 13 and 14 and the price output sheet for products that have been flagged as outliers in column 28. Participating countries are required to establish the reliability of price observations and products flagged as outliers before sending their price input and output sheets to the group leader. In most cases this 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 was recorded. Price observations that are found to be incorrect should be either removed from the price input sheet 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.[34] It is to be expected that verification of outliers among price observations will introduce changes that will impact on the outlier status of products, especially those with high maximum-minimum price ratios.

4.85. 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. 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 outlets that are over represented.

Box 4.16: Test measures and critical values

Object tested	Test measure	Critical values for outliers	
		"Questionable" (need to be checked)	"Extremely questionable" (require thorough investigation)
Price observation	The price of the observation expressed as a ratio of the average survey price of the product.	If the ratio is less than **0.75** or greater than **1.25**.	If the ratio less than **0.5** or greater than **1.5**.
	The deviation of the price of the observation from the average survey price for the product expressed as a ratio of the standard deviation for the product. Called the "t-value".	If the t-value is greater than **2.0**.	If the t-value is greater than **3.0**.
Product	The maximum price for the product expressed as a ratio of the minimum price for the product.	If the ratio is greater than **2.0.**	If the ratio is greater than **4.0.**
	The standard deviation for the product expressed as a percentage of the average survey price for the product. Called the "variation coefficient".	If the variation coefficient is greater than **20 per cent**.	If the variation coefficient is greater than **40 per cent**.

4.86. 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 decide whether the products should be dropped, retained or split on the basis of what other countries have reported.

4.87. Once all the outliers have been investigated, participating countries should transmit the pre-checked price input and output sheets to the group leader. There will still be outliers among the price observations and products reported. Participating countries are required to document the reliability of these outliers when reporting their prices to the group leader.

From average survey prices to national annual prices

4.88. The majority of participating countries conduct their price surveys only in the capital city. The average survey prices they send to Eurostat are capital city prices.[35] After each survey, countries reporting capital city prices are required to provide Eurostat with spatial adjustment factors with which their capital city prices can be converted to national prices. Countries are expected to supply a spatial adjustment factor for each basic heading surveyed. They 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 the following January 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 those countries reporting capital city prices to national prices, basic heading by basic heading, using the spatial coefficients provided by coun-

tries. Participating countries 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 resurveyed.[36]

4.89. 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.[37] 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 benchmark approach.

4.90. Participating countries extract the temporal adjustment factors from their CPI data base. COICOP[38] is the classification underlying the CPIs of most participating countries. And, as explained in Chapter 3, it is as well the classification underlying the breakdown of individual consumption expenditure by households in the Eurostat-OECD classification of final expenditure on GDP. The correspondence between CPI sub-indices and basic headings is therefore 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.

ANNEX TO CHAPTER 4: QUANTITY APPROACH FOR HOUSING SERVICES

i.   The quantity approach as applied to housing services requires quantitative data on the number of dwellings and on useable surface by size of dwelling. It also requires qualitative data on the number of dwellings with facilities such as electricity, running water, inside toilet and central heating or air conditioning. The quantitative data are used to calculate an indicator of quantity and the qualitative data are used to calculate an indicator of quality. The quantity indicator and the quality indicator are combined to obtain a volume indicator. The mechanics of the quantity approach is explained by the worked example in Box A. It refers to dwellings – that is, flats and houses combined. But the procedure is exactly the same when flats and houses are treated separately.

ii. The quantity indicator is constructed using the data on useable surface by size of dwelling. Size is defined by number of rooms per dwelling. Points are given to each size class. They reflect that rent per square metre changes as the number of rooms and useable surface increase and are used to adjust the total useable surface for a size class accordingly. The points given to a size class depend on the average useable surface per dwelling for that size class and will vary from country to country. The points are obtained from the scale in Box B.[39] The scale was derived from rent scales showing the price per square metre of useable surface in 29 cities within the European Union.[40]

iii Thus, in the worked example in Box A, the average useable surface (m/n) for dwellings with one room is 34.7 square metres in country A and 20.2 square metres in country B for which the scale in Box B provides points of 0.980 and 1.011 respectively. By multiplying the useable surface (m) for dwellings with one room by these points (p), adjusted useable surfaces (m*p) of 10.5 million square metres for country A and of 20.6 million square metres for country B are obtained. This procedure is repeated for each size class. The adjusted useable surfaces are summed, put on a per capita basis and ratioed to provide the quantity indicator.

iv. In principle, the quality indicators should be the weighted average of the percentages of the dwelling stock having each of the facilities that contribute to the total value of rent, with the weights being each facility's share in the total value of rent. In practice, it is calculated as the sum of the percentages of the dwelling stock with electricity, with running water, with an inside toilet and with central heating or air conditioning. The indicator is rough because the four facilities represent only a part of the total value of rent and because each facility is given the same weight. Even so, although the four facilities give an incomplete picture of the quality of the dwelling stock, they are important basic facilities for which data are generally available across countries.

v.   The per capita volume indicator is obtained by multiplying the per capita quantity indicator by the quality indicator. Hence, in the worked example in Box A, the per capita volume index for B is 34 when the per capita volume index for A is 100. The worked example is for two countries, but the volume measures so derived would be transitive in a multilateral comparison.

vi. Although not shown in the worked example, PPPs are derived indirectly with the quantity approach. The per capita indices of nominal final expenditure on housing services (that is, indices based on the final consumption expenditures of participating countries on housing services expressed in a common currency using exchange rates) are divided by the per capita volume indices for housing services to obtain the comparative price level indices for housing services (that is, indices based on the PPPs for housing services divided by exchange rates). The PPPs are computed by multiplying the comparative price level indices by exchange rates.[41]

vii. The nominal final expenditure on housing services used in the derivation of the PPPs covers all final consumption expenditure on housing services. It is the sum of the final consumption expenditure of households, non-profit institutions serving households and general government on housing services.

Box A: A worked[42] example of the quantity approach

1. Estimation of the quantity indicator (Qt)

Population (in thousands): country A = 7 718; country B = 23 207

Number of rooms per dwelling	Number of dwellings (thousands)	Useable surface (million m²)	Average useable surface per dwelling	Points per m²	Adjusted useable surface (million m²)
	n	m	m/n	p	m*p
Country A					
1 room	308	10.7	34.7	0.980	10.5
2 rooms	698	39.8	57.0	0.948	37.7
3 rooms	834	66.8	80.1	0.922	61.6
4 rooms	551	57.2	103.8	0.911	52.1
5 and more	509	68.8	135.2	0.919	63.2
Total	2900	243.3			225.1
per capita					**29.2**
Country B					
1 room	1008	20.4	20.2	1.011	20.6
2 rooms	3243	120.0	37.0	0.980	117.6
3 rooms	2353	122.3	52.0	0.955	116.8
4 rooms	789	53.7	68.1	0.931	50.0
5 and more	240	21.7	90.4	0.916	19.9
Total	7632	338.1			324.9
per capita					**14.0**

Quantity indicator country B relative to country A = $Qt_{b/a}$ = $[\Sigma(m_b*p)/pop_b)]/[\Sigma(m_a*p)/pop_a]$

$$= 14.000 / 29.171 = 0.480$$

2. Estimation of the quality indicator (Ql)

Facility	Number of dwellings with the specified facility (thousands)		Weight of facility	Share of dwellings with the specified facility (%)	
	Country A	Country B	w	Country A f_a	Country B f_b
Electricity	2900	7556	0.25	100	99
Running water	2863	4503	0.25	99	59
Toilet inside	2729	3739	0.25	94	49
Central heating	1775	3205	0.25	61	42
Total	2900	7632	1.00	88.5	62.2

Quality indicator country B relative to country A = $Ql_{b/a}$ = $(\Sigma\ f_b*w)/(\Sigma\ f_a*w)$ = 62.2/88.5 = 0.703

3. Estimation of the volume indicator

Volume indicator country B relative to country A = $Qt_{b/a}$ * $Ql_{b/a}$ = 0.480 * 0.703 = 0.337

Box B: Points per square metre of useable surface per dwelling

Useable Surface per Dwelling (m^2)	Points per m^2	Useable Surface per Dwelling (m^2)	Points per m^2
20 or less	1.011	120	0.912
25	1.000	125	0.914
30	0.990	130	0.916
35	0.980	135	0.919
40	0.971	140	0.922
45	0.963	145	0.926
50	0.955	150	0.931
55	0.948	155	0.936
60	0.942	160	0.942
65	0.936	165	0.949
70	0.931	170	0.956
75	0.926	175	0.964
80	0.922	180	0.972
85	0.919	185	0.981
90	0.916	190	0.991
95	0.914	195	1.001
100	0.912	200	1.012
105	0.911	205	1.023
110	0.911	210 or more	1.036
115	0.911		

1. The current survey cycle outlined in Box 4.1 was introduced in 2003. The previous survey cycle started in 1991 and was retained for four rounds until 2002. The price surveys of the current cycle differ from those of the previous cycle both in the order in which they are conducted and in their coverage. For example, medical goods and services were not included in the previous cycle. Their prices were collected by a special enquiry instead.

2. 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.

3. Experience shows that the more varied the consumption patterns of participating countries and the more narrowly defined the basic headings the more difficult it is to select products that are representative and comparable. The 1980 Eurostat comparison covered ten Member States with similar economies and household final consumption expenditure comprised around 265 basic headings. Current Eurostat comparisons cover 25 Member States with dissimilar economies and household final consumption expenditure is broken down into 148 basic headings. (The reduction in the number of basic headings is also explained by the difficulties that many participating countries faced when trying to estimate weights for the more detailed breakdown of household final consumption expenditure.)

4. To continue with the example of footnote 2. 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.

5. Reference PPPs are PPPs that are taken from elsewhere in the comparison to serve as proxies for the PPPs that would have been calculated had prices been collected for the basic headings for which no prices were collected.

6. See paragraphs 4.57 to 4.62 on assigning asterisks for a more complete explanation.

7. See paragraph IV.21 in Annex IV.

8. Whether the responses of a group member to the pre-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.

9. Group meetings also provide group members with the opportunity to discuss guidelines for the forthcoming survey, to review the preliminary summary results of the last survey and the near-final summary results of the last-but-one survey, and to consider proposals for new methods and procedures with respect to future surveys.

10. The share of overlap products varies from survey to survey. For example, surveys covering food (beverages and tobacco) and services have a much larger share of overlap products than do surveys covering clothing (and footwear) and durable goods (such as major household appliances and recreational equipment). Even so, experience to date suggests that, on average, 40 per cent of the products specified overlap all thee groups (NCS), 20 per cent overlap two groups (NC, NS or CS) and 40 per cent are country group specific (N, C, or S).

11. If the model is specified as an indicative characteristic because its name/number can change from country to country, a full set of the relevant technical parameters is listed.

12. For example, Bosch may be a specified brand for refrigerators but not for washing machines. In these circumstances, Bosch cannot be priced as a well-known brand under refrigerators but it can be priced as a well-known brand under washing machines. Note that both refrigerators and washing machines are covered by the same basic heading (11.05.31.1 Major household appliances whether electric or not).

13. Product specifications are first drafted in English. They are subsequently translated into the national language for price collectors in the short space of time between receipt of the final group product list and price collection.

14. "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.

15. These include mail order houses and internet sites. See Box 4.7.

16. This and other related points are explained and elaborated in paragraphs 16.105 to 16.109 of the 1993 SNA.

17. 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.

18. Household final consumption expenditure includes purchases by resident households from both national and international internet sites.

19. If this approach is followed, priority should be given to retaining overlap products on the list.

20. If a country's national accountants use list prices and make no adjustment for discounts, it will report a global discount rate of zero and no adjustment will be made to the list prices it reported for cars.

21. Suppose that the quantity of a pharmaceutical product purchased is 1000 units and that the price per unit is 10 € of which households pay 2 € and government 8 €. In the national accounts, 2000 € will be recorded as household expenditure and 8000 € will be recorded as government expenditure. If the amounts actually paid – that is, 2 € by households and 8 € by government – are used to deflate these expenditures, it will seem that both households and government have each purchased 1000 units or 2000 units in total. But if the total amount paid – that is, 10 € – is used, households will appear to have purchased 200 units and government 800 units - a total of 1000 units.

22. 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.

23. That is, by comparing the CUP-Indices of the products priced in the Quaranta table for the basic heading. See Annex IV.

24. The term "rent" is used throughout this section. From a national accounts viewpoint, this is incorrect. The term "rental" should be used instead. The SNA 93 and the ESA 95 broadly define rent as property income received by owners of non-produced assets such as land or subsoil assets and rentals as payment for a service made to owners of produced assets such as buildings or machinery.

25. Or once every three years for OECD comparisons.

[26] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[27] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[28] The reporting form for the OECD rent survey covers a longer list of dwellings to accommodate the circumstances of non-European participating countries. The definitions of these additional dwellings include either number of rooms or number of bedrooms, but they do not include either age of dwelling or useable floor space.

[29] That is, the total or composite price should be used. But the expenditures remain separate. The reduced rents paid by households are recorded under household final consumption expenditure and the social benefits paid by government are recorded under government final consumption expenditure.

[30] More specifically, the volume indices obtained by the quantity approach are linked with the volume indices obtained by the price approach as follows. First, the two sets of volume indices are rebased on Austria – that is, Austria = 100. The two sets can now be combined as the volume indices of each set are directly comparable with the volume indices of the other set through Austria. The combined set of volume indices can be rebased on another country or on a group of countries, such as the EU 25 or the OECD, as required.

[31] They are also ready to be used to calculate PPPs.

[32] The six months required for inter-country validation within groups is also due to the teams responsible for the price surveys in participating countries being small and being occupied with more than one survey at any one time.

[33] These checks are not made manually, but by the program that links the price input sheet and the price output sheet. The same program produces a country summary table showing for each basic heading covered by the survey: the overall number of items specified (that is, the number of items specified for the survey for all country groups), the number of specified items priced by the country, the number of items priced by the country that are representative (that is, with an asterisk), the total number of price quotations collected by the country, the number of items priced by the country that are "questionable" (that is, flagged with one question mark - ?) and number the items priced by the country that are "extremely questionable" (that is, flagged with three question marks - ???). The summary table provides an overview of the survey and the quality of the data collection completed by the country.

[34] In principle, it is preferable to remove outliers with extreme values, 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.

[35] Countries participating in OECD comparisons report national prices.

[36] The repeated reporting of spatial adjustments that remain unchanged is a formality. Not all countries collecting capital city prices resurvey their spatial adjustment factors over the same six year cycle. Countries are required to confirm that their spatial coefficients are unchanged if they are not providing new ones.

[37] Countries participating in Eurostat comparisons are also required to provide temporal adjustment factors for seasonal food products as explained in the section dealing with seasonal products.

[38] "Classification of Individual Consumption According to Purpose (COICOP)", *Classification of Expenditure According to Purpose,* United Nations, New York, 2000.

[39] The scale shows rent per square metre decreasing until 105 m^2 and increasing after 115 m^2.

[40] Earlier scales were based on 19 cities in the 15 countries that were EU Member States prior to enlargement.

[41] In practice a simpler and more straightforward calculation is made. The indirect $PPP_{A/B} = [PCFCEnc_A / PCFCEnc_B] / PCVI_{A/B}$ where PCFEnc is the per capita final consumption expenditure on housing services in national currency of country A and country B respectively and PCVI is the per capita volume index for housing services between country A and country B.

CHAPTER 5: GOVERNMENT SERVICES

Introduction

5.1. Government services are the services provided to households by general government. They comprise individual services and collective services. Individual services are the services that general government provides to specific identifiable households – that is, services, such as health and education, which benefit, or which are consumed by, individual households. Collective services are those that general government provides simultaneously to all members of the community – that is, services, such as police and fire protection, which benefit, or which are consumed by, households collectively.

5.2. "General government" is the term used in the SNA 93[1] and the ESA 95[2] to describe the institutional sector that consists of central, regional, state and local government units together with the social security funds controlled by these units. Non-profit institutions engaged in non-market production that are controlled and mainly financed by government units or social security funds are also included in the general government sector. Throughout this chapter "government" means "general government" unless specifically stated otherwise.

5.3. Government expenditure on government services is called "government final consumption expenditure" or "GFCE". It is divided between two main aggregates in the Eurostat-OECD expenditure classification. Expenditures on individual services constitute *individual consumption expenditure by government*. Expenditures on collective services make up *collective consumption expenditure by government*. Both main aggregates are important in terms of their shares of GDP in EU Member States and OECD Member Countries. Individual consumption expenditure by government ranges from 5 to 19 per cent of GDP depending on the country, while collective consumption expenditure by government accounts for around 8 or 9 per cent of GDP in most countries.

5.4. Individual consumption expenditure by government is also important because it is one of three components of *actual individual consumption* – the other components being individual consumption expenditure by households and individual consumption expenditure by non-profit institutions serving households (NPISHs). Actual individual consumption is a measure of what households actually consume - rather than what they actually purchase - and as such it is of particular relevance to comparisons of economic welfare. Among EU Member States and OECD Member Countries, the contribution of individual consumption expenditure by government to actual individual consumption is significant. It is 12 per cent on average with a range of 8 to 27 per cent.

5.5. This chapter explains how PPPs for individual consumption expenditure by government and collective consumption expenditure by government are obtained within the framework of a Eurostat-OECD comparison. It starts by defining the individual and collective services covered by these two main aggregates and continues by distinguishing between the services that government produces itself and the services that government purchases from market producers. This is followed by an outline of the basic methodology and a review of the reference PPPs that are used in the absence of prices. The chapter continues by describing the survey of compensation of employees which is the only price collection conducted specifically for the calculation of PPPs for government expenditure. It concludes with an annex on productivity adjustment which, as explained in the annex, is an important consideration when comparing GFCE across countries.

Individual and collective services

5.6. Individual and collective services are comprehensively defined in COFOG 98 and these are the definitions that are followed in the Eurostat-OECD expenditure classification. Broadly speaking, individual services are housing, health, recreation and culture, education and social protection; and collective services are general public services, defence, public order and safety, economic affairs, environment protection, and housing and community amenities. Box 5.1 gives a more precise definition in terms of COFOG groups. All the COFOG groups shaded in grey are collective services. They include the research and development (R&D) for individual services: R&D Health, R&D Education, etc. They include as well the overall policy-making, planning, regulatory, budgetary, co-ordinating and monitoring responsibilities of ministries overseeing individual services: Health n.e.c., Education n.e.c., etc. These activities, unlike the services to which they relate, cannot be identified with specific individual households and are considered to benefit households collectively.

Market and non-market services

5.7. Collective services are produced by government. Individual services can be produced by government and they can also be purchased by government from market producers. The mix varies from country to country. The individual services that government purchases from market producers are called "market services". This is because they are sold at prices that are economically significant – that is, at prices that determine the amounts producers supply and purchasers buy. Being economically significant, the prices can be used to value the outputs of market producers by multiplying the quantities produced by the prices at which they are sold. The collective and individual services that government produces itself are referred to as "non-market services". This is because they are supplied free or sold at prices that are not economically significant.[3]

5.8. The absence of economically-significant prices for non-market services means that it is not possible to value the outputs of non-market producers in the same way as the outputs of market producers are valued. Because of this, national accountants have adopted the convention of valuing the outputs of non-market producers by totalling up the costs to produce them. The value of the output of non-market producers is equal to the sum of their expenditures on the non-market services they produce or, if there have been sales, to the sum of their expenditures less the value of their sales. To maintain consistency with the prices underlying these expenditures, it is necessary to use the purchasers' prices of inputs to calculate the PPPs for non-market services. This is called the "input-price approach".

Treatment of non-market services

5.9. The input-price approach requires a breakdown of the expenditure on non-market services by cost components. The basic cost components used in Eurostat-OECD comparisons are: compensation of employees, intermediate consumption, gross operating surplus, net taxes on production and receipts from sales. The breakdown is based on the assumption that the data will be taken from the gov-

Box 5.1: Collective services (CS) and individual services (IS)

COFOG 98 Groups		COFOG 98 Groups	
01. GENERAL PUBLIC SERVICES		**06. HOUSING & COMMUNITY AMENITIES**	
01.1	Executive & legislative organs, financial & fiscal affairs, external affairs (CS)	06.1	Housing development (CS)
01.2	Foreign economic aid (CS)	06.2	Community development (CS)
01.3	General services (CS)	06.3	Water supply (CS)
01.4	Basic research (CS)	06.4	Street lighting (CS)
01.5	R&D General public services (CS)	06.5	R&D Housing & community amenities (CS)
01.6	General public services n.e.c. (CS)	06.6	Housing & community amenities n.e.c. (CS)
01.7	Public debt transactions (CS)	**07. HEALTH**	
01.8	Transfers of a general character between different levels of government (CS)	07.1	Medical products, appliances & equipment (IS)
02. DEFENCE		07.2	Out-patient services (IS)
02.1	Military defence (CS)	07.3	Hospital services (IS)
02.2	Civil defence (CS)	07.4	Public health services (IS)
02.3	Foreign military aid (CS)	07.5	R&D Health (CS)
02.4	R&D Defence (CS)	07.6	Health n.e.c. (CS)
02.5	Defence n.e.c. (CS)		
03. PUBLIC ORDER & SAFETY		**08. RECREATION, CULTURE & RELIGION**	
03.1	Police services (CS)	08.1	Recreational & sporting services (IS)
03.2	Fire-protection services (CS)	08.2	Cultural services (IS)
03.3	Law courts (CS)	08.3	Broadcasting & publishing services (CS)
03.4	Prisons (CS)	08.4	Religious & other community services (CS)
03.5	R&D Public order & safety (CS)	08.5	R&D Recreation, culture & religion (CS)
03.6	Public order & safety n.e.c. (CS)	08.6	Recreation, culture & religion n.e.c. (CS)
04. ECONOMIC AFFAIRS		**09. EDUCATION**	
04.1	General economic, commercial & labour affairs (CS)	09.1	Pre-primary & primary education (IS)
04.2	Agriculture, forestry, fishing & hunting (CS)	09.2	Secondary education (IS)
04.3	Fuel & energy (CS)	09.3	Post-secondary non-tertiary education (IS)
04.4	Mining, manufacturing & construction (CS)	09.4	Tertiary education (IS)
04.5	Transport (CS)	09.5	Education not definable by level (IS)
04.6	Communication (CS)	09.6	Subsidiary services to education (IS)
04.7	Other industries (CS)	09.7	R&D Education (CS)
04.8	R&D Economic affairs (CS)	09.8	Education n.e.c. (CS)
04.9	Economic affairs n.e.c. (CS)	**10. SOCIAL PROTECTION**	
05. ENVIRONMENT PROTECTION		10.1	Sickness & disability (IS)
05.1	Waste management (CS)	10.2	Old age (IS)
05.2	Waste water management (CS)	10.3	Survivors (IS)
05.3	Pollution abatement (CS)	10.4	Family & children (IS)
05.4	Protection of biodiversity & landscape (CS)	10.5	Unemployment (IS)
05.5	R&D Environment protection (CS)	10.6	Housing (IS)[1]
05.6	Environment protection n.e.c. (CS)	10.7	Social exclusion n.e.c. (IS)
		10.8	R&D Social protection (CS)
		10.9	Social protection n.e.c. (CS)

[1] In the Eurostat-OECD classification of final expenditure on GDP, housing is not included under social protection. Instead, both are identified as separate expenditure categories.

ernment production account. Receipts from sales is required to net off gross output to obtain government final consumption expenditure on the production of these services. Gross operating surplus and net taxes on production are included for completeness. In practice, gross operating surplus will be equal to consumption of fixed capital since net operating surplus is expected to be negligible. Box 5.2 shows that this cost structure has been introduced into the Eurostat-OECD expenditure classification only for the three most important services produced by government: health, education and collective services. PPPs for the remaining services - housing, recreation and culture, and social protection - are not derived through the input-price approach. Reference PPPs are used instead as explained below.

5.10. It can be seen from Box 5.2 that, while basic cost components - compensation of employees, intermediate consumption, gross operating surplus, net taxes on production and receipts on sales – are the same for health, education and collective services, different additional details, or refinements, have been introduced for all three services. For health, compensation of employees is broken down by whether the employee is medical staff or non-medical staff and intermediate consumption is broken down by type of product. For education, compensation of employees is broken down by the level of education being provided. For collective services, both compensation of employees and intermediate consumption are broken down by whether or not the service is related to defence.

Treatment of market services

5.11. Purchases of individual services from market producers by government are financed differently from country to country. The government may buy the services direct from the producers or it may reimburse households, either in full or in part, after the households themselves have made the purchase. Irrespective of the way the purchases are effected, application of the "who pays" principle of the SNA 93 and the ESA 95 means that all government expenditure on individual services purchased from market producers is recorded under government and that only the household expenditure on these purchases that is not reimbursed is included under households.

5.12. The prices paid for the outputs of market producers are economically significant. This means that the prices of outputs – and not the prices of inputs as for non-market production - can be collected and used to calculate PPPs for individual services purchased by government from market producers. The output prices to be collected are "total prices". In countries where households pay the whole pur-

chasers' price to the market producer prior to being either completely or partially reimbursement by the government, the total price is the price that households pay before they are reimbursed. In countries where households pay only a portion of the purchasers' price to the market producer and the remainder is paid to the market producer by government, the total price is the composite price – that is, the sum of the non-reimbursable part paid by households and the part paid by government.[4][5]

5.13. To facilitate the use of these output prices, it is important that government expenditure on individual services purchased from market producers is separated from government expenditure on government-produced services. From Box 5.7, it can be seen that the Eurostat-OECD expenditure classification clearly makes this distinction for government expenditures on health and education services. Government expenditure on health benefits and reimbursements is separated from government expenditure on the production of health services. And government expenditure on education benefits and reimbursements is separated from government expenditure on the production of education services.

5.14. Although it is possible to collect output prices for individual services purchased by government from market producers in principle, it is difficult to collect internationally comparable output prices for health and education services in practice. For Eurostat-OECD comparisons, output prices are only collected for medical goods and services delivered to outpatients. Output prices are not collected for hospital services. Nor are they collected for education services (other than adult educational programmes not defined by education level). Reference PPPs are used for hospital services and for education benefits and reimbursements.

Reference PPPs

5.15. Box 5.2 shows government expenditure broken down into 36 basic headings: 29 cover expenditure on individual services – that is, individual consumption expenditure by government; and seven cover expenditure on collective services – that is, collective consumption expenditure by government. No prices are collected for 27 of the basic headings. These are the basic headings highlighted in grey. The PPPs for these basic headings are based on price data, but price data that have been collected for other basic headings. Such PPPs are called "reference PPPs". They are taken from elsewhere in the comparison to serve as proxies for the PPPs that would have been calculated had prices been collected for the basic headings for which no prices were collected. The reference PPPs are listed in Box 5.3.

Box 5.2: Individual services and collective services by basic heading

	INDIVIDUAL SERVICES	
	Housing	
13.01.11.1	Housing	
	Health benefits and reimbursements	
13.02.11.1	Pharmaceutical products	
13.02.11.2	Other medical products	
13.02.11.3	Therapeutic appliances and equipment	
13.02.12.1	Out-patient medical services	
13.02.12.2	Out-patient dental services	
13.02.12.3	Out-patient paramedical services	
13.02.12.4	Hospital services	
	Production of health services	
13.02.21.1	Compensation of employees: Physicians	
13.02.21.2	Compensation of employees: Nurses and other medical staff	
13.02.21.3	Compensation of employees: Non-medical staff	
13.02.22.1	Intermediate consumption: Pharmaceutical products	
13.02.22.2	Intermediate consumption: Other medical goods	
13.02.22.3	Intermediate consumption: Therapeutic appliances and equipment	
13.03.22.4	Intermediate consumption n.e.c.	
13.02.23.1	Gross operating surplus	
13.02.24.1	Net taxes on production	
13.02.25.1	Receipts from sales	
	Recreation and culture	
13.03.11.1	Recreation and culture	
	Education benefits and reimbursements	
13.04.11.1	Education benefits and reimbursements	
	Production of education services	
13.04.21.1	Compensation of employees: Pre-primary and primary education	
13.04.21.2	Compensation of employees: Secondary education	
13.04.21.3	Compensation of employees: Post-secondary non-tertiary education	
13.04.21.4	Compensation of employees: Tertiary education	
13.04.22.1	Intermediate consumption	
13.04.23.1	Gross operating surplus	
13.04.24.1	Net taxes on production	
13.04.25.1	Receipt from sales	
	Social protection	
13.05.11.1	Social protection	
	COLLECTIVE SERVICES	
14.01.11.1	Compensation of employees (collective services relating to defence)	
14.01.11.2	Compensation of employees (collective services other than defence)	
14.01.12.1	Intermediate consumption (collective services relating to defence)	
14.01.12.2	Intermediate consumption (collective services other than defence)	
14.01.13.1	Gross operating surplus	
14.01.14.1	Net taxes on production	
14.01.15.1	Receipts from sales	

5.16. The choice of reference PPP is self-explanatory in most cases. For example, the reference PPPs for housing are the PPPs for actual rentals and the reference PPPs for gross operating surplus - which in practice equals consumption of fixed capital since net operating surplus is generally minimal - are the PPPs for gross fixed capital formation. When such corresponding proxies are not available to be used as reference PPPs, a neutral average is chosen instead. For example, the reference PPPs for intermediate consumption - other than the intermediate consumption of collective services relating to defence - are the PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs) and the reference PPPs for recreation and culture and for social protection are the PPPs for individual consumption expenditure by government (excluding

Box 5.3: Reference PPPs for individual services and collective services

Basic heading	Reference PPP
INDIVIDUAL SERVICES	
Housing	
13.01.11.1 Housing	PPPs for actual rentals
Health benefits & reimbursements	
13.02.11.1 Pharmaceutical products 13.02.11.2 Other medical products 13.02.11.3 Therapeutic appliances and equipment 13.02.12.1 Out-patient medical services 13.02.12.2 Out-patient dental services 13.02.12.3 Out-patient paramedical services	PPPs for household final consumption expenditure on: - Pharmaceutical products[1] - Other medical products[1] - Therapeutic appliances and equipment[1] - Out-patient medical services[1] - Out-patient dental services[1] - Out-patient paramedical services[1]
13.02.12.4 Hospital services	PPPs for production of health services by government (without receipts from sales)
Production of health services	
Intermediate consumption: 13.02.22.1 Pharmaceutical products 13.02.22.2 Other medical goods 13.02.22.3 Therapeutic appliances and equipment	PPPs for household final consumption expenditure on: - Pharmaceutical products - Other medical products - Therapeutic appliances and equipment
13.03.22.4 Intermediate consumption n.e.c.	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
13.02.23.1 Gross operating surplus	PPPs for gross fixed capital formation
13.02.24.1 Net taxes on production	PPPs for production of health services by government (without net taxes on production and receipts from sales)
13.02.25.1 Receipts from sales	PPPs for production of health services by government (without receipts from sales)
Recreation and culture	
13.03.11.1 Recreation and culture	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
Education benefits & reimbursements	
13.04.11.1 Education benefits & reimbursements	PPPs for production of education services by government (without receipts from sales)
Production of education services	
13.04.22.1 Intermediate consumption	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
13.04.23.1 Gross operating surplus	PPPs for gross fixed capital formation
13.04.24.1 Net taxes on production	PPPs for production of education services by government (without net taxes on production and receipts from sales)
13.04.25.1 Receipts from sales	PPPs for production of education services by government (without receipts from sales)
Social protection	
13.05.11.1 Social protection	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
COLLECTIVE SERVICES	
14.01.12.1 Intermediate consumption (collective services relating to defence)	PPPs for gross fixed capital formation in machinery and equipment
14.01.12.2 Intermediate consumption (collective services other than defence)	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
14.01.13.1 Gross operating surplus	PPPs for gross fixed capital formation
14.01.14.1 Net taxes on production	PPPs for production of collective services by government (without net taxes on production and receipts from sales)
14.01.15.1 Receipts from sales	PPPs for production of collective services by government (without receipts from sales)

[1] Strictly speaking these are not reference PPPs as they have been calculated specifically to be used with both household expenditure and government expenditure. See paragraph 5.12 and footnote 4.

recreation and culture, social protection and receipts from sales).

5.17. The choice of the PPPs for gross fixed capital formation in machinery and equipment as the reference PPPs for the intermediate consumption of collective services relating to defence is less evident. The explanation is that the major part of intermediate consumption of defence consists of expenditure on machinery and equipment that are not dual purpose – that is, they are for military use only and can not be put to civilian use as well. Such expenditure is classified as intermediate consumption - and not as gross fixed capital formation - in the SNA 93 and the ESA 95.

5.18. There is a certain amount of recycling in the derivation of some of the references PPPs. For example, the reference PPPs for hospital services are the PPPs for the production of health services by government (without receipts from sales). These reference PPPs are the weighted averages of the PPPs for compensation of employees, intermediate consumption, gross operating surplus and net taxes on production. Of these four sets of PPPs, only the PPPs for compensation of employees are based on specifically-collected price data. These are the input prices obtained through the survey of compensation of employees described below. The PPPs for intermediate consumption, gross operating surplus and net taxes on production are themselves reference PPPs.

Survey of compensation of employees[6]

5.19. The remaining nine basic headings in Box 5.2 – that is, those not highlighted in grey - all refer to compensation of employees. PPPs for these basic headings are calculated using the compensation of employees that participating countries are required to report for a selection of occupations in general government, public education and public hospitals. The selection is made by Eurostat and the OECD in consultation with the participating countries. The intention is to represent the various education and skill levels that are commonly to be found among employees working in these three government services. The selection is reviewed from time to time, but irregularly. Forty-six occupations are included in the current selection: forty civilian occupations, six military occupations. They are listed in Box 5.4. Those in *italics* appear more than once, usually under education services and other collective services. The civilian occupations are defined using job descriptions taken from the ISCO-88[7]. These descriptions specify the occupations in terms of the kind of work done and are attached to the survey questionnaire that countries have to complete each reference year. The military occupations are specified as NATO[8] ranks and their country equivalents. They refer to members of the regular armed forces and not to conscripts.

5.20. The compensation of employees that participating countries are to report for the selected occupations is defined in Box 5.5 as comprising gross salaries and wages – that is, the basic salary or wage plus other cash payments over and above the basic salary or wage - employers' actual social contributions and imputed social contributions. The definition is consistent with that of the SNA 93 and the ESA 95 except for the exclusion from gross salaries and wages of overtime payments and benefits in cash and kind not related to the salary scale. Experience has shown that it is too difficult to obtain data on overtime that are comparable across countries. This results in volume measures that are marginally inflated, but their comparability is judged to be improved by ignoring overtime. It has also proved difficult for countries to evaluate benefits in cash and kind not related to the salary scale as they can vary from one government institution to another. In most cases, the contribution of such benefits to the total is negligible, so they too are omitted.

5.21. The compensation of employees to be reported for the selected occupations should not be extracted from government payrolls. Dividing the total compensation of employees paid to employees in a selected occupation by the total number of full-time employees (or full-time equivalents) in the selected occupation gives an average that is representative of the country, but it does not give an average that is comparable across countries. This is because the distribution of the employees in the selected occupation over the grades, categories and steps that make up the pay scale for the occupation will differ from country to country. Instead, the compensation of employees should be derived by a less representative but more comparable approach that involves working from government salary scales directly. The approach is described in the paragraphs below. Many participating countries find it difficult, if not impossible, to implement. Either they do not have the employment data required or the government pay system does not conform, or no longer conforms, to the model underlying the approach. These countries resort to extracting the compensation of employees from government payrolls or other statistical sources.

5.22. The prescribed approach is as follows. Underlying the compensations of employees paid by government are the basic salaries and wages that are laid down in government salary scales. Once the basic salary or wage has been established for an occupation, computing the compensation of employees is relatively straightforward because the other components of compensation of employees are normally related to the salary scale by being defined as percentage additions to the basic salary or wage. To determine the compensation of employees for the selected occupations, countries have first to locate the basic salary or wage for each selected occupation in the government salary scales. The procedure to be applied is explained in Box 5.6.

Box 5.4: Selected occupations

Production of health services	Physicians	Other medical staff	Non-medical staff	
01. Doctor, head of department	X			
02. Doctor, senior consultant	X			
03. Doctor	X			
04. Nurse, head of department		X		
05. Nurse, operating theatre		X		
06. Nurse		X		
07. Nursing auxiliary		X		
08. Physiotherapist		X		
09. Laboratory assistant		X		
10. Hospital chief executive			X	
11. Secretary I			X	
12. Cook			X	

Production of education services	Pre-primary & primary	Secondary	Post-secondary	Tertiary
13. Kindergarten teacher	X			
14. Primary school teacher	X			
15. Secondary school teacher		X	X	
16. Head teacher	X	X	X	X
17. University lecturer			X	X
06. Nurse	X	X		
24. Finance department manager	X	X	X	X
25. Executive official (skill level III)	X	X	X	X
26. Executive official (skill level IV)	X	X	X	X
27. Computer operator	X	X	X	X
28. Bookkeeping clerk	X	X	X	X
29. Data entry clerk	X	X	X	X
30. Secretary II	X	X	X	X
31. Telephone switchboard operator	X	X	X	X
32. Messenger	X	X	X	X
33. Maintenance electrician	X	X	X	X
34. Building caretaker	X	X	X	X
35. Cleaner	X	X	X	X
39. Social worker	X	X	X	X

Production of collective services	Defence	Other than defence		
18. Private of infantry regiment	X			
19. Commander of infantry regiment	X			
20. Able seaman	X			
21. Commander of frigate	X			
22. Airman	X			
23. Fighter pilot	X			
24. Finance department manager		X		
25. Executive official (skill level III)		X		
26. Executive official (skill level IV)		X		
27. Computer operator		X		
28. Bookkeeping clerk		X		
29. Data entry clerk		X		
30. Secretary II		X		
31. Telephone switchboard operator		X		
32. Messenger		X		
33. Maintenance electrician		X		
34. Building caretaker		X		
35. Cleaner		X		
36. Policeman/woman		X		
37. Prison guard		X		
38. Fire-fighter		X		
39. Social worker		X		
40. Town planner		X		
41. Civil engineer		X		
42. Draughtsman		X		
43. Construction labourer		X		
44. Driver		X		
45. Agricultural scientist		X		
46. Librarian		X		

Box 5.5: Compensation of employees

Compensation of employees includes all payments in cash and kind made by general government in a year. These payments in cash and kind comprise:

- **Gross salaries and wages** (before deduction of taxes and social contributions payable by employees) covering:

   o Basic salaries and wages as laid down in the salary scales;

   o Other payments, over and above the basic salary or wage, such as: housing or residence allowance, passage or leave allowance, family allowance (for the purpose of Eurostat-OECD comparisons this is taken to cover a married employee with two dependent children), special duty allowance or acting allowance, 13th month pay and other cash payments other than overtime payments. It is difficult to obtain data on overtime payments that are comparable across countries. _Overtime payments are not to be included_ when calculating the gross salaries and wages of selected occupations for Eurostat-OECD comparisons.

   o Benefits in cash or kind that are not related to the salary scale, such as free or subsidised housing, transport allowance, reimbursement of medical expenses and the like. These benefits are difficult to evaluate, as they can vary from one general government institution to another, and in most cases are negligible relative to the total. _Such benefits are not to be included_ when calculating the gross salaries and wages of selected occupations for Eurostat-OECD comparisons.

- **Employers' actual social contributions** consisting of the payments made by general government institutions to insurers for the benefit of their employees. These payments cover contributions for old age pensions, as well as for insurance against sickness, accident and disability. They are calculated on the basis of the schemes in operation in the various countries.

- **Imputed social contributions** representing the counterpart to social benefits paid directly by general government institutions without participating in, or establishing a fund, reserve or other special scheme for this purpose. Since these contributions do not involve actual cash flows, they have to be imputed. The imputations have to be done in line with the corresponding imputations made in the national account. For example, government may pay pensions to retired employees from general revenue. In such a case, national accountants usually evaluate the pension element by reference to the compensation paid to past employees during their term of employment and to the average pensions paid over recent years. The ratio, pensions paid per compensation of employees, supplies the contribution in the form of a rate which can be applied to the basic salary for each occupation.

5.23. The compensation of employees reported for each selected occupation must be annual. This is not a particularly difficult requirement as salary scales usually show annual amounts and any revisions to the salary scales that take place during the reference year are relatively straightforward to accommodate. When there are revisions, a weighted average needs to be calculated. This can be illustrated by returning to the example of an executive official with skill level III in Box 5.6. If a five per cent increase in salaries came into effect in October of the reference year, for the first nine months the salary for category T3 would be 46,800 and for the last three months it would be 49,140. The weighted average of the two provides the basic salary required: ([46,800 x 9] + [49,140 x 3]) / 12 = 47,385.

5.24. The compensation of employees should also be the national average taking into account the discrepancies in compensation which may arise between the several levels of government – that is, between central, regional, state and local governments - and within the same level of government – that is, between different ministries and departments of central government or between different regional governments, state governments or local governments. Unless there are national salary scales, this can be a problem because access to the various salary scales that need to be consulted is often not readily available. Even if access is obtained, there is still the question of how to combine them. In principle some form of weighted average should be used.

5.25. One solution that countries have adopted to the absence of national salary scales for general government is to use only the salary scales of central government. The validity of this approach depends on the extent to which the wages and salaries paid by central government are representative of those paid by general government. Some adjustments may be necessary to make them more representative such as excluding the allowance paid to compensate for the higher costs associated with working in the capital city. But it is not a complete solution because there are occupations – such as teachers or doctors in some countries – that are employed by regional, state or local governments and not by the central government. For the selected occupations that fall into this group, the need to refer to the salary scales of the appropriate level of government remains. The most obvious, although not necessarily the most feasible, approach to this situation would be to draw – either purposively or at random - a small sample of the relevant government levels with "probability proportional to size".

Reporting prices

5.26. Countries are required to report the compensation of employees and its components for each of the selected occupations listed in Box 5.4 on the electronic reporting form that Eurostat and the OECD provide with the survey questionnaire. On the same form, countries are also required to report for each

Box 5.6: Determining the basic salary for a selected occupation using a salary scale

Grades and Categories	Steps						
	1	2	3	4	5	6	7
P4	88,900	91,400	93,900	96,400	98,900	101,400	103,900
P3	76,800	78,800	80,800	82,800	84,800	86,800	89,000
P2	66,100	67,900	69,700	71,500	73,300	75,100	76,900
P1	53,600	55,000	56,400	57,800	59,200	60,600	62,000
T4	47,900	49,500	51,100	52,700	54,300	55,900	57,500
T3	41,200	42,600	44,000	45,400	46,800	48,200	49,600
T2	35,500	36,700	37,900	39,100	40,300	41,500	42,700
T1	31,100	32,100	33,100	34,100	35,100	36,100	37,100
W4	34,700	35,700	36,700	36,800	36,900	37,000	37,100
W3	31,300	32,300	33,300	34,300	35,300	36,300	37,300
W2	28,400	29,200	30,000	30,800	31,600	32,400	33,200
W1	25,700	26,500	27,300	28,100	28,900	29,700	30,050

1. Employees in public administrations are usually paid on the basis of a salary scale such as the simplified version shown above. The scale is divided into grades – P, T and W. Grades generally correspond to levels of education or skills. The ISCO-88, for example, identifies four skill levels. Level I is defined as five years of primary education. Level II is defined as five to six years of secondary education supplemented or partly replaced by a period of on-the-job training. Level III is defined as three to four years of post-secondary education leading to an award not equivalent to a graduate university degree. And level IV is defined as three or more years of post-secondary education leading to an award of a graduate or postgraduate university degree or its equivalent. In the salary scale above, the W grade corresponds to skill levels I and II, the T grade corresponds to skill level III and the P grade corresponds to skill level IV.

2. Within grades there are various career brackets over several categories – 1 to 4 above - and each category is itself divided into steps - 1 to 7 above. Each step is usually 12 months, though steps of 18 or 24 months are not uncommon. For each selected occupation the category that is most representative in each country is to be identified. The criterion that should be used for this is the number of employees in each of the categories associated with the selected occupation and taking the modal category. The appropriate step within the category is indicated by the seniority specified for the selected occupation. For convenience, the same seniority is specified for all the selected occupations, namely: five years or five steps if each step is 12 months.

3. Take, for example, an executive official with skill level III – selected occupation number 25 in Box 5.4. Such officials would be associated with grade T, and possibly the lower categories of grade P, in the salary scale above. If the distribution of these officials over the relevant categories was 15 per cent T1, 25 per cent T2, 35 per cent T3, 20 per cent T4 and 5 per cent P1, then T3 being the most frequent would be the modal category. If each step is 12 months, the salary for category T3 with five years seniority – equivalent to five steps – will be 46,800. But if each step was 18 months or 24 months, five years seniority would be equivalent to four steps and a salary of 45,400 in the case of 18 month steps and to three steps and a salary of 44,000 in the case of 24 month steps.

4. It can happen that the distribution of employees over the categories associated with a particular occupation is bimodal, or approximately bimodal. In such cases the salary of both categories should be determined and an arithmetic average taken of the two. For example, if in the distribution of executive officials in the previous paragraph categories T2 and T3 were both 30 per cent, the salary – assuming steps of 12 months - would be 40,300 for T2 and 46,800 for T3. In this case the basic salary for an executive official with skill level III would be the arithmetic average of the basic salaries established for these two categories – which is, (40,300 + 46,800) / 2 or 43,550.

selected occupation: the standard number of hours worked per week, the holiday entitlement (number of working days paid leave), the number of public holidays falling on working days during the reference year, and the percentage share of the occupation within the basic heading for which it has been selected[9].

5.27. The standard number of hours worked per week and the number of working days taken as holidays should refer to an employee working in the selected occupation at the modal category with the specified years of seniority – that is, the employee to whom the reported compensation of employees refers. These data are used by Eurostat and the OECD to standardise the compensation of employees across countries. The norm applied is 1710 hours – that is, 52 working weeks, each of 38 hours duration, less 7 working weeks (or 35 working days) of paid leave and public holidays. The compensation of employees of selected occupations working less than 1710 hours are increased proportionally. The compensation of employees of selected occupations working more than 1710 hours are decreased proportionally.[10]

5.28. The percentage shares of the selected occupations within their basic headings should refer to the wider groups of employees that the selected occupations represent and not just to the employees in the selected occupations. The selected occupations are a sample. And each occupation selected represents a stratum of employees that have comparable occupations and similar levels of compensation of employees. The percentage shares are to relate to these occupational strata. But the sample is purposive and, in the absence of explicit sampling ratios, these percentage shares have to be derived in the manner described in Box 5.7.

5.29. Eurostat uses the percentage shares in conjunction with the standardised compensation of employees to obtain expenditure weights for each selected occupation that can be used when calculating PPPs for the basic heading to which it is assigned. For example, assume that for a basic heading covering compensation of employees three occupations have been selected - X, Y and Z. Assume also that the standardised compensation of employees for the three occupations are 150 for X, 100 for Y and 80 for Z and that percentages shares of the three occupations are 20 for X, 30 for Y and 50 for Z. The total compensation paid to persons working in these occupations would then be [150 x 20] + [100 x 30] + [80 x 50] or 3000 + 3000 + 4000 or 10,000 and the expenditure weights would be 30 per cent for X, 30 per cent for Y and 40 per cent for Z.

Validation of prices

5.30. There are two edits that participating countries should carry out before they return the completed reporting form to Eurostat or the OECD. The first is to check the internal coherency of the data set. For example, it is usually the case that: doctors earn more than nurses; head teachers earn more than other teachers; officers in the armed forces earn more than privates, able seamen and airmen; executive officials with a university degree (skill level IV) earn more than executive officials without a university (skill level III); etc. Income differentials between occupations that are contrary to expectations should be verified. And errors identified in this way should be corrected.

5.31. The second edit is to check the consistency between the compensation of employees that are to be reported for the latest reference year and the compensation of employees that were reported for the previous reference year. Differences can be expected between the two data sets because either the salary scales have changed between the two periods or, but less likely, the modal categories have changed. Discrepancies that cannot be explained in this way should be verified. If there are errors, they could be with either or both data sets. In all cases, errors should be corrected. Errors in the compensation of employees previously reported should be brought to the attention of Eurostat or the OECD.

5.32. Eurostat and the OECD will repeat these two edits and request countries to explain or correct the discrepancies observed. They will also apply the Quaranta editing procedure to compare the price levels of the compensation of employees reported for the selected occupations across countries. The outliers identified through this procedure will be returned to the countries reporting them for verification. Countries are required to either correct the compensation of employees originally reported or to confirm that they are correct.

Box 5.7: Determining the percentage shares of selected occupations within a basic heading

Grades and categories	Part I							Part II				
	Number of employees in selected occupations					Total number of employees in selected occupations	Total number of employees covered by the basic heading	Number of employees represented by selected occupations				
	A	B	C	D	E			A	B	C	D	E
P4	30					30	200	200				
P3	50	20				70	700	500	200			
P2	20	80				100	1600	320	1280			
P1		50	50			100	1800		900	900		
T4		50	100			150	1100		365	735		
T3			50	50		100	1250			625	625	
T2				100		100	1950				1950	
T1				50		50	750				750	
W4				50	50	100	150				75	75
W3					100	100	200					200
W2				50		50	100					100
W1					50	50	200					200
Total	100	200	200	250	250	1000	10,000	**1020**	**2745**	**2260**	**3400**	**575**
Percentage shares to be reported						100		10	27	23	34	6

1. The table above refers to an unspecified basic heading covering compensation of employees paid by general government. It is has two parts. Part I shows the distribution of employees over the grades and categories of the salary scale from Box 5.6 for: five selected occupations (A, B, C, D and E); the total number of employees in the selected occupations (1000); and the total number of employees covered by the basic heading (10,000).

2. Part II shows the total number of employees covered by the basic heading (10,000) distributed over the grades and categories of the Box 5.6 salary scale and the occupational strata represented by the selected occupations (A, B, C, D, and E). The distribution has been derived by assuming that the total number of employees covered by the basic heading is distributed over the occupational strata and the grades and categories in the same proportions as the employees in the selected occupations (1000) are distributed in Part I. The total shown in bold for an occupational stratum is number of employees that the corresponding selected occupation represents. For example, selected occupation A actually represents 1020 employees and not just the 100 employees of Part I.

3. It is the percentage shares based on the totals for the occupational strata that are to be reported.

ANNEX TO CHAPTER 5: PRODUCTIVITY ADJUSTMENTS

i.   The input-price approach as applied by Eurostat and the OECD does not take into account differences in productivity between the producers of non-market services in different countries. It assumes that non-market producers are equally efficient and that the same level of input will yield the same volume of output regardless of the country in which the non-market producer is operating. This assumption might be tenable when countries are at similar levels of income - as were most of the nine participating countries in the early 1970s when the input-price approach was first used by Eurostat. But, when income levels vary to the extent they do among countries currently participating in Eurostat-OECD comparisons, the assumption is difficult to defend and the anomalies it gives rise to have at least to be recognised.

ii.   Box A shows the rankings of the per capita volume indices of GDP and GFCE for the 43 countries that participated in the 1999 Eurostat-OECD comparison. On the supposition that there is a positive correlation between the level of a country's income and its level of government expenditure, the rank of a country's per capita volume index of GFCE can be expected to shadow the rank of its per capita volume index of GDP. The two would not necessarily be the same, but they would be broadly similar. This clearly was not so for the United States, Switzerland, Ireland, Sweden, France, Israel, the Czech Republic, Korea, Hungary and the Slovak Republic in 1999.

iii. Some of the differences in rank are real differences that can be explained by the varying political, cultural, demographic and institutional circumstances of the countries. Others are not real. They arise because the productivity differences that exist between the non-market producers of the countries were not taken into account when the indices were calculated. Differences in productivity are being disguised as price differences. Hence, the volumes of output of non-market producers in countries whose cost of inputs are relatively low are being overestimated and the volumes of output of non-market producers in countries whose cost of inputs are relatively high are being underestimated. The relative cost of inputs is reflected by the comparative price levels indices for GFCE shown in the last column of Box A.

iv.   The failure to take account of productivity differences between the producers of non-market services in different countries does not only affect the PPPs and volume indices of health services, education services and collective services. It also affects the PPPs and volume indices of the main aggregates of which these expenditure categories are a part, namely: actual individual consumption (by households), actual collective consumption (by government) and GDP. And it is the effect on the volume indices of these aggregates – particularly the volume indices of GDP – that are the primary concern. Non-market services are not specifically a problem for international spatial comparisons. They are also a problem for national temporal comparisons. But it is a much more serious problem for international comparisons. Differences in the productivity of producers of non-market services between countries are significantly larger than the year-to-year changes in productivity of non-market producers of individual countries.

v.   One solution would be to complement the input-price approach with adjustments for differences in productivity. This was the strategy adopted by Statistics Austria when it organised the Group II comparisons covering eastern and central European countries for the European Comparison Programme (ECP).[11] An adjustment was made for differences in labour productivity. It was based on the assumption that productivity differences between the non-market producers of countries were roughly equal to the productivity differences between their market producers. The market sector was defined as all economic activities except agriculture and non-market services. Productivity was defined as value added per employee. And nominal market-sector value added was converted to real market-sector value added with the PPPs for that part of final expenditure on GDP that was generated by market activities.

vi.   Box B shows two sets of volume indices for GDP per capita for the thirteen transition economies that constituted Group II in 1996. Both sets of indices were obtained by the input-price approach. The first set are the indices before being adjusted for differences in labour productivity. The second set are the indices after being adjusted.[12] The per cent differences between two sets are large and, if the adjusted indices are to be believed, large enough to be of concern.[13]

vii. EU Member States and OECD Member Countries have not been in favour of such an adjustment being employed in Eurostat-OECD comparisons. Besides considering the approach too simple for their economies, they question its underlying assumption, arguing that productivity differences between countries are likely to be smaller in the non-market sector than they are in the market sector because the productivity of non-market producers is less dependent on capital inputs than the productivity of market producers. More generally, they argue against productivity adjustments because they are inevitably based on assumptions which cannot be verified without a genuine measurement of output. And, if output could be measured, then input methods would not be necessary.

Box A: Per capita volume indices for GDP and GFCE and their rankings, 1999

Countries participating in the 1999 Eurostat-OECD comparison	Per capita volume indices		Ranking		Comparative price levels
	GDP	GFCE	GDP	GFCE	GFCE
Luxembourg	190	149	1	7	138
United States	149	104	2	24	123
Norway	128	166	3	5	117
Switzerland	127	90	4	30	146
Denmark	124	185	5	2	121
Iceland	122	197	6	1	97
Canada	117	129	7	12	83
Netherlands	117	170	7	4	91
Ireland	114	104	9	24	91
Austria	113	131	10	11	104
Japan	110	120	11	16	127
Australia	109	125	12	13	80
Belgium	109	137	12	9	101
Germany	109	113	12	19	116
Italy	106	105	15	22	94
Sweden	104	166	16	5	117
Finland	103	137	17	9	105
United Kingdom	103	123	17	14	98
France	102	145	19	8	102
Israel	88	176	20	3	73
Cyprus	86	102	21	26	64
Spain	84	93	22	29	76
New Zealand	83	110	23	21	67
Portugal	75	105	24	22	57
Greece	70	76	25	34	63
Slovenia	70	116	25	17	47
Czech Republic	60	122	27	15	23
Korea	60	44	27	40	54
Malta	56	97	29	27	48
Hungary	51	116	30	17	24
Slovak Republic	49	112	31	20	17
Poland	40	61	32	37	27
Estonia	38	97	33	27	23
Mexico	37	43	34	41	33
Croatia	37	80	35	32	39
Lithuania	34	88	36	31	19
Latvia	29	78	37	33	19
Bulgaria	28	52	38	39	12
Macedonia	27	58	39	38	48
Russian Federation	27	69	39	43	8
Turkey	26	36	41	42	31
Romania	24	42	42	42	13
Ukraine	16	62	43	36	5
OECD	100	100	---	---	100

Box B: Per capita volume indices for GDP before and after productivity adjustments

ECP Group II 1996	GDP per capita volume indices		Per cent difference
	Input prices	Productivity adjusted	
Austria	100.0	100.0	---
Slovenia	59.7	53.6	-10.2
Russia	30.4	26.1	-14.2
Estonia	30.2	24.8	-17.9
Romania	29.8	25.0	-16.1
Croatia	28.4	23.8	-16.2
Lithuania	26.0	21.4	-17.6
Belarus	23.3	19.3	-17.3
Latvia	22.8	18.9	-17.1
Bulgaria	22.6	18.9	-16.2
Macedonia	19.1	14.1	-26.2
Ukraine	15.0	11.6	-22.6
Albania	13.0	11.0	-15.4
Moldova	9.5	7.3	-23.0

viii. Many outputs of non-market producers of individual services are equivalent to those of market producers of individual services. An alternative to productivity adjustments would be to value these outputs of the non-market sector at the same market prices as their counterparts in the market sector and to calculate PPPs for non-market services accordingly. But, even if a non-market service is identical to a market service, there is no reason to believe that the production of the service by non-market producers is as efficient as that of market producers. Non-market producers are under no constraint to maximise profits or minimise losses and it cannot be assumed that they employ inputs with a view to equating average real wages and marginal product. Their production, in other words, may be less efficient and more costly than market production and have correspondingly higher shadow prices. The cost differences between market and non-market producers are likely to be greater in some countries than in others. To use the prices of market output to calculate PPPs for non-market output would also be making an assumption, albeit implicit, about the productivity of market and non-market producers.[14]

ix. Reference PPPs - or, more specifically, the PPPs for individual consumption expenditure by households – have been proposed as an alternative to the input-price approach.[15] Two arguments have been advanced for adopting this alternative. The first is that, as the purpose of Eurostat-OECD comparisons is primarily to compare economic welfare, it is justifiable to use the PPPs for household expenditure as reference PPPs for government expenditure because it provides a measure of consumption forgone. The second is that the PPPs for household expenditure are better estimates of the PPPs for government expenditure than the PPPs obtained through the input-price approach.

x. Neither of these arguments has found support among EU Member States and OECD Member Countries. The first argument is based on the wrong premise. The purpose of Eurostat-OECD comparisons is to compare real GDP across participating countries. In so far as GDP per capita is a measure of economic welfare, its purpose is to compare economic welfare. But it is output that is being compared, not consumption or consumption forgone. The second argument is difficult to justify theoretically and there is little empirical evidence to support it. While use of a reference PPP appears to remove some of the counter-intuitive results of the input-price approach, it produces other results that are equally counter-intuitive.

xi. Efforts by Eurostat and the OECD to develop other approaches to non-market services have been handicapped by lack of data and the poor comparability of the information that was available. For example, an attempt to use physical measures of output to obtain the volume ratios directly for education and health services in EU Member States foundered on the lack of comparable physical measures of output.[16] This obstacle to the development of alternative approaches has become even greater with the increase in the number of countries participating in Eurostat-OECD comparisons. It is unlikely that either Eurostat or the OECD will find an acceptable replacement for the input-price approach in the short or medium term. In the long term, the solution will probably be found at the national level first.

[1] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[2] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[3] Non-market services are also called "comparison resistant services" because, as explained in the chapter, they have no economically-significant prices with which to value outputs, their units of output cannot be otherwise defined and measured, the institutional arrangements for their provision and the conditions of payment differ from country to country, and their quality varies between countries but the differences cannot be identified and quantified.

[4] The PPPs calculated with these output prices are to be used for both household expenditure and government expenditure on individual services purchased from market producers to avoid double counting. Suppose, for example, that the quantity of health services purchased is 1000 units and that the price per unit is 10 € of which households pay 2 € and government 8 €. In the national accounts, 2000 € will be recorded as household expenditure and 8000 € will be recorded as government expenditure. If the amounts actually paid – that is, 2 € by households and 8 € by government are used to deflate these expenditures, it will seem that both households and government have each purchased 1000 units or 2000 units in total. But if the total amount paid - that is 10 € - is used, households will appear to have purchased 200 units and government 800 units - a total of 1000 units.

[5] The rolling benchmark approach requires the prices of consumer products not surveyed during the reference year to be extrapolated using CPI sub-indices. As CPI sub-indices are based on prices actually paid by households, extrapolations of composite market prices can be problematic if the share of the composite price paid by household (and therefore the share paid by government) changes in years when the prices for the goods and services in question are not surveyed.

[6] Compensation of employees is by far the largest cost component of government expenditure on non-market services. In EU Member States and OECD Member Countries, it accounts on average for over 50%, 60% and 70% respectively of expenditure on government-produced collective, health and education services.

[7] *International Standard Classification of Occupations 1988*, International Labour Office, Geneva, 1990.

[8] North Atlantic Treaty Organisation.

[9] Countries participating in OECD comparisons are not asked to report the percentage shares of the occupations.

[10] Eurostat standardises the working hours for all occupations except those in education. The OECD standardises the working hours for all occupations other than those in defence, education and health.

[11] See, for example*, International Comparison of Gross Domestic Product in Europe 1993: Results of the European Comparison Programme*, Conference of European Statisticians Statistical Standards and Studies No. 47, United Nations, New York and Geneva, 1997.

[12] Official productivity adjustments for Group II countries were stopped after the 1993 comparison. Even so, Statistics Austria continued making productivity adjustments for Group II countries and the adjusted results were presented at ECP consultations for analytical purposes. The two sets of indices for 1996 were extracted from *Purchasing Power Parities (PPPs)*, unpublished OECD document, STD/NA(98)16.

[13] The differences between unadjusted and adjusted per capita volume indices become greater the lower the level of aggregation. At the level of specific non-market services such as health and education, the differences, if they are real differences, are large enough to question the usefulness of the volume comparisons of these non-market services that are based on unadjusted indices.

[14] See *Purchasing Power Parities for Non-Market Services: An Assessment of Alternative Methods*, E. Dean, unpublished paper presented at the Conference of the International Comparison Programme, World Bank, Washington, March 2002.

[15] See *Review of the OECD-Eurostat PPP Programme*, I. Castles, unpublished OECD document, STD/PPP(97)5, September 1997 and *A PPP Comparison for the NIS, 1994, 1995 and 1996: Final Report*, Centre for the Co-operation with Non-Members, OECD, Paris, 1999.

[16] *Calculation of purchasing power parities and volume ratios between Member States in the area of education and health services*, W. Krug and N. Rehm, University of Trier, Germany, 1992.

CHAPTER 6: CAPITAL GOODS AND SERVICES

Introduction

6.1. Gross capital formation is defined in the SNA 93[1] and the ESA 95[2] as the sum of gross fixed capital formation (GFCF), change in inventories and acquisitions less disposals of valuables. For the purposes of Eurostat and OECD comparisons, prices are collected only for GFCF. As prices are not collected for either change in inventories or acquisitions less disposals of valuables[3], this chapter is concerned primarily with the methods used to collect prices for GFCF.

6.2. GFCF is one of the seven main aggregates in the Eurostat-OECD expenditure classification. It comprises three expenditure categories: machinery and equipment (referred to throughout the rest of this chapter as "equipment goods"), construction and "other products"[4]. Together these three expenditure categories account for around 20 per cent of final expenditure on GDP in most EU Member States and OECD Member Countries. GFCF is therefore an important main aggregate.[5] It is also one of the more difficult and costly for which to collect internationally comparable and representative prices.[6] One reason for this is the complexity and variability of the products being priced. Construction projects, for example, are basically unique products even within the same country. It is because of this that Eurostat-OECD product specifications for equipment goods and construction projects are drawn up by engineers and quantity surveyors and not by statisticians. Another reason is that the expertise needed to draw up the Eurostat-OECD product specifications is also required to match and price them and this expertise is not usually available in most national statistical agencies. Typically the pricing of capital goods - particularly the pricing of construction projects - has to be contracted out to consultancy firms that specialise in engineering or in construction.

6.3. Eurostat-OECD comparisons are made by comparing the prices actually paid for comparable and representative products in the countries participating in the comparisons. Therefore, the products priced for a comparison of equipment good prices and a comparison of construction prices should be both comparable across the participating countries and representative of their price levels. In addition, the prices collected for these products should be transaction or market prices – that is, the prices that purchasers actually pay for the products to be delivered / assembled / installed / built in working order at the time and the place required by the purchasers. As such, they should include trade margins, transport and delivery cost, assembly and installation costs and non-deductible taxes on products. They should also be net prices inclusive of all discounts, surcharges and rebates. And they should be consistent with the prices underlying the expenditure estimates they are used to deflate – that is,

they should be national annual averages that reflect the level of prices over the whole of the country and over the whole of the reference year.

6.4. This chapter explains how national annual purchasers' prices are to be collected for a comparable and representative set of equipment goods and construction projects within the framework of a Eurostat-OECD comparison. It has three parts. The first part deals with the survey of equipment good prices and the second part with the survey of construction prices. The price surveys are conducted once every two years.[7][8] PPPs for GDP have to be calculated every year for EU Member States and EU associated countries[9]. Such calculations require PPPs for at least the principal expenditure groups and classes of GFCF. The third part of the chapter describes how PPPs for GFCF are estimated for the years in which there are no price surveys.

6.5. There is no price survey for "other products" – the third category of GFCF mentioned above. Of these products, only computer software is priced. It is included in the survey of equipment good prices and treated accordingly. Reference PPPs – or, more precisely, the overall PPPs for GFCF based on the prices collected for equipment goods and construction projects - are used for the "other products" that are not priced.

PART I: PRICING EQUIPMENT GOODS

General approach

6.6. The approach adopted for the survey of equipment good prices is similar to that followed for consumer goods and services – that is, specification pricing. This is the pricing methodology that involves the selection of a basket of precisely-defined products with a view to having comparable products priced in each country. The selection is made in consultation with the countries participating in the comparison. The products are defined in terms of characteristics that influence their purchasers' price. The objective is to price to constant quality in order to produce price relatives between countries that reflect "pure" price differences. The characteristics specified cover both the product (performance, operation and quality) and the transaction (order size, discounts, delivery and installation). The products priced by countries should be identical, but, if they are not, they should at least be equivalent – that is, meet the same needs with equal efficiency. For equipment goods, this means that the products priced do not necessarily have to be the same make and model and that some deviation from the technical parameters is tolerated. Transaction characteristics have to be respected because countries are required to report actual transaction prices and not list or catalogue prices.

Box 6.1: Product specification and price reporting form[1]

EQUIPMENT GOODS SURVEY 200X			Country
16.11: Tractor unit			*Austria*
Product	**Proposed**		**Priced**
Make (and nationality):	Mercedes Benz (German)		*Scania (Swedish)*
Model:	ABC–18-4x2		*XYZ-19-4x2*

Specifications		**Metric**	**Imperial**	**National**
01	GVW.	18000 kg	17.7 tons	*19000 kg*
02	Wheelbase	5700 mm	224 in	*5500 mm*
03	Engine capacity	11,946 l	729 cu in	*12.0 l*
04	Engine power output	292 kw	394 bhp	*338 kw*
05	Gearbox: number of forward speeds	16	16	*14*
06	Type of suspension: front	spring	spring	*spring*
07	Type of suspension: rear	air	air	*air*
08	Type of braking	ABS	ABS	*ABS*
09	Type of cab	1845 mm	73 in	*1900 mm*
10	With standard roof	yes	yes	*yes*
11	Fixed fifth wheel coupling	included	included	*included*
12				

Terms and conditions

a	Order quantity	one	one	*one*
b	Unit price	one	one	*10,500*
c	Currency	specify	specify	*euros*
d	Delivery costs to be included	yes	yes	*yes*
e	Installation costs to be included	no	no	*no*
f	Discount to be included	yes (%)	yes (%)	*(- 5%) - 525*
Total unit price without VAT				*9,975*

Representativity and comparability

Is the product priced representative (yes) or unrepresentative (no)?	*yes*
Is the product priced identical (1), equivalent (2) or not comparable (3) to the one specified?	*2*

Options

Price of standard model. No options available.

Notes

The model specified is not available. Expected on the market early next year.

Delivery costs not invoiced separately. Included in unit price.

Website address

www.mercedesbenz.com

[1] Product specification and price reporting forms evolve from price survey to price survey. This example illustrates their basic format and content.

Product specification

6.7. An example of a product specification for an equipment good is given in Box 6.1. (It is also the price reporting form with countries completing the area in grey.) First, the type of equipment good is identified - a tractor unit in this case. Next, the proposed make and model to be priced are identified, though occasionally no make and model are proposed. The nationality of the manufacturer is also given, but, with globalisation, the location of a manufacturer's headquarters does not necessarily imply that this is where the product or its various components are manufactured or even assembled. The characteristics of the product follow the identifiers. They are given in two parts. The first part specifies the technical parameters in both metric and imperial measures. These are broadly ranked in order of importance to assist matching. The second part specifies terms and conditions of sale - that is, the characteristics of the transaction. These are followed by two questions: one on the representativity of the product priced, the other on its comparability with the product specified. Finally, there are boxes in which to list options and extras and their prices and to note and explain deviations from the specification or the pricing guidelines. The website address of the manufacturer is also given for most products.

This can be visited by price collectors for further information, including pictures and lists of distributors of the products being surveyed.

6.8. Products specified for the equipment goods survey are new – that is, unused. Sales of used or second-hand equipment goods between resident producers cancel out for the economy as a whole and do not need to be taken into account when comparisons are made from the expenditure side.[10] But imports of used or second-hand equipment goods are purchases from non-residents and are recorded as GFCF (and imports) by the importing country.[11] For some countries participating in Eurostat and OECD comparisons, a significant proportion of their GFCF in equipment goods comprises imports of reconditioned second-hand items. Experimental pricing of second-hand equipment goods shows that quality varies quite considerably both between and among the items priced by different countries. It is difficult to price comparable second-hand goods. Quality adjustments are necessary, but quality adjustments are not a feature of Eurostat-OECD methodology. Countries participating in Eurostat and OECD comparisons are required to price new, unused items only. Prices of second-hand items are not accepted even when such items are the more representative.

Representativity

6.9. In the surveys of consumer prices, comparability and representativity are obtained by countries pricing the products they have nominated for the product list - that is, their representative products - and a selection of the products that other countries have nominated for the product list - that is, the representative products of others. Subsequently, when reporting prices, countries indicate which of the products priced are representative for them and this is taken into account when calculating the PPPs for consumer goods and services. The complexity of equipment goods, the variation in purchasing patterns among countries, the number of countries being compared and resource constraints means that this approach cannot be followed by the equipment goods survey. Instead, the equipment goods survey focuses initially on the pricing of comparable products - that is, products that are identical or equivalent. Countries are still expected to price representative products whenever feasible - that is, when it does not compromise comparability. They are also required to stipulate on the reporting form whether the product they have priced is representative or not. The information is used both in the validation of prices and in the calculation of PPPs.

6.10. Representativity is introduced into the equipment goods survey by including in the product list a number of alternative specifications for the same product. This allows the different factors that can influence a country's purchasing patterns – factors such as domestic producers, traditional trade links, average size of farms and factories, etc. - to be accom-

modated. This approach is illustrated by the pricing schedule for the 2003 survey in Box 6.2. A total of 116 products have been selected to cover the seventeen basic headings listed and a total of 235 alternative specifications have been defined. This is an average of two alternatives per product with a range of one to five alternatives depending on the product. The extent to which the products and their alternatives included on the product list are representative of participating countries depends on the efforts that countries invest in the pre-survey they are required to make of their national markets prior to the finalising of the product list.

6.11. The pricing schedule in Box 6.2 also indicates the minimum number of products that should be priced for each basic heading. The number of products that countries actually price will be more than the minimum for many basic headings. Countries are expected to determine the number of products they price for a basic heading by the importance of the basic heading - as measured by its share of GFCF - and the degree of price variation within the basic heading - as determined by the previous equipment goods survey[12]. The number of alternative specifications priced will be greater than the number of products priced because countries are required to price more than one alternative per product when a product has more than one alternative specified. This is to facilitate the matching of products across countries. Whether participating countries can actually price the stipulated number of products and alternatives per basic heading depends on the resources they devote to the pre-survey.

Pre-survey

6.12. EU Member States and EU associated countries survey equipment good prices every two years. The product lists for the surveys are established during the year prior to the year the survey is to be held. Early in the second half of the interim year, Eurostat convenes a meeting of participating countries. The meeting has two main objectives: to evaluate the price data collected and the experiences gained during the previous year's survey and to initiate the process of selecting the products that are to be priced in the following year's survey. The starting point of the selection process is the product list from the former survey. Together, Eurostat and the countries first review the distribution of products over the basic headings. By taking account of their importance and price variation, they identify the basic headings that should have their number of products increased and the basic headings that should have their number of products reduced. Having considered the overall balance of the list, Eurostat and the countries then examine it basic heading by basic heading. Out-of-date product specifications are removed, retained product specifications are updated and new product specifications are added. Following the meeting, Eurostat modifies the list accordingly, thereby producing the draft product list for the forthcoming equipment goods survey.

Box 6.2: Pricing schedule, 2003[1]

Expenditure classification code	Price collecting code	Basic heading	Number of products	Number of alternative specifications	Minimum number of products to be priced
15.01.11.1	01.	Fabricated metal products, except machinery and equipment	5	13	3
15.01.12.1	02.	Engines and turbines, pumps and compressors	4	6	3
15.01.12.2	03.	Other general purpose machinery	6	17	4
15.01.13.1	04.	Agricultural and forestry machinery	10	28	5
15.01.13.2	05.	Machine tools	7	11	5
15.01.13.3	06.	Machinery for metallurgy, mining, quarrying and construction	5	9	3
15.01.13.4	07.	Machinery for food, beverages and tobacco processing	5	15	3
15.01.13.5	08.	Machinery for textile, apparel and leather production	7	12	5
15.01.13.6	09.	Other special purpose machinery	6	17	5
15.01.14.1	10.	Office machinery	4	9	3
15.01.14.2	11.	Computers and other information processing equipment	7	13	6
15.01.14.3	12.	Electrical machinery and apparatus	6	15	4
15.01.14.4	13.	Radio, television and communications equipment and apparatus	5	5	4
15.01.14.5	14.	Medical, precision and optical instruments, watches and clocks	11	22	7
15.01.15.1	15.	Other manufactured goods n.e.c.	3	6	3
15.01.21.1	16.	Motor vehicles, trailers and semi-trailers	18	30	12
15.03.12.1	17.	Software	7	7	5
Total			**116**	**235**	**80**

[1] The pricing schedule is not fixed. It evolves from price survey to price survey.

6.13. Before it can be finalised, the draft product list has to be pre-surveyed – that is, the countries have to assess the list in the dual perspective of what is available in their national markets and what is representative of their national markets. The pre-survey is carried out by countries in the fourth quarter of the interim year after they have received the draft product list from Eurostat. Based on their comments and proposals, Eurostat modifies the product list further. Existing product specifications are either dropped, modified or accepted, new product specifications are added. This constitutes the final product list which is to be priced during April and May of the survey year. The success of the pricing exercise depends on the thoroughness of the pre-survey. Countries who have invested their time in conducting a comprehensive pre-survey should experience little difficulty in pricing the required number of products and representative alternatives. More importantly, their dialogue with Eurostat, both during the pre-survey and prior to the finalising of the product list, should greatly facilitate the pricing of identical products.

Equivalent products

6.14. Countries are expected to price products that are identical to those specified – that is, products which are the same make and model with the same technical parameters. This is not always possible. Either the make and model specified are unavailable on their national market or, if the make is available, the model specified is not. In these circumstances, countries are required to price equivalent products instead. This may mean that they price the same make, but a different model, or that they price a different make. Either way, pricing equivalent products necessitates flexibility in the interpretation of product specifications. Flexibility has to be exercised with caution. A too liberal interpretation will result in the loss of comparability. A too strict adherence to the specifications can mean that items cannot be priced. To avoid either of these extremes, the following should be borne in mind:

- Equivalent products should be selected by matching the technical parameters of the makes and models that are available in the country with the technical parameters of the specified make and model.[13] The technical parameters listed in the specifications are ranked in order of importance. They refer to performance (capacity, power, speed, size, output, etc.), to operation (number of speeds, source of power, type of controls, etc.), and to quality (materials of manufacture, weight, resistance, etc.). When matching technical parameters, countries should adhere to the performance parameters as closely as possible. The parameters relating to operation and quality can be interpreted with greater flexibility. Usually a substitution is acceptable when the parameter affected by the deviation accounts for only a small share of the total price.

- If, after matching the technical parameters, more than one make and model is found to be equivalent, preference should be shown to the make and the model that is the most representative all other things being equal. In this respect, coun-

tries should not hesitate to price a national make when its model is the most representative. The fact that the model is not exported and cannot be priced elsewhere is not a consideration since the matching of makes and models across countries is done on the basis of the technical parameters reported by countries.

Reporting items and their prices

6.15. The product specifications are also the price reporting forms. They are provided to countries in an electronic file. Countries are required to use this electronic file to report the details of the items they priced and the prices they collected. Completed reporting forms are to be returned to Eurostat or the OECD. An example of a completed reporting form is shown in Box 6.1. Countries complete the areas in grey. When completing the price reporting form, countries are required:

- To state the makes and models selected and to provide their technical parameters so as to facilitate the matching of models across countries. The provision of technical parameters is necessary even when countries price the make and model proposed. Experience has shown that the same make and model may not be sold with the same technical parameters in all countries. The provision of technical parameters is particularly important when countries select and price a model different from that specified.

- To specify which accessories are included in the price provided. Countries should report the price of the basic machine as specified and the prices for the commonest accessories and optional extras individually. Equipment goods are not necessarily sold with the same accessories in all countries. What is an accessory in one country can be an option in another. When the prices of the various components of highly complex items of equipment are known, this permits greater flexibility in determining composite prices for the item and matching the prices across countries.

- To state whether the product priced is representative (yes) or unrepresentative (no). In other words, to indicate whether or not the product's price level is representative of the price level in the country for that type of product. Representative products are usually those most frequently sold. As representative products generally have lower price levels than unrepresentative products, it is necessary to know about the representativity of products when validating their prices and calculating their PPPs.

- To state whether the product priced is identical (1), equivalent (2) or not comparable (3)[14] to the product specified. In other words, to indicate the degree to which the technical parameters of

the product priced match those of the product specified. It is preferable that the pricing experts within the countries, with their engineering experience or contacts, make this assessment, rather than the statisticians at Eurostat or the OECD. The information is essential for price validation.

- To report purchasers' prices without VAT - that is, the total, net of VAT, of the amounts that purchasers actually pay for the item of equipment to be delivered, assembled and installed in working order at the production site where it will be used. The price should include trade margins, transport and delivery costs, assembly and, when relevant, installation costs because these are all considered to be part of capital expenditure. The price should also be net of discounts. It should not include VAT.

  Transport and delivery costs are influenced by the circumstances of national geography and economic development. They depend as well on the type of good and the way it is marketed. When prices of equipment goods do not already include transport and delivery costs, they should be added. In the absence of detailed information about these costs, they should be estimated by countries selecting their own average distance over which the items priced are transported and delivered.

  The cases where equipment goods have to be *assembled and installed* are indicated in the product specifications. If there is an extra charge for erection or start up supervision by the manufacturer this should be added to the price.

  Discounts depend on a number of variables: national practices, the prevailing economic climate, the size of the order, the purchaser's negotiating power, etc. Although it is not possible to produce identical conditions in all countries, certain variables, such as the number of units bought or the period allowed for payment, can be fixed uniformly. These variables are listed in the specifications. Otherwise, only general discounts - that is, those that are available for most of the year and which are granted to the majority of purchasers should be taken into account.

  Purchasers' prices should include the *amounts of VAT that are not deductible* and entail actual expenditure for the purchaser. For many capital items, VAT is wholly or partly deductible for most purchasers. The experts pricing the equipment goods will not know the actual rate of VAT paid. And the information will not be available at the time the equipment goods are priced. Countries are therefore required to report prices without VAT. After the close of the survey year, the national statistical agencies responsible for their national accounts will report the rate of non-deductible VAT on equipment goods for the survey year – that is, they will report the rate of VAT actually paid by purchasers of equipment goods in

the survey year. Eurostat will use this global rate to adjust the prices reported to include non-deductible VAT.[15]

- To report purchasers' prices without VAT that are national averages - that is, prices that reflect the level of prices over the whole of the national territory and take into account any regional disparities in prices. Generally, it is easy to report national averages because, in the case of most equipment goods, the national market is dominated by national producers or by international companies which either sell their product on the same terms throughout the country or can give information about any price differences that apply.

- To report purchasers' prices without VAT that are annual averages - that is, prices that reflect the level of national prices over the whole year. But, as it would be too costly to record prices throughout the year, countries are only required to provide national average prices for April[16] of the survey year.

Source of prices

6.16. The prices can be obtained directly from producers, importers or distributors or from their catalogues. They may even be obtained from actual purchasers – which, although preferable in principle, is difficult in practice. The prices can be collected by whichever method, or combination of methods, countries find the most convenient - personal visit, telephone, letter, internet, etc. But whatever the source, whatever the method, strict conformity to the concept of purchasers' price as defined in the previous section - that is, purchasers' price without VAT - is essential in all cases.

6.17. Some participating countries obtain prices through their producer price index (PPI). Either they are able to match the equipment good specifications directly with product specifications used for the PPI or they request the PPI respondents who are producers of the types of equipment goods being surveyed to price the equipment good specifications. PPIs generally collect basic prices or producers' prices. Basic prices need to be reduced by any subsidies on products and increased by any non-deductible taxes on products paid by producers to obtain producers' prices. It is then necessary to add on any trade margins, transport and delivery costs, and assembly and installation costs paid by purchasers to obtain purchasers' prices net of VAT.

Validation of prices

6.18. Countries provide Eurostat or the OECD with an "average" price - the national purchasers' price in April of the survey year - for each item of equipment good they have priced. These averages are based on a very small number of price observations - one outlet or source for most items. Countries cannot implement the same checks for internal consistency

that they apply to the price observations for consumer products prior to reporting them. The validation procedures followed by Eurostat and the OECD for equipment good prices rely heavily on the reporting forms being filled out in full. Before sending their prices to Eurostat or the OECD, countries are required to verify that the reporting forms are complete with each make and model priced having its name and number, its technical and transaction characteristics, its representativity and comparability, and its commonest accessories and optional items - with their prices - recorded. It is in the interest of countries to provide these details from the beginning as it will reduce the response burden that editing imposes.

6.19. Eurostat and the OECD use the Quaranta editing procedure to validate the prices of consumer products. Verifying the prices of equipment goods by price alone is not sufficient because of the complexity of the items priced. The fact that prices for an item appear consistent across countries does not mean that the items priced are comparable across countries. The technical parameters of the items will still have to be checked against each other and mismatches identified. Before applying the Quaranta editing procedure to equipment good prices, Eurostat and the OECD compare the technical parameters of the products priced first.[17] Products are sorted into three groups on the basis of the comparability of their technical parameters with those of their product specifications as reported by countries, namely: identical, equivalent and not comparable.

6.20. Further distinctions are subsequently made. Products with technical parameters identical to those of the product specification are left as they are and stay matched with the product specification. Products with technical parameters equivalent to those of the product specification are checked against each other to see whether there are any with identical technical parameters – that is, have two or more countries in pricing an equivalent rather than an identical product for a given product specification actually priced the same product. Products that have matching technical parameters are treated as new alternative specifications. Products that do not remain matched against the original specification. The new alternative specifications are called "splittings" because they are split off from the specifications with which they were initially associated to become specifications in their own right. Finally, the products whose technical parameters are not comparable with those of the product specification are screened to see whether any among them have identical technical parameters. Splittings are made for those that do. Those that do not are discarded.

6.21. As a result of this edit, the products priced can be classified as:

- those with technical parameters that are identical to those of a product specification established prior to the price survey;

- those with technical parameters that are equivalent to those of a product specification established prior to the price survey;

- those with technical parameters that are identical to those of a product specification established retrospectively - that is, a splitting.

6.22. This makes it easier to interpret the Quaranta editing procedure. If the prices reported for a product specification are shown to be consistent across countries, it is reasonable to assume that they refer to comparable items. Whereas when outliers are identified, the error, if any, is more likely to be an incorrect price than an incorrect match. Outliers are referred back to the reporting country. It is asked to confirm or to correct the price. Depending on the country's response, the price of the outlier is either retained, replaced or dropped.

PART II: PRICING CONSTRUCTION PROJECTS

General approach

6.23. Three main types of construction "price" indices are compiled in EU Member States and OECD Member Countries. The first, which is not a price index but a cost index, involves collecting the prices of a basket of inputs covering different labour skills (general labourer, bricklayer, carpenter, plumber, etc.), standard building materials (cement, sand, metal rods, bricks, etc.) and plant (trucks, bulldozers, excavators, cranes, etc.).[18] The second, which is a "halfway house" between a cost index and a price index, entails pricing a set of standard components or operations such as "constructing so many square metres of brick wall" or "laying of so many square metres of roofing tiles" or "installing a hot water boiler of a given capacity".[19] The third, which is a price index, requires pricing actual or model construction projects. Of the methods underlying these indices, only that of the third type of index is capable of generating the purchasers' prices required for Eurostat-OECD comparisons of construction prices. It is also the expensive method. It requires expertise which most national statistical agencies do not have and the pricing usually has to be contracted out to consultants.

6.24. The objective of Eurostat-OECD comparisons of construction prices is to compare the purchasers' prices actually paid for comparable and representative buildings and civil engineering works across participating countries. In practice the complexity and the country-specific nature of the products of the construction industry make it difficult to achieve both complete comparability and representativity in the same comparison. In the comparison of consumer prices, comparability and representativity are obtained when countries price both representative products - that is, the products they have proposed for the product list - and unrepresentative products - that is, the products other countries have proposed for the product list. Given the number of countries being compared, the types of constructions covered

and the fact that the pricing has to be contracted out to experts, it would be prohibitively expensive to apply this approach in the comparison of construction prices. Another approach has to be employed instead.

6.25. The main approaches to international comparisons of construction prices are as follows. First, an identical construction can be priced by experts in each country. With this approach, the constructions and their prices will be comparable across countries but not necessarily representative of any country or group of countries. Second, the experts can provide the price for a typical construction of a specified type in their country. With this approach, the constructions and their prices will be representative of each country although not necessarily comparable across countries. Third, a standard construction, that may be modified to accommodate different national circumstances and practices, can be priced by experts in each country. With this approach, the constructions and their prices will be less comparable across countries but more representative of each country. Of these approaches, the first emphasises comparability, the second representativity and the third is a compromise between the two. It is the third approach that Eurostat and the OECD have adopted for the survey of construction prices.

6.26. The approach, although a compromise, favours comparability. Even so, when calculating PPPs for construction, the representativeness of the constructions priced is taken into account. Countries are required to indicate which of the constructions they priced are representative when reporting their prices. Representativity is introduced into the survey of construction prices in much the same way as it is introduced into the equipment goods survey – that is, by giving countries the possibility of pricing more representative alternatives and by allowing countries some flexibility in the interpretation of the product specifications.

Standard construction projects

6.27. Countries participating in Eurostat and OECD construction price comparisons are required to price a number of standard, but fictitious, construction projects covering different types of residential buildings, non-residential buildings and civil engineering works. The standard construction projects are listed in Box 6.3. The list reflects the view of construction experts that representativity - when assessed in terms of variation among countries - is an important consideration for residential buildings, but less important for non-residential buildings and even less so for civil engineering works. The standard construction projects for the single-family house are specific to individual countries or groups of countries while the projects for other constructions are common to all. Countries are currently expected to price nine projects in total – three residential buildings, three non-residential and three civil engineering works.

Box 6.3: Standard construction projects

15.02.11.0 Residential buildings	
01.	European single-family house
02.	Portuguese single-family house
03.	Nordic single-family house
04.	Apartment in a multi-apartment building
05.	*North American single-family house*
06.	*Japanese single-family house*
07.	*Australasian house*
15.02.21.0 Non-residential buildings	
08.	Agricultural shed
09.	European factory building
10.	Office building
11.	Primary school
12.	*Japanese factory building*
15.02.31.0 Civil engineering works	
13.	Asphalt road
14.	Concrete road
15.	Bridge
16.	Concrete main sewer

The choice of pricing projects 05, 06, 07 and 12 is restricted to countries working directly with the OECD.

Box 6.4: An example of a major component and its elementary components

Item specification		Unit	Quantity	Unit Price	Total Price
3.	**Masonry**			(national currency)	(national currency)
3.1	Ground floor double-skin external wall:				
	• 20 cm sand-lime brickwork + 11 cm facing brickwork, inclusive of pointing and acid cleaning	m²	257	17	4369
	• Plastering	m²	257	8	2056
3.2	Upper floors double skin external wall:				
	• 11 cm sand lime brickwork + 10 cm facing brickwork, inclusive of pointing and acid cleaning	m²	413	18	7434
	• Plastering	m²	413	8	3304
3.3	Gable ends, 11 cm facing bricks, inclusive of pointing and acid cleaning	m²	625	18	11250
3.4	Fair-finish 7 cm plaster block work	m²	585	7	4095
Total					**32508**

Box 6.5: An example of a summary sheet detailing major components

	(national currency)
01. Earthworks	2489
02. Concrete	28985
03. Masonry.	**32508**
04. Roofing	16220
05. Joinery	26732
06. Metal joinery	2443
07. Sanitary installations	12825
08. Central heating	10182
09. Electrical installations	6777
10. Ventilation	715
11. Coverings	35097
A. Overall price of work done (01 + 02 + …….. + 11)	174973
B. Architect's and engineer's fees (5%[1] of A)	8749
Total price without VAT (A + B)	183722

[1] Standard rate prevailing in the country. The 5% is for illustration only.

6.28. Although not real constructions, the standard construction projects are based on actual construction methods and practices. Like actual construction projects, they consist of a number of major components, such as earthworks, concrete, masonry, joinery, roofing, etc. Each major component comprises a number of elementary components, such as the mechanical excavation of the terrain, the mechanical excavation of foundation trenches, the supply, transport, dumping and compacting of spoil for foundation trenches, the supply, transport, dumping and compacting of crushed aggregate for foundation trenches, etc. Each standard construction project has its major components and their elementary components itemised and defined in a product specification called a "bill of quantities". In addition to detailing the components, the bill of quantities also provides a "preamble" describing the project, its location and other factors that need to be taken into account when pricing it.[20] Each bill is accompanied by a set of technical drawings.

6.29. For pricing purposes, the elementary components of the standard projects are detailed in bills of quantities as shown in Box 6.4. The total price for the elementary component is computed by multiplying the unit price in national currency units (NCUs) by the quantity specified. For example, the total price of brickwork for the ground floor external wall as specified in Box 6.4 is 4,369 NCUs – that is, 257 square metres multiplied by a unit price of 17 NCUs per square metre. By summing the total prices of its elementary components, a total price can be determined for each major component. The total price for masonry as detailed in Box 6.4 is 32,508 NCUs. By summing the total prices of the major components, an overall price for work done can be obtained. Each bill of quantity has a summary sheet such as that in Box 6.5 specifically for this purpose. The overall price for work done is not the final price of the project. It needs to be augmented by architects' and engineers' fees and by non-deductible taxes on products in order to arrive at the desired purchasers' price. But, as explained later, countries are only required to supply the overall price for work done and the architects' and engineers' fees when completing the summary sheet.

6.30. Experience shows that about 50 per cent of the elementary components that go to make up a whole construction account for around 90 per cent of the overall price for the work done. It has also been established that PPPs based on this 50 per cent do not differ significantly from PPPs based on all elementary components. The bills of quantities for the standard construction projects list only the elementary components that are the principal contributors to the overall price for work done and not all the elementary components required to complete the projects. They are sometimes called "reduced bills of quantities" because of this.[21] [22]

Variants and compromise quantities

6.31. The bills of quantities have been designed to be representative of actual constructions to be found in participating countries with regard to their shape and size, their finish, their internal fittings and, to a lesser extent, to the construction materials and methods used. Since there is a close connection between the construction materials used and the construction methods adopted, and since both materials and methods vary between countries, variants for a number of elementary components are included in the bills of quantities to improve their representativity. When pricing components with variants, countries should attempt to price all the alternatives indicating which are nearest to the materials and methods most widely used by them. This is to facilitate the matching of the standard construction projects and their variants across countries.

6.32. For certain elementary components in the bills of quantities, such as glazing, insulation, heating and air conditioning, specifications have been drawn up which represent a compromise between the norms that commonly apply in participating countries. For example, it may be that the volume of heating specified in a bill of quantities is too high for countries with a warm or hot climate and too low for countries with a temperate or cold climate. For these items, it is essential for comparability that countries price the compromise quantities specified.

Flexibility in interpretation

6.33. For each standard construction project the same bill of quantities is priced in each country so that, in principle, all countries pricing a specific bill of quantities are pricing a comparable product. In practice, this is not necessarily so. Materials and methods of construction can vary between countries. National standards and regulations can also differ between countries. Some flexibility of interpretation has to be allowed if countries are to provide prices that are representative.

6.34. The general rule to be followed with regard to flexibility of interpretation is that, if strict adherence to the specification means that the component cannot be easily priced or leads to special pricing, a more readily available substitute should be priced instead because the aim of the exercise is to avoid unrepresentative prices as far as possible. For example:

- Wall thicknesses are often governed by the sizes of bricks and, since standard measurements of bricks are not identical in all countries, each country should price the national standard brick which gives the wall thickness closest to that specified.

- The type of brick may also vary from country to country. Countries should price the type of brick which for them is most usual.

- Standard measurements of doors, windows and other joinery work are not the same in all countries. Countries should price the national standard measurements which are closest to those specified.

- National standards and regulations applicable to electrical and other fittings also differ. Countries should comply with their own regulations when pricing these items.

6.35. Care should be taken that flexible interpretation does not become too liberal and result in marked differences in quality or in a different construction being priced. Substituting concrete bricks for clay bricks is allowed, replacing a brick wall by one of reinforced concrete is not. The dividing line between these two extremes is a grey area and it is left to the individual countries themselves to decide what can or can not be substituted. Usually substitutions are acceptable when the components affected represent only a small share of the total price and the basic features of the construction remain unchanged. When substitutions are made, they should be clearly identified and explained in the bill of quantities.

Unit prices

6.36. When pricing the bills of quantities, a distinction has to be drawn between "producer's cost" and "purchaser's price". The "producer's cost" of a construction is what it costs the contractor to build it. The "purchaser's price" of a construction is what the purchaser pays the contractor for it. The prices that countries should provide for the standard construction projects are purchasers' prices - that is, the prices that purchasers would pay for the standard construction projects if they were actually built and marketed.

6.37. The unit prices used in the bills of quantities must cover not only the producer's direct cost for each of the specified elementary components (such as materials, labour, hire of equipment, sub-contractors' fees), but also the contractor's profits (or losses), and the general expenses (including share of main office overheads) and preliminary expenses (including the cost of site preparation) connected with the construction. The unit prices do not include architects' and engineers' fees and non-deductible VAT. These are added after the overall price of work has been established. Nor do the unit prices include the expenditure incurred for the purchase of the land. But in this case no addition is made to the overall price of work either for the cost of the land itself or for the financial and other costs associated with the transfer of ownership.

- *General and preliminary expenses* comprise overhead costs, start up costs and contractor's profit (or loss). Although they are not specified in the bills of quantities, these costs are to be included in the unit prices all the same. Box 6.6 lists the items which general and preliminary expenses usually cover. The general guideline to be followed by countries with regard to such costs is that they are to be included if the contractor is obliged by law to pay them or required by the standard contracting practice of the country to pay them.

- *Architects' fees and engineers' fees* are percentage additions made after all the components specified in the bill of quantities have been priced and summed. The fees are to cover both the realisation of the project and the supervision of works. Box 6.7 details the services which the fees should normally cover though these may be subject to some variation in line with standard practice in the country concerned.

- *Non-deductible VAT* entails actual expenditure for the purchaser and should be covered in the purchasers' prices of the standard construction projects. Usually it is levied on the overall cost of the construction - that is, the overall price of work done plus architects' and engineers' fees - and treated as a percentage addition. VAT is wholly or partly deductible for most purchasers of capital goods and so the standard rate of VAT is not the same as the rate based on what was actually paid. The experts pricing the bills of quantities will not know the actual rate of VAT paid. And the information will not be available at the time the bills of quantities are priced. Countries are required to report the prices of the standard construction projects without VAT. Following the close of the survey year, the national statistical agencies that are responsible for their national accounts will report the rate of non-deductible VAT on buildings and civil engineering works for the survey year – that is, they will report the rate of VAT actually paid by purchasers of buildings and civil engineering works in the survey year. Eurostat will apply this global rate to adjust the prices reported to include non-deductible VAT.[23]

6.38. Countries are required to report unit prices that are national averages - that is, prices that reflect the level of prices over the whole of the national territory and take account of any regional disparities in prices. In principle, the national unit prices should be the weighted averages of regional unit prices, with regional unit prices being weighted by regional shares of national construction output. In practice, this may not be possible and the national unit prices will have to be estimated. How this is done should be clearly explained on the price reporting form.

Box 6.6: Coverage of general and preliminary expenses

The following are among the items not specified in the bills of quantities, but the cost of which should be included in the unit prices:

‒ The taking out of a builder's all-risk insurance which includes public liability cover, contractor's liability cover, fire insurance, earthquake insurance, and any other cover or insurance usually required by the standard contract.

‒ The giving and placing of all notices and notifications, the obtaining of the necessary permits, the paying of all associated charges and any other statutory fees or local taxes that may be required.

‒ The setting out of the works, including a set-out guide for subcontractors, and the paying of any registered surveyor's fees.

‒ The provision of a temporary power supply and the paying of all charges associated with its connection and use.

‒ The provision of a temporary water supply and the paying of all charges associated with its connection and use.

‒ The provision of a temporary telephone and the paying of all charges associated with its connection and use.

‒ The provision and maintenance of temporary toilet and washing facilities and the paying of all associated charges.

‒ The provision of a site office, a mess-room or other accommodation for the workers, and facilities for the storage of material and tools, and their subsequent removal on completion of the works.

‒ The provision and maintenance of a suitably placed job sign board and its subsequent removal on completion of the works.

‒ The provision and maintenance of competent managers or foremen to supervise the works.

‒ The provision and maintenance of any temporary fences or barriers required for the security of the works or for safety precautions.

‒ The provision of temporary scaffolding and trestles.

‒ The provision of a banker's guarantee or a performance bond as usually required by the standard contract.

‒ The removal of all rubbish from site as it accumulates and at the completion of the works.

‒ The cleaning of the building, inside and out, and the removal of all stains, etc., to the satisfaction of the supervisor.

‒ The protection of other property from damage.

‒ The share of main office overheads.

‒ Other preliminary expenses not elsewhere specified:

‒ Provision of working drawings,

‒ Plant which is not readily allocated to specific work items (such as a tower crane),

‒ Furnished office for clerk of works (including telephone, telephone charges and heating)

‒ Temporary roads or hard standing,

‒ Compliance with statutory requirements in relation to working conditions.

‒ Profit (loss) of the contractor.

6.39. Countries should also report unit prices that are annual averages - that is, prices that reflect the level of national prices over the whole year. But, as it would be too costly to record prices throughout the year, countries are only required to provide the national average prices prevailing in April[24] of the survey year.

Reporting prices

6.40. The bills of quantities are also the price reporting forms. They are provided to countries in an electronic file. When filling out the bills of quantities, countries need only to enter the unit prices for the elementary units and the percentages that need to be added for architect's and engineer's fees as the bills of quantities are programmed to complete themselves. Completed bills of quantities are to be returned to Eurostat or the OECD.

Sources of prices

6.41. The unit prices with which to value the elementary components of the bills of quantities can be obtained either from actual bills of quantities that have been valued for tenders submitted by construction companies or from one of the computerised systems of unit costs that major consultancy firms and research institutes maintain for the construction industry. If the first source is adopted, only unit prices from tenders that have been successful - or from tenders that can be considered realistic because they would permit the carrying out of work in good condition - should be used to value the standard construction projects. Tenders may vary by up to 30 or 40 per cent and so not accurately reflect actual prices. Extreme prices, be they high or low, must be excluded.

Box 6.7: Coverage of architects' and engineers' fees

<table>
<tr><td colspan="2" align="center">**Preliminary Services**</td></tr>
<tr><td>**Work stage A:**</td><td>**Inception**</td></tr>
</table>

– Discuss the client's requirements including timescale and any financial limits; assess these and give general advice on how to proceed; agree the architect's services.

– Obtain from the client information on ownership and any lessors and lessees of the site, any existing buildings on the site, boundary fences and other enclosures, and any known easement, encroachments, underground services, rights of way, rights of support and other relevant matters.

– Visit the site and carry out an initial appraisal.

– Advise on the need for other consultants' services and on the scope of these services.

– Advise on the need for specialist contractors, sub-contractors and suppliers to design and execute part of the works to comply with the architect's requirements.

– Advise on the need for site staff.

– Prepare where required an outline timetable and fee basis for further services for the client's approval.

Work stage B: **Feasibility**

– Carry out such studies as may be necessary to determine the feasibility of the client's requirements; review with the client alternative design and construction approaches and cost implications; advise on the need to obtain planning permissions, approvals under building acts or regulations, and other similar statutory requirements.

<div align="center">**Basic Services**</div>

Work stage C: **Outline proposals**

– With other consultants where appointed, analyse the client's requirements; prepare outline proposals and an approximation of the construction cost for the client's preliminary approval.

Work stage D: **Scheme design**

– With other consultants where appointed develop a scheme design from the outline proposals taking into account amendments requested by the client; prepare a cost estimate; where applicable give an indication of possible start and completion dates for the building contract. The scheme design will illustrate the size and character of the project in sufficient detail to enable the client to agree the spatial arrangements, materials and appearance.

– With other consultants where appointed, advise the client of the implications of any subsequent changes on the cost of the project and on the overall programme.

– Make where required application for planning permission. The permission itself is beyond the architect's control and no guarantee that it will be granted can be given.

Work stage E: **Detail Design**

– With other consultants where appointed, develop the scheme design; obtain the client's approval of the type of construction, quality of materials and standard of workmanship; co-ordinate any design work done by consultants, specialist contractors, sub-contractors and suppliers; obtain quotations and other information in connection with specialist work.

– With other consultants where appointed, carry out cost checks as necessary; advise the client of the consequences of any subsequent change on the cost and programme.

– Make and negotiate where required applications for approvals under building acts, regulations or other statutory requirements.

Work stages F and G: **Production information and bills of quantities**

– With other consultants where appointed, prepare production information including drawings, schedules and specification of material and workmanship; provide information for bills of quantities, if any, to be prepared: all information complete in sufficient detail to enable a contractor to prepare a tender.

Box 6.7: Coverage of architects' and engineers' fees (contd.)

Work stage H:	**Tender action**
	– Arrange, where relevant, for other contracts to be let prior to the contractor commencing work.
	– Advise on and obtain the client's approval to a list of tenderers.
	– Invite tenders from approved contractors; appraise and advise on tenders submitted. Alternatively, arrange for a price to be negotiated with a contractor.
Work stage I:	**Project planning**
	– Advise the client on the appointment of contractor and on the responsibilities of the client, contractor and architect under the terms of the building contract; where required prepare the building contract and arrange for it to be signed by the client and the contractor; provide production information as required by the building contract.
Work stage J:	**Operations on site**
	– Administer the terms of the building contract during operations on site.
	– Visit the site as appropriate to inspect generally the progress and quantity of the work.
	– With other consultants where appointed, make where required periodic financial reports to the client including the effect of any variations on the construction cost.
Work stage K:	**Completion**
	– Administer the terms of the building contract relating to the completion of the work.
	– Give general guidance on maintenance.
	– Provide the client with a set of drawings showing the building and the main lines drainage; arrange for drawings of the services installations to be provided.

6.42. If the second source is employed, the standard construction projects will be valued at resource cost and not at purchasers' prices. It is necessary to adjust the underlying unit costs to unit prices using the total prices of successful tenders to establish the level to which the unit costs have to be raised. Of the two sources, the second is preferable to the first because it provides internationally comparable unit prices. Total tender prices may be realistic, but the unit prices used to value individual elementary components may not be. Contractors modify unit prices - understating some, overstating others - for a number of reasons such as improving their cash flow. The first objective of the pricing exercise is to obtain internationally comparable total prices for the standard construction projects so either source is acceptable.

Validation of prices

6.43. The bills of quantities are designed to provide a single total price – the national purchasers' price for April of the survey year - for each standard construction project and for each of its variants. Since bills of quantities are priced only once within a country, countries cannot implement the same editing procedures that they are required to follow for consumer products prior to reporting prices. Unlike the price surveys for consumer products and equipment goods, the product list for the construction price survey is comparatively stable over time. The bills of quantities do not change, or change only marginally, from one survey to the next. Another edit can be employed by countries instead.

6.44. This involves taking the summary sheets of the projects priced in the current survey and comparing them with the summary sheets for the same projects from the previous survey. The object of the review is to see whether the contribution to the total price of each major component is approximately the same in both surveys and, if it is not, to check the unit prices of its elementary components across the two surveys. There are three possible outcomes: both sets of unit prices are correct, the unit prices of the previous survey are wrong or the unit prices of the current survey are wrong. If the unit prices of the current survey are wrong, they should be corrected. If the unit prices are correct for both surveys or if the unit prices for the previous survey are wrong, Eurostat and the OECD should be informed of this at the time of reporting prices. This will avoid additional response burden on countries when the edit is repeated by Eurostat and the OECD.

6.45. Eurostat and the OECD apply the Quaranta editing procedure to detect outliers by comparing the total prices for the standard construction projects and their variants across countries. Editing bills of quantities by total price alone is not sufficient. Outliers do not necessarily mean that the projects priced are not comparable, while, conversely, the absence of outliers does not necessarily mean that the projects priced are comparable. Additional validation at lower levels of aggregation is needed. The validation is carried out at the level of major components initially. For ease of application and of comprehension, Eurostat and the OECD do not employ the Quaranta editing procedure at this level. An edit similar to the inter-temporal edit just described is used instead. This involves matching the summary sheets

for the projects priced by countries and comparing them to establish whether the contribution of each major component to total price is approximately the same in each country. If they are not, the shares of the elementary components to the total price of the major component under review are then compared to see whether there are any questionable unit prices. Suspect unit prices are referred back to the countries reporting them for correction or confirmation that they are correct.[25]

PART III: ESTIMATION OF PPPS FOR GFCF IN INTERIM YEARS

6.46. Eurostat is required to calculate PPPs for GDP and its component final expenditures every year for EU Member States and EU associated countries. To do this, it has to have PPPs for all basic headings, including those comprising GFCF, for the year in question. Although the programme of price collection is continuous, not all goods and services are priced each year. Most consumer products are priced once every three years and capital goods are priced once every two years. PPPs cannot be calculated for all basic headings every year. Other means have to be employed to obtain the PPPs for those basic headings for which PPPs cannot be calculated.

6.47. For consumer products that are priced every three years, the basic heading PPPs they generate are advanced through time using corresponding sub-indices from the CPI. This is not an option for capital goods as the majority of participating countries do not have the price indices required. Attempts to apply implicit price deflators from the national accounts have not been successful because they are available only at a broad level of aggregation. Instead of extrapolation, Eurostat has decided to employ interpolation to derive the basic heading PPPs for GFCF for the interim years when equipment good prices and construction prices are not surveyed. Basic heading PPPs for GFCF for the interim year t are obtained by taking the geometric average of the basic heading PPPs for year t-1 and t+1.[26] This ensures that the PPPs for t are base country invariant.

6.48. Eurostat calculates preliminary PPPs for a reference year twelve months after the year ends - that is, in the following December. This means that the prices collected for equipment goods and construction projects in t+1 must be validated and available by the end of September of t+1 if the interpolated PPPs for t are to be derived in time for their inclusion in the calculation. To facilitate this, the surveys of equipment good prices and construction prices are conducted in April and May of t+1.

[1] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[2] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[3] Without prices, PPPs cannot be calculated for these two expenditure categories. Instead, reference PPPs are used to obtain their real values. The reference PPPs used for change in inventories are the weighted averages of the PPPs for consumer goods and the PPPs for equipment goods. The reference PPPs used for acquisitions less disposals of valuables are the PPPs for jewellery, clocks and watches.

[4] Comprising: plantation, orchard and vineyard development; change in stocks of breeding stock, draught animals, dairy cattle, animals raised for wool clippings, etc.; computer software that a producer expects to use in production for more than one year; land improvement including dams and dikes which are part of flood control and irrigation projects; mineral exploration; acquisition of entertainment, literary or artistic originals; other intangible fixed assets.

[5] Some authors dispute this. Castles, for example, argues "if one country must put aside more of its current production than another to replace capital currently being consumed, then it has less available for its current needs and for increasing its capital stock. It follows that the aggregates which are appropriate for international comparisons of real income or product should make allowance for capital consumed in the process of production: Net Domestic Product is, in principle, a better measure than Gross Domestic Product of total income or product and Net Fixed Capital Formation (8% of Net Domestic Product for the OECD as a whole) is a better measure than Gross Fixed Capital Formation (20 % of Gross Domestic Product for the OECD as a whole) of the resources used to increase capital stock rather than meet current needs". Paragraph 8.8, *Review of the OECD-Eurostat PPP Programme*, I. Castles, unpublished OECD document, STD/PPP(97)5, September 1997.

[6] For this reason it is proposed that the ICP in the short term should concentrate on consumption and not attempt to calculate PPPs for GFCF. See *Evaluation of the International Comparison Programme*, E/CN.3/19999/8, November 1998.

[7] Up until 2001, Eurostat surveyed equipment good prices and construction prices annually. Since 2001, Eurostat has carried out the price surveys every two years in order to make savings and reduce the overall cost of the Programme.

[8] Since 1990, the OECD has surveyed equipment good prices and construction prices once every three years (previously it had been once every five years). When Eurostat conducted its surveys annually, co-ordination was not a concern. Now that Eurostat only collects prices every two years, it means that Eurostat and the OECD only conduct joint surveys once every six years.

[9] The EU Candidate Countries – Bulgaria, Croatia, Romania and Turkey – and the EFTA countries – Iceland, Norway and Switzerland.

[10] According to the SNA 93 and the ESA 95, when the ownership of an existing fixed asset, such as a used or second-hand equipment good, is transferred from one resident producer to another, the value of the asset transferred is to be recorded as negative GFCF for the seller and as positive GFCF for the purchaser. The value of the positive GFCF to be recorded for the purchaser will exceed the value of the negative GFCF to be recorded for the seller only by the value of the costs of ownership transfer incurred by both parties to the transaction. Over the whole economy, sales and purchases cancel each other out and only the costs of the transfer of ownership paid by both seller and purchaser are recorded as GFCF. (See paragraphs 10.39 to 10.43 in the SNA 93 for a more detailed description of the treatment of existing assets.)

[11] The exporting country records them as negative GFCF (and exports). A country can report a negative expenditure weight for one or more of its basic headings under GFCF because of this.

[12] The Quaranta editing procedure provides for each participating country a measure of the variation of its relative price level within a basic heading. See Annex IV.

[13] When matching products and deciding whether or not the one observed is a close substitute to the one specified, it is not just the number of parameters not matching that needs to be taken into account, but also the degree to which they differ. Products with "near misses" on most, if not all, parameters could still be an acceptable substitute for the product specified.

[14] In principle, if the pre-survey has been thorough, all products priced by a country would at least be equivalent. In practice, changes in the national market and/or modifications to the product specifications pre-surveyed, may result in a country pricing non-comparable products.

[15] This approach is not followed by the OECD. Countries participating in OECD comparisons are expected to report prices that include the actual rate of non-deductible tax on products paid.

[16] Countries participating in OECD comparisons report mid-year (July) prices. Countries participating in Eurostat comparisons also reported mid-year (July) prices when they surveyed equipment good prices annually. The change to April prices is explained in paragraph 6.48.

[17] Make and model are included among the technical parameters compared.

[18] Construction cost indices generally do not reflect the full range of factors that determine market prices – factors such as overhead costs, preliminary expenses, sub-contractors' margins, prime contractor's profit (or loss), architects' and engineers' fees and non-deductible taxes on products.

[19] Construction "price" indices based on standard components or operations do not reflect all the factors that influence market prices. Although, for example, they include sub-contractors' margins, they will not include prime contractor's profit (or loss).

[20] For these and other variables that need to be taken into account when pricing a bill of quantities see *Construction Cost Data Workbook*, N. Sinclair, P. Artin and S. Mulford, unpublished paper presented at the Conference of the International Comparison Programme, World Bank, Washington, March 2002.

[21] Eurostat introduced "reduced bills of quantities" during its 2001 survey of construction prices. The OECD introduced them in its 2002 survey. Prior to 2001, the bills of quantities priced for Eurostat-OECD comparisons listed all the elementary components required to complete the standard construction projects.

[22] The pre-survey approach to updating product lists is not applicable to bills of quantities. A system of annual reviews is being put in place instead. Three bills of quantities – one residential building, one non-residential building and one civil engineering work – will be reviewed each year. Each bill of quantities will be examined by a taskforce comprising three participating countries with the object of modernising it. This may mean making changes to the existing bill, replacing the bill by another for the same construction project or providing a bill for a different construction project. The recommendations of the taskforces will be discussed by all participating countries at a meeting convened by Eurostat in the year between survey years.

[23] This approach is not followed by the OECD. Countries participating in OECD comparisons are expected to report prices that include the actual rate of non-deductible tax on products paid.

[24]   Countries participating in OECD comparisons report mid-year (July) prices. Countries participating in Eurostat comparisons also reported mid-year (July) prices when they surveyed construction prices annually. The change to April prices is explained in paragraph 6.48.

[25]   The edits described in this paragraph are under review. Instead of a top down approach, a bottom up approach is proposed. This will involve comparing the prices of elementary components first. It has the advantage, among others, of allowing editing to start before all countries have reported their prices. The use of the Quaranta editing procedure at the major component level is also being reconsidered.

[26]   PPPs and not prices are interpolated because the products priced in t-1 and in t+1 will not necessarily be the same.

CHAPTER 7: CALCULATION AND AGGREGATION OF PPPS

Introduction

7.1. Many methods have been developed to calculate and aggregate PPPs.[1] This chapter is limited to describing those methods that have immediate relevance to a Eurostat-OECD comparison. PPPs are calculated and aggregated in two stages and the chapter is divided into two parts accordingly. The first part explains the methods used to calculate PPPs for a basic heading. The second part explains the methods used to aggregate basic heading PPPs to obtain PPPs for each level of aggregation up to and including the level of GDP.

7.2. To calculate PPPs for a basic heading, Eurostat and the OECD use the Èltetö-Köves-Szulc or EKS method[2] (although, under certain conditions, a modified version of the EKS method – the EKS-S method[3] - may be used instead). The method has been used since the beginning of the Eurostat-OECD PPP Programme in the early 1980s. The principal alternative to the EKS method is the Country Product Dummy or CPD method[4]. It was used in the first round of the International Comparison Programme (ICP) in 1970 and has been used repeatedly in subsequent rounds of the ICP over the last three decades.[5] For this reason, the CPD method is described and compared with the EKS method in Part I of the chapter even though it is not used for Eurostat-OECD comparisons.

7.3. Eurostat and the OECD also use the EKS method to aggregate PPPs above the basic heading. It was first used for this purpose in the 1990 comparison. It has been used to provide official results for Eurostat-OECD comparisons ever since. Prior to 1990, the Geary Khamis or GK method[6] was used to compile official results. Eurostat and the OECD still employ the GK method, but the results produced are for analytical purposes only, they have no official status. The GK method has been used in all rounds of the ICP that have been conducted so far. The two aggregation methods are described and compared in Part II of the chapter.

7.4. The methods use to calculate and aggregate PPPs should provide price and volume indices that have certain properties. *Commensurability* is such a property. It is common to the four methods considered in the chapter. All produce results that are invariant to changes in the units of measurement for prices and quantities. The four methods are also *base country invariant*. They treat all participating countries symmetrically so that it makes no difference to the final results which country is chosen as the base. The country selected serves simply as the point of reference and its currency as the numéraire. Other properties of the methods – *transitivity*, *characteristicity*, *additivity* and the *Gerschenkron effect* - are discussed later in the chapter.

7.5. Worked examples illustrating how the EKS method is applied at the level of the basic heading and how

the EKS and GK methods are applied above the basic heading level can be found in Annex V.

PART I: CALCULATION OF PPPS FOR A BASIC HEADING

Overview of the calculation procedure

7.6. A basic heading is defined as the lowest level of final expenditure on GDP for which explicit expenditure weights can be estimated. As expenditure weights are not available below the basic heading, the relative importance of the products priced for a basic heading cannot be determined by comparing their shares of total expenditure on the basic heading. Participating countries price not only products that are representative of their national market but also products that are representative of the national markets of others. Representative products usually have a lower price level than unrepresentative products. This has to be taken into account when calculating the PPPs for a basic heading otherwise the PPPs will be biased. To avoid this bias, implicit weights are employed to distinguish between representative and unrepresentative products.[7] So that implicit weights can be assigned, participating countries are required to indicate whether or not the products they priced are representative of their national markets when they report their prices. In this context, a product is said to be representative if it is sold in sufficient quantities for its price to be typical for that group of products in the national market.[8]

7.7. The information on representativeness, together with the prices to which it refers, is used to obtain unweighted PPPs at the basic heading level as follows:

- For each pair of countries, two binary PPPs are calculated. The first is the geometric mean of the price relatives for products representative of the first country – the *Laspeyres type PPP*. The second is the geometric mean of the price relatives for products representative of the second country – the *Paasche type PPP*. The geometric mean of these two PPPs is then taken to derive a single binary PPP between the two countries – the *Fisher type PPP*.[9]

- By following this procedure each basic heading is provided with a matrix of Fisher type PPPs. In some cases, the matrix is incomplete because it is not always possible to calculate a Fisher type PPP directly between each pair of countries. Moreover, the Fisher type PPPs in the matrix are intransitive.

- Gaps in the matrix are filled by taking the geometric mean of all the available indirect Fisher type PPPs bridging the pairs of countries for which direct Fisher type PPPs are missing.[10] This process does not always work. The circumstances for it not working and the alternatives employed when it does not work are outlined at

the end of Part II of the chapter under *Missing PPPs and reference PPPs*.

- The matrix is made transitive by applying the EKS procedure. Transitivity is attained by replacing the Fisher type PPP between each pair of countries by the geometric mean of itself squared and all the corresponding indirect Fisher type PPPs between the pair obtained using the other countries as a bridge.

Calculation of binary PPPs: Fisher type PPPs

7.8. Take two countries A and B and let p_{iA} denote the price of product i in country A and p_{iB} the price of the same product in country B. For a given basic heading, call the Laspeyres type PPP between country A and B, L_{AB}, the Paasche type PPP, P_{AB}, and the Fisher type PPP, F_{AB}. Further, let R_A be the set of those products that are representative for country A and suppose that there are n_A such products. Similarly, R_B stands for the set of products that are representative in country B, and the number of products in R_B is n_B. The three binary PPPs between countries A and B are then defined as:

$$L_{AB} = \prod_{i \in R_A} \left[\frac{p_{iB}}{p_{iA}} \right]^{\frac{1}{n_A}} \qquad (1a)$$

$$P_{AB} = \prod_{i \in R_B} \left[\frac{p_{iB}}{p_{iA}} \right]^{\frac{1}{n_B}} \qquad (1b)$$

$$F_{AB} = \sqrt{L_{AB} P_{AB}} \qquad (1c)$$

7.9. L_{AB} and P_{AB} are given equal weight in calculating F_{AB}. Thus, equal weight is given to the average of the price relatives for each country's representative products, irrespective of the number of price relatives (or products) on which each average is based. This implies that, if there is a greater number of A's representative products than B's, each price relative for a representative product in A must carry a correspondingly smaller weight in F_{AB} than each of the price relatives for B's representative products. This prevents the Fisher type PPPs for the basic heading from being dominated by the price relatives of the country which has the larger number of representative products.

7.10. Even though there are no explicit weights in the calculation, there are implicit ones whose pattern depends on the relative numbers of representative products in the two countries and also on the rela-

tive size of the overlap between them – that is, the set of products that are representative in both countries. The pattern of weights can vary substantially between different pairs of countries or for different sets of prices. Quite complex systems of weights may be generated even though there is no explicit information about the expenditure on the products.

Achieving transitivity: EKS PPPs

7.11. The Fisher type PPPs derived above are not transitive. The EKS formula is used to make them transitive. To explain the procedure, it is first necessary to introduce the concept of an indirect PPP. An indirect PPP between two countries is one obtained by calculating it indirectly through a third country. Let the three countries be A, B and C. Denote the direct Fisher type PPP between A on B as F_{AB} and the indirect Fisher type PPP for A on B via C as $_C F_{AB}$. Then, $_C F_{AB}$ is defined as follows:

$$_C F_{AB} \equiv F_{AC} / F_{BC} \qquad (2)$$

F_{AC} is the direct Fisher type PPP between A on C and F_{BC} is the direct Fisher type PPP between B on C.

7.12. More generally, and for a larger set of countries N = {A, B, C, …}, transitivity requires that every indirect PPP, $_l PPP_{jk}$ (k, j, l $\in$ N), should always equal the direct PPP, PPP_{jk}. Transitivity is regarded as a necessary property for a set of multilateral PPPs otherwise they would not be mutually consistent.

7.13. The EKS PPP is defined as the geometric mean of the direct PPP and all the indirect PPPs between a pair of countries, with the direct PPP having twice the weight of each indirect PPP. In the case of three countries A, B and C, the EKS PPP between country A and country B is:

$$EKS_{AB} = \left\{ F_{AB}^2 \times \frac{F_{AC}}{F_{BC}} \right\}^{\frac{1}{3}}$$

$$EKS_{AB} = \left\{ F_{AB}^2 \times_C F_{AB} \right\}^{\frac{1}{3}} \qquad (3)$$

7.14. A similar expression can be derived for the EKS PPPs between countries A and C, and B and C. The expression in (3) can be generalised for the larger set of countries N = {A, B, C, …}. Suppose that the number of countries in N is n. Then, the EKS PPP between countries j and k is given by equation (4) where transitivity is achieved by estimating the PPP between any pair of countries as a geometric mean of direct Fisher type PPPs and indirect Fisher type PPPs:

$$EKS_{jk} = \left\{ F_{jk}^2 \cdot \prod_{l \neq j,k} \frac{F_{jl}}{F_{kl}} \right\}^{\frac{1}{n}}$$

$$EKS_{jk} = \left\{ F_{jk}^2 \cdot \prod_{l \neq j,k} \, {}_l F_{jk} \right\}^{\frac{1}{n}} \qquad (4)$$

$$j, k, l \in N$$

7.15. An important justification for the EKS method is that, in addition to being transitive, the resulting multilateral EKS PPPs differ as little as possible from the original binary Fisher type PPPs. More precisely, the EKS procedure minimises the expression $\Sigma_{j \in N} \Sigma_{k \in N} (\log EKS_{jk} - \log F_{jk})^2$ and satisfies characteristicity to the extent possible.[11]

7.16. *Characteristicity* is the property that requires the transitive multilateral comparisons between members of a group of countries to retain the essential features of the intransitive binary comparisons that existed between them before transitivity. A transitive multilateral comparison between a pair of countries is influenced by the price and quantity data of all other participating countries. Characteristicity requires that the impact of these influences should be kept to a minimum when they are introduced into the intransitive binary comparison. The extent to which the EKS PPP and the Fisher type PPP for a pair of countries differ depends on the degree of homogeneity among the price structures of the group of countries being compared.

A modified version of the Fisher type approach: EKS-S method

7.17. Unrepresentative products normally have higher price levels than representative products. Application of the EKS method as described above can lead to a bias in the Fisher type PPP when among the products priced by both countries being compared one country has a larger number of representative products than the other. There can be a downward bias in the Fisher type PPP for the country that provides prices for a larger number of representative products. Conversely, there can be an upward bias in the Fisher type PPP for the country that provides prices for a larger number of unrepresentative products. As explained below, the use of a "Laspeyres - Paasche" approach does not eliminate this possible bias from the Fisher type PPP.[12] A modified version of the EKS method - the EKS-S method - is designed to correct for this bias.

7.18. The EKS-S method starts from the observation that a binary Fisher type PPP, F_{AB}, can be regarded as a geometric average of three and not two PPPs - namely, those based on:

- products that are representative in both countries;

- products that are representative in A but not in B;

- products that are representative in B but not in A.

7.19. In other words, as demonstrated in Box 7.1, the two sets of representative products introduced earlier, R_A and R_B, can be re-organised into three sets. The PPP based on the first set should provide an unbiased estimate of the basic heading PPP because representative products are being compared with representative products. The PPP for A relative to B based on the second set is likely to suffer from an upward bias, while the PPP based on the third set is likely to have a downward bias. If the second and the third set do not enter the calculation of the Fisher type PPP with the same weight, it can be argued that the result is a bias in the estimate of the PPP for the basic heading (see equation (4) in Box 7.1). In order to have an unbiased estimate, equal weight should be given to the PPPs for the second and third sets (see equation (5) in Box 7.1). In almost all cases, the weights for the second and third sets cannot be expected to be equal. And it can be argued that the EKS method is liable to produce biased results in general.

7.20. The procedure that the EKS-S method follows to avoid the bias is this:

- Divide the products and their PPPs into the three mutually exclusive sets defined above;

- Count each price relative in the first set twice on the grounds that PPPs between products that are representative in both countries are unbiased and likely to be more reliable;

- Adjust the total weights for the second and third sets to make them equal while keeping their combined weight unchanged (see equation (5) in Box 7.1)

- Take a weighted geometric mean of the PPPs for each of the three sets using the adjusted weights.

7.21. From a theoretical viewpoint, EKS-S seems to be marginally superior to the standard EKS method. While the two methods are likely to produce similar results in most cases, there may be exceptional cases in which they yield significantly different results. Both methods introduce differential weights for the price relatives that are by no means intuitively obvious, and which are liable to vary considerably depending on the relative sizes of each of three sets of products. These methods cannot be applied mechanically as other factors have to be taken into consideration, in particular the absolute number of products priced for the basic heading. Which method to use and when to use it has to be decided case by case. Not being able to specify the circumstances when each method should be used is clearly a disadvantage.[13]

Box 7.1: EKS weights and EKS-S weights

1. In the EKS method, Fisher type PPPs are calculated as the geometric mean of Laspeyres type PPPs and Paasche type PPPs. For a comparison with the EKS-S method, it is useful to present the formulas used for the EKS somewhat differently.

2. The formula for the Laspeyres type PPP can be broken down as follows:

$$(1)\ L_P = \left(\prod_{i=1}^{n_{11}} p_{i,11} \times \prod_{i=1}^{n_{10}} p_{i,10} \right)^{\frac{1}{n_{11}+n_{10}}} = \left(\prod_{i=1}^{n_{11}} p_{i,11} \right)^{\frac{1}{n_{11}+n_{10}}} \times \left(\prod_{i=1}^{n_{10}} p_{i,10} \right)^{\frac{1}{n_{11}+n_{10}}}$$

$$= \left(\left(\prod_{i=1}^{n_{11}} p_{i,11} \right)^{\frac{1}{n_{11}}} \right)^{\frac{n_{11}}{n_{11}+n_{10}}} \times \left(\left(\prod_{i=1}^{n_{10}} p_{i,10} \right)^{\frac{1}{n_{10}}} \right)^{\frac{n_{10}}{n_{11}+n_{10}}} = \widetilde{p}_{11}^{\frac{n_{11}}{n_{11}+n_{10}}} \times \widetilde{p}_{10}^{\frac{n_{10}}{n_{11}+n_{10}}}$$

where:
- $P_{i,11}$ is the price relative for product i that is representative in both countries. n_{11} is the total number of these cases;
- $P_{i,10}$ is the price relative for product i that is representative only in the first country. n_{10} is the total number of these cases;
- $P_{i,01}$ is the price relative for product i that is representative only in the second country. n_{01} is the total number of these cases;

- $\widetilde{p}_{11} \equiv \left(\prod_{i=1}^{n_{11}} p_{i,11} \right)^{\frac{1}{n_{11}}}$, $\widetilde{p}_{10} \equiv \left(\prod_{i=1}^{n_{10}} p_{i,10} \right)^{\frac{1}{n_{10}}}$ and $\widetilde{p}_{01} \equiv \left(\prod_{i=1}^{n_{01}} p_{i,01} \right)^{\frac{1}{n_{01}}}$ are geometric averages of the initial price relatives.

3. The formula for the Paasche type PPP can be broken down in a similar way:

$$(2)\ P_P = \widetilde{p}_{11}^{\frac{n_{11}}{n_{11}+n_{01}}} \times \widetilde{p}_{01}^{\frac{n_{01}}{n_{11}+n_{01}}}$$

4. The formula for the Fisher type PPP is then:

$$(3)\ F_P = \sqrt{L_P \times P_P} = \widetilde{p}_{11}^{\frac{0.5 \times n_{11}}{n_{11}+n_{10}}} \times \widetilde{p}_{10}^{\frac{0.5 \times n_{10}}{n_{11}+n_{10}}} \times \widetilde{p}_{11}^{\frac{0.5 \times n_{11}}{n_{11}+n_{01}}} \times \widetilde{p}_{01}^{\frac{0.5 \times n_{01}}{n_{11}+n_{01}}}$$

$$= \widetilde{p}_{11}^{\left(\frac{0.5 \times n_{11}}{n_{11}+n_{10}} + \frac{0.5 \times n_{11}}{n_{11}+n_{01}} \right)} \times \widetilde{p}_{10}^{\frac{0.5 \times n_{10}}{n_{11}+n_{10}}} \times \widetilde{p}_{01}^{\frac{0.5 \times n_{01}}{n_{11}+n_{01}}}$$

5. Thus, the weighting scheme in the EKS method is:

$$(4)\ w_{11} = \frac{0.5 \times n_{11}}{n_{11}+n_{10}} + \frac{0.5 \times n_{11}}{n_{11}+n_{01}} \ ; \ w_{10} = \frac{0.5 \times n_{10}}{n_{11}+n_{10}} \ ; \ w_{01} = \frac{0.5 \times n_{01}}{n_{11}+n_{01}}$$

6. The comparison between w_{10} and w_{01} shows the possible asymmetry of the EKS method. The larger the difference between n_{10} and n_{01} the greater the asymmetry.

7. Using the same notation as above, the weights of various PPPs in the EKS-S method are the following:

$$(5)\ w_{11} = \frac{2 \times n_{11}}{2 \times n_{11} + n_{10} + n_{01}} \ ; \ w_{10} = w_{01} = 0.5 \times \frac{n_{10} + n_{01}}{2 \times n_{11} + n_{10} + n_{01}}$$

7.22. There can be difficulties in implementing either EKS or EKS-S if the absolute number of products in any of the three sets becomes very small or zero. For example, suppose there are seven products in the second set and one product in the third set. With EKS-S, the geometric mean for third set will be based on a single price relative. An average based on a single observation has to be erratic. It can be argued that it would not be optimal to reduce the seven price relatives in the second set to an average and then to give this average no more weight than the single price relative in the third set. If there are no products in the third set then the question arises of what use, if any, can be made of the price relatives in the second set when there are no counter-balancing price relatives for them in third set. The problem remains even if the standard EKS is used, although it is probably not as acute as it is for EKS-S. The inclusion of more products in an EKS calculation produces more robust results, but the bias persists if the imbalance between representative products and unrepresentative products is not addressed.

CPD method

7.23. The CPD method is the multilateral method used by the ICP to obtain transitive PPPs at the basic heading level through regression analysis. It is not used by Eurostat and the OECD, but it is the principal alternative to the EKS method, which is why it is discussed here.[14] The method treats the calculation of PPPs as a matter of statistical inference, an estimation problem rather than an index number problem.[15] Its underlying hypothesis is that, apart from random disturbance, the PPPs for individual products within a basic heading are all constant between any given pair of countries. In other words, it is assumed that the pattern of relative prices of the different products within a given basic heading is the same in all countries. It is also assumed that each country has its own overall price level for the basic heading and it is this price level which fixes the levels of absolute prices of the products in the basic heading for the country. By treating the prices observed in the countries for the basic heading as random samples, the PPPs between each pair of countries and the common pattern of relative prices can be estimated using classical least square methods.

7.24. More specifically, the CPD method is a statistical tool that can be used to derive the PPPs for a particular basic heading by regressing the logarithm of observed prices against a set of dummy variables that are defined with respect to the products priced and the participating countries. The procedure involves the model:

$$\ln p_{ij} = \eta_1 D_{1j} + \eta_2 D_{2j} + \ldots + \eta_m D_{mj} +$$
$$\pi_1 D_{i1}^* + \pi_2 D_{i2}^* + \ldots + \pi_n D_{in}^* + u_{ij} \tag{5}$$

D_{ij} and D_{ij}^* (i = 1, 2, …, m; j = 1, 2, …, n) are, respectively, dummy variables for the m products in the basic heading and the n countries involved in the comparison. D_{ij} and D_{ij}^* are equal to 1 when product i is priced in country j, otherwise they equal 0. Once this regression equation is estimated, the PPP for currency of country k with country j as base can be obtained by the exponential of the difference in the estimates of π_j and π_k taken from the regression equation.

CPD and EKS methods compared

7.25. The EKS method views the calculation of PPPs as an index number problem. It starts with a binary approach and subsequently moves to a multilateral approach. The object is to maximise characteristicity – that is, to obtain multilateral transitive PPPs for the basic heading which are as close as possible to the binary intransitive PPPs initially calculated for the basic heading. The method provides greater flexibility by distinguishing between representative and unrepresentative products. It recognises that within a basic heading price differentials between products can vary from country to country.[16] But the Fisher type PPPs it produces are intransitive. Transitivity is imposed by applying the EKS procedure. Additionally, because of its binary approach, the EKS method is data demanding. Even so, in practice, there may be so few price matches between a single pair of countries that it is impossible to estimate the Fisher type PPP directly. And, as a consequence, price data will be ignored when the missing Fisher type PPPs are estimated indirectly.[17]

7.26. The CPD method considers the calculation of PPPs to be a question of statistical inference. It has a multilateral approach from the beginning. The aim is to calculate transitive PPPs for the basic heading with maximum use of the price data collected for the basic heading. The assumption underlying the method - that the pattern of relative prices within a basic heading is the same in all countries whether or not one or other, or both, of the products is representative - is unrealistic. It is also in direct conflict with the assumption underlying the EKS method. Later versions of the CPD method, for example the Country Product Representativity Dummy or CPRD method, include representativity as another dummy variable.[18] The CPD method produces PPPs that are immediately transitive. In this respect, it is considered to be more transparent than the EKS method. Moreover, missing prices are estimated using the regression coefficients of the respective dummy variables that are based on all the prices collected for the basic heading. The method also allows sampling errors to be estimated for the PPPs.

7.27. Neither method is thought to be absolutely better than the other. When all products are priced in all countries and representativity is not taken into account, the CPD and the EKS produce identical basic heading PPPs.[19] Experimental applications of the EKS, EKS-S, CPD and CPRD methods with ac-

tual data suggest that in practice the differences in results are usually not significant. The choice of method depends more on the circumstances of the comparison.

PART II: AGGREGATION OF PPPS ABOVE THE BASIC HEADING

EKS Method

7.28. With the EKS method, the aggregation of basic heading PPPs is undertaken at each level of expenditure up to the level of GDP as follows:

- For each pair of countries, the basic heading EKS PPPs are weighted, summed and averaged using first the expenditures on the basic headings of the first country as weights and then the expenditures on the basic headings of the second country as weights. This gives two weighted PPPs: a *Laspeyres type PPP* and a *Paasche type PPP*.[20] The geometric mean of these two PPPs gives a single *Fisher type PPP* between the two countries.

- By following this procedure each level of aggregation is provided with a matrix of intransitive Fisher PPPs. Application of the EKS formula makes the matrix transitive.

- The EKS PPPs are then used to convert the national expenditures in national currencies to real final expenditures in a common currency.

7.29. The EKS method provides PPPs for each pair of countries in the comparison that are close to the PPPs that would be obtained if each pair of countries had been compared separately. This is because the EKS procedure in making the Fisher PPPs transitive minimises the differences between them and the resulting EKS PPPs. It also provides real final expenditures that are not additive. It is for this reason that PPPs have to be calculated for each level of aggregation. EKS real final expenditures are not subject to the Gerschenkron effect.

Additivity

7.30. The values of the final expenditure aggregates of participating countries are equal to the sum of the values of their components when both aggregates and components are valued at national prices. Additivity requires this identity to be preserved when the values of the aggregates and their components are valued at international prices. An aggregation method is additive if, for each country being compared, it provides real final expenditures for basic headings that sum to the real final expenditures of the aggregates of which they are components. An additive aggregation method provides volumes that satisfy the average test for volumes – that is, the average volume lies between the maximum and minimum volumes.[21]

Gerschenkron effect

7.31. The Gerschenkron effect applies to aggregation methods that use either a reference price structure – that is, each country's quantities are valued by a uniform set of prices - or a reference volume structure – that is, each country's prices are used to value a uniform set of quantities - to compare countries. With methods employing a reference price structure, a country's share of total GDP - that is, the total for the group of countries being compared - will rise as the reference price structure becomes less characteristic of its own price structure. With methods employing a reference volume structure, a country's share of total GDP will fall as the reference volume structure becomes less characteristic of its own volume structure.

7.32. The Gerschenkron effect arises because of the negative correlation between prices and volumes. In other words, expenditure patterns change in response to changes in relative prices because consumers switch their expenditure towards relatively cheap products. The EKS method does not use a reference price structure or a reference volume structure when estimating real final expenditures. The GK method uses a reference price structure.

GK method

7.33. When applied at the basic heading level, the GK method provides a way of calculating PPPs from observed price and quantity data. Let p_{ij} and q_{ij} denote the price and quantity of product i in country j. Also let P_i denote the international average price of product i. The GK method is defined through the system of interrelated equations below:

$$P_i = \frac{\sum_{j=1}^{M}(p_{ij}/PPP_j)q_{ij}}{\sum_{j=1}^{M}q_{ij}}$$

$$= \frac{\sum_{j=1}^{M}(p_{ij}q_{ij})/PPP_j}{\sum_{j=1}^{M}q_{ij}}$$

and

$$PPP_j = \frac{\sum_{i=1}^{N}p_{ij}q_{ij}}{\sum_{i=1}^{N}P_iq_{ij}}$$

$$= \frac{\sum_{i=1}^{N}p_{ij}q_{ij}}{\sum_{i=1}^{N}p_{ij}q_{ij}/(p_{ij}/P_i)}$$

(6)

PPPj is the PPP for an aggregate that includes the basic headings i = 1...n for a country j, N is the number of products and M is the number of countries. These equations are used for all the products and the currencies of the countries involved in the comparison. In practice, the input data are not prices and quantities for individual products, but notional prices and quantities for basic headings that comprise sets of products. The notional prices are the PPPs for the basic headings expressed as national currency units per unit of numéraire currency. The notional quantities are the expenditures on the basic headings expressed in terms of the numéraire currency – that is, national expenditures on the basic headings divided by the corresponding basic heading PPPs.

7.34. GK PPPs are transitive. They provide real final expenditures that are additive. As shown in the worked example in Annex V, it is sufficient to calculate GK PPPs and GK real final expenditures for basic headings only. The real final expenditure for an aggregate is obtained by summing the real final expenditures on its constituent basic headings. The PPPs for the aggregate is derived by dividing the national expenditure on the aggregate by the real final expenditure on the aggregate. GK real final expenditures are subject to the Gerschenkron effect.

EKS and GK methods compared

7.35. The EKS method treats participating countries as a set of independent units, each with an equal weight. It involves calculating a set of binary PPPs between each pair of countries. These binary PPPs are then made transitive by a procedure that minimises the differences between them and the multilateral PPPs it produces. The EKS method provides PPPs for each pair of countries that are "close" to the PPPs that would be obtained if each pair of countries had been compared separately. The extent to which the EKS PPP and the Fisher PPP for a pair of countries differ depends on the degree of homogeneity among the price and expenditure structures of the group of countries being compared. The real final expenditures derived using these PPPs are not additive; nor are they subject to the Gerschenkron effect. EKS PPPs and real final expenditures are considered to be better suited to comparisons across countries of the price and volume levels of individual aggregates, such as clothing and footwear, actual individual consumption, gross fixed capital formation or GDP.

7.36. The GK method treats countries as members of a group, each with a weight equal to its share of real GDP for the group. It entails valuing a matrix of quantities using a vector of prices. The vector is obtained by averaging prices across the group. One disadvantage of this is that a change in the composition of the group can change significantly the average prices as well as the relationships between countries. (This can also happen with the EKS method, but generally the changes are not significant.) Another more important disadvantage is that the real final expenditures are subject to the Gerschenkron effect which can be large.[22] The real final expenditures are additive. GK results are considered to be better suited to the analysis of price and volume structures across countries. Such analyses involve at least two aggregates: for example, clothing and footwear's share of actual individual consumption or gross fixed capital formation's price level relative to that of the GDP.

Missing PPPs and reference PPPs

7.37. Any method of aggregation requires the matrix of basic heading PPPs to be complete. This is not always the case and there are basic headings for which PPPs cannot be calculated for a country. Either the country has not priced a representative product or, if it has, other countries have not priced its representative product or, if they have, it has not priced their representative products. Consequently, no direct binary PPP can be calculated between it and any other country. In such cases, the PPPs for the countries and basic headings are taken either from a comparable basic heading - such as beef for veal - or from the next level of aggregation - such as meat for pork.

7.38. For a number of basic headings no prices are collected because, for various reasons, it is difficult to specify and to price products that are comparable across countries for them. PPPs based on price data that have been collected for other basic headings are used for these basic headings. Such PPPs are called "reference PPPs". They serve as proxies for the PPPs that would have been calculated had prices been collected for the basic headings for which no prices were collected.

7.39 The basic headings affected and the reference PPPs selected for them are listed in Box 7.2. From the Box, it will be seen that the reference PPPs are either for highly aggregated expenditure components, such as household final consumption expenditure, or for goods and services that are similar to the goods and services for which no prices were collected. Exchange rates are used for net purchases abroad and for balance of exports and imports.

Box 7.2: Reference PPPs by basic heading

Basic heading	Reference PPP
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	
11.02.31.1 Narcotics	PPPs for household final consumption expenditure on the domestic market (excluding all basic headings under health and education and all basic headings with reference PPPs)
11.04.42.1 Miscellaneous services relating to the dwelling	PPPs for water supply or actual rent
11 06.31 1 Hospital services	PPPs for production of health services by government (without receipts from sales)
11.07.14.1 Animal drawn vehicles	PPPs for household final consumption expenditure on the domestic market (excluding all basic headings under health and education and all basic headings with reference PPPs)
11.07.35.1 Combined passenger transport	PPP for transport services
11.08.21.1 Telephone and telefax equipment 11.09.21.1 Major durables for outdoor recreation 11.09.22.1 Musical instruments and major durables for indoor recreation	PPPs for durable goods
11.09.43.1 Games of chance	PPPs for household final consumption expenditure on the domestic market (excluding all basic headings under health and education and all basic headings with reference PPPs)
11.09.61.1 Package holidays	Weighted average of PPPs for transport services and PPPs for restaurants and hotels
11.10.11.1 Pre-primary and primary education 11.10.21.1 Secondary education 11.10.31.1 Post-secondary non-tertiary education 11.10.41.1 Tertiary education	PPPs for production of education services by government (without receipts from sales)
11.11.12.1 Canteens	PPPs calculated from selected prices for catering services
11.12.21.1 Prostitution	PPPs for household final consumption expenditure on the domestic market (excluding all basic headings under health and education and all basic headings with reference PPPs)
11.12.41.1 Social protection	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
11.12.51.1 Insurance 11.12.61.1 FISIM	PPPs for household final consumption expenditure on the domestic market (excluding all basic headings under health and education and all basic headings with reference PPPs)
11.13.11.1 Purchases by residential households in the rest of the world 11.13.11.2 Purchases by non-residential households in the economic territory of the country	Exchange rates
INDIVIDUAL CONSUMPTION EXPENDITURE BY NPISHs	
12.01.11.1 Housing	PPPs for actual rents
12.02.11.1 Health	PPPs for production of health services by government (without receipts from sales)
12.03.11.1 Recreation and culture	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
12.04.11.1 Education	PPPs for production of education services by government (without receipts from sales)
12.05.11.1 Social protection 12.06.11.1 Other services	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)

Box 7.2: (contd.)

Basic heading	Reference PPP
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	
13.01.11.1 Housing	PPPs for actual rentals
Health benefits & reimbursements	
13.02.12.4 Hospital services	PPPs for production of health services by government (without receipts from sales)
Production of health services	
Intermediate consumption: ▪ 13.02.22.1 Pharmaceutical products ▪ 13.02.22.2 Other medical goods ▪ 13.02.22.3 Therapeutic appliances and equipment	PPPs for household final consumption expenditure on: ▪ Pharmaceutical products ▪ Other medical products ▪ Therapeutic appliances and equipment
13.03.22.4 Intermediate consumption n.e.c.	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
13.02.23.1 Gross operating surplus	PPPs for gross fixed capital formation
13.02.24.1 Net taxes on production	PPPs for production of health services by government (without net taxes on production and receipts from sales)
13.02.25.1 Receipts from sales	PPPs for production of health services by government (without receipts from sales)
Recreation and culture	
13.03.11.1 Recreation and culture	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
Education benefits & reimbursements	
13.04.11.1 Education benefits & reimbursements	PPPs for production of education services by government (without receipts from sales)
Production of education services	
13.04.22.1 Intermediate consumption	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
13.04.23.1 Gross operating surplus	PPPs for gross fixed capital formation
13.04.24.1 Net taxes on production	PPPs for production of education services by government (without net taxes on production and receipts from sales)
13.04.25.1 Receipts from sales	PPPs for production of education services by government (without receipts from sales)
Social protection	
13.05.11.1 Social protection	PPPs for individual consumption expenditure by government (excluding social protection, recreation and culture, and receipts from sales)
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	
14.01.12.1 Intermediate consumption (collective services relating to defence)	PPPs for gross fixed capital formation in machinery and equipment
14.01.12.2 Intermediate consumption (collective services other than defence)	PPPs for individual consumption expenditure by households on the domestic market (excluding all basic headings with reference PPPs)
14.01.13.1 Gross operating surplus	PPPs for gross fixed capital formation
14.01.14.1 Net taxes on production	PPPs for production of collective services by government (without net taxes on production and receipts from sales)
14.01.15.1 Receipts from sales	PPPs for production of collective services by government (without receipts from sales)

Box 7.2: (contd.)

Basic heading	Reference PPP
GROSS FIXED CAPITAL FORMATION	
15.01.22.1 Ships, boats, steamers, tugs, floating platforms, rigs 15.01.22.2 Locomotives and rolling stock	PPPs for gross fixed capital formation in machinery and equipment
15.01.22.3 Aircraft, helicopters and other aeronautical equipment	Exchange rates
15.03 11.1 Products of agriculture, forestry, fisheries and aquaculture 15.03.13.1 Other products n.e.c.	PPPs for gross fixed capital formation
OTHER 16.01.11.1 Change in inventories	Weighted average of the PPPs for consumer goods and the PPPs for equipment goods
16.02.11.1 Acquisition less disposals of valuables	PPPs for jewellery, clocks and watches
17.01.11.1 Exports of goods and services 17.01.11.2 Imports of goods and service	Exchange rates.

[1]   See, for example, "A taxonomy of multilateral methods for making international comparisons of prices and quantities", R. Hill, *The Review of Income and Wealth*, March 1997.

[2]   The EKS method is named after the three individuals who independently advocated its use: Èltetö, Köves and Szulc. It was called "EKS" by Lazlo Drechsler in "Weighting of index numbers in multilateral comparisons", *The Review of Income and Wealth*, March 1973. The formula was actually proposed 40 years earlier by Gini in "On the circular test of index numbers", *International Review of Statistics*, Vol. 9, No. 2, 1931. "EKS" refers to a procedure whereby any set of intransitive binary index numbers are made transitive. The procedure is independent of the method used to calculate the intransitive binary indices. But, as used in this chapter and in most literature on the subject, "EKS" covers both the way the intransitive binary PPPs are calculated and the procedure to make them transitive and multilateral.

[3]   The second "S" stands for Sergey Sergeev who proposed the modification in *Equi-representativity and Some Modifications of the EKS Method at the Basic Heading Level* at the Joint Consultation on the European Comparison Programme, ECE, Geneva, 2003.

[4]   The CPD method was proposed by Robert Summers in "International comparisons with incomplete data", *The Review of Income and Wealth*, March 1973.

[5]   See *A System of International Comparisons of Gross Product and Purchasing Power*, I. Kravis. Z. Kenessey, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1975; *International Comparisons of Real Product and Purchasing Power*, I. Kravis, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1978; and *World Product and Income, International Comparisons of Real Product and Purchasing Power*, I. Kravis, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1982.

[6]   The GK method was proposed by R. C. Geary in "A note on the comparison of exchange rates and the purchasing power between countries", *Journal of the Royal Statistical Society*, Series A, Vol. 121, 1958. Practical application was developed by S. H. Khamis in: "Properties and conditions for the existence of a new type of index numbers", *Sankhya*, Series , Vol. 2, 1970; "A new system of index numbers for national and international purposes", *Journal of the Royal Statistical Society*, Series A, Vol. 135, 1972; and "On aggregation methods for international comparisons", *The Review of Income and Wealth*, Vol.30, 1984.

[7]   Eurostat and the OECD assign a weight of "1" to products that are representative and a weight of "0" to products that are not representative. In this way the price relatives that are based on products that are unrepresentative of both countries are excluded when calculating PPPs between two countries for a basic heading. Even so, the choice of "1" and "0" as weights is arbitrary. Weights of "2" and "1", or any other similar combination, could also be used.

[8]   For a more complete explanation of representativity and the assigning of representativity indicators see paragraphs 4.57 to 4.62 of Chapter 4.

[9]   The qualifier "type" is used for two reasons. The first is that Laspeyres, Paasche and Fisher indexes are generally used for temporal comparisons rather than spatial comparisons. Standard Laspeyres, Paasche and Fisher indexes have a "base period" and a "current period", whereas Laspeyres, Paasche and Fisher type PPPs have a "base country" and a "partner country". The second reason is that, whereas a standard Laspeyres index is a weighted arithmetic mean and a standard Paasche index is a weighted harmonic mean, the Laspeyres and Paasche type PPPs calculated for a basic heading are quasi-weighted geometric means. In this respect, the terminology is misleading. It would be more accurate and simpler to refer to the Laspeyres and Paasche type PPPs as "Jevons type PPPs" and to refer to the Fisher type PPPs as "Törnqvist type PPPs". This terminology has recently been introduced in Chapter 10, "The estimation of PPPs for basic headings", revision 1, February 2005, of the *ICP 2003-2006 Handbook* at www.worldbank.org/data/.

[10] The process is iterative. During the first round only the original Fisher type PPPs are used. If the matrix remains incomplete, there is a second round using both the original Fisher type PPPs and the new Fisher type PPPs derived indirectly during the first round. The process is continued until either the matrix is complete or it becomes clear that the matrix cannot be completed.

[11] The EKS procedure is applied to intransitive binary Fisher type PPPs in Eurostat-OECD comparisons. But, as already mentioned in footnote 3, the procedure can be applied to other sorts of intransitive binary PPPs such as Törnqvist, Marshall-Edgeworth, etc.

[12] This is for practical rather than theoretical reasons. In Eurostat-OECD comparisons the Fisher type PPP between any pair of participating countries is based on a set of commonly-priced products selected from a product list designed to facilitate a multilateral comparison and not from a product list that has been tailored specifically to make a bilateral comparison between the two countries in question. Hence, the numbers of representative and unrepresentative products among the commonly-priced products depend on what the two countries have priced. And what the two countries have priced is determined by factors other than ensuring that the numbers of representative and unrepresentative products are appropriately balanced for the bilateral comparison between them or with any other participating country.

[13] Not being able to specify the circumstances under which different methods should be used is not specific to the EKS and the EKS-S. For example, when to use the EKS method and when to use the CPD method is still being debated.

[14] Or "was" the principal alternative. See paragraph 7.26 and footnote 18.

[15] In *Multilateral Measurement of Purchasing Power and Real GDP* (Eurostat, 1982), Peter Hill asks "whether or not it is legitimate to by-pass index number problems in this way by falling back on the somewhat unfashionable concept of price level, even at the very detailed level of disaggregation of a basic heading" though he concedes that "there is much more justification for associating specific price levels with countries when dealing with individual basic headings containing small numbers of fairly homogeneous items" than "at a much higher levels of aggregation with larger and more heterogeneous groups of goods and services whose relative prices have much greater scope for variation from country to country". In Annex 2 of *Equi-representativity and Some Modifications of the EKS Method at the Basic Heading Level* (Joint Consultation on the European Comparison Programme, ECE, Geneva, 2003), Sergey Sergeev points out that the economics of the regression equation are not obvious making the CPD appear as a mathematical exercise. He also points out that the stochastic assumptions for the regression procedure are not realistic in practice when the number of products priced per basic heading is small. This leads him to propose a modification to the CPD method that makes possible its presentation as an index number method.

[16] In practice, with the use of "1" and "0" as weights, there is an implicit assumption that products countries nominate as representative are equally representative and that products they nominate as unrepresentative are equally unrepresentative. In other words, the price differential between representative and unrepresentative products is the same for all countries.

[17] This is not the only example of price data being ignored. As explained in footnote 7, when calculating the Laspeyres and Paasche type PPPs between a pair of countries, Eurostat and the OECD assign weights of "1" and "0" to representative and unrepresenta-

tive products respectively. As a consequence, no account is taken of the prices of products that are unrepresentative of both countries and which both have priced.

[18] The inclusion of a variable for representativity in the CPD was first suggested by James and Margaret Cuthbert in "On aggregation methods of purchasing power parities", *OECD Department of Economic Statistics Working Papers*, No.56, Paris, November 1988. It is very likely that the CPRD, and not the CPD, will be used for ICP 2005. The CPRD is explained in Chapter 10, "The estimation of PPPs for basic headings", revision 1, February 2005, of the *ICP 2003-2006 Handbook* at www.worldbank.org/data/.

[19] When first applied, the EKS method did not take into account the representativity of the products priced. This version of the EKS is sometimes referred to as the "classic" EKS. Similarly, the original version of the CPD, which also does not take representativity into account, is sometimes referred as the "classic" or "traditional" CPD.

[20] Unlike their namesakes in Part I which are quasi-weighted geometric means, these Laspeyres and Paasche type PPPs are like standard Laspeyres and Paasche indexes being, respectively, weighted arithmetic means and weighted harmonic means.

[21] Additive aggregation methods generally use a reference price structure to value national expenditures on basic headings at international prices. The reference price structure consists of an international price for each basic heading. An international price for a basic heading is defined as the average of the national prices for the basic heading prevailing in participating countries. The average may be weighted or unweighted, PPP adjusted or PPP-unadjusted. It may be an average of prices or an average of price structures. For example, in the GK method which is discussed later, the average is defined as a quantity-weighted arithmetic average of the national prices adjusted by the global PPPs across all countries.

[22] For example, countries significantly affected by the Gerschenkron effect in the GK calculation for the 1999 comparison were: Turkey, Romania, FYROM, Estonia, and Lithuania - all over 15 per cent; and the Russian Federation, Latvia, Bulgaria and Ukraine - all over 20 per cent. The percentage shows the difference between the EKS and GK real final expenditure on GDP for a country expressed as a percentage of its EKS real final expenditure on GDP.

CHAPTER 8: PRESENTATION, DISSEMINATION AND UPDATING OF RESULTS

Introduction

8.1. The term "results" is used in the title, and in the chapter, as shorthand for "the PPPs, the real and nominal final expenditures and the associated price and volume indices" that are generated by Eurostat and OECD comparisons of final expenditure on GDP. Unless stated otherwise, the results referred to are those calculated by the Ëltetö-Köves-Szulc or EKS method. The EKS results that Eurostat calculates for EU Members States are the official results for the European Union (EU).

8.2. Eurostat and OECD comparisons cover different, but overlapping, groups of countries: principally the European Union and the OECD.[1] Only half of the total number of countries covered is common to both groups and, as explained below, the results for dual participants can differ between the two comparisons. Eurostat comparisons are made annually so every year is a benchmark year for Eurostat. OECD comparisons are made every three years so every third year is a benchmark year for the OECD. Every third year is also a common benchmark year because, like every year, it is a benchmark year for Eurostat.

8.3. This chapter describes how Eurostat and the OECD present and disseminate results for a common benchmark year that do not conflict with each other. It describes as well how Eurostat presents and disseminates the results of its annual comparisons. It also explains how Eurostat and the OECD update the results for the latest benchmark year before the results for the next benchmark year become available. Both use extrapolation, but at different levels of aggregation. The chapter also clarifies the revision policy followed by Eurostat and the OECD with respect to results already published for a benchmark year and subsequent revisions made by participating countries to their estimates of GDP for the benchmark year. This is an important consideration as such revisions can change the relativities originally established between countries.

Fixity

8.4. Eurostat comparisons focus on EU Member States (previously the EU 15, currently the EU 25). OECD comparisons focus on OECD Member Countries (formerly the OECD 24, now the OECD 30). This does not change when non-member countries are included in the comparisons. Eurostat results are calculated at "average EU price levels" and OECD results are calculated at "average OECD price levels". For countries that are covered by both calculations – that is, countries that are both EU Member States and OECD Member Countries - this means that the relativities between them in the Eurostat comparison can differ from those in the OECD comparison. While it is a statistical fact of life that the relative position of countries can change as the composition of the group of countries being com-

pared changes, the existence of two sets of results can confuse users. Generally, it is desirable to avoid such a situation, but it is particularly desirable if the results are used for administrative purposes.

8.5. The results for the European Union are used in the allocation of the Structural Funds which account for a third of the European Commission's budget. For this reason, Eurostat requires that only one set of results – that is, the set it calculates for EU Member States - be recognised as the official results for the European Union. To facilitate this, Eurostat and the OECD have agreed that the official results for EU Member States will remain unchanged when these countries are included in comparisons with a wider group of countries such as the OECD. The agreement is referred to as the "fixity convention". It has been observed since the 1980 comparison. It now covers all countries that participate in both Eurostat comparisons and OECD comparisons irrespective of whether or not they are EU Member States.

8.6. Essentially, fixity is obtained by taking the PPPs calculated for a specific sub-group of countries, for example the EU 25, substituting them for the PPPs calculated for the sub-group in a comparison covering a larger group of countries, such as the Eurostat-OECD comparison, and linking the substitute PPPs with the PPPs for the other countries included in the comparison. More precisely, fixity involves two groups of countries, one smaller than the other, with the smaller group being a sub-group of the larger group. There are two sets of PPPs for the smaller group. The first set is that calculated for the group on its own. The second set is that calculated for the group as a sub-group of the larger group. Fixity requires that the first set replaces the second set in the larger comparison. This is achieved by taking the ratio of the geometric means of the two sets of PPPs and multiplying the first set of PPPs by this ratio so as to put them at the same overall level as the second set of PPPs. The procedure preserves the relativities between the countries in the sub-group and the relativities between the other countries in the larger group. It also preserves the relativities between the other countries and the sub-group as a whole.[2]

Presentation of Eurostat-OECD results

8.7. Prior to 2002, results for common benchmark years were published separately by Eurostat and the OECD and their presentation and coverage differed. But these differences are no longer relevant. Starting with the 2002 comparison, Eurostat and the OECD have published the results of common benchmark years jointly. This required the adoption of a standard set of tables covering the same final expenditures, the same countries and the same country groups. Complete uniformity has not been possible. Eurostat results are presented at average

Box 8.1: Standard tables for presenting Eurostat results[1]

Table 1:	*Final expenditure on GDP at national price levels in national currencies; population and exchange rates*	The table gives the final expenditures on GDP, the mid-year populations and the annual average exchange rates (vis-à-vis the euro) of participating countries. The final expenditures are valued at national price levels and expressed in national currencies.
Table 2:	*Purchasing power parities for final expenditure on GDP in national currencies per euro (EU 25 = 1.00)*	The table presents EKS PPPs in national currencies per euro that have been calculated for participating countries with the price and expenditure data they supplied for the reference year. The PPPs are transitive and base country invariant. They provide real final expenditures that are valued at average EU 25 price levels. EKS real final expenditures are neither additive nor subject to the Gerschenkron effect.
Table 3:	*Nominal final expenditure on GDP at national price levels in euros*	The table shows the final expenditures on GDP of Table 1 converted to euros using the annual average exchange rates of Table 1. Exchange rates do not reflect the relative purchasing powers of different currencies and the converted final expenditures, though expressed in a common currency, are still valued at national price levels. As such, they remain measures of value, the spatial equivalent of a time series of GDP for a single country at current prices. Hence, they are called "nominal final expenditures". The nominal final expenditures in the table reflect both differences in the quantities of goods and services purchased in participating countries and differences in the price levels of participating countries
Table 4:	*Nominal final expenditures per head on GDP at national price levels in euros*	The table gives the nominal final expenditures on GDP of Table 3 put on a per capita basis using the mid-year population totals from Table 1.
Table 5:	*Indices of nominal final expenditure on GDP at national price levels (EU 25 = 100)*	The two tables present the nominal final expenditures on GDP from Table 3 and the nominal final expenditures per head on GDP from Table 4 as indices with EU 25 = 100.
Table 6:	*Indices of nominal final expenditure per head on GDP at national price levels (EU 25 = 100)*	
Table 7:	*Real final expenditure on GDP at average EU 25 price levels in euros*	The table shows the final expenditures on GDP of Table 1 converted to euro using the EKS PPPs from Table 2. PPPs equalise the purchasing power of different currencies during the process of conversion and the converted final expenditures, as well as being expressed in a common currency, are valued at the same price level (that is, at average EU 25 price levels). As such, they are volume measures, the spatial equivalent of a time series of GDP for a single country at constant prices. Hence, they are called "real final expenditures". The real final expenditures in the table reflect only differences in the volumes of goods and services purchased in the participating countries. Because they were derived using EKS PPPs, the real final expenditures are neither additive nor subject to the Gerschenkron effect.
Table 8:	*Real final expenditure per head on GDP at average EU 25 price levels in euros*	The table gives the real final expenditures on GDP of Table 7 put on a per capita basis using the mid-year population totals from Table 1.
Table 9:	*Indices of real final expenditure on GDP at average EU 25 price levels (EU 25 = 100)*	The two tables present the real final expenditures on GDP from Table 7 and the real final expenditures per head on GDP from Table 8 as indices with EU 25 = 100.
Table 10:	*Indices of real final expenditure per head on GDP at average EU 25 price levels (EU 25 = 100)*	
Table 11:	*Comparative price levels for final expenditure on GDP at average EU 25 price levels (EU 25 = 100)*	The table gives the comparative price levels of final expenditure on GDP. They are computed as ratios of the EKS PPPs in Table 2 to the annual average exchange rates in Table 1 and they are expressed as indices with EU 25 = 100. For a given analytical category, they indicate the number of units of the common currency needed to buy the same volume of the analytical category in each participating country. A comparative price level that exceeds 100 indicates that the price level for the given analytical category in the country is higher than the average price level for the analytical category in the EU 25 as a whole.

[1] The same tables are used to present OECD results except that the US dollar is the numeraire and OECD 30 is the reference country. This means that in the box above "euros" should be replaced by "US dollars" and "EU 25" by "OECD 30".

EU price levels with the European Union as reference country and the euro as numéraire[3]. OECD results are presented at average OECD price levels with the OECD as reference country and the US

dollar as numéraire. Accordingly, the joint publication has two parts: one with Eurostat results based on EU 25 and the euro, the other with OECD results based on OECD 30 and the US dollar. (Also, for reasons explained later, the publication has an annex containing a selection of results calculated by the Geary Khamis or GK method.).

8.8. The standard tables are described in Box 8.1. There are eleven tables in total. The first two contain the basic data from which the other nine are derived. These nine tables are ordered didactically allowing users to follow a progression from values through volumes to prices. They show first the nominal final expenditures and the corresponding value indices, then the real final expenditures and the corresponding volume indices and, finally, the price level indices. In the tables, final expenditure on GDP is broken down into 38 analytical categories[4]

Box 8.2: Analytical categories

	1993 SNA - 1995 ESA
01	**Actual individual consumption:**
02	Food and non-alcoholic beverages
03	Alcoholic beverages, tobacco and narcotics
04	Clothing and footwear
05	Housing, water, electricity, gas and other fuels
06	Household furnishings, equipment and maintenance
07	Health
08	Transport
09	Communication
10	Recreation and culture
11	Education
12	Restaurants and hotels
13	Miscellaneous goods and services
14	Net purchases abroad
15	**Actual collective consumption**
16	**Gross fixed capital formation**[(1)]**:**
17	Construction
18	Machinery and equipment
19	**Changes in inventories and valuables**[(2)]
20	**Balance of exports and imports**
21	**Gross domestic product**
	Of which:
22	*Final consumption expenditure*[(3)]*:*
23	*Household final consumption expenditure*
24	*Government final consumption expenditure:*
25	*Collective consumption expenditure*
26	*Individual consumption expenditure*
	TYPE OF PRODUCT
27	**Total goods:**
28	Consumer goods:
29	Non-durable goods
30	Semi-durable goods
31	Durable goods
32	Capital goods
33	**Total services:**
34	Consumer services
35	Government services:
36	Collective services
37	Individual services
38	**Gross domestic product**

[(1)] Includes expenditure on products of agriculture, forestry, fishing and aquaculture; software; land improvement; mineral exploration and other intangible fixed assets. [(2)] Includes statistical discrepancy. [(3)] Includes the final consumption expenditure of NPISHs.

that are classified either in line with the SNA 93[5] and the ESA 95[6] or by type of product. The analytical categories included in the tables are listed in Box 8.2 and elaborated in Box 8.3. In addition to the countries participating in the comparison, the tables also cover four country groups: EURO 12, EU 15[7], EU 25 and OECD 30. Their composition is given in Box 8.4.

PPPs for country groups

8.9.   The PPPs and the real and nominal final expenditures for EURO 12, EU 15, EU 25 and OECD 30 are derived using the PPPs and the national ex-

penditures in national currencies of their constituent countries. Before doing this, it is necessary to nominate a currency as numéraire for each group. The euro was selected for EURO 12, EU 15 and EU 25 and the US dollar for OECD 30. It is also necessary to designate a reference country. Traditionally, Germany has been chosen for this purpose. It should be noted that neither the choice of numéraire nor the choice of reference country influences the final results because the PPPs with which they are derived are base country invariant.

8.10. Having selected the currencies for the groups and the reference country, the PPPs and the real and

Box 8.3: Analytical categories (contd.)

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1993 SNA - 1995 ESA CLASSIFICATIONS

1.   As explained in paragraphs 3.10 to 3.14 of Chapter 3, the SNA 93 and the ESA 95 classify final consumption expenditure in two ways. One is by reference to the type of consumption - that is, by whether the purchase is consumed by households individually or collectively (lines 01 to 15). The other is by reference to the purchaser - that is, by whether the purchase is made by households, non-profit institutions serving households (NPISHs) or government (lines 22 to 26). The essential difference between these two classifications is how government final consumption expenditure is treated.

2.   By definition, all household final consumption expenditure (line 23) benefits individual households. And, by national accounting convention, all final consumption expenditure by NPISHs (which is not shown separately because it is not identified uniformly in the national accounts of participating countries) also benefits individual households. But government final consumption expenditure (line 24) can benefit households either collectively or individually and is divided between collective consumption expenditure (line 25), which is expenditure on collective services, and individual consumption expenditure (line 26), which is expenditure on individual services. Collective services principally cover general public services, defence, public order and safety, economic affairs, environment protection, and housing and community services. Individual services comprise the provision of most services relating to housing, health, recreation and culture, education and social protection.

3.   When final consumption expenditure is classified by purchaser, government final consumption expenditure is considered in its entirety. But when final consumption expenditure is classified by type of consumption, the individual consumption expenditure by government (line 26) is removed from government final consumption expenditure (line 24) and added to the final consumption expenditure of households (line 23) and the final consumption expenditure of NPISHs (which is not shown) to obtain actual individual consumption (line 01). The government final government expenditure that remains is the expenditure on collective services, otherwise known as "actual collective consumption" (line 15) or "collective consumption expenditure" (line 25).

4.   At the lower levels of aggregation, summing the final consumption expenditures of households and NPISHs and the individual consumption expenditure of government to obtain actual individual consumption affects the following analytical categories: housing, water, electricity gas and other fuels (line 05), health (line 07), recreation and culture (line 10), education (line 11) and miscellaneous goods and services (line 13).

5.   The division of government expenditure between individually-consumed services and collectively-consumed services is necessary because of the various ways the former are financed in different countries. Under the classification by purchaser, households in countries where government directly provides individually-consumed services will appear to consume a smaller volume of goods and services than households in countries where households themselves pay directly for these services. Hence, while the analytical category "household final consumption expenditure" (line 23) is a better measure of the total volume of goods and services purchased by households in different countries, the analytical category "actual individual consumption" (line 01) is a better measure of the actual volume of goods and services consumed by these households.

6.   Since one of the purposes of international volume comparisons of final expenditure on GDP is to compare the economic welfare of households across countries, the classification by type of consumption has been given pre-eminence in the tables with the major aggregates of the classification by purchaser provided as memorandum items (lines 22 to 26).

CLASSIFICATION BY TYPE OF PRODUCT

7.   The classification by type of product first distinguishes between final expenditure on goods (line 27) and final expenditure on services (line 33). Final expenditure on goods is divided between consumer goods (line 28) and capital goods (line 32) with expenditure on consumer goods being broken down into expenditure on non-durable goods (line 29), expenditure on semi-durable goods (line 30) and expenditure on durable goods (line 31). Final expenditure on services is divided between consumer services (line 34) and government services (line 35) with expenditure on government services being broken into expenditure on collective services (line 36) and expenditure on individual services (line 37).

8.   The distinction between non-durable goods and durable goods is based on whether the goods can be used only once or whether they can be used repeatedly or continuously over a period of considerably more than one year. Durables also have a relatively high purchasers' price. Semi-durable goods differ from durable goods in that their expected lifetime of use, though more than one year, is often significantly shorter and that their purchasers' price is substantially less.

9.   The classification covers all analytical categories except net purchases abroad (line 14), changes in inventories and valuables (line 19) and balance of exports and imports (line 20). These three analytical categories are not classified by type of product.

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nominal final expenditures are calculated for the groups as follows:

- First, the national expenditures in national currencies of the countries are converted to real final expenditures in "German euros" using PPPs where Germany, or the euro in Germany, equals 1.00. Real final expenditures for the four groups are obtained by summing the real final expenditures of their constituent countries.

- Next, the national expenditures in national currencies of the countries comprising EURO 12, EU 15 and EU 25 are converted to nominal final expenditures in euros using exchange rates. Nominal final expenditures for the three groups are obtained by summing the nominal final expenditures of their constituent countries. Nominal final expenditures in US dollars are similarly generated for OECD 30.

- Finally, the nominal final expenditures for the groups are divided by their real final expenditures to provide PPPs for each group where Germany, or the euro in Germany, equals 1.00 – that is, euro per "German euro" for EURO 12, EU 15 and EU 25 and US dollar per "German euro" for OECD 30.

8.11. The PPPs and the real and nominal final expenditures for the country groups are, like the PPPs and the real and nominal final expenditures for individual countries, based on the "German euro" and Germany. For presentational purposes, the PPPs and the real and nominal final expenditures for both individual countries and country groups are subsequently rebased on the euro and EU 25 and on the US dollar and OECD 30.

8.12. A simple example of how PPPs and real and nominal final expenditures are obtained for a country group is given in Box 8.5. Because EKS real final expenditures are not additive, the process has to be repeated for each basic heading, aggregation level and analytical category.[8]

Purchasing power standards (PPS)

8.13. Neither the EU 25 nor the OECD 30 has an actual "national" currency and so euros and US dollars are used instead. That euros and US dollars are used and not some other currency is simply a matter of convention and convenience. Euros based on the EU 25 are euros that have the same purchasing power over the whole of the EU 25. Their purchasing power is a weighted average of the purchasing power of the national currencies of EU Member States. As such they reflect the average price level in the EU 25 or, more precisely, the weighted average of the price levels of Member States. Similarly, US dollars based on the OECD 30 are US dollars that have the same purchasing power over the OECD 30 and reflect the average price level of the OECD 30.

8.14. Eurostat has adopted the practice of calling the currency units in which the PPPs and real final ex-

penditures for the EU 25 are expressed, "purchasing power standards" or "PPS". The OECD calls the currency units in which the PPPs and real final expenditures for the OECD 30 are shown, "US dollars at average OECD price levels". This is sometimes shortened by users to "OECD dollars". Both "PPS" and "OECD dollars" are clearly artificial currency units constructed specifically for the country group EU 25 and the country group OECD 30. They are defined, as described in the previous section, by equating their respective group's total real final expenditure on a specific basic heading, aggregate or analytical category to the group's total nominal final expenditure on the same basic heading, aggregate or analytical category.

Selected GK results

8.15. Chapter 7 explains that EKS real final expenditures are free of the Gerschenkron effect but not additive and that GK real final expenditures are additive but subject to the Gerschenkron effect. Because of this, EKS PPPs and real final expenditures are considered to be better suited for comparisons across countries of the price and volume levels of individual analytical categories and GK PPPs and real final expenditures are considered to be better suited for comparisons of price and volume structures between countries. Accordingly, the joint publication includes an annex with a selection of GK results to complement the official EKS results. The selection is limited to those GK indices that are useful for the analysis of price and volume structures. The annex comprises two tables, namely:

- *Real final expenditure on GDP at average OECD prices as a percentage of GDP:* These show the relative importance of the final expenditures on the analytical categories vis-à-vis the final expenditure on their corresponding GDP after the expenditures have been valued at a uniform set of average prices. They enable the real shares of final expenditure on GDP to be compared across countries.

- *Relative price levels of final expenditure on GDP at average OECD prices*: These are defined as the ratios of the specific PPPs for the analytical categories to the overall PPP for their corresponding GDP. They indicate whether the price level for a given analytical category is higher or lower relative to the overall or general price level in the country.

The two tables cover the same analytical categories, the same countries and the same country groups as the standard tables presenting EKS results. But, unlike the EKS results, the selected GK results have no official status within the European Union and do not respect fixity.

Publication of annual results

8.16. Eurostat uses the rolling benchmark approach to make comparisons covering the 25 EU Member States and the seven EU associated countries[9] every year. The rolling benchmark approach is explained in some detail in Box 2 of Chapter 2 and will not be elaborated further here. The annual results produced are published in Eurostat's *Statistics in Focus* series. There is a regular publication calendar which is synchronised with the timetable for the delivery of national accounts data set out in the ESA 95 regulation[10]. This requires countries to provide in September of the year t a first estimate of

Box 8.4: Composition of country groups

EURO 12	Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.
EU 15	EURO 12 plus Denmark, Sweden and United Kingdom.
EU 25	EU 15 plus Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic and Slovenia
OECD 30	EU 15 plus Czech Republic, Hungary, Iceland, Norway, Poland, Switzerland, Turkey, Australia, New Zealand, Japan, Korea Canada, Mexico and United States.

Box 8.5: Deriving PPPs and real and nominal final expenditures for a country group

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Countries in the group	National expenditure in national currency	Exchange rates (national currency per euro)	PPPs (national currency per "German euro")	Nominal final expenditure (euros)	Real final expenditure ("German euros")	Group PPP ("Group euro" per "German euro")	PPPs (national currency per "Group euro")	Real final expenditure ("Group euros")
Germany	1970	1.00	1.00	1970	1970		1.05	1875
France	1350	1.00	0.95	1350	1420		1.00	1350
Italy	1100	1.00	0.80	1100	1375		0.84	1310
Spain	565	1.00	0.75	565	755		0.79	715
Sweden	2000	8.20	9.70	245	205		10.20	195
Untd. King.	900	0.60	0.65	1500	1385		0.70	1285
GROUP	6730	1.00		6730	7110	0.95	1.00	6730

1. The hypothetical country group consists of six countries. The euro is the national currency of Germany, France, Italy and Spain. The krona and pound are the national currencies of Sweden and the United Kingdom respectively. The euro has been selected to be the "national" currency for the group and Germany has been chosen as reference country.

2. The basic data required to calculate the PPP for the group are the national expenditures in national currencies in column (1), the exchange rates between national currencies and the euro in column (2) and the PPPs between national currencies and the "German euro" in column (3). The "German euro" represents what the euro buys in Germany. For example, one euro in Germany purchases the same volume of goods and services as 0.95 euros in France. Although the currency is the same for both countries, their price levels are different.

3. The nominal final expenditures for the countries in column (4) are expressed in euros. They are obtained by dividing their national expenditures in column (1) by their exchange rates in column (2). The nominal final expenditure for the group is the sum of these nominal final expenditures. Since the euro has been designated the "national" currency for the group, its nominal final expenditure is, in effect, also its "national" expenditure.

4. The real final expenditures for the countries in column (5) are expressed in "German euros". They are obtained by dividing their national expenditures in column (1) by their PPPs in column (3). The real final expenditure for the group is the sum of these real final expenditures.

5. PPPs can be derived by dividing national expenditures by their corresponding real final expenditures. The Group PPP in column (6) has been calculated by dividing the group's nominal/"national" final expenditure in column (4) by its real final expenditure in column (5). The Group PPP is based on the "German euro". It reflects the average price level for the group as a whole vis-à-vis the price level for Germany.

6. For the presentation of results, it is necessary to rebase the country PPPs on the group so that the "Group euro", and not the "German euro", equals 1.00. Rebasing is done by dividing the country PPPs in column (3) by the Group PPP in column (6). The rebased PPPs are shown in column (7). These PPPs are divided into the national expenditures in column (1) to provide the real final expenditures in column (8) that have the group as reference country.

7. The columns shaded in grey contain the data that are presented to users. The unshaded columns are intermediate steps. Note that the national, nominal and real final expenditures are the same for the "reference country" irrespective of whether it is an actual country or a country group.

the detailed breakdown of final expenditure on GDP for the year t-1 and a final estimate of the detailed breakdown of final expenditure on GDP for the year t-2. Also available at this time are a provisional matrix of basic heading PPPs for the year t-1 and a final matrix of basic heading PPPs for the year t-2.

8.17. Between September and December of the year t, Eurostat uses the expenditure data and the matrices of basic heading PPPs to calculate preliminary results for the year t-1 and final results for the year t-2. Results at the level of GDP for the two years are then published in *Statistics in Focus* in December of the year t. At the same time, the results are uploaded to Eurostat's public database. The database contains the same analytical categories as those listed in Box 8.2 but with more detail for *food and non-alcoholic beverages; alcoholic beverages, tobacco and narcotics;* and *transport.* The additional analytical categories are shown in Box 8.6.

Publication of survey price level indices

8.18. As well as annual results, Eurostat also publishes in the year t the comparative price level indices for the two price surveys of consumer goods and services that were conducted in the year t-1. Publication is twice a year, in May and December, in the *Statistics in Focus* series. The level of aggregation at which the price level indices are published varies from survey to survey. The indices for the food, drinks and tobacco survey, for example, are published at the level of the basic heading because they are judged to be reliable. They are based on relatively large numbers of prices that countries have collected for products that have good comparability across countries. For other surveys, such as the services survey, the indices are not published at the basic heading level but at a higher level of aggregation. There is no rule fixing the level of aggregation at which indices should be published. The level chosen depends on judgement about the reliability of the indices and on whether the level is analytically meaningful. The OECD does not publish results at survey level.

Access to data and results

8.19. The national statistical institutes (NSIs) of participating countries have access to all data necessary for the calculation of PPPs and real final expenditure including data from other participating countries.[11] Among the data they have access to are the average prices of the products priced and the PPPs and national expenditures at the basic heading level. Such access is necessary both for the editing of the price data and for the assessment and approval of results. Even so, the NSIs of participating countries are not permitted to publish or disseminate results at a level below that given in Eurostat's public database. Nor are they allowed to use or circulate intermediate results or results calculated at the level of a country group.

8.20 More generally, government departments of participating countries have access to basic heading results and, on a selective basis, to the average prices of products. But this is on the understanding that they are to be used for internal purposes only and are not for publication.[12]

8.21. There is great interest among academics and researchers to be able to access PPPs at the basic heading level. They are used, for example, in models on productivity, competitiveness and international trade. Such requests by the academic community are granted by Eurostat and OECD on two conditions. The first is that there is a clear scientific purpose for which the PPPs are to be used. The second is that the researcher signs an agreement of confidentiality. This specifies that, while the PPPs may be used in calculations required for the research, they cannot be published.

8.22. Eurostat and the OECD also provide PPPs and national expenditures for the International Comparison Programme (ICP). Without this data a world comparison can not be made. The data are provided on the understanding that the relativities established between countries participating in the Eurostat-OECD comparison remain unchanged – that is,

Box 8.6: Additional analytical categories in Eurostat's public database

- *Food and non-alcoholic beverages:*
  - o Food:
    - – Bread and cereals
    - – Meat
    - – Fish
    - – Milk, cheese and eggs
    - – Oils and fats
    - – Fruit, vegetables, potatoes
    - – Other food
    - – Non-alcoholic beverages
- *Alcoholic beverages, tobacco and narcotics:*
  - o Alcoholic beverages
  - o Tobacco
- *Transport:*
  - o Personal transport equipment

fixed - when the results of the world comparison are published; that the world results for countries participating in the Eurostat-OECD comparison are not published at a level of aggregation lower than that

shown in Eurostat's public database; and that the PPPs and national expenditures supplied by Eurostat and the OECD are not disseminated without the prior agreement of Eurostat and the OECD.

Global extrapolation

8.23. By using the rolling benchmark approach, Eurostat is able to make annual comparisons that provide PPPs and real final expenditures for each level of aggregation up to GDP. The OECD makes such detailed calculations only once every three years. PPPs for GDP for the years between these benchmark calculations are obtained by "global" extrapolation. With this method, the PPPs for GDP for the latest benchmark year are extrapolated by the relative rates of inflation in different countries as measured by the implicit price deflators for GDP. More specifically, a country's PPP for the year t+1 is obtained by multiplying its PPP for the benchmark year t by its GDP implicit price deflator for the year t+1 and then dividing by the GDP implicit price deflator for the year t+1 for the reference country[13] when both implicit price deflators are relative to the year t. As changes in PPPs depend directly on relative rates of inflation in different countries, this method produces robust estimates for intermediate years provided they are not too remote from the benchmark year and there have been no significant changes in price or expenditure structures within countries.

8.24. The GDP PPPs for the year t+1 that the OECD estimates for its Member Countries are available in the first quarter of the year t+2. Global extrapolation requires summary data at the level of GDP only. The data are extracted from the national accounts series compiled quarterly by OECD Member Countries and the projections of GDP underlying the *OECD Economic Outlook*. The annual calculations made by Eurostat require a detailed breakdown of GDP. The data for the year t+1 usually do not become available before the third quarter of the year t+2 and Eurostat calculations are not completed until the end of the fourth quarter of that year. When Eurostat releases its preliminary results for t+1, the OECD links the PPPs for GDP that Eurostat has calculated for those EU Member States that are also OECD Member Countries with the PPPs for GDP that it has estimated for its non-EU OECD Member Countries.

8.25. Linking takes place at the level of GDP. It involves replacing the PPPs for EU OECD Member Countries obtained by global extrapolation by the PPPs calculated for them by Eurostat. Substitution is effected by first taking the ratio of the geometric means of the two sets of PPPs for the EU OECD Member Countries as a group. The PPPs calculated by Eurostat are then multiplied by this ratio so as to put them at the same overall level as the PPPs obtained by global extrapolation. This preserves the relationship between the EU OECD Member Countries established by Eurostat and the relationships between the non-EU OECD Member Countries established by the OECD. It also preserves the relationship between the two groups of countries.

Nowcasting

8.26. For the year t, Eurostat makes a preliminary calculation of detailed results at t+12 months and a final calculation of detailed results at t+24 months. In addition, Eurostat makes a "nowcast" for the year t at t+5 months. This is when Eurostat receives the first set of national accounts estimates for the year t from its countries. The nowcast produces results at the level of GDP only.

8.27. Nowcasting entails the extrapolation of PPPs using appropriate price indices or implicit price deflators. The technique is the same as that employed by the

Box 8.7: Nowcasting procedure

Aggregate	Treated as	What is extrapolated or use of reference PPP	Extrapolator or reference PPP
Household final consumption expenditure	14 analytical categories[(1)]	Latest PPP for the analytical category available from the survey cycle	HICP index for the analytical category
Net purchases abroad	one aggregate	Reference PPP	Exchange rate
Final consumption expenditure of NPISHs	one aggregate	Reference PPP	PPP for household final consumption expenditure
Government final consumption expenditure	one aggregate	Latest PPP for the aggregate available from the survey cycle	Implicit price deflator for the category aggregate from the national accounts
Gross fixed capital formation	one aggregate	Latest PPP for the aggregate available from the survey cycle	Implicit price deflator for the aggregate from the national accounts
Changes in stocks	one aggregate	Reference PPP	PPP for gross fixed capital formation
Balance of exports and imports	one aggregate	Reference PPP	Exchange rate

[(1)] The analytical categories 02 to 13 in Box 2. Category 05 is divided into three categories: actual and imputed rentals; maintenance and repair services, water supply, and miscellaneous services relating to the dwelling; electricity, gas and other fuels.

OECD for global extrapolation other than that the extrapolation is done at lower levels of aggregation – namely, seven aggregates with one of them, household final consumption expenditure, broken

down into 14 analytical categories - as shown in Box 8.7. Hence, a country's PPP for the year t for an analytical category, such as *food and non-alcoholic beverages*, is obtained by multiplying its PPP for the category in the previous year, t-1, by its HICP[14] index for the category in the year t and then dividing by the EU HICP index for the category in the year t. Both the HICP index for the country and the HICP index for the European Union are relative to the year t-1. When price indices or implicit price deflators are not available for an aggregate, a reference PPP is used. The PPPs for the 14 analytical categories and six aggregates for the year t are aggregated by the EKS method to obtain the PPP for GDP. Final expenditures on GDP for the year t are used as weights. As expenditure data are available only for the seven aggregates, weights for the analytical categories are derived using the structure of the year t-1.

Revision of PPPs

8.28. The final calculations that Eurostat and the OECD make two years after the close of the benchmark year are final in as much as the calculation will not be repeated to obtain new PPPs when countries subsequently revise their GDP estimates for the benchmark year. Such revisions occur frequently and regularly and continue long after the benchmark year has passed. The t+2 closure was chosen in the expectation that countries will have introduced most of the major revisions to their national accounts estimates for t by then, but experience shows that this is not always the case. The approach adopted by Eurostat and the OECD when countries revised their GDP estimates for a benchmark year after the final calculation has been made is as follows. The revisions are incorporated in the original results without recalculating the PPPs. The revised national expenditures are converted to new real final expenditures using the original PPPs. This means that the relativities between countries' volume measures will change, and that the relativities between countries' price measures – the PPPs and comparative price levels – will remain as they were.

Volume measure relativities between countries and their country group will also change, but so too will the price measure relativities. PPPs for country groups are weighted averages which change when their expenditure weights change.

8.29. Final calculations will be repeated under certain circumstances. During the second half of 1990s, there was a significant change in national accounting methodology as participating countries moved from the SNA 68 and the ESA 79 to the SNA 93 and the ESA 95. Countries introduced the new accounting systems by degrees, at varying speeds and at different points in time. As a result, many breaks existed in their national accounts data that affected both the comparability of the volume measures between countries within a given year and the comparability of the volume measures over time – a fact that was widely criticised by economists, politicians and the media. Between April 2002 and December 2003, Eurostat and the countries participating in its comparison programme undertook a thorough revision of the PPPs for the years 1995 to 2000. Such a comprehensive and systematic revision was unprecedented in the history of PPPs. It was successfully completed with Eurostat publishing the final results in August 2004.[15] No similar exercise was conducted by the OECD. It is unlikely that Eurostat will repeat the exercise except to accommodate major changes in the national accounts compilation system or in PPP methodology. Significant changes to either the SNA 93 or the ESA 95 are not envisaged before 2008.

8.30. Final calculations will also be repeated if there has been a mistake made by either a participating country, Eurostat or the OECD. A mistake is defined as "a use of incorrect basic information or an inappropriate application of a calculation procedure". For the recalculation to take place, the mistake must be discovered within three months of publication of the final results. For the results of the recalculation to be published and to replace the results initially disseminated, the mistake must cause at least a change of 0.5 per cent in the real GDP per capita of at least one participating country.

[1] A complete list of countries participating in the Eurostat-OECD comparison for 2005 can be found in Box 2.3 of Chapter 2.

[2] Hence, the relativities between individual EU Member States will be the same in both the Eurostat comparison and the Eurostat-OECD comparison and the relativities between individual non-EU OECD Member Countries will be the same in both the OECD comparison and the Eurostat-OECD comparison. But the relativities between individual EU Member States and individual non-EU OECD Member Countries will not be the same in the Eurostat-OECD comparison as they are in the OECD comparison, although the relativities between the EU 25 as a group and the individual non-EU OECD Member Countries will be.

[3] The common currency in which the PPPs and the real and nominal final expenditures are expressed.

[4] Previously some 55 analytical categories were used by Eurostat and the OECD to present results. After the 1993 comparison, the OECD discontinued this practice as it considered that the reliability of results, particularly those for non-European countries for which it was responsible, did not justify such detail. Eurostat continued with the more detailed breakdown for European countries until the 2002 comparison.

[5] *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[6] *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[7] Results continue to be presented for the EU 15 to facilitate comparisons over time.

[8] With an additive aggregation method, such as the GK method, the procedure has only to be done once, at the level of GDP.

[9] The EU Candidate Countries – Bulgaria, Croatia, Romania and Turkey – and the EFTA countries – Iceland, Norway and Switzerland.

[10] Commission regulation (EC) 2223/1996 of 25th June 1996.

[11] The one exception are the individual price observations that participating countries report to group leaders and Eurostat. These individual price observations are strictly confidential and, besides the reporting country, are available only to the group leader and to Eurostat. Participating countries do not have access to the individual price observations reported by other participating countries.

[12] This access and the rules surrounding it also apply to services, other than Eurostat, of the European Commission and to directorates, other than the Statistics Directorate, of the OECD.

[13] The choice of reference country does not influence the final results. In practice the OECD uses the United States.

[14] Harmonised index of consumer prices.

[15] "Purchasing power parities and related economic indicators for EU, Candidate Countries and EFTA - Data 1991 to 2003, including final results of the revision 1995 to 2000", S. Stapel, J. Pasanen and S. Reinecke, *Statistics in Focus*, 37/2004, Eurostat, Luxembourg, August 2004.

ANNEX I: BRIEF HISTORY OF THE PROGRAMME

Introduction

I.1.   The origins of international price and volume comparisons of GDP can be traced back to the experimental comparisons carried out by the Organisation for European Economic Cooperation (OEEC) in the 1950s. Two approaches were adopted. The first was a comparison made from the expenditure side using mainly price data. Initially, it covered France, Germany, Italy, the United Kingdom and the United States.[1] Subsequently, it was expanded to include Belgium, Denmark, the Netherlands and Norway.[2] The second was a comparison between the United Kingdom and the United States made from the production side using mainly quantity data.[3] In both studies, "purchasing power equivalents" rather than exchange rates were used to express the GDPs and their components in a common currency and at uniform price levels.

I.2.   The reasons given for using purchasing power equivalents - or purchasing power parities (PPPs) to use current terminology - can be paraphrased as follows:

   Exchange rates are not indicators of the internal purchasing power of currencies. At best they could only be so for goods and services that are internationally traded. For them to be so, it would be necessary for a long-term free-market equilibrium in exchange rates to exist which, even without the exchange controls, multiple exchange rates and prevailing quantitative restrictions on trade, would be difficult to establish. Moreover, if established, the equilibrium exchange rates would not, even for internationally traded goods, reflect the final prices at which these goods are sold to domestic buyers because of tariffs and other indirect taxes, costs of transportation - both to the country and within the country - and costs of domestic processing and distribution. Given also that a significant proportion of goods and services are not traded internationally, exchange rates should not be used for international price and volume comparisons of GDP.

I.3.   An important practical lesson learnt from the OEEC studies was that PPP-based GDP comparisons made from the expenditure side demand less data than those made from the production side. Comparisons from the expenditure side only require prices for final goods and services, but comparisons from the production side require prices of both outputs and intermediate inputs. Consequently, when, in the late 1960s, the research was continued under the auspices of the International Comparison Project (ICP), it was decided that it would focus on comparisons made from the expenditure side. Comparisons are still made from the production side, but usually they cover a small number of countries, focus on a limited number of economic activities and are based generally on unit values rather than prices.[4] Almost all of these comparisons have been organised under the programme for International Comparisons of Output and Productivity (ICOP) initiated by Professor Angus Maddison at Groningen University in the Netherlands.

International Comparison Project[5]

I.4.   The ICP was started as a research project, but its ultimate goal was to set up worldwide PPP-based comparisons of GDP on a regular basis. Responsibility for the project was shared by the United Nations Statistics Division (UNSD)[6] and the University of Pennsylvania with the University of Pennsylvania taking the leading role. The research was a co-operative effort involving many institutions and persons in the countries participating in the project. Both the Ford Foundation and the World Bank made major financial contributions. The first director of the project was Professor Irving Kravis of the University of Pennsylvania.

I.5.   The project's initial task was to develop a methodology which would serve for a comprehensive system of international comparisons based on PPPs. In this it was assisted by the experiences gained from the two OEEC comparisons of market economies mentioned above, the comparisons of centrally-planned economies co-ordinated by the Council for Mutual Economic Assistance since 1959[7], the comparisons carried out in the early and late 1960s in Latin America[8] and the comparisons between centrally-planned and market economies started by Statistics Austria[9] during the 1960s[10].

I.6.   The next task was to test the methodology by making actual comparisons using PPPs. Thus, the first three rounds or phases of the ICP – 1970, 1973 and 1975 - were essentially experimental in character. Comparisons were set up for a small group of countries representative of different income levels, social systems and geographical regions. During Phase I, comparisons of GDP were made for ten countries for 1970. Six of the ten countries also supplied data for 1967 and for these six countries comparisons were made for 1967 as well.[11] In Phase II, the ten Phase I countries were joined by six others. Comparisons covering all sixteen countries were made for 1970 and for 1973.[12] Phase III comparisons covered 34 countries and had 1975 as the reference year.[13] The results of these and subsequent ICP comparisons were published with the United States as reference country and the international dollar as numeraire.

Box I.1: ICP comparisons 1970 to 1993 (countries by region)

Region	Phase I 1970	Phase II 1973	Phase III 1975	Phase IV 1980	Phase V 1985	Phase VI 1993
Africa	1	1	3	15	22	22
Middle East	-	-	1	-	-	8
Asia & Oceania	2	6	9	8	13	16
N. America	1	1	1	2	2	2
C. & S. America	1	1	5	16	7	-
Europe	5	7	15	19	20	35
Total	10	16	34	60	64	83
Published	1975	1978	1982	1986/7	1994	---

I.7. After Phase III, there were three major developments. First, the ICP became a regular part of the work programme of the UNSD with the University of Pennsylvania advising on methodological issues. Second, Eurostat started to play an increasingly important role, organising the comparisons for the European Union[14], providing technical and financial assistance to regional comparisons in Africa and encouraging the OECD to become involved in the work. The third and most significant development was the regionalisation of the ICP.

I.8. The need for regionalisation became evident in several respects during Phase III. It was clear that, as the number of participating countries increased, a highly centralised scheme of organisation was no longer feasible, especially as there was no one international body in a position to manage it. Early results from Phase III had indicated that countries within regions tended to form more or less homogeneous subsets and it was recognised that there were operational advantages in grouping countries according to their geographical proximity. The Phase III comparison for the European Union had demonstrated that a comparison tailored to meet the specific requirements of a region need not jeopardise the larger comparison of which it is a part. Eurostat had made the comparison using a different list of representative items and a different aggregation method. At the same time, the basic methodological rules and classification system of the ICP had been retained and the price and expenditure data could still be used for the world comparison.

I.9. Regionalisation placed a greater share of the work on the regional organisations of the United Nations, namely: the Economic Commission for Europe (ECE), the Economic Commission for Latin America and the Caribbean (ECLAC), the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Economic and Social Commission for Western Asia (ESCWA). This left UNSD at the centre to co-ordinate the regional comparisons and to ensure that they could be linked in a global comparison. Two rounds of the ICP were completed after regionalisation: Phase IV which covered 60 countries and had 1980 as the reference year[15]; and Phase V which covered 64 countries and had 1985 as the reference year[16]. A third round, Phase VI, covering 83 countries and having 1993 as the reference year, was started but not completed. Reports were published for the regional comparisons carried out in Africa[17], the Middle East[18], Asia[19] and Europe[20].

I.10. Box I.1 summarises the regional distribution of countries that participated in the six rounds of the ICP. It shows that at the global level coverage was limited and uneven. Box I.1 also gives the years when the results were published. On average there was a six year gap between the reference year and the year of publication.

I.11. After Phase VI failed to produce a world comparison, the United Nations Statistical Commission (UNSC) decided at its twenty-ninth session (New York, February 1997) that the ICP should be thoroughly reviewed before any further round was attempted. A consultant was recruited to establish whether or not the ICP should continue and, if it should, what improvements were required and how these improvements should be brought about. The consultant's report was presented to the UNSC at its thirtieth session (New York, March 1999).[21] It concluded that PPPs and PPP-related statistics are needed, but that the ICP was not producing these data on a timely and regular basis for a sufficient number of countries as required by important potential users such as the World Bank.

I.12. Poor management and insufficient resources at all levels – central, regional and national - were identified as the principal reasons for this. Other important contributory factors included inadequate documentation, heavy data requirements that did not take account of the circumstances of individual countries, lack of uniformity in the execution of activities across regions, lack of confidence among countries that others were following guidelines and standards consistently, and failure to involve countries in the editing and calculation stages of the exercise. The report recommended that the UNSC should not sanction a new round until at least the management and resource issues had been addressed.

Box I.2: ICP 2005 (countries by region)

Region	Full Comparison	Partial Comparison	Total
Africa	34	15	49
Middle East	11	1	12
Asia & Oceania	22	5	27
N. America	2	-	2
C. & S. America	11	-	11
Europe	45	3	48
Total	125	24	149
To be published			2007

I.13. The UNSC response to the report was to ask the World Bank – the de facto global co-ordinator of the ICP since 1993 - to a propose a strategy for a comprehensive solution to the deficiencies identified by the consultant. The World Bank, in consultation with other interested agencies, drew up an implementation plan for a new round of the ICP. The plan involved mobilising funds from a variety of sources and establishing a governance infrastructure to provide effective management and co-ordination – both at and between - the central, regional and national levels. It also involved providing complete clearly-written documentation on technical and procedural guidelines and standards, allowing countries to participate in a full comparison covering GDP or a partial comparison covering final consumption expenditure, using, as far as possible, regular national statistical programmes to obtain price and national accounts data for the ICP, and linking participation in the ICP with national statistical capacity building.

I.14. The UNSC considered the implementation plan at its thirty-first session (New York, March 2000) and again at its thirty-second session (New York, March 2001). It was particularly concerned about securing adequate funding before starting another round. The World Bank, in the meantime, had embarked on a successful major fund raising exercise and, at its thirty-third session (New York, March 2002), the UNSC agreed to a new round.

I.15. The reference year for the new round is 2005. Data collection is scheduled to start towards the end of 2004. Regional comparisons will be organised by the African Development Bank, the Asian Development Bank, ESCWA, ECLAC and Statistics Canada, the Interstate Statistical Committee of the Commonwealth of Independent States (CISSTAT) and the State Committee of the Russian Federation on Statistics (Goskomstat-Russia), and Eurostat and the OECD[22]. A global office has been established at the World Bank to provide overall co-ordination and to ensure technical and procedural uniformity across the regions. The global office is also responsible for organising the "ring comparison" which, by comparing a small number of countries from each region across regions, will provide the means to link the regional comparisons with each other in one global or worldwide comparison.[23] The regional distribution of countries expected to take part in ICP 2005 is given in Box I.2. Box I.2 also shows the number of countries participating in a full comparison of GDP and the number of countries participating in a partial comparison covering just final consumption expenditure. Final results of the regional and global comparisons are scheduled to be published at the end of 2007.

European Comparison Programme

I.16. One of the regional comparison programmes that resulted from the regionalisation of the ICP was the European Comparison Programme (ECP). It was launched at the twenty-seventh plenary session of the Conference of European Statisticians (Geneva, June 1979). The ECE is responsible for the ECP and publishes the results of its comparisons, but the actual comparisons are organised by other agencies. This is because the ECP is an amalgam of independent comparisons involving different groups of countries. The Eurostat-OECD PPP Programme is central to the ECP and brings with it coverage beyond Europe through the inclusion of non-European OECD Member Countries.

I.17. Box I.3 summarises country participation and organisation during the six rounds of the ECP that were conducted between 1980 and 1999/2000.[24] Before 1996, the ECP covered two groups of countries. Group I consisted of the countries that were participating in the comparisons organised by Eurostat and the OECD for their joint programme. These countries are listed in Annex Table A and Annex Table B. Group II consisted of countries from central and eastern Europe that were participating in the comparisons co-ordinated by Statistics Austria specifically for the ECP at the request of the ECE. These countries are listed in Annex Table C.

Box I.3: ECP comparisons 1980 to 1999/2000 (countries by group)

ECP	1980	1985	1990	1993	1996	1999/ 2000
Group I	18	22	24	24	30	43
Group II	3	3	6	15	13	-
Group III	-	-	-	-	9	11
Total	21	25	30	39	52	54

I.18. Group I comparisons were multilateral comparisons, based on a common basket of goods and services, with each country being compared directly with each of the other participating countries. Group II comparisons were bilateral comparisons with each country compared directly with Austria. Each bilateral comparison was based on a different basket of goods and services. Quality adjustments were made when it proved impossible to find strictly comparable goods and services. Adjustments were also made for differences in the productivity of producers of non-market services such as general public administration, health and education. (Neither quality adjustments nor productivity adjustments were a feature of Group I comparisons.) Comparisons between Group II countries were made through Austria. Comparisons between countries in Group I and countries in Group II were also made through Austria. Austria participated in the comparisons of both groups for this purpose.

I.19. The 1996 comparison was a turning point for the ECP. It had three important features. The first was that a third group of countries, Group III, was included in the ECP. The group was made up of the member countries of the Commonwealth of Independent States (CIS) - except Ukraine - plus Mongolia and Turkey. These countries are listed in Annex Table D. The Group III comparison was a multilateral comparison. It was managed by the OECD with the assistance of CISSTAT, Goskomstat-Russia and the State Institute of Statistics of Turkey. Countries in Group III were compared with countries in Group I and Group II through Austria. The link between Group III and Austria was established through the four countries in Group III that had participated with Austria in one of the other groups – the Russian Federation, Belarus and Moldova in Group II and Turkey in Group I.

I.20. The second feature of ECP 1996 was that the comparisons in Group II were organised as a single multilateral comparison and not as a set of bilateral comparisons with Austria. Quality adjustments were discontinued because, with the adoption of a multilateral approach and the opening up of markets in the transition economies of Group II, it became easier for countries to price comparable products. Productivity adjustments were also stopped. This was to ensure that the treatment of non-market services was the same for the EU Candidate Countries in Group II as it was for the EU Member States and the EU Candidate Countries in Group I.[25] These changes aligned the methodology of Group II with that used in the other two groups.

I.21. The third feature was the start of the break-up of Group II. The Czech Republic, Hungary, Poland and the Slovak Republic – countries which originally had participated in Group II comparisons - moved to Group I. The Russian Federation and Slovenia, while remaining in Group II, also participated in the Group I comparisons on an experimental basis. By ECP 1999/2000, Group II no longer existed. EU Candidate Countries from Group II moved to Group I to work with Eurostat. Croatia, FYROM and Ukraine also joined Group I, but to work with the OECD. Belarus and Moldova, as CIS countries, joined Group III which, since 1999, has been organised by CISSTAT and Goskomstat-Russia with minor assistance from the OECD. The results of all ECP comparisons carried out between 1980 and 1996 were published with Austria as the reference country and the Austrian schilling as numeraire. After 1996, results have been presented with the European Union as reference country and the euro as numeraire.

Eurostat-OECD PPP Programme

I.22. Annex Table A traces the evolution of the Eurostat PPP Programme. Although EU Member States were involved in a comparison for 1970[26], the first official comparison conducted by Eurostat was for 1975. It covered the nine countries that were EU Member States at that time.[27] Subsequently, until 1990, Eurostat carried out comparisons every five years, in 1980[28], 1985[29] and 1990[30]. These comparisons were principally for EU Member States and countries like Greece, Portugal and Spain that were in line for EU membership. But countries falling into neither of these two categories - such as Israel in 1980[31], Austria in 1980[32], 1985 and 1990, and Switzerland in 1990 - also participated. Austria's participation was occasioned by the need to provide a "bridge" between the EU Member States and other countries in ECP Group I and the eastern and central European countries in ECP Group II. Throughout these first twenty years, the Programme was under the direction of Hugo Krijinse Locker.

I.23. After 1990, Eurostat adopted the "rolling benchmark approach" and started making annual comparisons.[33] At the same time, the number of countries covered rose from 14 in 1991 to 19 in 1994 after which it stayed stable until 1999. The increase was due to the continuing enlargement of the European Union and to countries of the European Free Trade Association (EFTA)[34] harmonising their statistics and statistical programmes with those of EU Member States. In 1999, the number of countries covered by Eurostat comparisons rose to 31 with the inclusion of the 13

Box I.4: Eurostat-OECD Comparisons 1980 to 1999

	1980	1985	1990	1993	1996	1999
Countries co-ordinated by Eurostat	<u>13</u>	<u>13</u>	<u>14</u>	<u>16</u>	<u>19</u>	<u>31</u>
- EU Member States	10	10	12	12	15	15
- Non-EU OECD countries	3	3	2	4	4	8
- Other countries	-	-	-	-	-	8
Countries co-ordinated by the OECD	<u>5</u>	<u>9</u>	<u>10</u>	<u>8</u>	<u>13</u>	<u>12</u>
- Non-EU OECD countries	5	9	10	8	9	7
- Other countries	-	-	-	-	4	5
Total	18	22	24	24	32	43

countries that were candidates for EU membership. To accommodate this increase, Eurostat had to rethink the whole modus operandi of its comparisons. This led to the so called "ECP Reform".

I.24. Encouraged and assisted by Eurostat, the OECD began organising comparisons for those OECD Member Countries that were not already included in Eurostat comparisons in the early 1980s. The first comparison had 1980 as the reference year, but data collection did not start until 1983 and, as can be seen from Annex Table B, was limited to four countries. Two of these - Japan and the United States – were major non-European economies of particular interest to the European Commission because of their trade and investment links with the European Union. The results of this retrospective exercise were combined with those from the Eurostat comparison, thereby covering 18[35] of the OECD's 24 Member Countries.[36]

I.25. Thereafter the OECD worked closely with Eurostat to effect comparisons for 1985 and 1990. When put together, the Eurostat and OECD comparisons covered 22 OECD Member Countries in 1985[37] and all 24 OECD Member Countries in 1990[38]. It was during this time that formal agreements between the two organisations were made to establish the Eurostat-OECD PPP Programme. Eurostat and the OECD agreed to co-ordinate the data collections in two different groups of countries with the object of combining the data sets of the two groups in a single comparison. Coverage of the combined Eurostat-OECD comparisons is shown in Box I.4.

I.26. When Eurostat adopted the rolling benchmark approach after the 1990 comparison, the OECD followed suit, but only with respect to the three-year survey schedule for consumer goods and services. It did not adopt the schedule of yearly price surveys for equipment goods and construction projects that the annual comparisons required. Instead, because of the cost involved in pricing capital goods and the resource constraints of countries participating in OECD comparisons, it was decided they would only price capital goods every third year.[39] Since 1990, OECD comparisons have been three yearly – 1993[40], 1996[41] and 1999[42].

I.27. From Box I.4, it can be seen that the number of countries being managed by the OECD has fluctuated from comparison to comparison. Prior to 1993, this was due the increased coverage of non-EU OECD Member Countries. After 1993, it can be explained partly by an expansion in OECD membership, partly by OECD Member Countries moving over to participate in Eurostat comparisons, usually as candidates for EU membership, and partly because countries that are neither OECD Member Countries nor EU Member States have joined the comparison as a result of the ECP Reform and the break up of ECP Group II.

I.28. From the beginning, Eurostat has published the results of comparisons with the European Union as reference country and an artificial currency unit – the Purchasing Power Standard or PPS - as numeraire. (The PPS is, in effect, the "average" of the currencies of all EU Member States.) The OECD published the results of the 1980 and 1985 comparisons with the United States as reference country and the international dollar as numeraire because coverage of OECD Member Countries was incomplete. From 1990, when all Member Countries started to participate in the Programme, the OECD has published results of comparisons with the OECD as reference country and OECD dollars as numeraire. (The OECD dollar is the "average" of the currencies of all OECD Member Countries.)

The "great debate"

I.29. Prior to 1980, the ICP employed the Country-Product-Dummy (CPD) method to calculate PPPs at the basic heading level and the Geary-Khamis (GK) method to aggregate the basic heading PPPs up to the level of GDP. These methods were not generally accepted at the time and their advantages and disadvantages relative to other methods are still a subject of debate among experts. Regionalisation allowed the use of alternative methods. Eurostat and OECD comparisons have always used the Èltetö-Köves-Szulc (EKS) method to calculate PPPs at the basic heading level. Eurostat would also have liked to move away from the GK method of aggregation – for the 1975 comparison it had employed the Gerardi method – but it did not do so. Instead, in consultation with the UNSD and the ECE, it commis-

sioned a study to investigate the relative merits of the GK method and the Gerardi method.[43] The study favoured the GK method and it was used by Eurostat and the OECD for their 1980 and 1985 comparisons.

I.30. Subsequently, Eurostat proposed that the EKS method be used to aggregate basic heading PPPs because it provided volume indices that were free of the Gerschenkron effect and that these indices were better suited to the requirements of users within the European Commission. The OECD, on the other hand, wanted to retain the GK method, because, while its volume indices were not free of the Gerschenkron effect, the real final expenditures on which the indices were based were additive - which EKS real final expenditures are not - and, as such, more relevant to the type of analysis carried out by OECD economists. Consequently, in 1988 and again in 1989, the UNSD, the OECD and Eurostat jointly convened a meeting of experts to discuss aggregation methods. The experts recognised that comparison results serve many different purposes and that there was no one method of aggregation which can be considered satisfactory for all these purposes. They recommended the calculation and dissemination of two sets of results: one set to be aggregated using the EKS method, the other to be aggregated using the GK method.[44]

I.31. Both Eurostat and the OECD accepted the experts' recommendations in principle, but there was a practical difficulty to it being adopted. The results for EU Member States were used for administrative purposes – the allocation of structural funds - as well as for economic analysis. For this reason, Eurostat required that only one set of results be recognised as the official results for the European Union and that only these official results be disseminated initially. Eurostat selected the EKS results as the official results for the European Union.[45] The OECD agreed to publish these first and to publish the GK results a year later. This allowed time for the EKS results to be accepted as official and avoided any confusion that could arise from the simultaneous dissemination of two sets of results. This solution was adopted for the 1990 and 1993 comparisons.[46] Since the 1996 comparison, the OECD has published a complete set of EKS results together with a selected set of GK results. The GK results published are those relevant to the comparative analysis of price and volume structures of countries. As such they complement the EKS results which are better suited to comparing the prices and volumes of individual aggregates across countries.

Fixity

I.32. The EKS-GK controversy was not the first time that the need to have only one set of official results for EU Member States had been faced by Eurostat and the OECD. Because the relative position of countries can change as the compositions of the group of countries being compared changes, the inclusion of the EU Member States in the comparison covering all OECD Member Countries could change the relativities established between them when they were compared just among themselves. To avoid this, Eurostat and the OECD adopted the "fixity convention". This convention ensures that the price and volume relativities established by Eurostat between EU Member States remain unchanged, or fixed, when the EU Member States are included in the OECD or other comparisons that encompass a wider group of countries. It has been observed since the 1980 comparison.

I.33. Fixity has now a more general application than just Eurostat-OECD comparisons. Most countries participating in a comparison that is subsequently to be combined with another comparison expect fixity. It ensures that they have only one set of results to explain to users. Hence, in ECP comparisons, the relativities between countries within each group remain "fixed" when the groups are incorporated in the larger comparison. Similarly, in the forthcoming round of the ICP, it is anticipated that regions will require fixity so that the relativities between countries within their region will remain unchanged when they are included with other regions in the world comparison.

The Castles report[47]

I.34. After the publication of the results of the 1993 round, the usefulness and reliability of the Eurostat-OECD PPP Programme were seriously questioned by a number of non-European OECD countries which felt that the resources they allocated to participation would be better employed on their own statistical priorities. The OECD response was to anticipate the reassessment that the United Nations was proposing to make of the ICP by recruiting a consultant in 1996 to review the Eurostat-OECD PPP Programme. The consultant was to focus on the uses to which PPPs and PPP-related statistics were put by different users, the extent to which the PPPs produced by Eurostat and the OECD met the needs of these users, the alternative ways of comparing "comparison resistant" goods and services - such as the non-market services produced by government, equipment goods and construction - and the difference that would be made to the existing burden on the statistical resources of participating countries if the alternative ways of comparing comparison resistant goods and services were to be adopted.

I.35. The consultant's report was considered by all countries participating in the Programme at the meeting convened by Eurostat and the OECD to examine the preliminary results of the 1996 round (Paris, November 1997). It was also discussed, mainly by non-European OECD countries, at a meeting that the OECD held in New York during the UNSC of February 1998. The report commenced by affirming the need for PPPs and the international volume and price comparisons they facilitate. It made two main proposals:

- Because the Programme approached the calculation of real GDP from the expenditure side rather than the production side, its results were of limited value for analysts concerned with the measurement of the output or productivity of particular industries. They were of much greater usefulness for those concerned with the meas-

urement of real incomes and the command over goods and services enjoyed by the recipients of income in their capacity as consumers. Expenditures on government consumption and capital formation could be viewed as household consumption expenditure forgone and treated accordingly - that is, by converting both aggregates to real final expenditures using the PPPs for private consumption.

- Alternatively, consideration could be given to abandoning the input-price approach for non-market services and derive government consumption in real terms either directly using physical measures of output or indirectly using PPPs based on output prices collected for market services. (Real final expenditure on capital formation would still be obtained using the PPPs for private consumption.)

Adoption of either of these proposals would reduce the response burden on participating countries which would no longer be required to carry out the difficult and expensive task of pricing equipment goods and construction projects.

I.36. Participating countries agreed that the consultant was correct to identify the PPPs for government consumption and capital formation as among the least reliable of the PPPs estimated by the Programme. They did not accept that providing comparative measures of welfare as defined by the report was the only use of PPPs estimated from the expenditure side. The main objective of the Programme was to make volume comparisons of GDP and its component expenditures. Using the PPPs for private consumption as reference PPPs for government consumption and capital formation was not compatible with this objective. Most countries were of the opinion that there was a considerable analytical interest among users, such as economists and researchers, in PPPs for capital formation and that rather than abandon them Eurostat and the OECD should work on improving their accuracy. Countries supported the consultant's recommendation that physical output indicators be developed for deriving real expenditure on government consumption, but recognised that this was a long-term goal dependent on the research that they themselves were undertaking to improve the quality of their national accounts estimates of non-market services. In the short term, Eurostat and the OECD should be working to improve the representativeness of the input prices collected.

I.37. The consultant also proposed that responsibility for the results of the Programme should be accepted by Eurostat and the OECD and that it should not be shared with the statistical agencies of participating countries. Almost all countries disagreed with the proposal. They preferred that responsibility for the results of the Programme should continue to be shared by Eurostat, the OECD and participating countries. This was of particular relevance to EU Member States because, within the European Union, PPPs are used for administrative purposes as well as for statistical purposes. Shared responsibility required Eurostat and the OECD to improve the transparency of their editing and calculation procedures.

I.38. Castles' review of the Eurostat-OECD PPP Programme was an important milestone in its history. Most significantly, it confirmed the usefulness of PPPs and fostered a better understanding of their respective responsibilities and roles between Eurostat, the OECD and participating countries. In addition, it identified areas of weakness such as the poor quality of PPPs for non-market services and capital goods, the need for better checks on pricing inconsistencies between benchmarks, the need to investigate the use of alternative data sources available to Eurostat and the OECD, and the lack of transparency of the methodology employed.

ECP reform

I.39. Thirteen EU Candidate Countries were included in Eurostat comparisons in 1999. At the time, three of the countries - Poland since 1994, Cyprus since 1997 and Malta since 1998 – were already participating in Eurostat comparisons, five of them – the Czech Republic, Hungary, the Slovak Republic, Slovenia and Turkey – were participating in OECD comparisons, while the remaining five – Bulgaria, Estonia, Latvia, Lithuania and Romania – were still participating in ECP Group II comparisons. The reorganisation completed the break-up of ECP Group II referred to earlier. It also increased the number of countries working with Eurostat from 20 to 31.

I.40. Eurostat was already experiencing difficulties co-ordinating the activities of the 20 countries. With the arrival of eleven more countries pending, it became imperative to find a new way operating. The surveys that were proving particularly hard to organise centrally were - with the exception of the rent survey and the survey of medical goods and services - the consumer price surveys. The product lists for these surveys were becoming unmanageable making countries increasingly reluctant to conduct the pre-surveys essential to their updating. The pre-survey work that was done usually resulted in more products being added to the list than were removed from the list. Each new country introduced into the comparison inevitably lengthened the lists further as its products were added to them. Countries complained that the longer the product lists the more laborious and inefficient became their selection of the subset of products to price. In short, the product lists were not user friendly and this was detrimental to the quality of the prices collected.

I.41. It was decided to decentralise the management of these consumer surveys. Countries would be broken down into three groups. Each group would be comprised of countries that were relatively homogeneous thereby making it easier to draw up representative product lists. Each group would consist of a balanced mix of experienced EU Member States and inexperienced EU Candidate Countries thereby facilitating the integration of the candidate countries into

the comparison. Each group would also have a group leader selected from among the countries in the group. The group leader would be responsible for: drawing up the product lists for the surveys in consultation with the other members of the group; visiting group members to ensure uniformity of product selection and pricing procedures; and editing the price data provided by group members. The group leaders together with Eurostat would also be responsible for ensuring that the product lists for the three groups had a sufficient number of overlap products at each basic heading so the comparisons could be effected across groups. The overall result of the reform would be smaller more manageable lists, more rigorous pre-surveys, easier selection of products for pricing and improved quality of price data.

I.42. The reform did not touch organisation of other surveys. The surveys dealing with rents, medical goods and services, consumer price indices, compensation of employees in general government, public education and public hospitals, equipment goods, construction projects and expenditure weights would continue to be managed centrally by Eurostat.

I.43. The three groups that were introduced in 1999, together with their constituent countries and their leaders, are shown in Annex Table E.

ANNEX TABLES

Table A: Eurostat comparisons 1975 to 1999

Country	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Belgium[1]	x	x	x	x	x	x	x	x	x	x	x	x	x
France[1]	x	x	x	x	x	x	x	x	x	x	x	x	x
Germany[1][9]	x	x	x	x	x	x	x	x	x	x	x	x	x
Italy[1]	x	x	x	x	x	x	x	x	x	x	x	x	x
Luxembourg[1]	x	x	x	x	x	x	x	x	x	x	x	x	x
Netherlands[1]	x	x	x	x	x	x	x	x	x	x	x	x	x
Denmark[2]	x	x	x	x	x	x	x	x	x	x	x	x	x
Ireland[2]	x	x	x	x	x	x	x	x	x	x	x	x	x
Untd. Kingdom[2]	x	x	x	x	x	x	x	x	x	x	x	x	x
Greece[3]		x	x	x	x	x	x	x	x	x	x	x	x
Portugal[4]		x	x	x	x	x	x	x	x	x	x	x	x
Spain[4]		x	x	x	x	x	x	x	x	x	x	x	x
Austria[5]		x	x	x	x	x	x	x	x	x	x	x	x
Finland[5]						x	x	x	x	x	x	x	x
Sweden[5]							x	x	x	x	x	x	x
Iceland[6]								x	x	x	x	x	x
Norway[6]								x	x	x	x	x	x
Switzerland[6]				x	x	x	x	x	x	x	x	x	x
Poland[7]								x	x	x	x	x	x
Cyprus[7]											x	x	x
Malta[7]												x	x
Czech Rep[7]													x
Estonia[7]													x
Hungary[7]													x
Latvia[7]													x
Lithuania[7]													x
Slovak Rep.[7]													x
Slovenia[7]													x
Bulgaria[8]													x
Romania[8]													x
Turkey[8]													x
Total	9	13	13	14	14	15	16	19	19	19	20	21	31

[1] Member State since 1958. [2] Member State since 1973. [3] Member State since 1981. [4] Member State since 1986. [5] Member State since 1995. [6] Member of the European Free Trade Area (EFTA). [7] Candidate country scheduled for membership in 2004. [8] Candidate country scheduled for membership 2007 or after. [9] West Germany only before 1992.

Table B: OECD comparisons 1980 to 1999

Country	1980	1985	1990	1993	1996	1999
Canada	x	x	x	x	x	x
Japan	x	x	x	x	x	x
Norway[3]	x	x	x	x		
United States	x	x	x	x	x	x
Australia		x	x	x	x	x
Finland[1]		x	x			
New Zealand		x	x	x	x	x
Sweden[2]		x	x			
Turkey[4]		x	x	x	x	
Iceland[3]			x	x		
Czech Rep.[4]					x	
Hungary[4]					x	
Mexico					x	x
Slovak Rep.[4]					x	
Korea						x
Israel					x	x
Russian Fed.					x	x
Croatia						x
FYROM						x
Slovenia[4]					x	
Ukraine						x
_____	____	____	____	____	____	____
Total	4	9	10	8	13	12

Moved to Eurostat comparisons in [1] 1992; [2] 1993; [3] 1994; [4] 1999.

Table C: Group II comparisons 1980 to 1996

Country	1980	1985	1990	1993	1996
Austria	x	x	x	x	x
Finland[1]	x				
Hungary[2]	x	x	x	x	
Poland[3]	x	x	x	x	
Yugoslavia	x	x	x		
Czechoslovakia			x		
Romania			x	x	x
USSR			x		
Belarus				x	x
Bulgaria				x	x
Croatia				x	x
Czech Rep.[2]				x	
Estonia				x	x
Latvia				x	x
Lithuania				x	x
Moldova				x	x
Russian Fed.				x	x
Slovak Rep.[2]				x	
Slovenia				x	x
Ukraine				x	x
Albania					x
FYROM					x
_____	____	____	____	____	____
Total	5	4	7	16	14

Moved to OECD comparisons in [1] 1985; [2] 1996. Moved to Eurostat comparisons in [3] 1994

Table D: Group III comparisons 1996 and 2000

Country	1996	2000
Armenia	x	x
Azerbaijan	x	x
Belarus	x	x
Georgia	x	x
Kazakhstan	x	x
Kyrgyz Republic	x	x
Moldova	x	x
Russian Fed.	x	x
Tajikistan	x	x
Turkmenistan	x	x
Turkey	x	
Uzbekistan	x	x
Mongolia	x	x
Total	13	12

Table E: Country groups and group leaders in 1999 after ECP reform

Northern group	Central group	Southern group
Denmark	Austria	Bulgaria
Estonia	Belgium	Cyprus
Finland	Czech Republic	France
Iceland	Germany	Greece
Ireland	Hungary	Italy
Latvia	Luxembourg	Malta
Lithuania	Netherlands	Portugal
Norway	Poland	Romania
Sweden	Slovak Republic	Spain
United Kingdom	Slovenia	Turkey
	Switzerland	
Group leader	Group leader	Group leader
Finland	Austria	Italy

[1] *An International Comparison of National Products and the Purchasing Power of Currencies: A Study of the United States, the United Kingdom, France, Germany and Italy*, M. Gilbert and I. Kravis, OEEC, Paris, 1954.

[2] *Comparative National Products and Price Levels: A Study of Western Europe and the United States*, M. Gilbert and Associates, OEEC, Paris, 1958.

[3] *A Comparison of National Output and Productivity of the United Kingdom and the United States*, D. Paige and G. Bombach, OEEC, Paris, 1959.

[4] See, for example, "International comparisons of purchasing power, real output and labour productivity: a case study of Brazilian, Mexican, and U.S. manufacturing, 1975", A. Maddison and B. van Ark, *The Review of Income and Wealth*, March 1989; or "Productivity levels in Germany, Japan and the United States", B. van Ark and D. Pilat, *Brookings Papers on Economic Activity, Microeconomics*, 2, 1993; or "Prices, quantities and productivity in industry: a study of transition economies in a comparative perspective", B. van Ark, E. Monnikhof and M. Trimmer, International and Interarea Comparisons of Income, Output and Prices, edited by A. Heston and R. Lipsey, *National Bureau of Economic Research, Studies in Income and Wealth*, Volume 61, Chicago University Press, 1999.

[5] It was renamed "International Comparison Programme" in 1989.

[6] At that time it was "United Nations Statistical Office (UNSO)", but its present title, "United Nations Statistics Division (UNSD)", is used throughout this Annex.

[7] For a description of these comparisons, see "An intercountry comparison of national income of planned economies", G. Szilagyi, *The Review of Income and Wealth*, June 1962.

[8] See "The measurement of Latin American real income in US dollars", *Economic Bulletin for Latin America*, October 1967, and "Latin American real product comparisons", J. Salazar-Carrillo, *Economic Journal*, December 1977.

[9] At the time it was "Austrian Central Statistics Office", but its present title, "Statistics Austria", is used throughout this Annex.

[10] *Comparisons of Levels of Consumption in Austria and Poland*, Conference of European Statisticians, United Nations, New York, 1968.

[11] *A System of International Comparisons of Gross Product and Purchasing Power*, I. Kravis, Z. Kenessey, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1975.

[12] *International Comparisons of Real Product and Purchasing Power*, I. Kravis, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1978.

[13] *World Product and Income, International Comparisons of Real Product and Purchasing Power*, I. Kravis, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1982.

[14] At this time it was "European Community". It became "European Union" with the signing of the Maastricht Treaty in November 1993. "European Union" is used throughout this Annex.

[15] *World Comparisons of Purchasing Power and Real Product for 1980: Part One, Summary Results for 60 Countries*, United Nations and Eurostat, New York, 1986; and *World Comparisons of Purchasing Power and Real Product for 1980: Part Two, Detailed, Summary Results for 60 Countries*, United Nations and Eurostat, New York, 1987.

[16] *World Comparisons of Purchasing Power and Real Product, 1985: Phase V of the International Comparison Programme*, United Nations and Eurostat, New York, 1994.

[17] *Comparisons of Price Levels and Economic Aggregates: The Results of 22 African Countries*, M. Mouyelo-Katoula and K. Munnsad, Eurostat, Luxembourg, 1996.

[18] *Purchasing Power Parities; Volume and Price Level Comparisons for the Middle East, 1993*, Economic Commission for Western Asia (ESCWA) and the World Bank, Amman, 1997.

[19] *ESCAP Comparisons of Real Gross Domestic Product and Purchasing Power Parities, 1993*, United Nations, Bangkok, 1999.

[20] "International Comparison of Gross Domestic Product in Europe 1993", *Conference of European Statisticians Statistical Standards and Studies*, No. 47, United Nations, New York and Geneva, 1997.

[21] *Evaluation of the International Comparison Programme*, E/CN.3/19999/8, November 1998. More commonly referred to as "the Ryten Report" after its author, Jacob Ryten.

[22] The comparisons organised by Eurostat and the OECD are not regional. The Eurostat-OECD PPP Programme covers countries in North and Central America, Asia, Oceania, Middle East and Europe. These countries are treated as a "region" for ICP management and organisation.

[23] The ring comparison is expected to cover around twenty countries in total.

[24] "International Comparison of Gross Domestic Product in Europe 1980", *Conference of European Statisticians Statistical Standards and Studies*, No. 37, United Nations, New York, 1985; "International Comparison of Gross Domestic Product in Europe 1985", *Conference of European Statisticians Statistical Standards and Studies*, No. 41, United Nations, New York, 1988; "International Comparison of Gross Domestic Product in Europe 1990", *Conference of European Statisticians Statistical Standards and Studies*, No. 45, United Nations, New York and Geneva, 1994; "International Comparison of Gross Domestic Product in Europe 1993", *Conference of European Statisticians Statistical Standards and Studies*, No. 47, United Nations, New York and Geneva, 1997; "International Comparison of Gross Domestic Product in Europe 1996", *Conference of European Statisticians Statistical Standards and Studies*, No.50, United Nations, Geneva, 1999.

[25] The other option – that is, Group I adopting productivity adjustments – was not considered because, as explained in the annex to Chapter 5, EU Member States and others in Group I considered the productivity adjustments of Group II to be too subjective and not sufficiently rigorous.

[26] See "Comparaison réelle du produit intérieur brut des pays de la Communauté européenne", V. Paretti, H. Krijinse Locker and P. Goybet, *Analyse et Prévision*, June 1974, Number 6.

[27] *Comparison in Real Values of the Aggregates of ESA, 1975*, Eurostat, Luxembourg, 1977.

[28] *Comparison in Real Values of the Aggregates of ESA, 1980*, Eurostat, Luxembourg, 1983.

[29] *Purchasing Power Parities and Gross Domestic Product in Real Terms, Results 1985*, Eurostat, 1987.

[30] *Comparison in Real Values of the Aggregates of ESA, Results for 1990 and 1991*, Eurostat, Luxembourg, 1993.

[31] *Comparison of National Accounts Aggregates between Israel and the European Community,* Eurostat, Luxembourg, 1985

[32] *Comparison of National Accounts Aggregates between Austria and the European Community,* Eurostat, Luxembourg, 1984.

[33] *Comparison in Real Values of the Aggregates of ESA, Results for 1990 and 1991*, Eurostat, Luxembourg, 1993; *Comparison in Real Values of the Aggregates of ESA, Results for 1992 and 1993*, Eurostat, Luxembourg, 1995; *Comparison in Real Values of the Aggregates of ESA, Results for 1994*, Eurostat, Luxembourg, 1996; *Purchasing Power Parities and Related Economic Indicators, Results for 1995 and 1996*, Eurostat, Luxembourg, 1999; *Purchasing Power Parities and Related Economic Indicators, Results for 1997*, Eurostat, Luxembourg, 1999; *Purchasing Power Parities and Related Economic Indicators, Results for 1998*, Eurostat, Luxembourg, 2000.

[34] Iceland, Norway and Switzerland, but not Liechtenstein.

[35] Twelve EU Member States plus Austria, Canada, Japan, Norway, the United States. In 1980 Finland participated in ECP Group II. It was included in the combined Eurostat-OECD comparison through Austria.

[36] *Purchasing Power Parities and Real Expenditures in the OECD*, M. Ward, OECD, Paris. 1985.

[37] *Purchasing Power Parities and Real Expenditures, 1985*, OECD, Paris, 1987.

[38] *Purchasing Power Parities and Real Expenditures, 1990, Volume 1, EKS Results*, OECD, Paris, 1992; *Purchasing Power Parities and Real Expenditures, 1990, Volume 2, GK Results*, OECD, Paris, 1993; *Purchasing Power Parities and Real Expenditures for Nordic Countries, 1990,* OECD, Paris, 1992; *Purchasing Power Parities and Real Expenditures for Canada and the United States, 1990,* OECD, Paris, 1993.

[39] An important difference between EU Member States and other countries participating in Eurostat-OECD comparisons is that the major part of their data collections are funded by Eurostat. Non-EU countries pay for the data collections themselves. This places an additional burden on their already limited statistical resources. The pricing of capital goods, particularly the pricing of construction projects which usually has to be contracted out to consultants, is especially onerous.

[40] *Purchasing Power Parities and Real Expenditures, 1993, Volume 1, EKS Results*, OECD, Paris, 1995; *Purchasing Power Parities and Real Expenditures, 1993, Volume 2, GK Results,* OECD, Paris, 1996; *Purchasing Power Parities and Real Expenditures for Nordic Countries, 1993,* OECD, Paris, 1995.

[41] *Purchasing Power Parities and Real Expenditures, 1996 Results,* OECD, Paris, 1999.

[42] *Purchasing Power Parities and Real Expenditures, 1999 Results,* OECD, Paris, 2002.

[43] *Multilateral Measurements of Purchasing Power and Real GDP*, P. Hill, Eurostat, 1982.

[44] This recommendation was subsequently included in the SNA 93. See paragraph 16.103.

[45] This is the approach adopted in the ESA 95. See paragraphs 10.73 and 10.74.

[46] See footnotes 38 and 40.

[47] *Review of the OECD-Eurostat PPP Programme*, I. Castles, unpublished OECD document, STD/PPP(97)5, September 1997.

ANNEX II: CLASSIFICATION OF FINAL EXPENDITURE ON GDP

II.1. The Eurostat-OECD classification of final expenditure on GDP adheres to the definitions, concepts, classifications and accounting rules of the SNA 93[1] and the ESA 95[2]. It is structured by type of final expenditure - individual consumption expenditure, collective consumption expenditure and capital expenditure - and, in the case of individual consumption expenditure, by purchaser - households, non-profit institutions serving households (or NPISHs) and general government (or government).

II.2. Final expenditure on GDP is broken down into seven main aggregates:

- individual consumption expenditure by households,
- individual consumption expenditure by NPISHs,
- individual consumption expenditure by government,
- collective consumption expenditure by government,
- gross fixed capital formation,
- change in inventories and acquisitions less disposals of valuables,
- balance of exports and imports.

II.3. These seven main aggregates are broken down into 31 expenditure categories, 71 expenditure groups, 152 expenditure classes and 226 basic headings as shown in Box II.1. Of these levels of aggregation, the basic heading level is particularly important because it is at this level that expenditures are defined, products selected, prices collected, prices edited and PPPs first calculated and averaged.

II.4. GDP, main aggregates, expenditure categories and expenditure groups are identified in the classification by capital letters and by having one-, two-, four- and five-digit codes respectively. Expenditure classes are underlined and have six-digit codes. Basic headings have seven-digit codes. These distinctions are illustrated in Box II.2. The abbreviations used in the classification are listed in Box II.3.

II.5. Individual consumption expenditures by households, NPISHs and government are classified by purpose following COICOP[3], COPNI[4] and COFOG 98[5]. Gross fixed capital formation is classified by type of product according to CPA 96[6]. The correspondence with COICOP, COPNI and CPA 96 is given at the level of the expenditure class. The correspondence with COFOG 98 is given at the expenditure category level.

II.6. ***Individual consumption expenditure by households*** is broken down by purpose in line with COICOP into 148 basic headings. Expenditure at the basic heading level is defined according to the domestic concept - that is, irrespective of whether the household making the purchase is resident or not. A global adjustment – *net purchases abroad* - is made to rectify this. It is defined as total expenditure abroad by resident households less total expenditure in the country by non-resident households.

II.7. The individual consumption expenditures of households are also classified by type of product. Basic headings containing consumer goods are denoted by either (ND), (SD) or (D) indicating "non-durable", "semi-durable" or "durable" respectively.[7] Basic headings containing consumer services are denoted by (S). Most basic headings comprise either goods or services, but, for practical reasons, some basic headings contain both goods and services. Similarly, there are basic headings which contain either both non-durable and semi-durable goods or both semi-durable and durable goods. Such basic headings are assigned a (ND), (SD), (D) or (S) according to which type of product is considered to be predominant.

II.8. ***Individual consumption expenditure by NPISHs*** is broken down by purpose in line with COPNI into six basic headings: housing, health, recreation and culture, education, social protection and other services (such as religion, political parties, labour and professional organisations and environment protection). By convention all consumption expenditures of NPISHs are treated as individual consumption expenditure. All six basic headings under this aggregate are classified as containing individual services (IS).

II.9. Government final consumption expenditure is broken down by purpose and by type of service in line with COFOG 98 into "individual consumption expenditure by government" and "collective consumption expenditure by government". Individual consumption expenditure by government is government expenditure on services which households consume individually (housing, health, recreation and culture, education and social protection). Collective consumption expenditure of government is government expenditure on services which benefit households collectively (general public services, defence, public order and safety, economic affairs, environment protection, and housing and community services).

II.10. ***Individual consumption expenditure by government*** is broken down into 29 basic headings. First, by purpose - housing, health, recreation and culture, education and social protection. And then, in the case of health and education, by whether the expenditure is for the purchase of health or education services from the private sector (in the

form of "benefits and reimbursements") or for the production of health and education services by government itself. The expenditure on government-produced health and education services is broken down further by cost components as required for the input-price approach[8]. All 29 basic headings under this aggregate are classified as containing individual services (IS).

II.11. **_Collective consumption expenditure by government_** is broken down into seven basic headings by cost components as required for the input-price approach. A distinction is made between "defence services" and "collective services other than defence services". All seven basic headings under this aggregate are classified as containing collective services (CS).

II.12. **_Gross fixed capital formation_** is broken down by type of product in line with CPA 96 into 32 basic headings: twenty for machinery and equipment, nine for construction and three for other products. Other products comprise products of agriculture, forestry, fisheries and aquaculture; computer software; land improvement, mineral exploration and other intangible fixed assets. All 32 basic headings under this aggregate are classified as containing investment goods (IG).

II.13. **_Change in inventories and acquisitions less disposals of valuables_** is broken into two basic headings: _change in inventories_ and _acquisitions less disposals of valuables_. **_Balance of exports and imports_** is also broken down into two basic headings: _exports of goods and services_ and _imports of goods and services_.

Box II.1: Number of categories, groups, classes and basic headings by main aggregates

Main aggregates Categories	Categories	Groups	Classes	Basic headings
11.00 Individual consumption expenditure by households	**13**	**48**	**109**	**148**
- .01 Food and non-alcoholic beverages		2	11	34
- .02 Alcoholic beverages, tobacco and narcotics		3	5	5
- .03 Clothing and footwear		2	6	10
- .04 Housing, water, electricity, gas and other fuels		5	11	11
- .05 Furnishings, household equipment and maintenance		6	12	16
- .06 Health		3	7	7
- .07 Transport		3	14	18
- .08 Communication		3	3	3
- .09 Recreation and culture		6	20	22
- .10 Education		5	5	5
- .11 Restaurants and hotels		2	3	4
- .12 Miscellaneous goods and services		7	11	11
- .13 Net purchases abroad		1	1	2
12.00 Individual consumption expenditure by NPISHs	**6**	**6**	**6**	**6**
- .01 Housing		1	1	1
- .02 Health		1	1	1
- .03 Recreation and culture		1	1	1
- .04 Education		1	1	1
- .05 Social protection		1	1	1
- .06 Other services		1	1	1
13.00 Individual consumption expenditure by government	**5**	**7**	**16**	**29**
- .01 Housing		1	1	1
- .02 Health		2	7	17
- .03 Recreation and culture		1	1	1
- .04 Education		2	6	9
- .05 Social protection		1	1	1
14.00 Collective consumption expenditure by government	**1**	**1**	**5**	**7**
15.00 Gross fixed capital formation	**3**	**6**	**13**	**32**
- .01 Machinery and equipment		2	7	20
- .02 Construction		3	3	9
- .03 Other products		1	3	3
16.00 Change in inventories and acquisitions less disposals of valuables	**2**	**2**	**2**	**2**
-.01 Change of inventories		1	1	1
-.02 Acquisitions less disposals of valuables		1	1	1
17.00 Balance of exports and imports	**1**	**1**	**1**	**2**
GDP	**31**	**71**	**152**	**226**

Box II.2: Levels of aggregation as shown in the classification

10.00.00.0 GROSS DOMESTIC PRODUCT	
11.00.00.0 INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	= main aggregate
11.01.00.0 FOOD AND NON-ALCOHOLIC BEVERAGES	= expenditure category
11.01.10.0 FOOD	= expenditure group
11.01.11.0 Bread and cereals [COICOP 01.1.1]*	= expenditure class
11.01.11.1 Rice (ND)**	= basic heading
11.01.11.2 Other cereals (ND)**	= basic heading
11.01.11.3 Bread (ND)**	= basic heading
11.01.11.4 Other bakery products (ND)**	= basic heading
11.01.11.5 Pasta products (ND)**	= basic heading
11.01.12.0 Meat [COICOP 01.1.2]*	= expenditure class
11.01.12.1 Beef and veal (ND)**	= basic heading
11.01.12.2 Pork (ND)**	= basic heading

* classification correspondence
** classification by type of product

Box II.3: Abbreviations used in the classification

c.i.f. – cost, insurance and freight

COFOG – classification of the functions of government

COICOP – classification of individual consumption according to purpose

COPNI – classification of the purposes of non-profit institutions serving households

CPA – classification of products by activity

CS – collective services

D – durable goods

f.o.b. – free on board

IG – investment goods

IS – individual services

ND – non-durable goods

n.e.c. – not elsewhere classified

NPISHs – non-profit institutions serving households

S – consumer services

SD – semi-durable goods

10.00.00.0 **GROSS DOMESTIC PRODUCT**

11.00.00.0 **INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS**

11.01.00.0 **FOOD AND NON-ALCOHOLIC BEVERAGES**

11.01.10.0 **FOOD**

The food products classified here are those purchased for consumption at home; *excludes* food products sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, etc. (11.11.11.1); cooked dishes prepared by restaurants for consumption off their premises (11.11.11.1); cooked dishes prepared by catering contractors whether collected by the customer or delivered to the customer's home (11.11.11.1); and products sold specifically as pet foods (11.09.34.1).

11.01.11.0 <u>**Bread and cereals**</u> [COICOP 01.1.1]

Includes farinaceous-based products prepared with meat, fish, seafood, cheese, vegetables or fruit.

11.01.11.1 **Rice (ND)**

Rice in all forms except flour (11.01.11.2).

11.01.11.2 **Other cereals, flour and other cereal products (ND)**

Maize, wheat, barley, oats, rye and other cereals in the form of grain, meal or flour; cereal preparations (cornflakes, oat flakes, etc.) and other cereal products (malt, malt flour, malt extract, potato starch, tapioca, sago and other starches); *includes* couscous; rice flour; *excludes* sweetcorn (11.01.17.1).

11.01.11.3 **Bread (ND)**

Fresh bread and special bread.

11.01.11.4 **Other bakery products (ND)**

Bakery products such as crispbread, rusks, toasted bread, biscuits, gingerbread, wafers, waffles, crumpets, muffins, croissants, cakes, tarts, pies, quiches and pizzas; *includes* mixes and doughs for the preparation of bakery products; *excludes* meat pies (11.01.12.6); fish pies (11.01.13.2).

11.01.11.5 **Pasta products (ND)**

Pasta products in all forms.

11.01.12.0 <u>**Meat**</u> [COICOP 01.1.2]

Includes animals and poultry purchased live for consumption as food.

11.01.12.1 **Beef and veal (ND)**

Fresh, chilled or frozen meat of bovine animals, *excludes* edible offal (11.01.12.5).

11.01.12.2 **Pork (ND)**

Fresh, chilled or frozen meat of swine; *excludes* edible offal (11.01.12.5).

11.01.12.3 **Lamb, mutton and goat (ND)**

Fresh, chilled or frozen meat of sheep and goat; *excludes* edible offal (11.01.12.5).

11.01.12.4 **Poultry (ND)**

Fresh, chilled or frozen meat of poultry (chicken, duck, goose, turkey, guinea fowl); *includes* edible poultry offal.

11.01.12.5 **Other meats and edible offal (ND)**

Fresh, chilled or frozen meat of hare, rabbit, game (antelope, deer, boar, pheasant, grouse, pigeon, quail, etc.), marine mammals (seal, walrus, whale, etc.), horse, mule, donkey, camel, ostrich, kangaroo, alligator, etc.; fresh, chilled or frozen edible offal; *excludes* edible poultry offal (11.01.12.4).

11.01.12.6   Delicatessen and other meat preparations (ND)

Dried, salted or smoked meat and edible offal (sausages, salami, bacon, ham, pâté, etc.); other preserved or processed meat and meat-based preparations (canned meat, meat extracts, meat juices, meat pies, etc.); *excludes* frogs, land and sea snails (11.01.13.1); lard and other edible animal fats (11.01.15.3); soups, broths and stocks containing meat (11.01.19.1).

11.01.13.0   <u>Fish and seafood</u> [COICOP 01.1.3]

11.01.13.1   Fresh, chilled or frozen fish and seafood (ND)

Fresh, chilled or frozen fish and seafood (crustaceans, molluscs and other shellfish, sea snails); *includes* land crabs, land snails and frogs; fish and seafood purchased live for consumption as food.

11.01.13.2   Preserved or processed fish and seafood (ND)

Dried, smoked or salted fish and seafood; other preserved or processed fish and seafood and fish and seafood based preparations (canned fish and seafood, caviar and other hard roes, fish pies, etc.); *excludes* soups, broths and stocks containing fish or seafood (11.01.19.1).

11.01.14.0   <u>Milk, cheese and eggs</u> [COICOP 01.1.4]

Includes non-dairy milk substitutes such as soya milk; *excludes* butter and butter products (11.01.15.1).

11.01.14.1   Fresh milk (ND)

Raw milk; pasteurised or sterilised milk; *includes* whole and low fat milk; recombined or reconstituted milk; soya milk.

11.01.14.2   Preserved milk and other milk products (ND)

Condensed, evaporated or powdered milk; yoghurt, cream, milk-based desserts, milk-based beverages and other similar milk-based products; *includes* milk, cream and yoghurt containing sugar, cocoa, fruit or flavourings.

11.01.14.3   Cheese (ND)

Cheese and curd.

11.01.14.4   Eggs and egg-based products (ND)

Eggs and egg products made wholly from eggs.

11.01.15.0   <u>Oils and fats</u> [COICOP 01.1.5]

11.01.15.1   Butter (ND)

Butter and butter products (butter oil, ghee, etc.).

11.01.15.2   Margarine (ND)

Margarine; *includes* "diet" margarine

11.01.15.3   Other edible oils and fats (ND)

Edible oils (olive oil, corn oil, sunflower-seed oil, cotton-seed oil, soybean oil, groundnut oil, walnut oil, etc.); edible animal fats (lard, etc.); edible vegetable fats (peanut butter, etc.); *excludes* cod or halibut liver oil (11.06.11.1).

11.01.16.0   <u>Fruit</u> [COICOP 01.1.6]

11.01.16.1   Fresh or chilled fruit (ND)

Fresh or chilled fruit; *includes* melons and water melons; *excludes* vegetables grown for their fruit such as aubergines, cucumbers and tomatoes (11.01.17.1).

11.01.16.2   Frozen, preserved or processed fruit and fruit-based products (ND)

Frozen fruit; dried fruit, fruit peel, fruit kernels, nuts and edible seeds; other preserved fruit; processed fruit; fruit-based products; *excludes* jams, marmalades, compotes, jellies, fruit purees and pastes (11.01.18.2); parts of plants preserved in sugar (11.01.18.2); fruit juices (11.01.22.3).

11.01.17.0 <u>**Vegetables**</u> [COICOP 01.1.7]

11.01.17.1 **Fresh or chilled vegetables other than potatoes (ND)**

Fresh or chilled vegetables cultivated for their leaves or stalks (asparagus, broccoli, cauliflower, endives, fennel, spinach, etc.), for their fruit (aubergines, cucumbers, courgettes, green peppers, pumpkins, tomatoes, etc.), and for their roots (beetroot, carrots, onions, parsnips, radishes, turnips, etc.); *includes* olives; garlic; pulses; sweetcorn; sea fennel and other edible seaweed; mushrooms and other edible fungi; *excludes* lentils (11.01.17.3); culinary herbs (parsley, rosemary, thyme, etc.) and spices (pepper, pimento, ginger, etc.) (11.01.19.1).

11.01.17.2 **Fresh or chilled potatoes (ND)**

Fresh or chilled potatoes; *includes* other tuber vegetables (manioc, arrowroot, cassava, sweet potatoes, etc.).

11.01.17.3 **Frozen, preserved or processed vegetables and vegetable-based products (ND)**

Frozen vegetables; dried vegetables; other preserved vegetables; processed vegetables; vegetable-based products; *includes* frozen preparations such as chipped potatoes; lentils; products of potatoes and other tuber vegetables such as flours, meals, flakes, purees, chips, crisps, etc.; *excludes* potato starch, tapioca, sago and other starches (11.01.11.2); soups, broths and stocks containing vegetables (11.01.19.1); vegetable juices (11.01.22.3).

11.01.18.0 <u>**Sugar, jam, honey, chocolate and confectionery**</u> [COICOP 01.1.8]

11.01.18.1 **Sugar (ND)**

Cane or beet sugar, unrefined or refined, powdered, crystallised or in lumps; *includes* artificial sugar substitutes.

11.01.18.2 **Jams, marmalades and honey (ND)**

Jams, marmalades, compotes, jellies, fruit purees and pastes, natural and artificial honey, maple syrup, molasses and parts of plants preserved in sugar.

11.01.18.3 **Confectionery, chocolate and other cocoa preparations (ND)**

Chocolate in bars and slabs, chewing gum, sweets, toffees, pastilles and other confectionery products; cocoa-based foods and cocoa-based dessert preparations; *excludes* cocoa and chocolate-based powder (11.01.21.1).

11.01.18.4 **Edible ice, ice cream and sorbet (ND)**

Edible ice, ice cream and sorbet.

11.01.19.0 <u>**Food products n.e.c.**</u> [COICOP 01.1.9]

11.01.19.1 **Food products n.e.c. (ND)**

Salt, spices (pepper, pimento, ginger, etc.), culinary herbs (parsley, rosemary, thyme, etc.), sauces, condiments, seasonings (mustard, mayonnaise, ketchup, soy sauce, etc.), vinegar; prepared baking powders, baker's yeast, dessert preparations, soups, broths, stocks, culinary ingredients, etc.; homogenised baby-food and dietary preparations irrespective of the composition; *excludes* soya milk (11.01.14.1); milk-based desserts (11.01.14.2); artificial sugar substitutes (11.01.18.1); cocoa-based dessert preparations (11.01.18.3).

11.01.20.0 **NON-ALCOHOLIC BEVERAGES**

The non-alcoholic beverages classified here are those purchased for consumption at home; *excludes* non-alcoholic beverages sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, etc. (11.11.11.2).

11.01.21.0   <u>**Coffee, tea and cocoa**</u> [COICOP 01.2.1]

11.01.21.1   **Coffee, tea and cocoa (ND)**

Coffee, whether or not decaffeinated, roasted or ground; tea, maté and other plant products for infusions; cocoa, whether or not sweetened, and chocolate-based powder; *includes* instant coffee; coffee substitutes; extracts and essences of coffee; tea substitutes; extracts and essences of tea; cocoa-based beverage preparations; *excludes* chocolate in bars or slabs (11.01.18.3); cocoa-based foods and cocoa-based dessert preparations (11.01.18.3).

11.01.22.0   <u>**Mineral waters, soft drinks, fruit and vegetable juices**</u> [COICOP 01.2.2]

11.01.22.1   **Mineral waters (ND)**

Mineral or spring waters; all drinking water sold in containers.

11.01.22.2   **Soft drinks and concentrates (ND)**

Soft drinks such as sodas, lemonades and colas; syrups and concentrates for the preparation of beverages; *excludes* non-alcoholic beverages which are generally alcoholic such as non-alcoholic beer (11.02.13.1).

11.01.22.3   **Fruit and vegetable juices (ND)**

Fruit and vegetable juices.

11.02.00.0   **ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS**

11.02.10.0   **ALCOHOLIC BEVERAGES**

The alcoholic beverages classified here are those purchased for consumption at home; *includes* low or non-alcoholic beverages which are generally alcoholic such as non-alcoholic beer; *excludes* alcoholic beverages sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, etc. (11.11.11.2).

11.02.11.0   <u>**Spirits**</u> [COICOP 02.1.1]

11.02.11.1   **Spirits (ND)**

Eaux-de-vie, liqueurs and other spirits; *includes* mead; aperitifs other than wine-based aperitifs (11.02.12.1).

11.02 12.0   <u>**Wine**</u> [COICOP 02.1.2]

11.02.12.1   **Wine (ND)**

Wine, cider and perry, including sake; champagne and other sparkling wines; fortified wines and wine-based aperitifs.

11.02.13.0   <u>**Beer**</u> [COICOP 02.1.3]

11.02.13.1   **Beer (ND)**

All kinds of beer, such as ale, lager and porter; *includes* non-alcoholic beer; shandy.

11.02.20.0   **TOBACCO**

Covers all purchases of tobacco by households, including purchases of tobacco in cafés, bars, restaurants, service stations, etc.

11.02.21.0   <u>**Tobacco**</u> [COICOP 02.2.0]

11.02.21.1   **Tobacco (ND)**

Cigarettes, cigarette tobacco and cigarette papers; cigars, pipe tobacco, chewing tobacco or snuff; *excludes* other smokers' articles (11.12.32.1).

11.02.30.0   **NARCOTICS**

11.02.31.0   <u>Narcotics</u> [COICOP 02.3.0]

11.02.31.1   **Narcotics (ND)**

Marijuana, opium, cocaine and their derivatives; other vegetable-based narcotics such as cola nuts, betel leaves and betel nuts; other narcotics including chemicals and man-made drugs.

11.03.00.0   **CLOTHING AND FOOTWEAR**

11.03.10.0   **CLOTHING**

11.03.11.0   <u>Clothing materials</u> [COICOP 03.1.1]

11.03.11.1   **Clothing materials (SD)**

Clothing materials of natural fibres, of man-made fibres and of their mixtures; *excludes* furnishing fabrics (11.05.21.1).

11.03.12.0   <u>Garments</u> [COICOP 03.1.2]

Garments for men, women, children (3 to 13 years) and infants (0 to 2 year), either ready-to-wear or made-to-measure, in all materials (including leather, furs, plastics and rubber), for everyday wear, for sport or for work; *includes* capes, overcoats, raincoats, anoraks, parkas, blousons, jackets, trousers, waistcoats, suits, costumes, dresses, skirts, etc.; shirts, blouses, pullovers, sweaters, cardigans, shorts, swimsuits, tracksuits, jogging suits, sweatshirts, T-shirts, leotards, etc.; vests, underpants, socks, stockings, tights, petticoats, brassières, knickers, slips, girdles, corsets, body stockings, etc.; pyjamas, night-shirts, night dresses, housecoats, dressing gowns, bathrobes, etc.; *excludes* articles of medical hosiery such as elasticated stockings (11.06.12.1).

11.03.12.1   **Men's clothing (SD)**

Men's clothing as defined above.

11.03.12.2   **Women's clothing (SD)**

Women's clothing as defined above.

11.03.12.3   **Children's and infant's clothing (SD)**

Children's and infant's clothing as defined above; *includes* babyclothes and babies' booties made of fabric; *excludes* babies' napkins (11.12.13.1).

11.03.13.0   <u>Other articles of clothing and clothing accessories</u> [COICOP 03.1.3]

11.03.13.1   **Other articles of clothing and clothing accessories (SD)**

Ties, handkerchiefs, scarves, squares, gloves, mittens, muffs, belts, braces, aprons, smocks, bibs, sleeve protectors, hats, caps, berets, bonnets, etc.; sewing threads, knitting yarns and accessories for making clothing such as buckles, buttons, press-studs, zip-fasteners, ribbons, laces, trimmings, etc.; *includes* gardening gloves and working gloves; crash helmets for motor cycles and bicycles; *excludes* gloves and other articles made of rubber (11.05.61.1); pins, safety pins, sewing needles, knitting needles, thimbles (11.05.61.1); protective headgear for sports (11.09.32.1); other protective gear for sports such as life jackets, boxing gloves, body padding, belts, supports, etc. (11.09.32.1); paper handkerchiefs (11.12.13.1); watches, jewellery, cuff-links, tie-pins (11.12.31.1); walking sticks and canes, umbrellas and parasols, fans, key rings (11.12.32.1).

11.03.14.0   <u>Cleaning, repair and hire of clothing</u> [COICOP 03.1.4]

11.03.14.1   **Cleaning, repair and hire of clothing (S)**

Dry-cleaning, laundering and dyeing of garments; darning, mending, repair and altering of garments; hire of garments; *includes* total value of the repair service (that is, both the cost of labour and the cost of materials are covered); *excludes* materials, threads, accessories, etc. purchased by households with the intention of undertaking the repairs themselves (11.03.11.1) or (11.03.13.1); repair of household linen and other household textiles (11.05.21.1); dry-cleaning, laundering, dyeing of household linen and household textiles (11.05.62.2); hire of household linen (11.05.62.2).

11.03.20.0   FOOTWEAR

11.03.21.0   <u>Shoes and other footwear</u> [COICOP 03.2.1]

All footwear for men, women, children (3 to 13 years) and infants (0 to 2 years) including sports footwear suitable for everyday or leisure wear (shoes for jogging, cross-training, tennis, basket ball, boating, etc.); *includes* gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves; *excludes* shoe-trees, shoehorns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1).

11.03.21.1   Men's footwear (SD)

Men's footwear as defined above.

11.03.21.2   Women's footwear (SD)

Women's footwear as defined above.

11.03.21.3   Children's and infant's footwear (SD)

Children's and infant's footwear as defined above; *excludes* babies booties made of fabric (11.03.12.3).

11.03.22.0   <u>Repair and hire of footwear</u> [COICOP 03.2.2]

11.03.22.1   Repair and hire of footwear (S)

Repair of footwear; shoe cleaning services; hire of footwear; *includes* total value of the repair service (that is, both the cost of labour and the cost of materials are covered); *excludes* parts of footwear, such as heels, soles, etc., purchased by households with the intention of undertaking the repairs themselves (11.03.21.1), (11.03.21.2) or (11.03.21.3); polishes, creams and other shoe-cleaning articles (11.05.61.1); repair (11.09.32.1) and hire (11.09.41.1) of game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.).

11.04.00.0   HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS

11.04.10.0   ACTUAL RENTALS FOR HOUSING

Rentals normally include payment for the use of the land on which the property stands, the dwelling occupied, the fixtures and fittings for heating, plumbing, lighting, etc., and, in the case of a dwelling let furnished, the furniture. They also include payment for the use of a garage to provide parking in connection with the dwelling. The garage does not have to be physically contiguous to the dwelling; nor does it have to be leased from the same landlord.

Rentals do not include payment for the use of garages or parking spaces not providing parking in connection with the dwelling (11.07.24.1). Nor do they include charges for water supply (11.04.41.1), refuse collection (11.04.42.1) and sewerage collection (11.04.42.1); co-proprietor charges for caretaking, gardening, stairwell cleaning, heating and lighting, maintenance of lifts and refuse disposal chutes, etc. in multi-occupied buildings (11.04.42.1); charges for electricity (11.04.51.1) and gas (11.04.52.1); charges for heating and hot water supplied by district heating plants (11.04.55.1).

11.04.11.0   <u>Actual rentals for housing</u> [COICOP 04.1.1 and 04.1.2]

11.04.11.1   Actual rentals for housing (S)

Rentals actually paid by tenants or subtenants occupying unfurnished or furnished apartments or one-family houses as their main residence; rentals actually paid for secondary residences; *includes* payments by households occupying a room in a hotel or boarding house as their main residence; *excludes* accommodation services of educational establishments and hostels (11.11.21.1), of holiday villages and holiday centres (11.11.21.1) or of retirement homes for elderly people (11.12.41.1).

11.04.20.0   IMPUTED RENTALS FOR HOUSING

The coverage is the same as that defined for actual rents – see note to (11.04.10.0) above - with one exception. Imputed rentals for housing do not include an imputation for furniture. They refer to owner-occupied dwellings without their furniture.

11.04.21.0   Imputed rentals for housing [COICOP 04.2.1 and 04.2.2]

11.04.21.1   Imputed rentals for housing (S)

Imputed rentals of owners occupying apartments or one-family houses as their main residence; imputed rentals for secondary residences; imputed rentals of households paying a reduced rental or housed free.

11.04.30.0   MAINTENANCE AND REPAIR OF THE DWELLING

Maintenance and repair of dwellings are distinguished by two features: first, they are activities that have to be undertake regularly in order to maintain the dwelling in good working order; second, they do not change the dwelling's performance, capacity or expected service life. There are two types of maintenance and re-pair of dwellings: those which are minor, such as interior decoration and repairs to fittings, and which are commonly carried out by both tenants and owners; and those which are major, such as replastering walls or repairing roofs, and which are carried out by owners only. Only expenditures which tenants and owner-occupiers incur on materials and services for minor maintenance and repair are part of individual con-sumption expenditure of households. Expenditures which owner-occupiers incur on materials and services for major maintenance and repair are not part of individual consumption expenditure of households. Pur-chases of materials made by tenants or owner-occupiers with the intention of undertaking the main-tenance or repair themselves should be shown under (11.04.31.1). If tenants or owner-occupiers pay an enterprise to carry out the maintenance or repair, then the total value of the service, including the costs of the materials used, should be shown under (11.04.32.1).

11.04.31.0   Materials for the maintenance and repair of the dwelling [COICOP 04.3.1]

11.04.31.1   Materials for the maintenance and repair of the dwelling (ND)

Products and materials, such as paints and varnishes, renderings, wallpapers, fabric wall coverings, win-dow panes, plaster, cement, putty, wallpaper pastes, etc., purchased for minor maintenance and repair of the dwelling; *includes* small plumbing items (pipes, taps, joints, etc.), surfacing materials (floor boards, ce-ramic tiles, etc.) and brushes and scrapers for paint, varnish and wallpaper; *excludes* fitted carpets and linoleum (11.05.12.1); hand tools, door fittings, power sockets, wiring flex and lamp bulbs (11.05.52.1); brooms, scrubbing brushes, dusting brushes and cleaning products (11.05.61.1); products, materials and fixtures used for major maintenance and repair (intermediate consumption) or for extension and conver-sion of the dwelling (capital formation).

11.04.32.0   Services for the maintenance and repair of the dwelling [COICOP 04.3.2]

11.04.32.1   Services for the maintenance and repair of the dwelling (S)

Services of plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc. engaged for minor maintenance and repair of the dwelling; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchases of materials made by households with the intention of undertaking the maintenance or repair themselves (11.04.31.1); services engaged for major maintenance and repair (intermediate consumption) or for extension and conversion of the dwelling (capital formation).

11.04.40.0   WATER SUPPLY AND MISCELLANEOUS SERVICES RELATING TO THE DWELLING

11.04.41.0   Water supply [COICOP 04.4.1]

11.04.41.1   Water supply (ND)

Water supply; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.; *excludes* drinking water sold in bottles or containers (11.01.22.1); hot water or steam sup-plied by district heating plants (11.04.55.1).

11.04.42.0 <u>**Miscellaneous services relating to the dwelling**</u> [COICOP 04.4.2, 04.4.3 and 04.4.4]

11.04.42.1 **Miscellaneous services relating to the dwelling (S)**

Refuse collection and disposal; sewerage collection and disposal; co-proprietor charges for caretaking, gardening, stairwell cleaning and lighting, maintenance of lifts and refuse disposal chutes, etc. in multi-occupied buildings; security services; snow removal and chimney sweeping; *excludes* household services such as window cleaning, disinfecting, fumigation and pest extermination (11.05.62.2); bodyguards (11.12.71.1).

11.04.50.0 **ELECTRICITY, GAS AND OTHER FUELS**

11.04.51.0 <u>**Electricity**</u> [COICOP 04.5.1]

11.04.51.1 **Electricity (ND)**

Electricity; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.

11.04.52.0 <u>**Gas**</u> [COICOP 04.5.2]

11.04.52.1 **Gas (ND)**

Town gas and natural gas; liquefied hydrocarbons (butane, propane, etc.); *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.

11.04.53.0 <u>**Liquid fuels**</u> [COICOP 04.5.3]

11.04.53.1 **Liquid fuels (ND)**

Domestic heating and lighting oils.

11.04.54.0 <u>**Solid fuels**</u> [COICOP 04.5.4]

11.04.54.1 **Solid fuels (ND)**

Coal, coke, briquettes, firewood, charcoal, peat and the like.

11.04.55.0 <u>**Heat energy**</u> [COICOP 04.5.5]

11.04.55.1 **Heat energy (ND)**

Hot water and steam purchased from district heating plants; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.; ice used for cooling and refrigeration purposes.

11.05.00.0 **FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE**

11.05.10.0 **FURNITURE AND FURNISHINGS, CARPETS AND OTHER FLOOR COVERINGS**

11.05.11.0 <u>**Furniture and furnishings**</u> [COICOP 05.1.1]

Includes the delivery and installation of furniture and furnishings when applicable; *excludes* works of art and antique furniture acquired primarily as stores of value (capital formation).

11.05.11.1 **Kitchen furniture (D)**

Tables, chairs, cupboards, etc. for kitchens.

11.05.11.2 **Bedroom furniture (D)**

Beds, tables, chairs, wardrobes, chests of drawers, etc. for bedrooms; *includes* base-mattresses, mattresses, tatamis; *excludes* sofa beds (11.05.11.3).

11.05.11.3 **Living-room and dining-room furniture (D)**

Sofas, sofa beds, couches, tables, chairs, cupboards, dressers, wall systems, book shelves for living rooms and dining rooms.

11.05.11.4   Other furniture and furnishings (D)

Baby furniture such as cradles, high-chairs and play-pens; camping and garden furniture; lighting equipment such as ceiling lights, standard lamps, globe lights and bedside lamps; pictures, sculptures, engravings, tapestries and other art objects including reproductions of works of art and other ornaments; screens, folding partitions and other furniture and fixtures; *includes* bathroom cabinets; blinds with the exception of fabric blinds (11.05.21.1); mirrors, candle-holders and candlesticks; *excludes* sunshades (11.05.21.1); safes (11.05.31.1); glassware and ceramic ware for households, offices and decoration (11.05.41.1); clocks (11.12.31.1); baby carriages and push-chairs (11.12.32.1); wall thermometers and barometers (11.12.32.1).

11.05.12.0   Carpets and other floor coverings [COICOP 05.1.2]

11.05.12.1   Carpets and other floor coverings (D)

Loose carpets, rugs, mats and other such movable floor coverings; fitted carpets, linoleum and other such fixed floor coverings; *includes* laying of floor covers; *excludes* floor boards and ceramic floor tiles (11.04.31.1); bathroom mats, rush mats and door mats (11.05.21.1); antique floor coverings acquired primarily as stores of value (capital formation).

11.05.13.0   Repair of furniture, furnishings and floor coverings [COICOP 05.1.3]

11.05.13.1   Repair of furniture, furnishings and floor coverings (S)

Repair of furniture, furnishings and floor coverings; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); restoration of works of art, antique furniture and antique floor coverings other than those acquired primarily as stores of value (capital formation); *excludes* separate purchases of materials made by households with the intention of undertaking the repairs themselves (11.05.11.1), (11.05.11.2), (11.05.11.3), (11.05.11.4) or (11.05.12.1); dry cleaning of carpets (11.05.62.2).

11.05.20.0   HOUSEHOLD TEXTILES

11.05.21.0   Household textiles [COICOP 05.2.0]

11.05.21.1   Household textiles (SD)

Furnishing fabrics, curtain material, curtains, double curtains, awnings, door curtains and fabric blinds; bedding such as futons, pillows, bolsters and hammocks; bedlinen such as sheets, pillowcases, blankets, travelling rugs, plaids, eiderdowns, counterpanes and mosquito nets; table linen and bathroom linen such as tablecloths, table napkins, towels and face-cloths; other textile household articles such as shopping bags, laundry bags, shoe bags, covers for clothes and furniture, flags, sunshades, etc.; repair of such articles; *includes* cloth bought by the piece; oilcloth; bathroom mats, rush mats and door mats; *excludes* fabric wall coverings (11.04.31.1); tapestries (11.05.11.4); floor coverings such as unfitted and fitted carpets (11.05.12.1); electric blankets (11.05.32.1); covers for motor cars, motor cycles, etc. (11.07.21.1); air mattresses and sleeping bags (11.09.32.1).

11.05.30.0   HOUSEHOLD APPLIANCES

11.05.31.0   Major household appliances whether electric or not [COICOP 05.3.1]

Includes the delivery and installation of the appliances when applicable; *excludes* such appliances that are built into the structure of the building (capital formation).

11.05.31.1   Major household appliances whether electric or not (D)

Refrigerators, freezers and fridge-freezers; washing-machines, dryers, drying cabinets, dishwashers, ironing and pressing machines; cookers, spit roasters, hobs, ranges, ovens and micro-wave ovens; air conditioners, humidifiers, space heaters, water heaters, ventilators and extractor hoods; vacuum cleaners, steam-cleaning machines, carpet shampooing machines and machines for scrubbing, waxing and polishing floors; safes, sewing machines, knitting machines, water softeners, etc.

11.05.32.0   Small electric household appliances [COICOP 05.3.2]

11.05.32.1   Small electric household appliances (SD)

Coffee mills, coffee-makers, juice extractors, can openers, food mixers, deep fryers, meat grills, knives, toasters, ice cream makers, sorbet makers, yoghurt makers, hotplates, irons, kettles, fans, electric blankets, etc.; *excludes* small non-electric kitchen household appliances and utensils (11.05.41.1); household scales (11.05.41.1); personal weighing machines and baby scales (11.12.13.1).

11.05.33.0   **Repair of household appliances** [COICOP 05.3.3]

11.05.33.1   **Repair of household appliances (S)**

Repair of household appliances; *includes* total value of the service (that is, both the cost of labour and the cost of are covered); *excludes* separate purchase of materials made by households with the intention of undertaking the repair themselves (11.05.31.1) or (11.05.32.1).

11.05.40.0   **GLASSWARE, TABLEWARE AND HOUSEHOLD UTENSILS**

11.05.41.0   **Glassware, tableware and household utensils** [COICOP 05.4.0]

11.05.41.1   **Glassware, tableware and household utensils (SD)**

Glassware, crystal-ware and ceramic ware of a kind used for table, kitchen, bathroom, toilet, office and indoor decoration; cutlery, flatware and silverware; non-electric kitchen utensils of all materials such as saucepans, stewpots, pressure cookers, frying pans, coffee mills, purée-makers, mincers, hotplates, household scales and other such mechanical devices; non-electric household articles of all materials such as containers for bread, coffee, spices, etc., waste bins, waste-paper baskets, laundry baskets, portable money-boxes and strong-boxes, towel rails, bottle racks, irons and ironing boards, letter boxes, feeding bottles, thermos flasks and ice boxes; repair of glassware, tableware and household utensils; *excludes* lighting equipment (11.05.11.4); electric household appliances (11.05.31.1) or (11.05.32.1); cardboard tableware (11.05.61.1); personal weighing machines and baby scales (11.12.13.1); ashtrays (11.12.32.1).

11.05.50.0   **TOOLS AND EQUIPMENT FOR HOUSE AND GARDEN**

11.05.51.0   **Major tools and equipment** [COICOP 05.5.1]

11.05.51.1   **Major tools and equipment (D)**

Motorised tools and equipment such as electric drills, saws, sanders and hedge cutters, garden tractors, lawn mowers, cultivators, chain saws and water pumps; repair of such articles; *includes* charges for leasing or rental of do-it-yourself machinery and equipment.

11.05.52.0   **Small tools and miscellaneous accessories** [COICOP 05.5.2]

11.05.52.1   **Small tools and miscellaneous accessories (SD)**

Small electric accessories such as power sockets, switches, wiring flex, electric bulbs, fluorescent lighting tubes, torches, hand-lamps, electric batteries for general use, bells and alarms; hand tools such as saws, hammers, screwdrivers, wrenches, spanners, pliers, trimming knives, rasps and files; garden tools such as wheel barrows, watering cans, hoses, spades, shovels, rakes, forks, scythes, sickles and secateurs; ladders and steps; door fittings (hinges, handles and locks), fittings for radiators and fireplaces, other metal articles for the house (curtain rails, carpet rods, hooks, etc.) or for the garden (chains, grids, stakes and hoop segments for fencing and bordering); repair of such articles.

11.05.60.0   **GOODS AND SERVICES FOR ROUTINE HOUSEHOLD MAINTENANCE**

11.05.61.0   **Non-durable household goods** [COICOP 05.6.1]

11.05.61.1   **Non-durable household goods (ND)**

Cleaning and maintenance products such as soaps, washing powders, washing liquids, scouring powders, detergents, disinfectant bleaches, softeners, conditioners, window-cleaning products, waxes, polishes, dyes, unblocking agents, disinfectants, insecticides, pesticides; fungicides and distilled water; articles for cleaning such as brooms, scrubbing brushes, dust pans and dust brushes, dusters, tea towels, floorcloths, household sponges, scourers, steel wool and chamois leathers; paper products such as filters, tablecloths and table napkins, kitchen paper, vacuum cleaner bags and cardboard tableware; other non-durable household articles such as matches, candles, lamp wicks, methylated spirits, clothes pegs, clothes hangers, pins, safety pins, sewing needles, knitting needles, thimbles, nails, screws, nuts and bolts, tacks, washers, glues and adhesive tapes for household use, string, twine and rubber gloves; *includes* polishes, creams and other shoe-cleaning articles; aluminium foil, cellophane wrap and plastic bin liners; shoe-trees and shoehorns; fire extinguishers for households; *excludes* brushes and scrapers for paint, varnish and wallpaper (11.04.31.1); products specifically for the cleaning and maintenance of transport equipment such as paints, chrome cleaners, sealing compounds and bodywork polishes (11.07.21.1); fire extinguishers for transport equipment (11.07.21.1); horticultural products for the upkeep of ornamental gardens (11.09.33.1); paper handkerchiefs, toilet paper, toilet soaps, toilet sponges and other products for personal hygiene (11.12.13.1); cigarette, cigar and pipe lighters and lighter fuel (11.12.32.1).

11.05.62.0 <u>Domestic services and household services</u> [COICOP 05.6.2]

11.05.62.1 **Domestic services (S)**

Domestic services supplied by paid staff in private service such as butlers, cooks, maids, cleaners, drivers, gardeners, governesses, secretaries, tutors and au pairs; domestic services, including baby-sitting and housework, supplied by enterprises or self-employed persons; *excludes* services of wet-nurses, crèches, day care centres and other child-minding facilities (11.12.41.1).

11.05.62.2 **Household services (S)**

Dry-cleaning, laundering and dyeing of household linen and household textiles; hire of furniture, furnishings, household equipment and household linen; household services such as window cleaning, disinfecting, fumigation and pest extermination; *excludes* dry-cleaning, laundering and dyeing of garments (11.03.14.1); refuse collection (11.04.42.1); sewerage collection (11.04.42.1); co-proprietor charges for caretaking, gardening, stairwell cleaning and lighting, maintenance of lifts and refuse disposal chutes, etc. in multi-occupied buildings (11.04.42.1); snow removal and chimney sweeping (11.04.42.1); removal and storage services (11.07.36.1).

11.06.00.0 **HEALTH**

Includes health services purchased from school and university health centres.

11.06.10.0 **MEDICAL PRODUCTS, APPLIANCES AND EQUIPMENT**

Medicaments, prostheses, medical appliances and equipment and other health-related products purchased by individuals, either with or without a prescription, usually from dispensing chemists, pharmacists or medical equipment suppliers. They are intended for consumption or use outside a health facility or institution. Such products supplied directly to out-patients by medical, dental and paramedical practitioners or to in-patients by hospitals and the like are classified in out-patient services (11.06.20.0) or hospital services (11.06.30.0).

11.06.11.0 <u>Pharmaceutical products</u> [COICOIP 06.1.1]

11.06.11.1 **Pharmaceutical products (ND)**

Medicinal preparations, medicinal drugs, patent medicines, serums and vaccines, vitamins and minerals, cod liver oil and halibut liver oil, oral contraceptives; *excludes* veterinary products (11.09.34.1); articles for personal hygiene such as medicinal soaps (11.12.13.1).

11.06.12.0 <u>Other medical products</u> [COICOP 06.1.2]

11.06.12.1 **Other medical products (ND)**

Clinical thermometers, adhesive and non-adhesive bandages, hypodermic syringes, first-aid kits, hot-water bottles and ice bags, medical hosiery items such as elasticated stockings and knee-supports, pregnancy tests, condoms and other mechanical contraceptive devices.

11.06.13.0 <u>Therapeutic appliances and equipment</u> [COICOP 06.1.3]

11.06.13.1 **Therapeutic appliances and equipment (D)**

Corrective eye-glasses and contact lenses, hearing aids, glass eyes, artificial limbs and other prosthetic devices, orthopaedic braces and supports, orthopaedic footwear, surgical belts, trusses and supports, neck braces, medical massage equipment and health lamps, powered and unpowered wheelchairs and invalid carriages, special beds, crutches, electronic and other devices for monitoring blood pressure, etc.; repair of such articles; *includes* dentures but not fitting costs; *excludes* hire of therapeutic equipment (11.06.23.1); protective goggles, belts and supports for sport (11.09.32.1); sun-glasses not fitted with corrective lenses (11.12.32 1).

11.06.20.0 **OUT-PATIENT SERVICES**

Medical, dental and paramedical services delivered to out-patients by medical, dental and paramedical practitioners and auxiliaries. The services may be delivered at home, in individual or group consulting facilities, dispensaries or the out-patient clinics of hospitals and the like. Out-patient services include the medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to out-patients by medical, dental and paramedical practitioners and auxiliaries. Medical, dental and paramedical services provided to in-patients by hospitals and the like are included in hospital services (11.06.30.0).

11.06.21.0 <u>**Medical Services**</u> [COICOP 06.2.1]

11.06.21.1 **Medical services (S)**

Services of physicians in general or specialist practice; *includes* orthodontic specialists; *excludes* services of medical analysis laboratories and X-ray centres (11.06.23.1) and services of practitioners of traditional medicine (11.06.23.1).

11.06.22.0 <u>**Dental services**</u> [COICOP 06.2.2]

11.06.22.1 **Dental services (S)**

Services of dentists, oral-hygienists and other dental auxiliaries; *includes* fitting costs of dentures but not the dentures themselves; *excludes* dentures (11.06.13.1); orthodontic specialists (11.06.21.1); services of medical analysis laboratories and X-ray centres (11.06.23.1).

11.06.23.0 <u>**Paramedical services**</u> [COICOP 06.2.3]

11.06.23.1 **Paramedical services (S)**

Services of medical analysis laboratories and X-ray centres; services of freelance nurses and midwives; services of freelance acupuncturists, chiropractors, optometrists, physiotherapists, speech therapists, etc.; medically-prescribed corrective-gymnastic therapy; out-patient thermal bath or seawater treatments; ambulance services other than hospital ambulance services; hire of therapeutic equipment; *includes* services of practitioners of traditional medicine.

11.06.30.0 **HOSPITAL SERVICES**

Covers the services of general and specialist hospitals, the services of medical centres, maternity centres and nursing and convalescence homes which chiefly provide in-patient health care, the services of institutions serving old people in which medical monitoring is an essential component and the services of rehabilitation centres providing in-patient health care and rehabilitative therapy where the objective is to treat the patient rather than to provide long-term support; *includes* hospital day care, home-based hospital treatment and hospices for terminally-ill persons; *excludes* the services of facilities, such as medical cabinets, clinics and dispensaries, devoted exclusively to out-patient care (11.06.20.0); the services of retirement homes for elderly persons, institutions for disabled persons and rehabilitation centres providing primarily long-term support (11.12.40.0).

11.06.31.0 <u>**Hospital services**</u> [COICOP 06.3.0]

11.06.31.1 **Hospital services (S)**

Comprises both the provision of *medical services*: services of physicians in general or specialist practice, of surgeons and of dentists; medical analysis and X-rays; paramedical services such as those of nurses, midwives, chiropractors, optometrists, physiotherapists, speech therapists, etc.; and the provision of *basic services*: administration; accommodation; food and drink; supervision and care by non-specialist staff (nursing auxiliaries); first-aid and resuscitation; ambulance transport; provision of medicines and other pharmaceutical products; provision of therapeutic appliances and equipment.

11.07.00.0 **TRANSPORT**

11.07.10.0 **PURCHASE OF VEHICLES**

Purchases of recreational vehicles such as camper vans, caravans, trailers, aeroplanes and boats are covered by (11.09.21.1).

11.07.11.0 <u>**Motor cars**</u> [COICOP 07.1.1]

Motor cars, passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.11.1 **Motor cars with diesel engine (D)**

Motor cars, etc. with a diesel engine.

11.07.11.2 **Motor cars with petrol engine of cubic capacity of less than 1200 cc (D)**

Motor cars, etc. with a petrol engine of cubic capacity of less than 1200 cc.

11.07.11.3   Motor cars with petrol engine of cubic capacity of 1200 cc to 1699 cc (D)

Motor cars, etc. with a petrol engine of cubic capacity of 1200 cc to 1699 cc.

11.07.11.4   Motor cars with petrol engine of cubic capacity of 1700 cc to 2999 cc (D)

Motor cars, etc. with a petrol engine of cubic capacity over 1700 cc to 2999 cc.

11.07.11.5   Motor cars with petrol engine with cubic capacity of 3000 cc and over (D)

Motor cars, etc. with a petrol engine of cubic capacity of 3000 cc and over.

11.07.12.0   <u>Motor cycles</u> [COICOP 07.1.2]

11.07.12.1   Motor cycles (D)

Motor cycles of all types, scooters and powered bicycles; *includes* side cars; snowmobiles, rickshaws; *excludes* invalid carriages (11.06.13.1); golf carts (11.09.21.1).

11.07.13.0   <u>Bicycles</u> [COICOP 07.1.3]

11.07.13.1   Bicycles (D)

Bicycles and tricycles of all types; *includes* rickshaws; *excludes* toy bicycles and tricycles (11.09.31.1).

11.07.14.0   <u>Animal drawn vehicles</u> [COICOP 07.1.4]

11.07.14.1   Animal drawn vehicles (D)

Animal drawn vehicles; *includes* animals required to draw the vehicles and related equipment (yokes, collars, harnesses, bridles, reins, etc.); *excludes* horses and ponies, horse or pony drawn vehicles and related equipment purchased for recreational purposes (11.09.21.1).

11.07.20.0   OPERATION OF PERSONAL TRANSPORT EQUIPMENT

Purchases of spare parts, accessories or lubricants made by households with the intention of undertaking the maintenance, repair or intervention themselves should be shown under (11.07.21.1) or (11.07.22.1). If households pay an establishment to carry out the maintenance, repair or fitting then the total value of the service, including the costs of the materials used, should be shown under (11.07.23.1).

11.07.21.0   <u>Spare parts and accessories for personal transport equipment</u> [COICOP 07 2.1]

11.07.21.1   Spare parts and accessories for personal transport equipment (SD)

Tyres (new, used or retreaded), innertubes, spark plugs, batteries, shock absorbers, filters, pumps and other spare parts or accessories for personal transport equipment; *includes* fire extinguishers for transport equipment; products specifically for the cleaning and maintenance of transport equipment such as paints, chrome cleaners, sealing compounds and bodywork polishes; covers for motor cars, motor cycles, etc.; *excludes* crash helmets for motor cycles and bicycles (11.03.13.1); non-specific products for cleaning and maintenance such as distilled water, sponges, chamois leathers, detergents, etc. (11.05.61.1); charges for the fitting of spare parts and accessories and for the painting, washing and polishing of bodywork (11.07.23.1); radio-telephones (11.08.21.1); car radios (11.09.11.1); baby-seats for cars (11.12.32.1).

11.07.22.0   <u>Fuels and lubricants for personal transport equipment</u> [COICOP 07.2.2]

11.07.22.1   Fuels and lubricants for personal transport equipment (ND)

Petrol and other fuels such as diesel, liquid petroleum gas, alcohol and two-stroke mixtures; lubricants, brake and transmission fluids, coolants and additives; *includes* fuel for recreational vehicles covered under (11.09.21.1); *excludes* charges for oil changes and greasing (11.07.23.1).

11.07.23.0   <u>Maintenance and repair of personal transport equipment</u> [COICOP 07.2.3]

11.07.23.1   Maintenance and repair of personal transport equipment (S)

Services purchased for the maintenance and repair of personal transport equipment such as fitting of parts and accessories, wheel balancing, technical inspection, breakdown services, oil changes, greasing and washing; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchase of spare parts, accessories or lubricants made by households with the intention of undertaking the maintenance or repair themselves (11.07.21.1) or (11.07.22.1); road worthiness tests (11.07.24.1).

11.07.24.0 <u>**Other services in respect of personal transport equipment**</u> [COICOP 07.2.4]

11.07.24.1 **Other services in respect of personal transport equipment (S)**

Hire of garages or parking spaces not providing parking in connection with the dwelling; toll facilities (bridges, tunnels, shuttle-ferries, motorways, etc.) and parking meters; driving lessons, driving tests and driving licences; road worthiness tests; hire of personal transport equipment without drivers; *excludes* hire of a car with driver (11.07.32.1); service charges for insurance in respect of personal transport equipment (11.12.51.1).

11.07.30.0 **TRANSPORT SERVICES**

Purchases of transport services are classified by mode of transport. When a ticket covers two or modes of transport - for example, intra-urban bus and underground or inter-urban train and ferry - and the expenditure cannot be apportioned between them then such purchases should be classified in (11.07.35.1). Cost of meals, snacks, drinks, refreshments or accommodation services have to be included if covered by the fare and not separately priced. If separately priced, these costs have to be classified in (11.11.00.0). *Includes* school transport; *excludes* ambulance services (11.06.23.1); package holidays (11.09.61.1).

11.07.31.0 <u>**Passenger transport by railway**</u> [COICOP 07.3.1]

11.07.31.1 **Passenger transport by railway (S)**

Urban and suburban transport of individuals and groups of persons and luggage by train, tram and underground; long-distance transport of individuals and groups of persons and luggage by train; *includes* transport of private vehicles; *excludes* funicular transport (11.07.36.1).

11.07.32.0 <u>**Passenger transport by road**</u> [COICOP 07.3.2]

11.07.32.1 **Passenger transport by road (S)**

Urban and suburban transport of individuals and groups of persons and luggage by bus, taxi and hired car with driver; long distance transport of individuals and groups of persons and luggage by coach, taxi and hired car with driver.

11.07.33.0 <u>**Passenger transport by air**</u> [COICOP 07.3.3]

11.07.33.1 **Passenger transport by air (S)**

Transport of individuals and groups of persons and luggage by aeroplane and helicopter.

11.07.34.0 <u>**Passenger transport by sea and inland waterway**</u> [COICOP 07.3.4]

11.07.34.1 **Passenger transport by sea and inland waterway (S)**

Transport of individuals and groups of persons and luggage by ship, boat, ferry, hovercraft and hydrofoil; *includes* transport of private vehicles.

11.07.35.0 <u>**Combined passenger transport**</u> [COICOP 07.3.5]

11.07.35.1 **Combined passenger transport (S)**

Transport of individuals and groups of persons and luggage by two or more modes of transport when the expenditure cannot be apportioned between them; *includes* transport of private vehicles; *excludes* package holidays (11.09.61.1).

11.07.36.0 <u>**Other purchased transport services**</u> [COICOP 07.3.6]

11.07.36.1 **Other purchased transport services (S)**

Funicular, cable-car and chair-lift transport; removal and storage services; services of porters and left-luggage and luggage-forwarding offices; travel agents' commissions, if separately priced; *excludes* cable car and chair-lift transport at ski resorts and holiday centres (11.09.41.1).

11.08.00.0   **COMMUNICATION**

11.08.10.0   **POSTAL SERVICES**

11.08.11.0   <u>Postal services</u> [COICOP 08.1.0]

11.08.11.1   **Postal services (S)**

Payments for the delivery of letters, postcards and parcels; private mail and parcel delivery; *includes* all purchases of new postage stamps, pre-franked postcards and aerogrammes; *excludes* purchase of used or cancelled postage stamps (11.09.31.1); financial services of post offices (11.12.62.1).

11.08.20.0   **TELEPHONE AND TELEFAX EQUIPMENT**

11.08.21.0   <u>Telephone and telefax equipment</u> [COICOP 08.2.0]

11.08.21.1   **Telephone and telefax equipment (D)**

Purchases of telephones, radio-telephones, telefax machines, telephone-answering machines and telephone loudspeakers; repair of such articles; *excludes* telefax and telephone answering facilities provided by personal computers (11.09.13.1).

11.08.30.0   **TELEPHONE AND TELEFAX SERVICES**

11.08.31.0   <u>Telephone and telefax services</u> [COICOP 08.3.0]

11.08.31.1   **Telephone and telefax services (S)**

Installation and subscription costs of personal telephone equipment; telephone calls from a private line or from a public line (public telephone box, post office cabin, etc.); telephone calls from hotels, cafés, restaurants and the like; telegraphy, telex and telefax services; information transmission services; internet connection services; hire of telephones, telefax machines, telephone answering-machines and telephone loudspeakers; *includes* radiotelephony, radiotelegraphy and radiotelex services.

11.09.00.0   **RECREATION AND CULTURE**

11.09.10.0   **AUDIO-VISUAL, PHOTOGRAPHIC AND INFORMATION PROCESSING EQUIPMENT**

11.09.11.0   <u>Equipment for the reception, recording and reproduction of sound and pictures</u> [COICOP 09.1.1]

11.09.11.1   **Equipment for the reception, recording and reproduction of sound and pictures (D)**

Television sets, video-cassette players and recorders, television aerials of all types; radio sets, car radios, radio clocks, two-way radios, amateur radio receivers and transmitters; gramophones, tape players and recorders, cassette players and recorders, CD-players, personal stereos, stereo systems and their constituent units (turntables, tuners, amplifiers, speakers, etc.), microphones and earphones; *excludes* video cameras, camcorders and sound-recording cameras (11.09.12.1).

11.09.12.0   <u>Photographic and cinematographic equipment and optical instruments</u> [COICOP 09.1.2]

11.09.12.1   **Photographic and cinematographic equipment and optical instruments (D)**

Still cameras, movie cameras and sound-recording cameras, video cameras and camcorders, film and slide projectors, enlargers and film processing equipment, accessories (screens, viewers, lenses, flash attachments, filters, exposure meters, etc.); binoculars, microscopes, telescopes and compasses.

11.09.13.0   <u>Information processing equipment</u> [COICOP 09.1.3]

11.09.13.1   **Information processing equipment (D)**

Personal computers, visual display units, printers and miscellaneous accessories accompanying them; computer software packages such as operating systems, applications, languages, etc.; calculators, including pocket calculators; typewriters and word processors; *includes* telefax and telephone answering facilities provided by personal computers; *excludes* pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software (11.09.14.1); video-game software (11.09.31.1); video-game computers that plug into a television set (11.09.31.1); typewriter ribbons (11.09.53.1); toner and ink cartridges (11.09.53.1); slide rules (11.09.53.1).

11.09.14.0   <u>Recording media</u> [COICOP 09.1.4]

11.09.14.1   **Pre-recorded recording media (SD)**

Records and compact discs; pre-recorded tapes, cassettes, video cassettes, diskettes and CD-ROMs for tape recorders, cassette recorders, video recorders and personal computers; *includes* pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software; *excludes* computer software packages such as operating systems, applications, languages, etc. (11.09.13.1); video-game software, video-game cassettes and video-game CD-ROMs (11.09.31.1).

11.09.14.2   **Unrecorded recording media (SD)**

Unrecorded tapes, cassettes, video cassettes, diskettes and CD-ROMs for tape recorders, cassette recorders, video recorders and personal computers; unexposed films, cartridges and discs for photographic and cinematographic use; *includes* photographic supplies such as paper and flash bulbs; unexposed film the price of which includes the cost of processing without identifying it; *excludes* batteries (11.05.52.1); the development of films and the printing of photographs (11.09.42.1).

11.09.15.0   <u>Repair of audio-visual, photographic and information processing equipment</u> [COICOP 09.1.5]

11.09.15.1   **Repair of audio-visual, photographic and information processing equipment (S)**

Repair of audio-visual equipment, photographic and information processing equipment; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchases of materials made by households with the intention of undertaking the repair themselves (11.09.11.1), (11.09.12.1) or (11.09.13.1).

11.09.20.0   **OTHER MAJOR DURABLES FOR RECREATION AND CULTURE**

11.09.21.0   <u>Major durables for outdoor recreation</u> [COICOP 09.2.1]

11.09.21.1   **Major durables for outdoor recreation (D)**

Camper vans, caravans and trailers; aeroplanes, microlight aircraft, gliders, hang-gliders and hot-air balloons; boats, outboard motors, sails, rigging and superstructures; horses and ponies, horse or pony drawn vehicles and related equipment (harnesses, bridles, reins, saddles, etc.); major items for games and sport such as canoes, kayaks, wind-surfing boards, sea-diving equipment, and golf carts; *includes* fitting out of boats, camper vans, caravans, etc.; *excludes* horses and ponies, horse or pony drawn vehicles and related equipment purchased for personal transport (11.07.14.1); inflatable boats, rafts and swimming pools for children and the beach (11.09.32.1).

11.09.22.0   <u>Musical instruments and major durables for indoor recreation</u> [COICOP 09.2.2]

11.09.22.1   **Musical instruments and major durables for indoor recreation (D)**

Musical instruments of all sizes, including electronic musical instruments, such as pianos, organs, violins, guitars, drums, trumpets, clarinets, flutes, recorders, harmonicas, etc.; billiard tables, ping-pong tables, pin-ball machines, gaming machines, etc.; *excludes* toys (11.09.31.1).

11.09.23.0   <u>Maintenance and repair of other major durables for recreation and culture</u> [COICOP 09.2.3]

11.09.23.1   **Maintenance and repair of other major durables for recreation and culture (S)**

Maintenance and repair of other major durables for recreation and culture; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); laying up for winter of boats, camper vans, caravans, etc.; hanger services for private planes; marina services for boats; veterinary and other services (stabling, feeding, farriery, etc.) for horses and ponies purchased for recreational purposes; *excludes* fuel for recreational vehicles (11.07.22.1); separate purchases of materials made by households with the intention of undertaking the repair themselves (11.09.21.1); veterinary and other services for pets (11.09.35.1).

11.09.30.0   OTHER RECREATIONAL ITEMS AND EQUIPMENT, GARDENS AND PETS

11.09.31.0   Games, toys and hobbies [COICOP 09.3.1]

11.09.31.1   Games, toys and hobbies (SD)

Card games, parlour games, chess sets and the like; toys of all kinds including dolls, soft toys, toy cars and trains, toy bicycles and tricycles, toy construction sets, puzzles, plasticine, electronic games, masks, disguises, jokes, novelties, fireworks, festoons and Christmas tree decorations; stamp-collecting requisites (used or cancelled postage stamps, stamp albums, etc.), other items for collections (coins, minerals, zoo-logical and botanical specimens, etc.) and other tools and articles n.e.c. for hobbies; *includes* video-game software; video-game computers that plug into a television set; video-game cassettes and video-game CD-ROMs; *excludes* collectors' items falling into the category of works of art or antiques (11.05.11.4); un-used postage stamps (11.08.11.1); Christmas trees (11.09.33.1); children's scrapbooks (11.09.51.1).

11.09.32.0   Equipment for sport, camping and open-air recreation [COICOP 09.3.2]

11.09.32.1   Equipment for sport, camping and open-air recreation (SD)

Gymnastic, physical education and sport equipment such as balls, rackets, bats, skis, golf clubs, foils, sabres, poles, weights, discuses, javelins, dumb-bells, chest expanders and other body-building equip-ment; parachutes and other sky diving equipment; firearms and ammunition for hunting, sport and person-al protection; fishing rods and other equipment for fishing; equipment for beach and open-air games such as bowls, croquet, frisbee, and inflatable boats, rafts and swimming pools; camping equipment such as tents and accessories, sleeping bags and back-packs, air mattresses and inflating pumps, camping stoves and barbecues; repair of such articles; *includes* game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.); protective headgear for sports; other protective gear for sports such as life jackets, boxing gloves, body padding, shin-guards, goggles, belts, supports, etc.; *excludes* crash helmets for motor cycles and bicycles (11.03.13.1); camping and garden furniture (11.05.11.4).

11.09.33.0   Gardens, plants and flowers [COICOP 09.3.3]

11.09.33.1   Gardens, plants and flowers (ND)

Natural or artificial flowers and foliage, plants, shrubs, bulbs, tubers, seeds, fertilisers, composts, garden peat, turf for lawns, specially treated soils for ornamental gardens, horticultural preparations, pots and pot holders; *includes* natural and artificial Christmas trees; delivery charges for flowers and plants; *excludes* gardening gloves (11.03.13.1); gardening services (11.04.42.1) or (11.05.62.1); gardening equipment (11.05.51.1); gardening tools (11.05.52.1); insecticides and pesticides for household use (11.05.61.1).

11.09.34.0   Pets and related products [COICOP 09.3.4]

11.09.34.1   Pets and related products (ND)

Pets, pet foods, veterinary and grooming products for pets, collars, leashes, kennels, birdcages, fish tanks, cat litters, etc.; *excludes* horses and ponies (11.07.14.1) or (11.09.21.1); veterinary services (11.09.35.1).

11.09.35.0   Veterinary and other services for pets [COICOP 09.3.5]

11.09.35.1   Veterinary and other services for pets (S)

Veterinary and other services for pets such as grooming and boarding; *excludes* veterinary and other services (stabling, feeding, farriery, etc.) for horses and ponies purchased for recreational purposes (11.09.21.1).

11.09.40.0   **RECREATIONAL AND CULTURAL SERVICES**

11.09.41.0   <u>**Recreational and sporting services**</u> [COICOP 09.4.1]

11.09.41.1   **Recreational and sporting services (S)**

Services provided by sports stadia, horse-racing courses, motor-racing circuits, velodromes, skating rinks, swimming pools, golf courses, gymnasia, fitness centres, tennis courts, squash courts, bowling alleys, fairs, amusement parks, roundabouts, see-saws and other playground facilities for children, pin-ball machines and other games for adults other than games of chance, ski slopes, ski lifts and the like; hire of equipment and accessories for sport and recreation, such as aeroplanes, boats, horses, skiing and camping equipment; out-of-school individual or group lessons in bridge, chess, aerobics, dancing, music, skating, skiing, swimming or other pastimes; services of mountain guides, tour guides, etc.; navigational aid services for boating; *includes* hire of game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.); *excludes* cable car and chair-lift transport not at ski resorts or holiday centres (11.07.36.1).

11.09.42.0   <u>**Cultural services**</u> [COICOP 09.4.2]

11.09.42.1   **Photographic services (S)**

Services of photographers such as film developing, print processing, enlarging, portrait photography, wedding photography, etc.

11.09.42.2   **Other cultural services (S)**

Services provided by cinemas, theatres, opera houses, concert halls, music halls, circuses, sound and light shows, museums, libraries, art galleries, exhibitions, historic monuments, national parks, zoological and botanical gardens, aquaria; hire of equipment and accessories for culture, such as television sets, video cassettes, etc.; television and radio broadcasting, in particular licence fees for television equipment and subscriptions to television networks; *includes* services of musicians, clowns, performers for private entertainments.

11.09.43.0   <u>**Games of chance**</u> [COICOP 09.4.3]

11.09.43.1   **Games of chance (S)**

Service charges for lotteries, bookmakers, totalisators, casinos and other gambling establishments, gaming machines, bingo halls, scratch cards, sweepstakes, etc. (Service charge is defined as the difference between the amounts paid for lottery tickets or placed in bets and the amounts paid out to winners.)

11.09.50.0   **NEWSPAPERS, BOOKS AND STATIONERY**

11.09.51.0   <u>**Books**</u> [COICOP 09.5.1]

11.09.51.1   **Books (SD)**

Books, including atlases, dictionaries, encyclopaedias, text books, guidebooks and musical scores; *includes* scrapbooks and albums for children; bookbinding; *excludes* pre-recorded tapes and compact discs of novels, plays, poetry, etc. (11.09.14.1); pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software (11.09.14.1); stamp albums (11.09.31.1).

11.09.52.0   <u>**Newspapers and periodicals**</u> [COICOP 09.5.2]

11.09.52.1   **Newspapers and periodicals (ND)**

Newspapers, magazines and other periodicals.

11.09.53.0 <u>**Miscellaneous printed matter, stationery and drawing materials**</u> [COICOP 09 5.3 and 09.5.4]

11.09.53.1 **Miscellaneous printed matter, stationery and drawing materials (ND)**

Writings pads, envelopes, account books, notebooks, diaries, etc.; pens, pencils, fountain pens, ball-point pens, felt-tip pens, inks, ink erasers, rubbers, pencil sharpeners, etc.; stencils, carbon paper, typewriter ribbons, inking pads, correcting fluids, etc.; paper punches, paper cutters, paper scissors, office glues and adhesives, staplers and staples, paper clips, drawing pins, etc.; drawing and painting materials such as canvas, paper, card, paints, crayons, pastels and brushes; catalogues and advertising material; posters, plain or picture postcards, calendars; greeting cards and visiting cards, announcement and message cards; maps and globes; *includes* toner and ink cartridges; educational materials such as exercise books, slide rules, geometry instruments, slates, chalks and pencil boxes; *excludes* pre-franked postcards and aerogrammes (11.08.11.1); stamp albums (11.09.31.1). pocket calculators (11.09.13.1).

11.09.60.0 **PACKAGE HOLIDAYS**

11.09.61.0 <u>**Package holidays**</u> [COICOP 09.6.0]

11.09.61.1 **Package holidays (S)**

All inclusive holidays or tours which provide for travel, food, accommodation, guides, etc.; *includes* half-day and one-day excursion tours; pilgrimages.

11.10.00.0 **EDUCATION**

Covers educational services only; *includes* education by radio or television broadcasting; *excludes* expenditures on educational materials, such as books (11.09.51.1) and stationery (11.09.53.1), or education support services, such as health care services (11.06.00.0), transport services (11.07.30.0), catering services (11.11.12.1) and accommodation services (11.11.21.1).

The breakdown of educational services is based upon the level categories of the 1997 International Standard Classification of Education (ISCED-97) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

11.10.10.0 **PRE-PRIMARY AND PRIMARY EDUCATION**

11.10.11.0 <u>**Pre-primary and primary education**</u> [COICOP 10.1.0]

11.10.11.1 **Pre-primary and primary education (S)**

Levels 0 and 1 of ISCED-97: nursery school and primary school; *includes* literacy programmes for students too old for primary school.

11.10.20.0 **SECONDARY EDUCATION**

11.10.21.0 <u>**Secondary education**</u> [COICOP 10.2.0]

11.10.21.1 **Secondary education (S)**

Levels 2 and 3 of ISCED-97: general, vocational or technical secondary education; *includes* out-of-school secondary education for adults and young people.

11.10.30.0 **POST-SECONDARY NON-TERTIARY EDUCATION**

11.10.31.0 <u>**Post-secondary non-tertiary education**</u> [COICOP 10.3.0]

11.10.31.1 **Post-secondary non-tertiary education (S)**

Level 4 of ISCED-97: post-secondary non-tertiary education; *includes* out-of-school post-secondary non-tertiary education for adults and young people.

11.10.40.0 **TERTIARY EDUCATION**

11.10.41.0 <u>**Tertiary education**</u> [COICOP 10.4.0]

11.10.41.1 **Tertiary education (S)**

Levels 5 and 6 of ISCED-97: tertiary education.

11.10.50.0   **EDUCATION NOT DEFINABLE BY LEVEL**

11.10.51.0   <u>**Education not definable by level**</u> [COICOP 10.5.0]

11.10.51.1   **Education not definable by level (S)**

Educational programmes, generally for adults, which do not require any special prior instruction, in particular vocational training and cultural development; *excludes* driving lessons (11.07.24.1); recreational training courses such as sport or bridge lessons given by independent teachers (11.09.41.1).

11.11.00.0   **RESTAURANTS AND HOTELS**

11.11.10.0   **CATERING SERVICES**

11.11.11.0   <u>**Restaurants, cafés and the like**</u> [COICOP 11.1.1]

Catering services (meals, snacks, drinks and refreshments) provided by restaurants, cafés, pubs, bars, buffets, tea-rooms, etc., including those provided: in places providing recreational, cultural, sporting or entertainment services (theatres, cinemas, sports stadia, swimming pools, sports complexes, museums, art galleries, night clubs, dancing establishments, etc.); or on public transport (coaches, trains, boats, aeroplanes, etc.) when priced separately; *includes* tips; *excludes* tobacco purchases (11.02.21.1); telephone calls (11.08.31.1).

11.11.11.1   **Restaurant services whatever the type of establishment (S)**

Expenditures primarily on food bought away from home; *includes* the sale of food products for immediate consumption by kiosks, street vendors and the like; food products dispensed ready for consumption by automatic vending machines; the sale of cooked dishes by restaurants for consumption off their premises; the sale of cooked dishes by catering contractors whether collected by the customer or delivered to the customers' home

11.11.11.2   **Pubs, bars, cafés, tea rooms and the like (S)**

Expenditures primarily on beverages bought away from home; *includes* the sale of beverages for immediate consumption by kiosks, street vendors and the like; beverages dispensed ready for consumption by automatic vending machines.

11.11.12.0   <u>**Canteens**</u> [COICOP 11.1.2]

11.11.12.1   **Canteens (S)**

Catering services of works canteens, office canteens and canteens in schools, universities and other educational establishments; *includes* university refectories, military messes and wardrooms; *excludes* food and drink provided to hospital in-patients (11.06.31.1).

11.11.20.0   **ACCOMMODATION SERVICES**

11.11.21.0   <u>**Accommodation services**</u> [COICOP 11.2.0]

11.11.21.1   **Accommodation services (S)**

Accommodation services provided by: hotels, boarding houses, motels, inns, holiday villages, holiday centres, camping sites, caravan sites, youth hostels, mountain chalets, boarding schools, universities and other educational establishments, public transport (trains, boats, etc.) when priced separately, hostels for young workers or immigrants; *includes* tips; porters; *excludes* rentals of households occupying a room in a hotel or boarding house as their main residence (11.04.11.1); rentals paid by households for a secondary residence for the duration of a holiday (11.04.11.1); catering services in such establishments except for breakfast or other meals included in the price of the accommodation (11.11.11.1) or (11.11.12.1); housing in orphanages, homes for disabled or maladjusted persons (11.12.41.1).

11.12.00.0   **MISCELLANEOUS GOODS AND SERVICES**

11.12.10.0   **PERSONAL CARE**

11.12.11.0   <u>**Hairdressing salons and personal grooming establishments**</u> [COICOP 12.1.1]

11.12.11.1   **Hairdressing salons and personal grooming establishments (S)**

Services of hairdressing saloons, barbers, beauty shops, manicures, pedicures, Turkish baths, saunas, solariums, non-medical massages, etc.; *includes* body care, depilation and the like; *excludes* spas (11.06.23.1) or (11.06.31.1); fitness centres (11.09.41.1).

11.12.12.0 <u>**Electric appliances for personal care**</u> [COICOP 12.1.2]

11.12.12.1 **Electric appliances for personal care (SD)**

Electric razors and hair trimmers, hand-held and hood hair dryers, curling tongs and styling combs, sun-lamps, vibrators, electric toothbrushes and other electric appliances for dental hygiene, etc.; repair of such articles.

11.12.13.0 <u>**Other appliances, articles and products for personal care**</u> [COICOP 12.1.3]

11.12.13.1 **Other appliances, articles and products for personal care (ND)**

Non-electric appliances: razors and hair trimmers and blades therefore, scissors, nail files, combs, shaving brushes, hairbrushes, toothbrushes, nail brushes, hairpins, curlers, personal weighing machines, baby scales, etc.; articles for personal hygiene: toilet soap, medicinal soap, cleansing oil and milk, shaving soap, shaving cream and foam, toothpaste, etc.; beauty products: lipstick, nail varnish, make-up and make-up removal products (including powder compacts, brushes and powder puffs), hair lacquers and lotions, pre-shave and after-shave products, sun-bathing products, hair removers, perfumes and toilet waters, personal deodorants, bath products, etc.; other products: toilet paper, paper handkerchiefs, paper towels, sanitary towels, cotton wool, cotton tops, babies' napkins, etc.; *excludes* handkerchiefs made of fabric (11.03.13.1).

11.12.20.0 **PROSTITUTION**

11.12.21.0 <u>**Prostitution**</u> [COICOP 12.2.0]

11.12.21.1 **Prostitution (S)**

Services provided by prostitutes and the like.

11.12.30.0 **PERSONAL EFFECTS N.E.C.**

11.12.31.0 <u>**Jewellery, clocks and watches**</u> [COICOP 12.3.1]

11.12.31.1 **Jewellery, clocks and watches (D)**

Precious stones and metals and jewellery fashioned out of such stones and metals; costume jewellery, cuff-links and tie-pins; clocks, watches, stop-watches, alarm clocks, travel clocks; repair of such articles; *excludes* ornaments (11.05.11.4) or (11.05.41.1); radio clocks (11.09.11.1); precious stones and metals and jewellery fashioned out of such stones and metals acquired primarily as stores of value (capital formation).

11.12.32.0 <u>**Other personal effects**</u> [COICOP 12.3.2]

11.12.32.1 **Other personal effects (SD)**

Suitcases, trunks, travel bags, attaché cases, satchels, hand-bags, wallets, purses, etc.; articles for babies: baby carriages, push-chairs, carry-cots, recliners, car beds and seats, back-carriers, front carriers, reins and harnesses, etc.; articles for smokers: pipes, lighters, cigarette cases, cigar cutters, ashtrays, etc.; miscellaneous personal articles: sun-glasses, walking sticks and canes, umbrellas and parasols, fans, key rings, etc.; funerary articles: urns, coffins, gravestones, etc.; repair of such articles; *includes* lighter fuel; wall thermometers and barometers; *excludes* baby furniture (11.05.11.4); shopping bags (11.05.21.1); feeding bottles (11.05.41.1).

11.12.40.0 **SOCIAL PROTECTION**

Social protection as defined here covers assistance and support services provided to persons who are: elderly, disabled, suffering from occupational injuries and diseases, survivors, unemployed, destitute, homeless, low-income earners, indigenous people, immigrants, refugees, alcohol and substance abusers, etc. It also covers assistance and support services provided to families and children. Such services include residential care, home help, day care and rehabilitation.

11.12.41.0   <u>**Social protection**</u> [COICOP 12.4.0]

11.12.41.1   **Social protection (S)**

Covers payments by households for: retirement homes for elderly persons, residences for disabled persons, rehabilitation centres providing long-term support for patients rather than health care and rehabilitative therapy, schools for disabled persons where the main aim is to help students overcome their disability; help to maintain elderly and disabled persons at home (home cleaning services, meal programmes, day-care centres, day-care services and holiday-care services); wet-nurses, crèches, play schools and other child-minding facilities; counselling, guidance, arbitration, fostering and adoption services for families.

11.12.50.0   **INSURANCE**

Services charges for insurance are defined as the differences between claims due and premiums earned and premium supplements.

11.12.51.0   <u>**Insurance**</u> [COICOP 12.5.1, 12.5.2, 12.5.3, 12.5.4 and 12.5.5]

11.12.51.1   **Insurance (S)**

Service charges for life assurance, death benefit assurance, education assurance, etc.; service charges paid by owner-occupiers and by tenants for the kinds of insurance typically taken out by tenants against fire, theft, water damage, etc.; service charges for private sickness and accident insurance; service charges for insurance in respect of personal transport equipment; service charges for travel insurance and luggage insurance; service charges for other insurance such as civil liability for injury or damage to third parties or their property not arising from the operation of personal transport equipment; *excludes* service charges paid by owner-occupiers for the kinds of insurance typically taken out by landlords (intermediate consumption).

11.12.60.0   **FINANCIAL SERVICES N.E.C.**

11.12.61.0   <u>**FISIM**</u> [COICOP 12.6.1]

11.12.61.1   **FISIM (S)**

Financial intermediation services indirectly measured.

11.12.62.0   <u>**Other financial services n.e.c.**</u> [COICOP 12.6.2]

11.12.62.1   **Other financial services n.e.c. (S)**

Actual charges for the financial services of banks, post offices, saving banks, money changers and similar financial institutions; fees and service charges for brokers, investment counsellors, tax consultants and the like; administrative charges of private pension funds and the like.

11.12.70.0   **OTHER SERVICES N.E.C.**

11.12.71.0   <u>**Other services n.e.c.**</u> [COICOP 12.7.0]

11.12.71.1   **Other services n.e.c. (S)**

Fees for legal services, employment agencies, etc.; charges for undertaking and other funeral services; payment for the services of estate agents, housing agents, auctioneers, operators of salesrooms and other intermediaries; payment for photocopies and other reproductions of documents; fees for the issue of birth, marriage and death certificates and other administrative documents; payment for newspaper notices and advertisements; payment for the services of graphologists, astrologers, private detectives, bodyguards, matrimonial agencies and marriage guidance counsellors, public writers, miscellaneous concessions (seats, toilets, cloakrooms), etc.

11.13.00.0   **NET PURCHASES ABROAD**

11.13.10.0   **NET PURCHASES ABROAD**

11.13.11.0   <u>**Net purchases abroad**</u>

Purchases by residential households in the rest of the world *less* purchases by non-residential households in the economic territory of the country.

11.13.11.1   **Purchases by residential households in the rest of the world**

Final consumption expenditure of residential households in the rest of the world (as tourists, travelling businessmen and government officials, crews, border and seasonal workers, diplomatic and military personal stationed abroad).

11.13.11.2   **Purchases by non-residential households in the economic territory of the country**

Final consumption expenditure of non-residential households in the economic territory of the country (as tourists, travelling businessmen, and government officials, crews, border and seasonal workers, diplomatic and military personal stationed abroad).

12.00.00.0   **INDIVIDUAL CONSUMPTION EXPENDITURE BY NPISHs**

12.01.00.0   **HOUSING**

12.01.10.0   **HOUSING**

12 01.11.0   <u>**Housing**</u> [COPNI 01.0.0]

12.01.11.1   **Housing (IS)**

Covers the following NPISHs: associations that undertake the development, construction, management, leasing, financing, renovation and rehabilitation of housing.

12.02.00.0   **HEALTH**

12.02.10.0   **HEALTH**

12.02.11.0   <u>**Health**</u> [COPNI 02.1.1 to 02.6.0]

12.02.11.1   **Health (IS)**

Covers the following NPISHs: general and specialised hospitals, nursing and convalescence homes, medical and maternity centres, hospices for terminally-ill persons; surgeries, clinics, vaccination centres and dispensaries; rehabilitation centres where the objective is to treat patients rather than to provide long-term support; volunteer organisations for ambulance crews and paramedical personnel that provide emergency medical services; organisations that promote public health and health education; organisations that provide medical services to persons who are victims of wars, famines and natural catastrophes whether in their own country or abroad; organisations that undertake research and scientific studies on medical and health matters and trust funds or charitable organisations that finance such activities; charitable foundations that provide financial support for hospitals, nursing homes, surgeries, etc. and charitable foundations that provide financial support for patients; *includes* hospitals, nursing homes, surgeries, etc. funded by religious organisations; *excludes* residential homes for elderly or disabled persons (12.05.11.1); shelters for homeless persons (12.05.11.1).

12.03.00.0   **RECREATION AND CULTURE**

12.03.10.0   **RECREATION AND CULTURE**

12.03.11.0   <u>**Recreation and culture**</u> [COPNI 03.1.0 and 03.2.0]

12.03.11.1   **Recreation and culture (IS)**

Covers the following NPISHs: clubs for playing indoor or outdoor sports, including fitness clubs, sailing, rowing and canoeing clubs; supporters' clubs for indoor or outdoor sports; clubs for games of skill or chance; youth clubs and organisations such as guides, scouts, young pioneers, YMCA and YWCA; clubs for outdoor activities such as rambling, hiking, caving and mountain-climbing, parachuting, scuba diving, hang gliding, etc.; social clubs such as veteran associations, Lions and Rotary Club; associations for bird-watchers, butterfly-hunters, model-builders, stamp-collectors, train spotters, vintage car enthusiasts, antique collectors, etc.; animal shelters, animal hospitals and veterinary services for pets; organisations that seek finance for, or otherwise support, participation of sportspersons and game-players in international competitions; libraries, museums and art galleries; historical, literary, humanistic and philosophical societies; theatre and dance groups, orchestras, choral and musical ensembles, etc., that produce live performances of plays, operas, ballets and other spectacles; photography, cinema and art clubs; associations for the maintenance and visiting of historical monuments, war cemeteries, zoological and botanical gardens and aquaria; fan-clubs for actors, singers, film stars and other performing artists; television and radio broadcasting; *excludes* associations that promote alternative life-styles (12.06.11.1); organisations whose objective is to protect wild animals (12.06.11.1).

12.04.00.0   EDUCATION

12.04.10.0   EDUCATION

12.04.11.0   Education [COPNI 04.1.0 to 04.7.0]

12.04.11.1   Education (IS)

Covers the following NPISHs: pre-primary and primary schools; secondary schools providing general, vocational or technical education; institutions providing post-secondary non-tertiary education; universities, colleges and the like providing tertiary education; organisations providing educational programmes not definable by level; parent-teacher associations; organisations that undertake research or other scientific studies on educational matters and trust funds and charitable foundations set up to finance such activities; charitable foundations that provide support for schools, colleges, universities, etc. and charitable foundations that provide bursaries and financial support for students; *includes* schools for disabled persons where the main aim is to provide students with a general education rather than to help them to overcome their disability; night-schools and educational institutes managed by trade unions and labour federations; seminaries and colleges for training priests, clerics, rabbis and other offices of religious organisations; education by radio or television broadcasting; *excludes* crèches, play schools and other child minding facilities (12.05.11.1); schools for disabled persons where the main aim is to help students overcome their disability rather than to provide a general education (12.05.11.1).

12.05.00.0   SOCIAL PROTECTION

12.05.10.0   SOCIAL PROTECTION

Social protection as defined here covers assistance and support services provided to persons who are: elderly, disabled, suffering from occupational injuries and diseases, survivors, unemployed, destitute, homeless, low-income earners, indigenous people, immigrants, refugees, alcohol and substance abusers, etc. It also covers assistance and support services provided to families and children. Such services include residential care, home help, day care and rehabilitation.

12.05.11.0   Social protection [COPNI 05.1.0 and 05.2.0]

12.05.11.1   Social protection (IS)

Covers the following NPISHs: retirement homes for elderly persons, residences for disabled persons, rehabilitation centres providing long-term support for patients rather than health care and rehabilitative therapy, schools for disabled persons where the main aim is to help students overcome their disability; organisations that provide home-cleaning services, meal programmes, day-care centres, day-care services, holiday-care and transport services for elderly and disabled persons; orphanages, crèches, nurseries, play schools, day-care centres and other child-minding facilities; organisations that provide counselling, guidance, arbitration, fostering and adoption services for families; single parent agencies and services, family violence shelters; organisations that provide counselling to persons who are disaster victims, victims of assault and abuse and potential suicides; organisations that provide temporary shelters or housing for homeless persons; organisations that provide long-term support for persons who are gamblers, alcohol abusers and substance abusers; organisations that provide cash assistance, food, clothing, shelter and other services to persons who are refugees, immigrants, destitute and low-income earners; organisations that seek to improve conditions in prisons, including prison visitors and social rehabilitation; organisations that seek to provide opportunities for economic or social development for deprived groups of persons, whether in their own country or abroad; organisations that undertake applied research and experimental development on subjects related to social protection and trust funds and charitable foundations that finance such activities.

12.06.00.0   OTHER SERVICES

12.06.10.0   OTHER SERVICES

Covers COPNI divisions 06 Religion, 07 Political parties, labour and professional organisations, 08 Environment protection and 09 Services n.e.c.

12.06.11.0   <u>Other services</u> [COPNI 06.0.0 to 09.2.0]

12.06.11.1   **Other services (IS)**

Covers the following NPISHs:

Organisations that promote religious beliefs, administer religious services and rituals, maintain places of worship, provide retreats for meditation or religious instruction; churches, convents, nunneries, monasteries, mosques, synagogues, temples, shrines, etc.; *includes* non-conventional cults and sects; *excludes* hospitals, nursing homes, surgeries, etc. funded by religious organisations (12.02.11.1); maintenance of war-cemeteries (12.03.11.1); schools, colleges, universities, etc. funded by religious organisations (12.04.11.1); seminaries and colleges for training priests, clerics, rabbis and other officers of religious organisations (12.04.11.1); orphanages and shelters for persons in distressed conditions funded by religious organisations (12.05.11.1).

Political parties; political action groups and organisations that seek to enhance respect for human rights, whether in their own country or abroad; political action groups and groups formed to promote equal employment or political rights or to oppose discrimination on grounds of race, gender, age or sexual preference; political parties and political action groups mainly concerned with single issues such as the environment, the abolition of blood-sports, gun control, capital punishment or right to life; research bodies directly linked to political parties and political action groups; trade unions, labour federations and similar groups whose purpose is to improve or maintain the living conditions of members; associations of members of particular professions which promote the interests of members, exchange information among members or issue regular publications on topics relevant to the professions; *exclude*s: night-schools and educational institutes managed by trade unions and labour federations (12.04.11.1).

Organisations set up to prevent or remedy damage to the environment; associations that seek to protect wild animals or preserve particular species of animals, birds, fish, insects etc.; organisations that seek to preserve forests, wet-lands and areas of natural beauty; organisations that undertake applied research and experimental development on subjects related to environment protection and trust funds and charitable organisations set up to finance such activities.

Community and neighbourhood organisations; organisations that seek to prevent cruel treatment of domesticated animals; organisations providing legal-aid services and related assistance; organisations carrying out economic forecasting and analysis; organisations that undertake basic research and applied research and experimental development on subjects not classified to 12.02.00.0, 12.04.00.0 or 12.05.00.0 and trust funds and charitable organisations set up to finance such activities; organisations providing services that cannot be assigned to 12.01.00.00 to 12.05.00.0

13.00.00.0   **INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT**

Covers COFOG divisions 07 Health, 08 Recreation, culture and religion, 09 Education and 10 Social protection; *excluding* COFOG classes 07.5.0 R&D Health, 07.6.0 Health n.e.c., 08.3.0 Broadcasting and publishing services, 08.4.0 Religious and other community services, 08.5.0 R&D Recreation, culture and religion, 08.6.0 recreation, culture and religion n.e.c., 09.7.0 R&D Education, 09.8.0 Education n.e.c., 10.8.0 R&D Social protection and 10.9.0 Social protection n.e.c.

13.01.00.0   **HOUSING**

COFOG 10.6.0 covers government outlays on housing services provided to individual persons.

13.01.10.0   **HOUSING**

13.01.11.0   <u>Housing</u>

13.01.11.1   **Housing (IS)**

Provision of social protection in the form of benefits in kind to help households meet the cost of housing (recipients of these benefits are means tested); administration, operation or support of such social protection schemes; benefits in kind, such as payments made on a temporary or long-term basis to help tenants with rent costs, payments to alleviate the current housing costs of owner-occupiers (that is, to help with paying mortgages or interest), provision of low-cost or social housing.

13.02.00.0   HEALTH

COFOG 07 Health covers government outlays on health services provided to individual persons and health services provided on a collective basis. Only expenditures on individual services - COFOG 07.1.1 to 07.4.0 - are allocated here. Expenditures on collective services - COFOG 07.5.0 and 07.6.0 - are assigned to 14.01.10.0.

13.02.10.0   HEALTH BENEFITS AND REIMBURSEMENTS

General government expenditure on medical goods and services produced by the private sector.

13.02.11.0   <u>Medical products, appliances and equipment</u>

Medicaments, prostheses, medical appliances and equipment and other health-related products purchased by individuals, either with or without a prescription, usually from dispensing chemists, pharmacists or medical equipment suppliers. They are intended for consumption or use outside a health facility or institution. Such products supplied directly to out-patients by medical, dental and paramedical practitioners or to in-patients by hospitals and the like are included in health services (13.02.12.0).

13.02.11.1   Pharmaceutical products (IS)

Medicinal preparations, medicinal drugs, patent medicines, serums and vaccines, vitamins and minerals, cod liver oil and halibut liver oil, oral contraceptives.

13.02.11.2   Other medical products (IS)

Clinical thermometers, adhesive and non-adhesive bandages, hypodermic syringes, first-aid kits, hot-water bottles and ice bags, medical hosiery items such as elasticated stockings and knee-pads, pregnancy tests, condoms and other mechanical contraceptive devices.

13.02.11.3   Therapeutic appliances and equipment (IS)

Corrective eye-glasses and contact lenses, hearing aids, glass eyes, artificial limbs and other prosthetic devices, orthopaedic braces and supports, orthopaedic footwear, surgical belts, trusses and supports, neck braces, medical massage equipment and health lamps, powered and unpowered wheelchairs and invalid carriages, special beds, crutches, electronic and other devices for monitoring blood pressure, etc.; repair of such articles; *includes* dentures but not fitting costs; *excludes* hire of therapeutic equipment (13.02.12.3).

13.02.12.0   <u>Health services</u>

Medical, dental and paramedical services delivered to out-patients by medical, dental and paramedical practitioners and auxiliaries and to in-patients by hospitals and the like. *Includes* the medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to out-patients by medical, dental and paramedical practitioners and auxiliaries and to in-patients by hospitals and the like.

13.02.12.1   Out-patient medical services (IS)

Medical services delivered to out-patients by physicians in general or specialist practice; *includes* services of orthodontic specialists; *excludes* dental clinics and dentists (13.02.12.2); services of medical analysis laboratories and X-ray centres (13 02.12.3).

13.02.12.2   Out-patient dental services (IS)

Dental services delivered to out-patients by dentists, oral hygienists or other dental operating auxiliaries; *includes* fitting costs of dentures; *excludes* dentures (13.02.11.3); services of orthodontic specialists (13.02.12.1); services of medical analysis laboratories and X-ray centres (13.02.12.3).

13.02.12.3   Out-patient paramedical services (IS)

Paramedical health services delivered to out-patients; *includes* acupuncturists, chiropodists, chiropractors, optometrists, practitioners of traditional medicine, etc.; medical analysis laboratories and X-ray centres; hire of therapeutic equipment; medically-prescribed corrective-gymnastic therapy; out-patient thermal bath or seawater treatments; ambulance services other than ambulance services operated by hospitals.

13.02.12.4   Hospital services (IS)

Comprises both *medical services*: services of physicians in general or specialist practice, of surgeons and of dentists; medical analysis and X-rays; paramedical services such as those of nurses, midwives, chiropractors, optometrists, physiotherapists, speech therapists, etc.; and *basic services*: administration; accommodation; food and drink; supervision and care by non-specialist staff (nursing auxiliaries); first-aid and resuscitation; ambulance transport; provision of medicines and other pharmaceutical products; provision of therapeutic appliances and equipment.

13.02.20.0   PRODUCTION OF HEALTH SERVICES

General government expenditure on government-produced health services

13.02.21.0   Compensation of employees

13.02.21.1   Physicians (IS)

Total remuneration in cash and kind made by general government to physicians employed in government-produced health services; comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.02.21.2   Nurses and other medical staff (IS)

Total remuneration in cash and kind made by general government to nurses and other medical staff employed in government-produced health services; comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.02.21.3   Non-medical staff (IS)

Total remuneration in cash and kind made by general government to non-medical staff employed in government-produced health services; comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.02.22.0   Intermediate consumption

13.02.22.1   Pharmaceutical products (IS)

Value of pharmaceutical products consumed in the production of government-produced health services.

13.02.22.2   Other medical goods (IS)

Value of other medical goods consumed in the production of government-produced health services.

13.02.22.3   Therapeutic appliances and equipment (IS)

Value of therapeutic appliances and equipment consumed in the production of government-produced health services.

13.02.22.4   Intermediate consumption n.e.c. (IS)

Value of goods and services (other than pharmaceutical products and therapeutic appliances and equipment) consumed in the production of government-produced health services.

13.02.23.0   Gross operating surplus

13.02.23.1   Gross operating surplus (IS)

Consumption of fixed capital *plus* operating surplus arising from the production of government-produced health services.

13.02.24.0   Net taxes on production

13.02.24.1   Net taxes on production (IS)

Taxes *less* subsidies on the production of government-produced health services.

13.02.25.0 <u>**Receipts from sales**</u>

13.02.25.1 **Receipts from sales (IS)**

Receipts from sales of government-produced health services.

13.03.00.0 **RECREATION AND CULTURE**

COFOG 08 Recreation, culture and religion covers government outlays on services provided to individual persons and services provided on a collective basis. Only expenditures on individual services - COFOG 08.1.0 and 08.2.0 - are allocated here. Expenditures on collective services - COFOG 08.3.0 to 08.6.0 - are assigned to 14.01.10.0.

13.03.10.0 **RECREATION AND CULTURE**

13.03.11.0 <u>**Recreation and culture**</u>

13.03.11.1 **Recreation and culture (IS)**

Provision of sporting and recreational services; administration of sporting and recreational affairs; supervision and regulation of sporting facilities; operation or support of facilities for active sporting pursuits or events (playing fields, tennis courts, squash courts, running tracks, golf courses, boxing rings, skating rinks, gymnasia, etc.); operation or support of facilities for passive sporting pursuits or events (chiefly specially equipped venues for playing cards, board games, etc.); operation or support of facilities for recreational pursuits (parks, beaches, camping grounds and associated lodging places furnished on a non-commercial basis, swimming pools, public baths for washing, etc.); grants, loans or subsidies to support teams or individual competitors or players; *includes* facilities for spectator accommodation; national, regional or local team representation in sporting events; *excludes* sporting and recreational facilities associated with educational institutions (13.04.00.0).

Provision of cultural services; administration of cultural affairs; supervision and regulation of cultural facilities; operation or support of facilities for cultural pursuits (libraries, museums, art galleries, theatres, exhibition halls, monuments, historic houses and sites, zoological and botanical gardens, aquaria, arboreta, etc.); production, operation or support of cultural events (concerts, stage and film productions, art shows, etc.); grants, loans or subsidies to support individual artists, writers, designers, composers and others working in the arts or to organisations engaged in promoting cultural activities; *includes* national, regional or local celebrations provided they are not intended chiefly to attract tourists; *excludes* cultural events intended for presentation beyond national boundaries (14.01.10.0); national, regional or local celebrations intended chiefly to attract tourists (14.01.10.0); production of cultural material intended for distribution by broadcasting (14.01.10.0).

13.04.00.0 **EDUCATION**

COFOG 09 Education covers government outlays on education services provided to individual persons and education services provided on a collective basis. Only expenditures on individual services - COFOG 09.1.1 to 09.6 0 - are allocated here. Expenditures on collective services - COFOG 09.7.0 and 09.8.0 - are assigned to 14.01.10.0.

13.04.10.0 **EDUCATION BENEFITS AND REIMBURSEMENTS**

13.04.11.0 <u>**Education benefits and reimbursements**</u>

13.04.11.1 **Education benefits and reimbursements (IS)**

General government expenditure on education services produced by the private sector.

13.04.20.0 **PRODUCTION OF EDUCATION SERVICES**

General government expenditure on government-produced education services.

13.04.21.0 <u>**Compensation of employees**</u>

The breakdown of educational services is based upon the level categories of the 1997 International Standard Classification of Education (ISCED-97) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

13.04.21.1   Pre-primary and primary education (IS)

Total remuneration in cash and kind made by general government to employees working in government-produced pre-primary and primary education services (ISCED-97 levels 0 and 1); comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.04.21.2   Secondary education (IS)

Total remuneration in cash and kind made by general government to employees working in government-produced secondary education services (ISCED-97 levels 2 and 3); comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.04.21.3   Post-secondary non-tertiary education (IS)

Total remuneration in cash and kind made by general government to employees working in government-produced post-secondary non-tertiary education services (ISCED-97 level 4); comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.04.21.4   Tertiary education (IS)

Total remuneration in cash and kind made by general government to employees working in government-produced tertiary education services (ISCED-97 levels 5 and 6); comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

13.04.22.0   Intermediate consumption

13.04.22.1   Intermediate consumption (IS)

Value of goods and services consumed - that is, transformed or used up - in the production of government-produced education services.

13.04.23.0   Gross operating surplus

13.04.23.1   Gross operating surplus (IS)

Consumption of fixed capital *plus* operating surplus arising from the production of government-produced education services.

13.04.24.0   Net taxes on production

13.04.24.1   Net taxes on production (IS)

Taxes *less* subsidies on the production of government-produced education services.

13.04.25.0   Receipts from sales

13.04.25.1   Receipt from sales (IS)

Receipts from sales of government-produced education services.

13.05.00.0   SOCIAL PROTECTION

COFOG 10 Social protection covers government outlays on services provided to individual persons and services provided on a collective basis. Only expenditures on individual services relating to sickness and disability, old age, survivors, family and children, unemployment and social exclusion n.e.c. - COFOG 10..1.1 to 10.5.0 and 10.7.0 - are allocated here. Expenditures on individual housing services - COFOG 10.6 0 - are assigned to 13.01.11.1. Expenditures on collective services - COFOG 10.8.0 and 10.9.0 - are assigned to 14.01.10.0.

13.05.10.0   SOCIAL PROTECTION

13.05.11.0   Social protection

13.05.11.1   Social protection (IS)

Provision of social protection in the form of cash benefits or benefits in kind; administration, operation or support of social protection schemes; *includes* the cash benefits and the benefits in kind provided.

14.00.00.0   COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT

14.01.00.0   COLLECTIVE SERVICES

Covers COFOG divisions 01 General public services, 02 Defence, 03 Public order and safety, 04 Economic affairs, 05 Environment protection and 06 Housing and community amenities; *including* COFOG classes 07.5.0 R&D Health, 07.6.0 Health n.e.c., 08.3.0 Broadcasting and publishing services, 08.4.0 Religious and other community services, 08.5.0 R&D Recreation, culture and religion, 08.6.0 recreation, culture and religion n.e.c., 09.7.0 R&D Education, 09.8.0 Education n.e.c., 10.8.0 R&D Social protection and 10.9.0 Social protection n.e.c.

14.01.10.0   COLLECTIVE SERVICES

14.01.11.0   <u>Compensation of employees</u>

14.01.11.1   Compensation of employees (collective services relating to defence) (CS)

Total remuneration in cash and kind made by general government to employees working in collective services relating to defence; comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

14.01.11.2   Compensation of employees (collective services other than defence) (CS)

Total remuneration in cash and kind made by general government to employees working in collective services other than defence; comprises gross salaries and wages (basic salary and wages plus other payments such as allowances, overtime and payments in kind), employers' actual social contributions and employers' imputed social contributions.

14.01.12.0   <u>Intermediate consumption</u>

14.01.12.1   Intermediate consumption (collective services relating to defence) (CS)

Value of goods and services consumed - that is, transformed or used up - in the production of collective services relating to defence.

14.01.12.2   Intermediate consumption (collective services other than defence) (CS)

Value of goods and services consumed - that is, transformed or used up - in the production of collective services other than defence.

14.01.13.0   <u>Gross operating surplus</u>

14.01.13.1   Gross operating surplus (CS)

Consumption of fixed capital *plus* operating surplus.

14.01.14.0   <u>Net taxes on production</u>

14.01.14.1   Net taxes on production (CS)

Taxes on production *less* subsidies on production.

14.01.15.0   <u>Receipts from sales</u>

14.01.15.1   Receipts from sales (CS)

Receipts from sales.

15.00.00.0   GROSS FIXED CAPITAL FORMATION

15.01.00.0   MACHINERY AND EQUIPMENT

15.01.10.0   METAL PRODUCTS AND EQUIPMENT

15.01.11.0   <u>Fabricated metal products, except machinery and equipment</u> [CPA 28.11 to 28.75]

15.01.11.1   Fabricated metal products, except machinery and equipment (IG)

Prefabricated buildings of metal; bridges, bridge sections, towers and lattice masts of iron or steel; reservoirs, tanks, vats and similar containers of iron, steel or aluminium for all materials; central heating radiators and boilers; steam generators; nuclear reactors; hand tools; casks, drums, cans, boxes and similar containers of iron, steel or aluminium for all materials except gas; other fabricated metal products n.e.c.

15.01.12.0   <u>General purpose machinery</u> [CPA 29.11 to 29.24]

15.01.12.1   **Engines and turbines, pumps and compressors (IG)**

Engines and turbines except aircraft, vehicle and cycle engines; pumps and compressors.

15.01.12.2   **Other general purpose machinery (IG)**

Ovens other than bakery ovens; furnaces, furnace burners and incinerators; lifting and handling equipment such as jacks and hoists for raising vehicles, derricks, cranes, fork-lift trucks, skip hoists, lifts, escalators, and moving walkways; non-domestic cooling and ventilation equipment; other general purpose equipment n.e.c.

15.01.13.0   <u>Special purpose machinery</u> [CPA 29.31 to 29.72]

15.01.13.1   **Agricultural and forestry machinery (IG)**

Agricultural tractors; ploughs, harrows, cultivators, seeders, planters, manure spreaders, fertilizer distributors and other machinery for the preparation and cultivation of the soil; mowing, harvesting, threshing, hay-making and baling machinery; mechanical appliances for the projecting, dispersing or spraying liquids or powders for agriculture or horticulture; self-loading or unloading trailers and semi-trailers for agriculture and forestry; machines for cleaning, sorting or grading agricultural produce; milking machines; machines for preparing animal feeding stuffs; incubators, brooders and other poultry-keeping machinery; bee-keeping machinery; other agricultural and forestry machinery n.e.c.

15.01.13.2   **Machine tools (IG)**

Machine tools for working metals, stone, ceramics, concrete, glass, wood, cork, bone, hard rubber, hard plastics and similar hard materials; pneumatic or motorised hand tools; soldering, brazing and welding tools; surface tempering and hot spraying machines and apparatus.

15.01.13.3   **Machinery for metallurgy, mining, quarrying and construction (IG)**

Converters, ladles, ingot moulds and casting machines for metallurgy; metal-rolling mills; continuous-action elevators and conveyors for underground use; coal or rock cutters and tunnelling machinery; boring and sinking machinery; self-propelled earthmoving and excavating machinery such as bulldozers, angle-dozers, graders, levellers, tamping machines, road rollers, mechanical shovels and shovel loaders; machinery for sorting, grinding and mixing of earth, ores and other mineral substances; foundry moulds forming machinery; track-laying tractors.

15.01.13.4   **Machinery for food, beverages and tobacco processing (IG)**

Centrifugal cream separators and other dairy machinery; machinery for the milling or working of cereals or dried vegetables; machinery used in the manufacture of wine, cider, fruit juices and similar beverages; non-electric bakery ovens; dryers for agricultural produce; non-domestic equipment for cooking or heating; machinery used in the manufacture of oils and fats; other machinery used in the manufacture of food and beverages; machinery for preparing or making up tobacco.

15.01.13.5   **Machinery for textile, apparel and leather production (IG)**

Machines for extruding, drawing, texturing or cutting textile materials; machines for preparing textile fibres; textile spinning, weaving or knitting machines; sewing machines; machinery for washing, cleaning, wringing, ironing, pressing, dyeing or reeling of textile yarn and fabrics; felt-finishing machinery; laundry-type washing machines, drying machines and dry-cleaning machines; machinery for working hides, skins or leather; machinery for making or repairing footwear and other articles.

15.01.13.6   **Other special purpose machinery (IG)**

Machinery for paper and paperboard production; book-binding and book-sewing machinery; machinery. apparatus and equipment, for type-setting, for preparing or making printing blocks or plates; offset printing and other printing machinery (excluding those of the office type); centrifugal clothes-dryers; dryers for wood, paper pulp, paper or paperboard; other special purpose machinery n.e.c.

15.01.14.0 <u>**Electrical and optical equipment**</u> [CPA 30.01 to 33.50]

15.01.14.1 **Office machinery (IG)**

Typewriters and word-processing machines; calculating machines, accounting machines and cash registers; office-type photo-copying apparatus and offset printing machinery; automatic banknote dispensers, coin-sorting, coin-counting and coin-wrapping machines.

15.01.14.2 **Computers and other information processing equipment (IG)**

Computers and other information processing equipment.

15.01.14.3 **Electrical machinery and apparatus (IG)**

Electric motors, generators and transformers; electricity distribution and control apparatus; accumulators and batteries; lighting equipment and electric lamps; electrical equipment n.e.c.

15.01.14.4 **Radio, television and communications equipment and apparatus (IG)**

Radio and television transmitters and receivers; television cameras; electric apparatus for line telephony and telegraphy; videophones; sound or video recording or reproducing apparatus.

15.01.14.5 **Medical, precision and optical instruments, watches and clocks (IG)**

Medical, surgical, dental and veterinary equipment, instruments, appliances and furniture; instruments and appliances for measuring, checking, testing, navigating and other purposes; industrial process control equipment; optical instruments and photographic equipment; watches and clocks.

15.01.15.0 <u>**Other manufactured goods n.e.c.**</u> [CPA 36.11 to 36.63]

15.01.15.1 **Other manufactured goods n.e.c. (IG)**

Office, shop and kitchen furniture; bedroom, dining room, living room and garden furniture; mattresses; musical instruments; sports goods.

15.01.20.0 **TRANSPORT EQUIPMENT**

15.01.21.0 <u>**Road transport equipment**</u> [CPA 34.10 to 34.30 and 35.41 to 35.50]

15.01.21.1 **Motor vehicles, trailers and semi-trailers (IG)**

Passenger cars, taxi cabs, vans, buses, coaches, trolley buses, lorries, trucks, tankers, tractor units for semi-trailers, trailers, semi-trailer, caravans, special purpose motor vehicles such as dumpers for off-highway use, breakdown lorries, crane lorries, ambulances, fire trucks, concrete-mixer lorries, road sweeper lorries, mobile radiological units, motorised sleighs, etc., including their bodies (coachwork), specialised parts and engines.

15.01.21.2 **Other road transport (IG)**

Motorcycles, side cars, scooters, bicycles, invalid carriages, including their specialised parts and engines.

15.01.22.0 <u>**Other transport equipment**</u> [CPA 35.11 to 35.30]

15.01.22.1 **Ships, boats, steamers, tugs, floating platforms, rigs (IG)**

Cruise ships, excursion boats, ferry boats, hovercraft, cargo ships, barges, lighters, tankers, refrigerated vessels, fishing vessels, factory ships; tugboats and pusher craft, ice-breakers, dredgers, cable ships, light vessels, research vessels and other non-trading ships (except naval ships); floating docks, floating dredges, oil rigs and other floating or submersible drilling or production platforms; specialised ship parts other than engines; all vessels which have undergone extensive reconstruction and conversion.

15.01.22.2 **Locomotives and rolling stock (IG)**

All railway and tramway locomotives, maintenance and service vehicles and rolling stock (passenger coaches, luggage vans, post office coaches, goods wagons, tank wagons, refrigerated vans, etc.) intended for railway service or for service in mining and industrial operations; their specialised parts other than engines.

15.01.22.3 **Aircraft, helicopters and other aeronautical equipment (IG)**

Aeroplanes, helicopters, balloons, gliders, spacecraft, satellites, including their specialised parts and engines.

15.02.00.0   **CONSTRUCTION**

Covers the construction of new structures and the renovation of, and the additions and alterations to, existing structures.

15.02.10.0   **RESIDENTIAL BUILDINGS**

15.02.11.0   <u>Residential buildings</u> [CPA division 45]

15.02.11.1   **One or two dwelling buildings**

Detached, semi-detached and terraced houses; *includes* farm houses and apartment houses with two dwelling units.

15.02.11.2   **Multi-dwelling buildings**

Apartment houses with three or more dwelling units; *includes* dormitories.

15.02.20.0   **NON-RESIDENTIAL BUILDINGS**

15.02.21.0   <u>Non- residential buildings</u> [CPA division 45]

15.02.21.1   **Agricultural buildings**

Non-residential farm buildings, such as stables, barns, granaries, grain bins, tower silos, machine sheds, etc.

15.02.21.2   **Industrial buildings and warehouses**

Buildings used to house production, assembly and warehousing activities of industrial establishments such as factories, plants, workshops, warehouses, etc.

15.02.21.3   **Commercial buildings**

Commercial or administrative buildings, such as office buildings, bank buildings, parking garages, petrol and service stations, shopping centres and air, rail or road transport terminals.

15.02.21.4   **Other non-residential buildings**

Public entertainment buildings such as cinemas, theatres, concert halls, dance halls and night clubs; inns, hotels, motels, hostels, restaurants and similar buildings; educational buildings such as schools, colleges, universities, libraries, archives and museums; health buildings such as hospitals and sanatoria; structures for stadia and sports grounds; non-residential buildings n.e.c. such as religious buildings and prison buildings.

15.02.30.0   **CIVIL ENGINEERING WORKS**

15.02.31.0   <u>Civil engineering works</u> [CPA division 45]

15.02.31.1   **Transport infrastructures**

Highways, roads, railways and airfield runways; bridges, elevated highways, tunnels and subways; waterways, harbours, dams and other waterworks.

15 02.31.2   **Pipelines, communication and power lines**

Pipelines for oil, gas, water supplies, sewerage or rain water; telecommunication transmission lines; electricity power lines including electricity power lines for railways.

15.02.31.3   **Other civil engineering works**

Power plants and other complex industrial constructions; flatwork for sport and recreation installations; civil engineering work n.e.c.

15.03.00.0   **OTHER PRODUCTS**

15.03.10.0   **OTHER PRODUCTS**

15.03.11.0   <u>**Products of agriculture, forestry, fisheries and aquaculture**</u> [CPA divisions 01, 02 and 05]

15.03.11.1   **Products of agriculture, forestry, fisheries and aquaculture (IG)**

Plantation, orchard and vineyard development; change in stocks of breeding stock, draught animals, dairy cattle, animals raised for wool clippings, etc.

15.03.12.0   <u>**Software**</u> [CPA 72.20]

15.03.12.1   **Software (IG)**

Computer software that a producer expects to use in production for more than one year.

15.03.13.0   <u>**Other products n.e.c.**</u> [CPA n.e.c.]

15.03.13.1   **Other products n.e.c. (IG)**

Land improvement including dams and dikes which are part of flood control and irrigation projects; mineral exploration; acquisition of entertainment, literary or artistic originals; other intangible fixed assets.

16.00.00.0   **CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES**

16.01.00.0   **CHANGES IN INVENTORIES**

16.01.10.0   **CHANGES IN INVENTORIES**

16.01.11.0   <u>**Changes in inventories**</u>

16.01.11.1   **Changes in inventories**

The value of physical change in: inventories of raw materials, supplies and finished goods held by producers, inventories of goods acquired for resale by wholesalers and retailers; inventories of all goods stored by government; work-in-progress in manufacturing, construction and service industries; work-in-progress on cultivated assets (namely, the natural growth prior to harvest of agricultural crops, vineyards, orchards, plantations and timber tracts and the natural growth in livestock raised for slaughter).

16.02.00.0   **ACQUISITIONS LESS DISPOSALS OF VALUABLES**

16.02.10.0   **ACQUISITIONS LESS DISPOSALS OF VALUABLES**

16.02.11.0   <u>**Acquisitions less disposals of valuables**</u>

16.02.11.1   **Acquisitions less disposals of valuables**

Acquisitions of valuables (produced assets, such as non-monetary gold, precious stones, antiques, paintings, sculptures and other art objects, that are not used primarily for production or consumption but purchased and held as stores of value) *less* disposals of valuables.

17.00.00.0   **BALANCE OF EXPORTS AND IMPORTS**

17.01.00.0   **BALANCE OF EXPORTS AND IMPORTS**

17.01.10.0   **BALANCE OF EXPORTS AND IMPORTS**

17.01.11.0   <u>**Balance of exports and imports**</u>

Exports of goods and services *less* imports goods and services.

17.01.11.1   **Exports of goods and services**[9]

The value (f.o.b.) of exports of goods and services.

17.01.11.2   **Imports of goods and services**[10]

The value (c.i.f.) of imports of goods and services.

[1]   *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[2]   *European System of Accounts 1995*, Eurostat, Luxembourg, 1996.

[3]   "Classification of Individual Consumption According to Purpose (COICOP)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

[4]   "Classification of the Purposes of Non-Profit Institutions Serving Households (COPNI)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

[5]   "Classification of the Functions of Government (COFOG)", *Classification of Expenditure According to Purpose*, United Nations, New York, 2000.

[6]   *Statistical Classification of Products by Activity in the European Economic Community (CPA 1996)*, Eurostat, Luxembourg, 1998.

[7]   The distinction between non-durable goods and durable goods is based on whether the goods can be used only once or whether they can be used repeatedly or continuously over a period of considerably more than one year (paragraph 9.38, SNA 93). Durables also have a relatively high purchasers' price. Semi-durable goods differ from durable goods in that their expected lifetime of use, though more than one year, is often significantly shorter and that their purchasers' price is substantially less (paragraph 6.93, SNA 68).

[8]   This is the approach used to obtain PPPs for non-market services. There are no economically-significant prices with which to value the outputs of non-market services. Instead, national accountants estimate the expenditures on non-market services by summing the costs of the inputs required to produce them. PPPs for non-market services are calculated with purchasers' prices for inputs. These are the prices that are consistent with the prices underlying the estimated expenditures.

[9]   In the Regulation and in the Eurostat questionnaire, this basic heading is broken down into six basic headings: (i) Exports of goods to EU countries; (ii) Exports of goods to institutions of the European Union; (iii) Exports of goods to third countries and international organisations; (iv) Exports of services to EU countries; (v) Exports of services to institutions of the European Union; (vi) Exports of services to third countries and international organisations. This information is required for purposes other than the calculation of PPPs.

[10]   In the Regulation and in the Eurostat questionnaire, this basic heading is broken down into six basic headings: (i) Imports of goods to EU countries; (ii) Imports of goods to institutions of the European Union; (iii) Imports of goods to third countries and international organisations; (iv) Imports of services to EU countries; (v) Imports of services to institutions of the European Union; (vi) Imports of services to third countries and international organisations. This information is required for purposes other than the calculation of PPPs.

ANNEX III: SURVEY CYCLE COVERAGE

III.1. Prices of consumer goods and services are collected for Eurostat-OECD comparisons over a period of three years. There are two price surveys a year: one in the first half of the year, the other in the second half of the year. The survey cycle currently consists of the following six surveys:

First year of cycle	Survey 1 – Food, drinks and tobacco
	Survey 2 – Personal appearance
Second year of cycle	Survey 1 – House and garden
	Survey 2 – Transport, restaurants and hotels
Third year of cycle	Survey 1 – Services
	Survey 2 – Furniture and health

III.2. Each survey covers a different set of basic headings. The basic headings comprising each survey are defined in this annex. Together, the six surveys cover 124 of the 148 basic headings under individual consumption expenditure by households. The 24 basic headings not included in the survey cycle and the reasons for their exclusion are listed below.

11.04.11.1	Actual rentals for housing	Prices for these basic headings are surveyed annually.
11.04.21.1	Imputed rentals for housing	
11.02.31.1	Narcotics	Prices are not collected for these basic headings because, for various reasons, it is difficult to specify and price products that are comparable across countries for them. In the absence of prices, reference PPPs are used instead. The reference PPPs are based on prices collected for other basic headings and serve as proxies for the PPPs that would have been calculated had prices been collected for these basic headings.
11.06.31.1	Hospital services	
11.04.42.1	Miscellaneous services relating to the dwelling	
11.07.14.1	Animal drawn vehicles	
11.07.35.1	Combined passenger transport	
11.08.21.1	Telephone and telefax equipment	
11.09.21.1	Major durables for outdoor recreation	
11.09.22.1	Musical instruments and major durables for indoor recreation	
11.09.23.1	Maintenance and repair of other major durables for recreation and culture	
11.09.43.1	Games of chance	
11.09.61.1	Package holidays	
11.10.11.1	Pre-primary and primary education	
11.10.21.1	Secondary education	
11.10.31.1	Post-secondary non-tertiary education	
11.10.41.1	Tertiary education	
11.11.12.1	Canteens	
11.12.21.1	Prostitution	
11.12.41.1	Social protection	
11.12.51.1	Insurance	
11.12.61.1	FISIM (or financial intermediation services indirectly measured)	
11.13.11.1	Purchases by residential households in the rest of the world	
11.13.11.2	Purchases by non-residential households in the economic territory of the country	

III.3. The following abbreviations are used in the annex:

ND – non-durable goods

SD – semi-durable goods

D – durable goods

S – consumer services

n.e.c. – not elsewhere classified

FIRST YEAR OF CYCLE: SURVEY 1 – FOOD, DRINKS AND TOBACCO

11.01.11.1   **Rice (ND)**

Rice in all forms except flour (11.01.11.2).

11.01.11.2   **Other cereals, flour and other cereal products (ND)**

Maize, wheat, barley, oats, rye and other cereals in the form of grain, meal or flour; cereal preparations (cornflakes, oat flakes, etc.) and other cereal products (malt, malt flour, malt extract, potato starch, tapioca, sago and other starches); *includes* couscous; rice flour; *excludes* sweetcorn (11.01.17.1).

11.01.11.3   **Bread (ND)**

Fresh bread and special bread.

11.01.11.4   **Other bakery products (ND)**

Bakery products such as crispbread, rusks, toasted bread, biscuits, gingerbread, wafers, waffles, crumpets, muffins, croissants, cakes, tarts, pies, quiches and pizzas; *includes* mixes and doughs for the preparation of bakery products; *excludes* meat pies (11.01.12.6); fish pies (11.01.13.2).

11.01.11.5   **Pasta products (ND)**

Pasta products in all forms.

11.01.12.1   **Beef and veal (ND)**

Fresh, chilled or frozen meat of bovine animals, *excludes* edible offal (11.01.12.5).

11.01.12.2   **Pork (ND)**

Fresh, chilled or frozen meat of swine; *excludes* edible offal (11.01.12.5).

11.01.12.3   **Lamb, mutton and goat (ND)**

Fresh, chilled or frozen meat of sheep and goat; *excludes* edible offal (11.01.12.5).

11.01.12.4   **Poultry (ND)**

Fresh, chilled or frozen meat of poultry (chicken, duck, goose, turkey, guinea fowl); *includes* edible poultry offal.

11.01.12.5   **Other meats and edible offal (ND)**

Fresh, chilled or frozen meat of hare, rabbit, game (antelope, deer, boar, pheasant, grouse, pigeon, quail, etc.), marine mammals (seal, walrus, whale, etc.), horse, mule, donkey, camel, ostrich, kangaroo, alligator, etc.; fresh, chilled or frozen edible offal; *excludes* edible poultry offal (11.01.12.4).

11.01.12.6   **Delicatessen and other meat preparations (ND)**

Dried, salted or smoked meat and edible offal (sausages, salami, bacon, ham, pâté, etc.); other preserved or processed meat and meat-based preparations (canned meat, meat extracts, meat juices, meat pies, etc.); *excludes* frogs, land and sea snails (11.01.13.1); lard and other edible animal fats (11.01.15.3); soups, broths and stocks containing meat (11.01.19.1).

11.01.13.1   **Fresh, chilled or frozen fish and seafood (ND)**

Fresh, chilled or frozen fish and seafood (crustaceans, molluscs and other shellfish, sea snails); *includes* land crabs, land snails and frogs; fish and seafood purchased live for consumption as food.

11.01.13.2   **Preserved or processed fish and seafood (ND)**

Dried, smoked or salted fish and seafood; other preserved or processed fish and seafood and fish and seafood based preparations (canned fish and seafood, caviar and other hard roes, fish pies, etc.); *excludes* soups, broths and stocks containing fish or seafood (11.01.19.1).

11.01.14.1   **Fresh milk (ND)**

Raw milk; pasteurised or sterilised milk; *includes* whole and low fat milk; recombined or reconstituted milk; soya milk.

11.01.14.2   **Preserved milk and other milk products (ND)**

Condensed, evaporated or powdered milk; yoghurt, cream, milk-based desserts, milk-based beverages and other similar milk-based products; *includes* milk, cream and yoghurt containing sugar, cocoa, fruit or flavourings.

11.01.14.3   **Cheese (ND)**

Cheese and curd.

11.01.14.4   **Eggs and egg-based products (ND)**

Eggs and egg products made wholly from eggs.

11.01.15.1   **Butter (ND)**

Butter and butter products (butter oil, ghee, etc.).

11.01.15.2   **Margarine (ND)**

Margarine; *includes* "diet" margarine

11.01.15.3   **Other edible oils and fats (ND)**

Edible oils (olive oil, corn oil, sunflower-seed oil, cotton-seed oil, soybean oil, groundnut oil, walnut oil, etc.); edible animal fats (lard, etc.); edible vegetable fats (peanut butter, etc.); *excludes* cod or halibut liver oil (11.06.11.1).

11.01.16.1   **Fresh or chilled fruit (ND)**

Fresh or chilled fruit; *includes* melons and water melons; *excludes* vegetables grown for their fruit such as aubergines, cucumbers and tomatoes (11.01.17.1).

11.01.16.2   **Frozen, preserved or processed fruit and fruit-based products (ND)**

Frozen fruit; dried fruit, fruit peel, fruit kernels, nuts and edible seeds; other preserved fruit; processed fruit; fruit-based products; *excludes* jams, marmalades, compotes, jellies, fruit purees and pastes (11.01.18.2); parts of plants preserved in sugar (11.01.18.2); fruit juices (11.01.22.3).

11.01.17.1   **Fresh or chilled vegetables other than potatoes (ND)**

Fresh or chilled vegetables cultivated for their leaves or stalks (asparagus, broccoli, cauliflower, endives, fennel, spinach, etc.), for their fruit (aubergines, cucumbers, courgettes, green peppers, pumpkins, tomatoes, etc.), and for their roots (beetroot, carrots, onions, parsnips, radishes, turnips, etc.); *includes* olives; garlic; pulses; sweetcorn; sea fennel and other edible seaweed; mushrooms and other edible fungi; *excludes* lentils (11.01.17.3); culinary herbs (parsley, rosemary, thyme, etc.) and spices (pepper, pimento, ginger, etc.) (11.01.19.1).

11.01.17.2   **Fresh or chilled potatoes (ND)**

Fresh or chilled potatoes; *includes* other tuber vegetables (manioc, arrowroot, cassava, sweet potatoes, etc.).

11.01.17.3   **Frozen, preserved or processed vegetables and vegetable-based products (ND)**

Frozen vegetables; dried vegetables; other preserved vegetables; processed vegetables; vegetable-based products; *includes* frozen preparations such as chipped potatoes; lentils; products of potatoes and other tuber vegetables such as flours, meals, flakes, purees, chips, crisps, etc.; *excludes* potato starch, tapioca, sago and other starches (11.01.11.2); soups, broths and stocks containing vegetables (11.01.19.1); vegetable juices (11.01.22.3).

11.01.18.1   **Sugar (ND)**

Cane or beet sugar, unrefined or refined, powdered, crystallised or in lumps; *includes* artificial sugar substitutes.

11.01.18.2   **Jams, marmalades and honey (ND)**

Jams, marmalades, compotes, jellies, fruit purees and pastes, natural and artificial honey, maple syrup, molasses and parts of plants preserved in sugar.

11.01.18.3   **Confectionery, chocolate and other cocoa preparations (ND)**

Chocolate in bars and slabs, chewing gum, sweets, toffees, pastilles and other confectionery products; cocoa-based foods and cocoa-based dessert preparations; *excludes* cocoa and chocolate-based powder (11.01.21.1).

11.01.18.4   **Edible ice, ice cream and sorbet (ND)**

Edible ice, ice cream and sorbet.

11.01.19.1   **Food products n.e.c. (ND)**

Salt, spices (pepper, pimento, ginger, etc.), culinary herbs (parsley, rosemary, thyme, etc.), sauces, condiments, seasonings (mustard, mayonnaise, ketchup, soy sauce, etc.), vinegar; prepared baking powders, baker's yeast, dessert preparations, soups, broths, stocks, culinary ingredients, etc.; homogenised babyfood and dietary preparations irrespective of the composition; *excludes* soya milk (11.01.14.1); milk-based desserts (11.01.14.2); artificial sugar substitutes (11.01.18.1); cocoa-based dessert preparations (11.01.18.3).

11.01.21.1   **Coffee, tea and cocoa (ND)**

Coffee, whether or not decaffeinated, roasted or ground; tea, maté and other plant products for infusions; cocoa, whether or not sweetened, and chocolate-based powder; *includes* instant coffee; coffee substitutes; extracts and essences of coffee; tea substitutes; extracts and essences of tea; cocoa-based beverage preparations; *excludes* chocolate in bars or slabs (11.01.18.3); cocoa-based foods and cocoa-based dessert preparations (11.01.18.3).

11.01.22.1   **Mineral waters (ND)**

Mineral or spring waters; all drinking water sold in containers.

11.01.22.2   **Soft drinks and concentrates (ND)**

Soft drinks such as sodas, lemonades and colas; syrups and concentrates for the preparation of beverages; *excludes* non-alcoholic beverages which are generally alcoholic such as non-alcoholic beer (11.02.13.1).

11.01.22.3   **Fruit and vegetable juices (ND)**

Fruit and vegetable juices.

11.02.11.1   **Spirits (ND)**

Eaux-de-vie, liqueurs and other spirits; *includes* mead; aperitifs other than wine-based aperitifs (11.02.12.1).

11.02.12.1   **Wine (ND)**

Wine, cider and perry, including sake; champagne and other sparkling wines; fortified wines and wine-based aperitifs; *includes* non-alcoholic wine.

11.02.13.1   **Beer (ND)**

All kinds of beer, such as ale, lager and porter; *includes* non-alcoholic beer; shandy.

11.02.21.1   **Tobacco (ND)**

Cigarettes, cigarette tobacco and cigarette papers; cigars, pipe tobacco, chewing tobacco or snuff; *excludes* other smokers' articles (11.12.32.1).

FIRST YEAR OF CYCLE: SURVEY 2 – PERSONAL APPEARANCE

11.03.11.1   **Clothing materials (SD)**

Clothing materials of natural fibres, of man-made fibres and of their mixtures; *excludes* furnishing fabrics (11.05.21.1).

11.03.12.1   **Men's clothing (SD)**

All garments for men, either ready-to-wear or made-to-measure, in all materials (including leather, furs, plastics and rubber), for everyday wear, for sport or for work; *includes* capes, overcoats, raincoats, anoraks, parkas, blousons, jackets, trousers, waistcoats, suits, etc.; shirts, pullovers, sweaters, cardigans, shorts, swimsuits, tracksuits, jogging suits, sweatshirts, T-shirts, etc.; vests, underpants, socks, etc.; pyjamas, night-shirts, dressing gowns, bathrobes, etc.; *excludes* articles of medical hosiery such as elasticated stockings (11.06.12.1).

11.03.12.2   **Women's clothing (SD)**

All garments for women, either ready-to-wear or made-to-measure, in all materials (including leather, furs, plastics and rubber), for everyday wear, for sport or for work; *includes* capes, overcoats, raincoats, anoraks, parkas, blousons, jackets, trousers, waistcoats, suits, costumes, dresses, skirts, etc.; shirts, blouses, pullovers, sweaters, cardigans, shorts, swimsuits, tracksuits, jogging suits, sweatshirts, T-shirts, leotards, etc.; vests, socks, stockings, tights, petticoats, brassières, knickers, slips, girdles, corsets, body stockings, etc.; pyjamas, night dresses, housecoats, dressing gowns, bathrobes, etc.; *excludes* articles of medical hosiery such as elasticated stockings (11.06.12.1).

11.03.12.3   **Children's and infant's clothing (SD)**

All garments for children (3 to 13 years) and infants (0 to 2 year), either ready-to-wear or made-to-measure, in all materials (including leather, furs, plastics and rubber), for everyday wear, for sport or for work; *includes* capes, overcoats, raincoats, anoraks, parkas, blousons, jackets, trousers, waistcoats, suits, costumes, dresses, skirts, etc.; shirts, blouses, pullovers, sweaters, cardigans, shorts, swimsuits, tracksuits, jogging suits, sweatshirts, T-shirts, leotards, etc.; vests, underpants, socks, stockings, tights, petticoats, knickers, slips, etc.; pyjamas, night-shirts, night dresses, housecoats, dressing gowns, bathrobes, etc.; babyclothes and babies' booties made of fabric; *excludes* articles of medical hosiery such as elasticated stockings (11.06.12.1); babies' napkins (11.12.13.1).

11.03.13.1   **Other articles of clothing and clothing accessories (SD)**

Ties, handkerchiefs, scarves, squares, gloves, mittens, muffs, belts, braces, aprons, smocks, bibs, sleeve protectors, hats, caps, berets, bonnets, etc.; sewing threads, knitting yarns and accessories for making clothing such as buckles, buttons, press-studs, zip-fasteners, ribbons, laces, trimmings, etc.; *includes* gardening gloves and working gloves; crash helmets for motor cycles and bicycles; *excludes* gloves and other articles made of rubber (11.05.61.1); pins, safety pins, sewing needles, knitting needles, thimbles (11.05.61.1); protective headgear for sports (11.09.32.1); other protective gear for sports such as life jackets, boxing gloves, body padding, belts, supports, etc. (11.09.32.1); paper handkerchiefs (11.12.13.1); watches, jewellery, cuff-links, tie-pins (11.12.31.1); walking sticks and canes, umbrellas and parasols, fans, key rings (11.12.32.1).

11.03.21.1   **Men's footwear (SD)**

All footwear for men, including sports footwear suitable for everyday or leisure wear (shoes for jogging, cross-training, tennis, basket ball, boating, etc.); *includes* gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves; *excludes* shoe-trees, shoehorns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1).

11.03.21.2   **Women's footwear (SD)**

All footwear for women, including sports footwear suitable for everyday or leisure wear (shoes for jogging, cross-training, tennis, basket ball, boating, etc.); *includes* gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves; *excludes* shoe-trees, shoehorns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1).

11.03.21.3   **Children's and infant's footwear (SD)**

All footwear for children (3 to 13 years) and infants (0 to 2 years), including sports footwear suitable for everyday or leisure wear (shoes for jogging, cross-training, tennis, basket ball, boating, etc.); *includes* gaiters, leggings and similar articles; shoelaces; parts of footwear, such as heels, soles, etc., purchased by households with the intention of repairing footwear themselves; *excludes* babies booties made of fabric (11.03.12.3); shoe-trees, shoehorns and polishes, creams and other shoe-cleaning articles (11.05.61.1); orthopaedic footwear (11.06.13.1); game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.) (11.09.32.1); shin-guards, cricket pads and other protective apparel for sport (11.09.32.1).

11.12.11.1   **Hairdressing salons and personal grooming establishments (S)**

Services of hairdressing saloons, barbers, beauty shops, manicures, pedicures, Turkish baths, saunas, solariums, non-medical massages, etc.; *includes* body care, depilation and the like; *excludes* spas (11.06.23.1) or (11.06.31.1); fitness centres (11.09.41.1).

11.12.12.1   **Electric appliances for personal care (SD)**

Electric razors and hair trimmers, hand-held and hood hair dryers, curling tongs and styling combs, sun-lamps, vibrators, electric toothbrushes and other electric appliances for dental hygiene, etc.; repair of such articles.

11.12.13.1   **Other appliances, articles and products for personal care (ND)**

Non-electric appliances: razors and hair trimmers and blades therefor, scissors, nail files, combs, shaving brushes, hairbrushes, toothbrushes, nail brushes, hairpins, curlers, personal weighing machines, baby scales, etc.; articles for personal hygiene: toilet soap, medicinal soap, cleansing oil and milk, shaving soap, shaving cream and foam, toothpaste, etc.; beauty products: lipstick, nail varnish, make-up and make-up removal products (including powder compacts, brushes and powder puffs), hair lacquers and lotions, pre-shave and after-shave products, sun-bathing products, hair removers, perfumes and toilet waters, personal deodorants, bath products, etc.; other products: toilet paper, paper handkerchiefs, paper towels, sanitary towels, cotton wool, cotton tops, babies' napkins, etc.; *excludes* handkerchiefs made of fabric (11.03.13.1).

11.12.31.1   **Jewellery, clocks and watches (D)**

Precious stones and metals and jewellery fashioned out of such stones and metals; costume jewellery, cuff-links and tie-pins; clocks, watches, stop-watches, alarm clocks, travel clocks; repair of such articles; *excludes* ornaments (11.05.11.4) or (11.05.41.1); radio clocks (11.09.11.1); precious stones and metals and jewellery fashioned out of such stones and metals acquired primarily as stores of value (capital formation).

11.12.32.1   **Other personal effects (SD)**

Suitcases, trunks, travel bags, attaché cases, satchels, hand-bags, wallets, purses, etc.; articles for babies: baby carriages, push-chairs, carry-cots, recliners, car beds and seats, back-carriers, front carriers, reins and harnesses, etc.; articles for smokers: pipes, lighters, cigarette cases, cigar cutters, ashtrays, etc.; miscellaneous personal articles: sun-glasses, walking sticks and canes, umbrellas and parasols, fans, key rings, etc.; funerary articles: urns, coffins, gravestones, etc.; repair of such articles; *includes* lighter fuel; wall thermometers and barometers; *excludes* baby furniture (11.05.11.4); shopping bags (11.05.21.1); feeding bottles (11.05.41.1).

SECOND YEAR OF CYCLE: SURVEY 1 – HOUSE AND GARDEN

11.04.31.1   Materials for the maintenance and repair of the dwelling (ND)

Purchases of materials made by tenants or owner-occupiers with the intention of undertaking the minor maintenance or repair themselves; products and materials, such as paints and varnishes, renderings, wallpapers, fabric wall coverings, window panes, plaster, cement, putty, wallpaper pastes, etc., purchased for minor maintenance and repair of the dwelling; *includes* small plumbing items (pipes, taps, joints, etc.), surfacing materials (floor boards, ceramic tiles, etc.) and brushes and scrapers for paint, varnish and wallpaper; *excludes* services of plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc. engaged for minor maintenance and repair of the dwelling; products and materials used by plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc. engaged for minor maintenance and repair of the dwelling fitted carpets and linoleum (11.05.12.1); hand tools, door fittings, power sockets, wiring flex and lamp bulbs (11.05.52.1); brooms, scrubbing brushes, dusting brushes and cleaning products (11.05.61.1); products, materials and fixtures used for major maintenance and repair (intermediate consumption) or for extension and conversion of the dwelling (capital formation).

11.05.31.1   Major household appliances whether electric or not (D)

Refrigerators, freezers and fridge-freezers; washing-machines, dryers, drying cabinets, dishwashers, ironing and pressing machines; cookers, spit roasters, hobs, ranges, ovens and micro-wave ovens; air conditioners, humidifiers, space heaters, water heaters, ventilators and extractor hoods; vacuum cleaners, steam-cleaning machines, carpet shampooing machines and machines for scrubbing, waxing and polishing floors; safes, sewing machines, knitting machines, water softeners, etc.; *includes* the delivery and installation of the appliances when applicable; *excludes* such appliances that are built into the structure of the building (capital formation).

11.05.32.1   Small electric household appliances (SD)

Coffee mills, coffee-makers, juice extractors, can openers, food mixers, deep fryers, meat grills, knives, toasters, ice cream makers, sorbet makers, yoghurt makers, hotplates, irons, kettles, fans, electric blankets, etc.; *excludes* small non-electric kitchen household appliances and utensils (11.05.41.1); household scales (11.05.41.1); personal weighing machines and baby scales (11.12.13.1).

11.05.41.1   Glassware, tableware and household utensils (SD)

Glassware, crystal-ware and ceramic ware of a kind used for table, kitchen, bathroom, toilet, office and indoor decoration; cutlery, flatware and silverware; non-electric kitchen utensils of all materials such as saucepans, stewpots, pressure cookers, frying pans, coffee mills, purée-makers, mincers, hotplates, household scales and other such mechanical devices; non-electric household articles of all materials such as containers for bread, coffee, spices, etc., waste bins, waste-paper baskets, laundry baskets, portable money-boxes and strong-boxes, towel rails, bottle racks, irons and ironing boards, letter boxes, feeding bottles, thermos flasks and ice boxes; repair of glassware, tableware and household utensils; *excludes* lighting equipment (11.05.11.4); electric household appliances (11.05.31.1) or (11.05.32.1); cardboard tableware (11.05.61.1); personal weighing machines and baby scales (11.12.13.1); ashtrays (11.12.32.1).

11.05.51.1   Major tools and equipment (D)

Motorised tools and equipment such as electric drills, saws, sanders and hedge cutters, garden tractors, lawn mowers, cultivators, chain saws and water pumps; repair of such articles; *includes* charges for leasing or rental of do-it-yourself machinery and equipment.

11.05.52.1   Small tools and miscellaneous accessories (SD)

Small electric accessories such as power sockets, switches, wiring flex, electric bulbs, fluorescent lighting tubes, torches, hand-lamps, electric batteries for general use, bells and alarms; hand tools such as saws, hammers, screwdrivers, wrenches, spanners, pliers, trimming knives, rasps and files; garden tools such as wheel barrows, watering cans, hoses, spades, shovels, rakes, forks, scythes, sickles and secateurs; ladders and steps; door fittings (hinges, handles and locks), fittings for radiators and fireplaces, other metal articles for the house (curtain rails, carpet rods, hooks, etc.) or for the garden (chains, grids, stakes and hoop segments for fencing and bordering); repair of such articles.

11.05.61.1   Non-durable household goods (ND)

Cleaning and maintenance products such as soaps, washing powders, washing liquids, scouring powders, detergents, disinfectant bleaches, softeners, conditioners, window-cleaning products, waxes, polishes, dyes, unblocking agents, disinfectants, insecticides, pesticides; fungicides and distilled water; articles for cleaning such as brooms, scrubbing brushes, dust pans and dust brushes, dusters, tea towels, floorcloths, household sponges, scourers, steel wool and chamois leathers; paper products such as filters, tablecloths and table napkins, kitchen paper, vacuum cleaner bags and cardboard tableware; other non-durable household articles such as matches, candles, lamp wicks, methylated spirits, clothes pegs, clothes hangers, pins, safety pins, sewing needles, knitting needles, thimbles, nails, screws, nuts and bolts, tacks, washers, glues and adhesive tapes for household use, string, twine and rubber gloves; *includes* polishes, creams and other shoe-cleaning articles; aluminium foil, cellophane wrap and plastic bin liners; shoe-trees and shoehorns; fire extinguishers for households; *excludes* brushes and scrapers for paint, varnish and wallpaper (11.04.31.1); products specifically for the cleaning and maintenance of transport equipment such as paints, chrome cleaners, sealing compounds and bodywork polishes (11.07.21.1); fire extinguishers for transport equipment (11.07.21.1); horticultural products for the upkeep of ornamental gardens (11.09.33.1); paper handkerchiefs, toilet paper, toilet soaps, toilet sponges and other products for personal hygiene (11.12.13.1); cigarette, cigar and pipe lighters and lighter fuel (11.12.32.1).

11.09.11.1   Equipment for the reception, recording and reproduction of sound and pictures (D)

Television sets, video-cassette players and recorders, television aerials of all types; radio sets, car radios, radio clocks, two-way radios, amateur radio receivers and transmitters; gramophones, tape players and recorders, cassette players and recorders, CD-players, personal stereos, stereo systems and their constituent units (turntables, tuners, amplifiers, speakers, etc.), microphones and earphones; *excludes* video cameras, camcorders and sound-recording cameras (11.09.12.1).

11.09.12.1   Photographic and cinematographic equipment and optical instruments (D)

Still cameras, movie cameras and sound-recording cameras, video cameras and camcorders, film and slide projectors, enlargers and film processing equipment, accessories (screens, viewers, lenses, flash attachments, filters, exposure meters, etc.); binoculars, microscopes, telescopes and compasses.

11.09.13.1   Information processing equipment (D)

Personal computers, visual display units, printers and miscellaneous accessories accompanying them; computer software packages such as operating systems, applications, languages, etc.; calculators, including pocket calculators; typewriters and word processors; *includes* telefax and telephone answering facilities provided by personal computers; *excludes* pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software (11.09.14.1); video-game software (11.09.31.1); video-game computers that plug into a television set (11.09.31.1); typewriter ribbons (11.09.53.1); toner and ink cartridges (11.09.53.1); slide rules (11.09.53.1).

11.09.14.1   Pre-recorded recording media (SD)

Records and compact discs; pre-recorded tapes, cassettes, video cassettes, diskettes and CD-ROMs for tape recorders, cassette recorders, video recorders and personal computers; *includes* pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software; *excludes* computer software packages such as operating systems, applications, languages, etc. (11.09.13.1); video-game software, video-game cassettes and video-game CD-ROMs (11.09.31.1).

11.09.14.2   Unrecorded recording media (SD)

Unrecorded tapes, cassettes, video cassettes, diskettes and CD-ROMs for tape recorders, cassette recorders, video recorders and personal computers; unexposed films, cartridges and discs for photographic and cinematographic use; *includes* photographic supplies such as paper and flash bulbs; unexposed film the price of which includes the cost of processing without identifying it; *excludes* batteries (11.05.52.1); the development of films and the printing of photographs (11.09.42.1).

11.09.31.1   Games, toys and hobbies (SD)

Card games, parlour games, chess sets and the like; toys of all kinds including dolls, soft toys, toy cars and trains, toy bicycles and tricycles, toy construction sets, puzzles, plasticine, electronic games, masks, disguises, jokes, novelties, fireworks, festoons and Christmas tree decorations; stamp-collecting requisites (used or cancelled postage stamps, stamp albums, etc.), other items for collections (coins, minerals, zoological and botanical specimens, etc.) and other tools and articles n.e.c. for hobbies; *includes* video-game software; video-game computers that plug into a television set; video-game cassettes and video-game CD-ROMs; *excludes* collectors' items falling into the category of works of art or antiques (11.05.11.4); unused postage stamps (11.08.11.1); Christmas trees (11.09.33.1); children's scrapbooks (11.09.51.1).

11.09.33.1   Gardens, plants and flowers (ND)

Natural or artificial flowers and foliage, plants, shrubs, bulbs, tubers, seeds, fertilisers, composts, garden peat, turf for lawns, specially treated soils for ornamental gardens, horticultural preparations, pots and pot holders; *includes* natural and artificial Christmas trees; delivery charges for flowers and plants; *excludes* gardening gloves (11.03.13.1); gardening services (11.04.42.1) or (11.05.62.1); gardening equipment (11.05.51.1); gardening tools (11.05.52.1); insecticides and pesticides for household use (11.05.61.1).

11.09.34.1   Pets and related products (ND)

Pets, pet foods, veterinary and grooming products for pets, collars, leashes, kennels, birdcages, fish tanks, cat litters, etc.; *excludes* horses and ponies (11.07.14.1) or (11.09.21.1); veterinary services (11.09.35.1).

11.09.51.1   Books (SD)

Books, including atlases, dictionaries, encyclopaedias, text books, guidebooks and musical scores; *includes* scrapbooks and albums for children; bookbinding; *excludes* pre-recorded tapes and compact discs of novels, plays, poetry, etc. (11.09.14.1); pre-recorded diskettes and CD-ROMs containing books, dictionaries, encyclopaedias, foreign language trainers, multimedia presentations, etc. in the form of software (11.09.14.1); stamp albums (11.09.31.1).

11.09.52.1   Newspapers and periodicals (ND)

Newspapers, magazines and other periodicals.

11.09.53.1   Miscellaneous printed matter, stationery and drawing materials (ND)

Writings pads, envelopes, account books, notebooks, diaries, etc.; pens, pencils, fountain pens, ball-point pens, felt-tip pens, inks, ink erasers, rubbers, pencil sharpeners, etc.; stencils, carbon paper, type-writer ribbons, inking pads, correcting fluids, etc.; paper punches, paper cutters, paper scissors, office glues and adhesives, staplers and staples, paper clips, drawing pins, etc.; drawing and painting materials such as canvas, paper, card, paints, crayons, pastels and brushes; catalogues and advertising material; posters, plain or picture postcards, calendars; greeting cards and visiting cards, announcement and message cards; maps and globes; *includes* toner and ink cartridges; educational materials such as exercise books, slide rules, geometry instruments, slates, chalks and pencil boxes; *excludes* pre-franked postcards and aerogrammes (11.08.11.1); stamp albums (11.09.31.1). pocket calculators (11.09.13.1).

SECOND YEAR OF CYCLE: SURVEY 2 – TRANSPORT, RESTAURANTS AND HOTELS

11.07.11.1   **Motor cars with diesel engine (D)**

Motor cars, etc. with a diesel engine; *includes* passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.11.2   **Motor cars with petrol engine of cubic capacity of less than 1200 cc (D)**

Motor cars, etc. with a petrol engine of cubic capacity of less than 1200 cc.; *includes* passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.11.3   **Motor cars with petrol engine of cubic capacity of 1200 cc to 1699 cc (D)**

Motor cars, etc. with a petrol engine of cubic capacity of 1200 cc to 1699 cc.; *includes* passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.11.4   **Motor cars with petrol engine of cubic capacity of 1700 cc to 2999 cc (D)**

Motor cars, etc. with a petrol engine of cubic capacity over 1700 cc to 2999 cc.; *includes* passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.11.5   **Motor cars with petrol engine with cubic capacity of 3000 cc and over (D)**

Motor cars, etc. with a petrol engine of cubic capacity of 3000 cc and over; *includes* passenger vans, station wagons, estate car and the like with either two-wheel drive or four-wheel drive; *excludes* invalid carriages (11.06.13.1); camper vans (11.09.21.1); golf carts (11.09.21.1).

11.07.12.1   **Motor cycles (D)**

Motor cycles of all types, scooters and powered bicycles; *includes* side cars; snowmobiles, rickshaws; *excludes* invalid carriages (11.06.13.1); golf carts (11.09.21.1).

11.07.13.1   **Bicycles (D)**

Bicycles and tricycles of all types; *includes* rickshaws; *excludes* toy bicycles and tricycles (11.09.31.1).

11.07.21.1   **Spare parts and accessories for personal transport equipment (SD)**

Purchases of spare parts and accessories made by households with the intention of undertaking the maintenance, repair or intervention themselves; tyres (new, used or retreaded), innertubes, spark plugs, batteries, shock absorbers, filters, pumps and other spare parts or accessories for personal transport equipment; *includes* fire extinguishers for transport equipment; products specifically for the cleaning and maintenance of transport equipment such as paints, chrome cleaners, sealing compounds and bodywork polishes; covers for motor cars, motor cycles, etc.; *excludes* crash helmets for motor cycles and bicycles (11.03.13.1); non-specific products for cleaning and maintenance such as distilled water, sponges, chamois leathers, detergents, etc. (11.05.61.1); charges (both for the service and the materials used) for the fitting of spare parts and accessories and for the painting, washing and polishing of bodywork (11.07.23.1); radio-telephones (11.08.21.1); car radios (11.09.11.1); baby-seats for cars (11.12.32.1).

11.07.22.1   **Fuels and lubricants for personal transport equipment (ND)**

Petrol and other fuels such as diesel, liquid petroleum gas, alcohol and two-stroke mixtures; lubricants, brake and transmission fluids, coolants and additives; *includes* fuel for recreational vehicles covered under (11.09.21.1); *excludes* charges for oil changes and greasing (11.07.23.1).

11.09.32.1   **Equipment for sport, camping and open-air recreation (SD)**

Gymnastic, physical education and sport equipment such as balls, rackets, bats, skis, golf clubs, foils, sabres, poles, weights, discuses, javelins, dumb-bells, chest expanders and other body-building equipment; parachutes and other sky diving equipment; firearms and ammunition for hunting, sport and personal protection; fishing rods and other equipment for fishing; equipment for beach and open-air games such as bowls, croquet, frisbee, and inflatable boats, rafts and swimming pools; camping equipment such as tents and accessories, sleeping bags and back-packs, air mattresses and inflating pumps, camping stoves and barbecues; repair of such articles; *includes* game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.); protective headgear for sports; other protective gear for sports such as life jackets, boxing gloves, body padding, shin-guards, goggles, belts, supports, etc.; *excludes* crash helmets for motor cycles and bicycles (11.03.13.1); camping and garden furniture (11.05.11.4).

11.11.11.1   **Restaurant services whatever the type of establishment (S)**

Expenditures primarily on food bought away from home; *includes* the sale of food products for immediate consumption by kiosks, street vendors and the like; food products dispensed ready for consumption by automatic vending machines; the sale of cooked dishes by restaurants for consumption off their premises; the sale of cooked dishes by catering contractors whether collected by the customer or delivered to the customers' home; the sale of food products in places providing recreational, cultural, sporting or entertainment services (theatres, cinemas, sports stadia, swimming pools, sports complexes, museums, art galleries, night clubs, dancing establishments, etc.); the sale of food products on public transport (coaches, trains, boats, aeroplanes, etc.) when priced separately; tips; *excludes* tobacco purchases (11.02.21.1); telephone calls (11.08.31.1).

11.11.11.2   Pubs, bars, cafés, tea rooms and the like (S)

Expenditures primarily on beverages bought away from home; *includes* the sale of beverages for immediate consumption by kiosks, street vendors and the like; beverages dispensed ready for consumption by automatic vending machines; the sale of beverages in places providing recreational, cultural, sporting or entertainment services (theatres, cinemas, sports stadia, swimming pools, sports complexes, museums, art galleries, night clubs, dancing establishments, etc.); the sale of beverages on public transport (coaches, trains, boats, aeroplanes, etc.) when priced separately tips; *excludes* tobacco purchases (11.02.21.1);

11.11.21.1   Accommodation services (S)

Accommodation services provided by: hotels, boarding houses, motels, inns, holiday villages, holiday centres, camping sites, caravan sites, youth hostels, mountain chalets, boarding schools, universities and other educational establishments, public transport (trains, boats, etc.) when priced separately, hostels for young workers or immigrants; *includes* tips; porters; *excludes* rentals of households occupying a room in a hotel or boarding house as their main residence (11.04.11.1); rentals paid by households for a secondary residence for the duration of a holiday (11.04.11.1); catering services in such establishments except for breakfast or other meals included in the price of the accommodation (11.11.11.1) or (11.11.12.1); housing in orphanages, homes for disabled or maladjusted persons (11.12.41.1).

THIRD YEAR OF CYCLE: SURVEY 1 – SERVICES

11.03.14.1   **Cleaning, repair and hire of clothing (S)**

Dry-cleaning, laundering and dyeing of garments; darning, mending, repair and altering of garments; hire of garments; *includes* total value of the repair service (that is, both the cost of labour and the cost of materials are covered); *excludes* materials, threads, accessories, etc. purchased by households with the intention of undertaking the repairs themselves (11.03.11.1) or (11.03.13.1); repair of household linen and other household textiles (11.05.21.1); dry-cleaning, laundering, dyeing of household linen and household textiles (11.05.62.2); hire of household linen (11.05.62.2).

11.03.22.1   **Repair and hire of footwear (S)**

Repair of footwear; shoe cleaning services; hire of footwear; *includes* total value of the repair service (that is, both the cost of labour and the cost of materials are covered); *excludes* parts of footwear, such as heels, soles, etc., purchased by households with the intention of undertaking the repairs themselves (11.03.21.1), (11.03.21.2) or (11.03.21.3); polishes, creams and other shoe-cleaning articles (11.05.61.1); repair (11.09.32.1) and hire (11.09.41.1) of game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.).

11.04.32.1   **Services for the maintenance and repair of the dwelling (S)**

Services of plumbers, electricians, carpenters, glaziers, painters, decorators, floor polishers, etc. engaged for minor maintenance and repair of the dwelling; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchases of materials made by households with the intention of undertaking the maintenance or repair themselves (11.04.31.1); services engaged for major maintenance and repair (intermediate consumption) or for extension and conversion of the dwelling (capital formation).

11.04.41.1   **Water supply (ND)**

Water supply; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.; *excludes* drinking water sold in bottles or containers (11.01.22.1); hot water or steam supplied by district heating plants (11.04.55.1).

11.04.51.1   **Electricity (ND)**

Electricity; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.

11.04.52.1   **Gas (ND)**

Town gas and natural gas; liquefied hydrocarbons (butane, propane, etc.); *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.

11.04.53.1   **Liquid fuels (ND)**

Domestic heating and lighting oils.

11.04.54.1   **Solid fuels (ND)**

Coal, coke, briquettes, firewood, charcoal, peat and the like.

11.04.55.1   **Heat energy (ND)**

Hot water and steam purchased from district heating plants; *includes* associated expenditure such as hire of meters, reading of meters, standing charges, etc.; ice used for cooling and refrigeration purposes.

11.05.33.1   **Repair of household appliances (S)**

Repair of household appliances; *includes* total value of the service (that is, both the cost of labour and the cost of are covered); *excludes* separate purchase of materials made by households with the intention of undertaking the repair themselves (11.05.31.1) or (11.05.32.1).

11.05.62.1   **Domestic services (S)**

Domestic services supplied by paid staff in private service such as butlers, cooks, maids, cleaners, drivers, gardeners, governesses, secretaries, tutors and au pairs; domestic services, including baby-sitting and housework, supplied by enterprises or self-employed persons; *excludes* services of wet-nurses, crèches, day care centres and other child-minding facilities (11.12.41.1).

11.05.62.2   Household services (S)

Dry-cleaning, laundering and dyeing of household linen and household textiles; hire of furniture, furnishings, household equipment and household linen; household services such as window cleaning, disinfecting, fumigation and pest extermination; *excludes* dry-cleaning, laundering and dyeing of garments (11.03.14.1); refuse collection (11.04.42.1); sewerage collection (11.04.42.1); co-proprietor charges for caretaking, gardening, stairwell cleaning and lighting, maintenance of lifts and refuse disposal chutes, etc. in multi-occupied buildings (11.04.42.1); snow removal and chimney sweeping (11.04.42.1); removal and storage services (11.07.36.1).

11.07.23.1   Maintenance and repair of personal transport equipment (S)

Services purchased for the maintenance and repair of personal transport equipment such as fitting of parts and accessories, wheel balancing, technical inspection, breakdown services, oil changes, greasing and washing; *includes* total value of the service (that is both the cost of labour and the cost of materials are covered); *excludes* separate purchase of spare parts, accessories or lubricants made by households with the intention of undertaking the maintenance or repair themselves (11.07.21.1) or (11.07.22.1); road worthiness tests (11.07.24.1).

11.07.24.1   Other services in respect of personal transport equipment (S)

Hire of garages or parking spaces not providing parking in connection with the dwelling; toll facilities (bridges, tunnels, shuttle-ferries, motorways, etc.) and parking meters; driving lessons, driving tests and driving licences; road worthiness tests; hire of personal transport equipment without drivers; *excludes* hire of a car with driver (11.07.32.1); service charges for insurance in respect of personal transport equipment (11.12.51.1).

11.07.31.1   Passenger transport by railway (S)

Urban and suburban transport of individuals and groups of persons and luggage by train, tram and underground; long-distance transport of individuals and groups of persons and luggage by train; *includes* transport of private vehicles; cost of meals, snacks, drinks, refreshments or accommodation services if covered by the fare and not separately priced; *excludes* funicular transport (11.07.36.1).

11.07.32.1   Passenger transport by road (S)

Urban and suburban transport of individuals and groups of persons and luggage by bus, taxi and hired car with driver; long distance transport of individuals and groups of persons and luggage by coach, taxi and hired car with driver; *includes* cost of meals, snacks, drinks, refreshments or accommodation services if covered by the fare and not separately priced.

11.07.33.1   Passenger transport by air (S)

Transport of individuals and groups of persons and luggage by aeroplane and helicopter; *includes* cost of meals, snacks, drinks, refreshments or accommodation services if covered by the fare and not separately priced.

11.07.34.1   Passenger transport by sea and inland waterway (S)

Transport of individuals and groups of persons and luggage by ship, boat, ferry, hovercraft and hydrofoil; *includes* transport of private vehicles; cost of meals, snacks, drinks, refreshments or accommodation services if covered by the fare and not separately priced.

11.07.36.1   Other purchased transport services (S)

Funicular, cable-car and chair-lift transport; removal and storage services; services of porters and left-luggage and luggage-forwarding offices; travel agents' commissions, if separately priced; *excludes* cable car and chair-lift transport at ski resorts and holiday centres (11.09.41.1).

11.08.11.1   Postal services (S)

Payments for the delivery of letters, postcards and parcels; private mail and parcel delivery; *includes* all purchases of new postage stamps, pre-franked postcards and aerogrammes; *excludes* purchase of used or cancelled postage stamps (11.09.31.1); financial services of post offices (11.12.62.1).

11.08.31.1   Telephone and telefax services (S)

Installation and subscription costs of personal telephone equipment; telephone calls from a private line or from a public line (public telephone box, post office cabin, etc.); telephone calls from hotels, cafés, restaurants and the like; telegraphy, telex and telefax services; information transmission services; internet connection services; hire of telephones, telefax machines, telephone answering-machines and telephone loudspeakers; *includes* radiotelephony, radiotelegraphy and radiotelex services.

11.09.15.1   **Repair of audio-visual, photographic and information processing equipment (S)**

Repair of audio-visual equipment, photographic and information processing equipment; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); *excludes* separate purchases of materials made by households with the intention of undertaking the repair themselves (11.09.11.1), (11.09.12.1) or (11.09.13.1).

11.09.35.1   **Veterinary and other services for pets (S)**

Veterinary and other services for pets such as grooming and boarding; *excludes* veterinary and other services (stabling, feeding, farriery, etc.) for horses and ponies purchased for recreational purposes (11.09.21.1).

11.09.41.1   **Recreational and sporting services (S)**

Services provided by sports stadia, horse-racing courses, motor-racing circuits, velodromes, skating rinks, swimming pools, golf courses, gymnasia, fitness centres, tennis courts, squash courts, bowling alleys, fairs, amusement parks, roundabouts, see-saws and other playground facilities for children, pin-ball machines and other games for adults other than games of chance, ski slopes, ski lifts and the like; hire of equipment and accessories for sport and recreation, such as aeroplanes, boats, horses, skiing and camping equipment; out-of-school individual or group lessons in bridge, chess, aerobics, dancing, music, skating, skiing, swimming or other pastimes; services of mountain guides, tour guides, etc.; navigational aid services for boating; *includes* hire of game-specific footwear (ski boots, football boots, golfing shoes and other such footwear fitted with ice skates, rollers, spikes, studs, etc.); *excludes* cable car and chair-lift transport not at ski resorts or holiday centres (11.07.36.1).

11.09.42.1   **Photographic services (S)**

Services of photographers such as film developing, print processing, enlarging, portrait photography, wedding photography, etc.

11.09.42.2   **Other cultural services (S)**

Services provided by cinemas, theatres, opera houses, concert halls, music halls, circuses, sound and light shows, museums, libraries, art galleries, exhibitions, historic monuments, national parks, zoological and botanical gardens, aquaria; hire of equipment and accessories for culture, such as television sets, video cassettes, etc.; television and radio broadcasting, in particular licence fees for television equipment and subscriptions to television networks; *includes* services of musicians, clowns, performers for private entertainments.

11.10.51.1   **Education not definable by level (S)**

Educational programmes, generally for adults, which do not require any special prior instruction, in particular vocational training and cultural development; *excludes* driving lessons (11.07.24.1); recreational training courses such as sport or bridge lessons given by independent teachers (11.09.41.1).

11.12.62.1   **Other financial services n.e.c. (S)**

Actual charges for the financial services of banks, post offices, saving banks, money changers and similar financial institutions; fees and service charges for brokers, investment counsellors, tax consultants and the like; administrative charges of private pension funds and the like.

11.12.71.1   **Other services n.e.c. (S)**

Fees for legal services, employment agencies, etc.; charges for undertaking and other funeral services; payment for the services of estate agents, housing agents, auctioneers, operators of salesrooms and other intermediaries; payment for photocopies and other reproductions of documents; fees for the issue of birth, marriage and death certificates and other administrative documents; payment for newspaper notices and advertisements; payment for the services of graphologists, astrologers, private detectives, bodyguards, matrimonial agencies and marriage guidance counsellors, public writers, miscellaneous concessions (seats, toilets, cloakrooms), etc.

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11.05.11.1   Kitchen furniture (D)

Tables, chairs, cupboards, etc. for kitchens; *includes* delivery and installation of the furniture when applicable; *excludes* works of art and antique furniture acquired primarily as stores of value (capital formation).

11.05.11.2   Bedroom furniture (D)

Beds, tables, chairs, wardrobes, chests of drawers, etc. for bedrooms; *includes* base-mattresses, mattresses, tatamis; delivery and installation of the furniture when applicable; *excludes* sofa beds (11.05.11.3); works of art and antique furniture acquired primarily as stores of value (capital formation).

11.05.11.3   Living-room and dining-room furniture (D)

Sofas, sofa beds, couches, tables, chairs, cupboards, dressers, wall systems, book shelves for living rooms and dining rooms; *includes* delivery and installation of the furniture when applicable; *excludes* works of art and antique furniture acquired primarily as stores of value (capital formation).

11.05.11.4   Other furniture and furnishings (D)

Baby furniture such as cradles, high-chairs and play-pens; camping and garden furniture; lighting equipment such as ceiling lights, standard lamps, globe lights and bedside lamps; pictures, sculptures, engravings, tapestries and other art objects including reproductions of works of art and other ornaments; screens, folding partitions and other furniture and fixtures; *includes* bathroom cabinets; blinds with the exception of fabric blinds (11.05.21.1); mirrors, candle-holders and candlesticks; delivery and installation of the furniture and furnishings when applicable; *excludes* sunshades (11.05.21.1); safes (11.05.31.1); glassware and ceramic ware for households, offices and decoration (11.05.41.1); clocks (11.12.31.1); baby carriages and push-chairs (11.12.32.1); wall thermometers and barometers (11.12.32.1); works of art and antique furniture acquired primarily as stores of value (capital formation).

11.05.12.1   Carpets and other floor coverings (D)

Loose carpets, rugs, mats and other such movable floor coverings; fitted carpets, linoleum and other such fixed floor coverings; *includes* laying of floor covers; *excludes* floor boards and ceramic floor tiles (11.04.31.1); bathroom mats, rush mats and door mats (11.05.21.1); antique floor coverings acquired primarily as stores of value (capital formation).

11.05.13.1   Repair of furniture, furnishings and floor coverings (S)

Repair of furniture, furnishings and floor coverings; *includes* total value of the service (that is, both the cost of labour and the cost of materials are covered); restoration of works of art, antique furniture and antique floor coverings other than those acquired primarily as stores of value (capital formation); *excludes* separate purchases of materials made by households with the intention of undertaking the repairs themselves (11.05.11.1), (11.05.11.2), (11.05.11.3), (11.05.11.4) or (11.05.12.1); dry cleaning of carpets (11.05.62.2).

11.05.21.1   Household textiles (SD)

Furnishing fabrics, curtain material, curtains, double curtains, awnings, door curtains and fabric blinds; bedding such as futons, pillows, bolsters and hammocks; bedlinen such as sheets, pillowcases, blankets, travelling rugs, plaids, eiderdowns, counterpanes and mosquito nets; table linen and bathroom linen such as tablecloths, table napkins, towels and face-cloths; other textile household articles such as shopping bags, laundry bags, shoe bags, covers for clothes and furniture, flags, sunshades, etc.; repair of such articles; *includes* cloth bought by the piece; oilcloth; bathroom mats, rush mats and door mats; *excludes* fabric wall coverings (11.04.31.1); tapestries (11.05.11.4); floor coverings such as unfitted and fitted carpets (11.05.12.1); electric blankets (11.05.32.1); covers for motor cars, motor cycles, etc. (11.07.21.1); air mattresses and sleeping bags (11.09.32.1).

11.06.11.1   Pharmaceutical products (ND)

Medicinal preparations, medicinal drugs, patent medicines, serums and vaccines, vitamins and minerals, cod liver oil and halibut liver oil, oral contraceptives purchased by individuals, either with or without a prescription, usually from dispensing chemists or pharmacists and intended for consumption or use outside a health facility or institution; *excludes* veterinary products (11.09.34.1); articles for personal hygiene such as medicinal soaps (11.12.13.1).

11.06.12.1   **Other medical products (ND)**

Clinical thermometers, adhesive and non-adhesive bandages, hypodermic syringes, first-aid kits, hot-water bottles and ice bags, medical hosiery items such as elasticated stockings and knee-supports, pregnancy tests, condoms and other mechanical contraceptive devices purchased by individuals, either with or without a prescription, usually from dispensing chemists or pharmacists and intended for consumption or use outside a health facility or institution.

11.06.13.1   **Therapeutic appliances and equipment (D)**

Corrective eye-glasses and contact lenses, hearing aids, glass eyes, artificial limbs and other prosthetic devices, orthopaedic braces and supports, orthopaedic footwear, surgical belts, trusses and supports, neck braces, medical massage equipment and health lamps, powered and unpowered wheelchairs and invalid carriages, special beds, crutches, electronic and other devices for monitoring blood pressure, etc. purchased by individuals, either with or without a prescription, usually from medical equipment suppliers and intended for consumption or use outside a health facility or institution; repair of such articles; *includes* dentures but not fitting costs; *excludes* hire of therapeutic equipment (11.06.23.1); protective goggles, belts and supports for sport (11.09.32.1); sun-glasses not fitted with corrective lenses (11.12.32 1).

11.06.21.1   **Medical services (S)**

Services of physicians in general or specialist practice delivered to outpatients; *includes* orthodontic specialists; medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to out-patients; *excludes* services of medical analysis laboratories and X-ray centres (11.06.23.1) and services of practitioners of traditional medicine (11.06.23.1).

11.06.22.1   **Dental services (S)**

Services of dentists, oral-hygienists and other dental auxiliaries delivered to outpatients; *includes* fitting costs of dentures but not the dentures themselves; medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to out-patients; e*xcludes* dentures (11.06.13.1); orthodontic specialists (11.06.21.1); services of medical analysis laboratories and X-ray centres (11.06.23.1).

11.06.23.1   **Paramedical services (S)**

Paramedical services delivered to outpatients: services of medical analysis laboratories and X-ray centres; services of freelance nurses and midwives; services of freelance acupuncturists, chiropractors, optometrists, physiotherapists, speech therapists, etc.; medically-prescribed corrective-gymnastic therapy; out-patient thermal bath or seawater treatments; ambulance services other than hospital ambulance services; hire of therapeutic equipment; *includes* services of practitioners of traditional medicine; medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to out-patients.

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ANNEX IV: QUARANTA EDITING PROCEDURE

IV.1. Eurostat and the OECD use the Quaranta editing procedure[1] to validate the prices that participating countries report for consumer products, government services and capital goods. The procedure is both an editing tool and an analytical tool. As an editing tool it identifies outliers that need to be checked among the prices reported by countries. As an analytical tool it provides information that can be used to assess the reliability of completed price surveys and to assist the planning of future price surveys. In short, the Quaranta editing procedure plays a key role in improving the quality of Eurostat-OECD comparisons.

IV.2. The procedure has been in place since the early 1990s when it was used to edit the prices collected for consumer goods and services - the purpose for which it was originally intended. In the meantime, the procedure has evolved and its application broadened to other price surveys such as those covering equipment goods and construction projects. The Quaranta editing procedure described in this Annex is the standard version currently employed. The description focuses on the validation of prices for consumer products as this remains the procedure's principal application.

IV.3. The validation of the prices collected for consumer goods and services is carried out price survey by price survey in two stages. The first stage involves the price input and output sheets and the intra-country editing of individual price observations by product. The second stage involves the Quaranta editing procedure and the inter-country validation of average survey prices by basic heading. The first stage is described in Chapter 4. The second stage is described in the following paragraphs.

IV.4. The Quaranta editing procedure 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. As participating countries report prices in national currencies, average survey prices can be compared only if they are expressed in a common unit of currency. Both exchange rates and PPPs are used in the Quaranta editing procedure to convert average survey prices to a common currency.

IV.5. Once converted to a common currency, the average survey prices of different countries for the same product can be compared with each other and outliers identified according to predetermined criteria. But prices, even when expressed in the same currency, cannot be compared directly across products. On the other hand, the price ratios of countries pricing a product can be compared with the corresponding price ratios for other products providing they have first been "standardised". Standardised price ratios for a product are the ratios between the individual average survey prices of the countries pricing the product and the geometric mean of the average survey prices of all the countries pricing the product when the average survey prices are expressed in a common currency. The measures of price dispersion used in the Quaranta editing procedure are calculated with standardised price ratios based on average survey prices that have been converted to a common currency with PPPs.

IV.6. Central to the Quaranta editing procedure is the "Quaranta table" and central to the Quaranta table is the basic heading. Inter-country validation of average survey prices takes place at the basic heading level. When a price survey is to be edited, a Quaranta table is prepared for each basic heading covered by the survey. A Quaranta table consists of two tables: a basic heading table and a product table. For any given basic heading, the Quaranta table will have only one basic heading table, but usually it will have a number of product tables – one for each product specified for the basic heading.

IV.7. The inter-country validation of prices collected for consumer goods and services is done first within the country groups and then between the country groups. The preparation of Quaranta tables for the intra-group validation of price surveys covering consumer products is the responsibility of the group leaders. Box IV.1 contains an example of such a Quaranta table. The example is incomplete because it shows product tables for only two of the eight products specified for the basic heading.

IV.8. From the survey identifier on the first line in the Box, it can be seen that the table refers to the price survey that was conducted in the first half of 2003 – which was *Food, drinks and tobacco* – and to the prices collected by the Central group. It can also be seen that it is the final version of the table – that is, the version sent to Eurostat after the iterative verification process between group leader and group members had been completed. The numbers in italics and square brackets – that is, the numbers from *[1]* to *[28]* - have been added to the table for ease of reference. They, and the acronyms employed in the table, are explained in Box IV.2. Numbers *[1]* to *[12]* cover the basic heading table and numbers *[13]* to *[28]* cover the product table.

Box IV.1: An example of a Quaranta table

EUROSTAT- PPP: QUARANTA TABLES   **SURVEY:** 2003-I Central group (final version)   **Date:** 08.01.2004   **Page:** 1

[1] **11.01.11.1 Rice**   *[2]* **Av. Weight:** 59   *[3]* **No. of it.:** 8

[4] EKS method; Selected options: limits for XR-, PPP-indices = 80%, 125%, with *, without L/P limits   *[5]* **Var. Coef. (%):** 19.7

[6]	[7] XR NC/EURO	[8] PPP NC/CUP	[9] PLI (%) PPP/XR	[10] Weight/ 100000	[11] No. of Items	[12] Var. Coef.	[6]	[7] XR NC/EURO	[8] PPP NC/CUP	[9] PLI (%) PPP/XR	[10] Weight/ 100000	[11] No. of Items	[12] Var. Coef.
OS	1.00000	1.01637	101.6	23.8	7: *4	13.8	LUX	1.00000	1.29062	129.1	74.0	6: *3	22.3
BE	1.00000	1.40005	140.0	34.6	8: *6	22.7	NL	1.00000	1.04821	104.8	40.6	7: *4	24.5
CH	1.54110	1.64876	107.0	58.3	5: *5	16.9	PL	4.35350	2.63721	60.6	47.5	5: *3	13.7
CZE	31.3910	18.9608	60.4	63.9	7: *4	25.7	SVK	41.0920	24.8722	60.5	149.5	7: *5	18.3
DE	1.00000	1.68260	168.3	13.8	7: *7	19.3	SVN	232.959	230.491	98.9	95.3	7: *3	13.4
HUN	245.180	199.895	81.5	91.1	7: *3	21.5	DE2	1.00000	1.61527	161.5	13.8	7: *7	16.3

1 *[13]* **11.01.11.1aa = CNS – Rice, long grain, 500 – 1000 g, specified brand, reference quantity = 1000 g**   *[14]* **Var. Co.:** 16.6

[15]	[16] NC-price	[17] *	[18] Qts.	[19] Var. Co.	[20] Wn	[21] EURO-pr.	[22] EURO-In.	[23] Wn	[24] CUP-price	[25] CUP-In.	[26] Wn	
						[27] **GM=>** 2.74			*[28]* **GM=>** 2.64			
OS	3.04	*	4	5.1		3.04	111		2.99	114		
BE	3.01	*	13	16.8		3.01	110		2.15	82		
CH	4.58	*	9	21.2		2.97	109		2.78	106		
CZE	52.80		5	4.4		1.84	67	<	3.05	116		
DE	3.18	*	12	14.2		3.18	116		1.89	72	<	
HUN	533.20		5	8.6		2.17	79	<	2.67	102		
LUX	3.46	*	5	9.1		3.46	126	>	2.68	102		
NL	2.63	*	9	14.2		2.63	96		2.51	96		
SVK	82.08		10	7.7		2.00	73	<	3.30	126	>	
SVN	720.08		5	7.5		3.09	113		3.12	119		
DE2	3.33	*	8	8.9		3.33	122		2.06	79	<	

2 *[13]* **11.01.11.1ac = CN – Rice, long grain, 500 – 1000 g, well-known brand, reference quantity = 1000 g**   *[14]* **Var. Co.:** 15.0

[15]	[16] NC-price	[17] *	[18] Qts.	[19] Var. Co.	[20] Wn	[21] EURO-pr.	[22] EURO-In.	[23] Wn	[24] CUP-price	[25] CUP-In.	[26] Wn	
						[27] **GM=>** 1.69			*[28]* **GM=>** 1.71			
OS	1.76	*	3	2.7		1.76	104		1.73	101		
BE	2.75	*	9	12.4		2.75	162	>	1.96	115		
CZE	24.53	*	4	14.6		0.78	46	<	1.29	76	<	
DE	3.39	*	7	19.1		3.39	200	>	2.02	118		
HUN	318.50	*	2	25.0		1.30	77	<	1.59	93		
LUX	1.66	*	8	35.9	>	1.66	98		1.29	76	<	
NL	1.86		5	30.1		1.86	110		1.77	104		
PL	4.63	*	6	15.3		1.06	63	<	1.76	103		
SVK	50.10	*	7	10.4		1.22	72	<	2.01	118		
SVN	356.67	*	14	24.7		1.53	90		1.55	91		
DE2	3.25	*	10	10.2		3.25	192	>	2.01	118		

Note: In Germany, both the present capital, Berlin, and the former capital, Bonn, are surveyed. DE is Berlin and DE2 is Bonn. Their prices are validated separately and then combined as unweighted arithmetic means. The asterisks from Berlin determine representativity.

Box IV.2: Reading the Quaranta table in Box IV.1

	Basic heading table
[1]	The basic heading covered by the table.
[2]	**Av. Weight** or average weight: The average expenditure weight for the group of countries covered by the Quaranta table. The unweighted arithmetic mean of the national weights in column *[10]*. Like the national weights it is scaled to 100,000.
[3]	**No. of It.** or number of items: The number of products specified for the basic heading. The number of product tables comprising the Quaranta table.
[4]	Identifies the options selected when preparing the Quaranta table – namely: the method used to calculate the PPPs for the basic heading PPPs in column *[8]*; and the range in which the EURO-indices in column *[22]* and the CUP-indices in column *[25]* should lie if they are not to be flagged as outliers in column *[23]* or column *[26]*. In this case, the EKS method, with representativity (*), without limits on the Laspeyres-Paasche spread, has been used to calculate the PPPs; and the range in which the EURO-indices and CUP-indices should lie is 80 to 125. Selected options can be changed as required.
[5]	**Var. Coef.** or variation coefficient: The unweighted arithmetic mean of the variation coefficients of the products at *[14]*. The average variation of the standardised price ratios of the products priced for the basic heading.
[6]	Abbreviated names of the countries covered by the Quaranta table.
[7]	**XR NC/EURO**: The market exchange rates (XR) of the countries expressed as the number of units of national currency (NC) per euro. The exchange rate is 1.00000 for countries in the Euro area.
[8]	**PPP NC/CUP**: The PPPs for the basic heading calculated as specified in *[4]* – that is, the EKS method - and expressed as the number of units of national currency (NC) per conventional unit for expressing parities (CUP). The CUP is obtained by first standardising the EKS PPPs and then multiplying them by a coefficient to scale them to the euro. The scaling coefficient is defined as the unweighted geometric mean of the NC/EURO exchange rates in column *[7]*. The prices used to calculate the PPPs are the average survey prices in national currencies that countries report for the products they priced for the basic heading – that is, the NC-prices in column *[16]*.
[9]	**PLI (%) PPP/XR** or price level indices. The PPPs in column *[8]* expressed as a percentage of the exchange rates in column *[7]*.
[10]	**Weight/100000**: National expenditure weights scaled to 100,000. That part of a country's household individual consumption expenditure that is spent on the basic heading when both expenditures are expressed in national currency and valued at national price levels. Household individual consumption expenditure is defined by the domestic concept, before adjusting for net purchases abroad.
[11]	**No. of items**: Number of products that are priced by each country and the number of products priced by each country that are representative – that is, the number of products assigned an asterisk (*).
[12]	**Var. Coef.** or variation coefficient: The standard deviation expressed as a percentage of the arithmetic mean of the indices of PPP converted prices – that is, the CUP-indices in column *[25]* - for all products priced by the country irrespective of whether they are representative or unrepresentative. CUP-indices of products priced by only one country are not included. ***P.T.O.*** **>>>>**

IV.9. The basic heading table gives summary information for the basic heading. The information relates either to the basic heading as a whole – from *[1]* to *[5]* – or to each country covered by the basic heading – from *[6]* to *[12]*. The product table shows for each product the average survey prices reported by countries in national currencies *[16]*, the average survey prices converted to a common currency with exchange rates *[21]*, the average survey prices converted to a common currency with the PPPs for the basic heading *[24]*, the standardised price ratios based on the exchange rate converted prices *[22]* and the standardised price ratios based on the PPP converted prices *[25]*. Outliers among the standardised price ratios are identified in *[23]* and *[26]*. Values that are below the predetermined range of acceptability are flagged by **<** , values that above are flagged by **>** .[2]

IV.10. The PPPs in the Quaranta table are calculated from the average survey prices that are being validated.[3] This means that verification starts with PPPs calculated from prices that have still to be edited. These opening PPPs are likely to be unreliable and the flagging of outliers among the PPP converted prices is likely to be unreliable as well. This is one of the reasons that standardised price ratios based on exchange rate converted prices are included in the Quaranta table. As PPPs are calculated because exchange rate converted prices do not reflect the price levels of countries, it appears paradoxical to use them to edit prices with which PPPs are to be calculated. But experience shows that exchange rate converted prices provide, at least at the beginning of the validation process, a better "feel" for the reliability of the prices collected. Experience also shows that many of the prices initially identified as outliers among the exchange rate converted prices are found to be incorrect.

IV.11. Intra-group validation is an iterative process with an evolving set of Quaranta tables going backwards and forwards between the group leader and the other group members. The whole process can involve several iterations or rounds before being completed. After each round, new Quaranta tables based on revised price data are prepared. As incorrect prices are removed or corrected, the PPPs will become more reliable and so too will the flagging of outliers among PPP converted prices. As the editing progresses, the focus on outliers shifts from those among the exchange rate converted prices to those among the PPP converted prices. The goal of the exercise is to remove, or at least reduce, the outliers among the PPP converted prices. Providing this is achieved, outliers remaining among exchange rate converted prices can be ignored.

Box IV.2 Reading the Quaranta table in Box IV.1, contd.

	Product table
[13]	Code, name, and summary definition of the product covered in the subsequent product table.
[14]	**Var. Co.** or variation coefficient: The standard deviation expressed as a percentage of the arithmetic mean of the indices of PPP converted prices for a product – that is, the CUP-indices in column *[25]*.
[15]	Abbreviated names of the countries pricing the product.
[16]	**NC-price**: Average survey price in national currency (NC).
[17]	Representativity indicator. Generally, representativity is marked by an asterisk (*), but in the case of rents numerical weights (percentages) are shown.
[18]	**Qts.** or quotations: The number of price observations on which the average survey prices - the NC-prices - in column *[16]* are based.
[19]	**Var. Co.** or variation coefficient: The standard deviation expressed as a percentage of the arithmetic mean of the price observations underlying the average survey price in column *[16]*.
[20]	**Wn** or warning: Variation coefficients in column *[19]* that have a value which is greater than the selected crucial value of 33 per cent are flagged by **>** .
[21]	**EURO-pr.** or EURO-prices: The prices in national currency – the NC-prices – in column *[16]* converted to euros with the exchange rates in column *[7]*.
[22]	**EURO-In.** or EURO-indices: Indices based on the exchange rate converted prices – the EURO-prices – in column *[21]*. The EURO-prices expressed as a percentage of their geometric mean at *[27]*. Referred to in the text as "standardised price ratios based on exchange rate converted prices".
[23]	**Wn** or warning: Flags the indices of exchange rate converted prices – the EURO-indices – in column *[22]* that have a value which falls outside the selected range of 80 to 125 *[4]*. Values that are below 80 are flagged by **<** , values above 125 are flagged by **>** .
[24]	**CUP-price**(s): The prices in national currency – the NC-prices – in column *[16]* converted to the conventional unit in which to express parities (CUP) with the PPPs in column *[8]*.
[25]	**CUP-In.** or CUP-indices: Indices based on the PPP converted prices – the CUP-prices – in column *[24]*. The CUP-prices expressed as a percentage of their geometric mean at *[28]*. Referred to in the text as "standardised price ratios based on PPP converted prices".
[26]	**Wn** or warning: Flags the indices of PPP converted prices – the CUP-indices – in column *[25]* that have a value which falls outside the selected range of 80 to 125 *[4]*. Values that are below 80 are flagged by **<** , values above 125 are flagged by **>** .
[27]	**GM** or geometric mean of the exchange rate converted prices – the EURO-prices – in column *[21]*. The use of a geometric mean here and in *[28]* insures invariance with respect to choice of numeraire.
[28]	**GM** or geometric mean of the PPP converted prices – the CUP-prices – in column *[24]*. It will be the same as *[27]* when all countries covered by the Quaranta table have priced the product.

IV.12. It is important to remember during each round of inter-country validation that 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 returned to them as outliers and to confirm whether they correct or incorrect. When prices are found to be incorrect, participating countries are expected to correct them, otherwise they are suppressed.

IV.13. Strictly speaking, an outlier that is correct should be retained. Even so, such an outlier can 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 important to 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[4] on a case by case basis.

IV.14. Inter-country validation within country groups is followed by inter-country validation between country groups. Again the Quaranta editing procedure is applied. Quaranta tables that cover all countries in the country groups are prepared by Eurostat. These are sent to countries and the process of iterative verification starts afresh. Validation is done in two steps. First, the average survey prices are edited. Then, once validated, they are edited again, but this time after they have been converted to national annual prices with the spatial and temporal adjustment factors that participating countries provide for this purpose.

IV.15. The two steps are necessary partly for logistic reasons, but chiefly so that countries are able to recognise their average survey prices immediately - which they may not be able to do after the prices have been converted to national annual averages. This is an important consideration because with the introduction of new countries much in the Quaranta table changes – namely: the PPPs *[8]*, the price level indices *[9]*, the PPP converted prices *[24]*, the

standardised price ratios based on PPPs *[25]*, and their associated variation coefficients *[5]*, *[12]* and *[14]*. New outliers among the PPP converted prices will also be flagged *[26]*.

IV.16. Validation during the first step focuses on overlap products. Here, the main problem encountered tends to be country groups interpreting generic product specifications differently so that, while prices within groups are comparable, prices between groups are not. In such cases, the product is split between country groups and the overlap is lost. Validation during the second step is generally a formality, but an important one nonetheless. When signing off from the validation process, participating countries are accepting responsibility for their national annual prices.

IV.17. A Quaranta table also contains four variation coefficients. Two in the product table – *[14]* and *[19]* – and two in the basic heading table – *[5]* and *[12]*. They serve different uses not all of which are immediately relevant to validation. Three of them – *[14]*, *[12]* and *[5]* - can all be expected to become smaller as editing progresses and the number of outliers is reduced. In this respect, they provide a means of assessing the effectiveness of validation at the product, country and basic heading levels.

IV.18. The first variation coefficient is at *[14]*.[5] It is product specific. It refers to the product covered in the product table immediately below it. It measures the variation in the average survey prices for a product after they have been converted to a common currency with the PPPs for the basic heading. It is the most important of the variation coefficients for validation purposes. A product with a high variation coefficient – above 33 per cent is the current Eurostat-OECD crucial value – should be considered suspect and possibly not comparable between countries. Such products are candidates for splitting or for deletion and should be carefully investigated by participating countries.

IV.19. The second variation coefficient is in column *[19]*.[6] It is country and product specific. It measures the variation among the price observations on which the average survey price in column [16] is based. It is taken directly from the price input and output sheets where it was used in the identification of outliers during intra-country validation. It serves primarily as an aide-mémoire. Values above 33 per cent are flagged in column *[20]*.

IV.20. The third variation coefficient is at *[5]*. It is basic heading specific. It is the average product variation coefficient for the basic heading. It provides a measure of the homogeneity of the price structures of the countries covered by the basic heading and of the reliability of the PPPs calculated for the basic heading. The closer its value is to zero the greater is the homogeneity of the price structures and the reliability of the PPPs. As a summary measure of price variation among products within the basic heading, it can be used, together with the basic heading weight *[2]*, in the planning of the survey the next time it comes around in the survey cycle – for example, when allocating the number of products to be sampled to basic headings.

IV.21. The fourth variation coefficient is in column *[12]*. It is country and basic heading specific. It measures the variation in a country's price levels among the products it priced for a basic heading. The lower the value, the more uniform are the country's price levels within the basic heading. It provides a rough estimate of the reliability of a country's PPP for the basic heading. Together with the country's basic heading weight *[10]*, it can assist countries to decide how many products they need to price to obtain reliable PPPs for the basic heading the next time it is to be surveyed.

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[1]   The procedure is named after its originator, Vicenzo Quaranta of INSTAT, who first proposed it to the Eurostat Working Party on Price Statistics in January 1990. It was subsequently described in "A data quality control approach in price surveys for PPP estimates", V. Quaranta, *Improving the Quality of Price Indices: CPI and PPP*, (proceedings of an international seminar held in Florence, December 1995), Eurostat and University of Florence, Luxembourg, 1996.

[2]   The intervals of the range are not equal because it is the relative deviations from a geometric mean that are being measured.

[3]   Eurostat and the OECD use the EKS method with representativity to calculate PPPs for a basic heading. If the price of a product is to be included in the calculation, at least two countries should have priced it and at least one of these countries should have assigned it an asterisk (*) – the representativity indicator currently used by Eurostat and the OECD. A full description of the EKS method can be found in Chapter 7 and Annex V.

[4]   Or Eurostat in the case of inter-country validation involving all participating countries.

[5]   Theoretically, this variation coefficient should be calculated using logarithms because the CUP-indices are based on the geometric mean of the CUP-prices. It is calculated using the arithmetic mean and standard deviation of the CUP-indices for practical reasons.

[6]   When participating countries report average survey prices and not individual price observations, as they do for rents, compensation of employees, equipment goods and construction projects, this coefficient of variation does not appear in the Quaranta table.

ANNEX V: CALCULATION AND AGGREGATION OF PPPS

Introduction

V.1.   The calculation and aggregation of PPPs requires each country participating in a Eurostat-OECD comparison to provide a set of national annual prices for a selection of representative and comparable products chosen from a common basket of goods and services that covers the whole range of final expenditure on GDP and a detailed breakdown of final expenditure on GDP according to a common classification. Annex V – which should be read as a supplement to Chapter 7 - follows a worked example to show how the national annual prices are converted into PPPs and how these PPPs are aggregated using the final expenditures as weights. The worked example is in two parts. The first part describes how PPPs are calculated for a basic heading using the Èltetö-Köves-Szulc (EKS) method. The second part explains how the PPPs for a basic heading are combined with those of other basic headings to provide weighted PPPs for each level of aggregation up to the level of GDP. It covers two aggregation methods: the EKS method and the Geary-Khamis (GK) method.

PART I: CALCULATION OF PPPS FOR A BASIC HEADING

Basic headings, representative products and quasi expenditure weights

V.2.   National annual prices are collected and reported at the level of the basic heading. A basic heading is the lowest level of disaggregation for which explicit expenditure weights can be estimated. For example, cheese is a basic heading and cheddar, camembert, feta, gorgonzola, gouda, etc. are individual products within it. Expenditure on cheese is known, but expenditures on specific cheese varieties are not. By definition, explicit expenditure weights can not be used below the basic heading level. Quasi expenditure weights are used instead as explained below.

V.3.   Countries participating in Eurostat-OECD comparisons are required to price not only items that are representative of their national market but also items that are representative of the national markets of others. They are also required to indicate which of the products they have priced are representative of their national markets. A product is said to be representative if it is purchased in sufficient quantities for its price level to be typical for that type of product in the national market. In the cheese example above, cheddar is obviously representative of the United Kingdom, camembert of France, feta of Greece, gorgonzola of Italy and gouda of the Netherlands. But cheddar is sold in sufficient quantities in France and the Netherlands for it to be representative of these countries as well. Similarly, camembert is also representative of Germany, Norway and Sweden, and gouda of Greece, Spain and Portugal. Countries currently indicate representative products by an asterisk (*). Representative products are sometimes referred to as "asterisk products"

V.4.   The representativity of the goods and services priced needs to be taken into account when calculating PPPs for a basic heading because the price levels of representative products are generally lower than the price levels of unrepresentative products. Failure to do so may result in the price level for the basic heading being underestimated or overestimated and the corresponding volume level being overestimated or underestimated. To avoid this bias, products that are representative – that is, the products identified by an asterisk - are assigned a quasi expenditure weight of "1" and products that are not representative – that is, the products with no asterisks - are given a quasi expenditure weight of "0". The choice of "1" and "0" as quasi expenditure weights is an arbitrary convention. Weights of "2" and "1", or any other similar combination, could also be used. It has been decided that for Eurostat-OECD comparisons it is preferable to exclude price relatives that are based on products that are unrepresentative of both countries when calculating PPPs between two countries for a basic heading.

Stages of calculation

V.5.   There are six stages to the calculation of EKS PPPs for a basic heading:

- The calculation of a matrix of Laspeyres type PPPs.
- The calculation of a matrix of Paasche type PPPs.
- The calculation of a matrix of Fisher type PPPs.
- Completing the matrix of Fisher type PPPs.
- The calculation of the matrix of EKS PPPs.
- Standardising the matrix of EKS PPPs.

V.6.   "Type" is used to qualify Laspeyres, Paasche and Fisher for two reasons. The first is that Laspeyres, Paasche and Fisher indexes are generally used for temporal comparisons rather than spatial comparisons. Traditional Laspeyres, Paasche and Fisher indexes have a "base period" and a "current period". Laspeyres, Paasche and Fisher type PPPs have a "base country" and a "partner country". The second reason is that a traditional Laspeyres index is a weighted arithmetic average and a traditional Paasche index is a weighted harmonic average. The

Laspeyres and Paasche type PPPs calculated for a basic heading are quasi-weighted geometric averages. Note that this second reason is only valid for the Laspeyres and Paasche type PPPs calculated for a basic heading. The Laspeyres and Paasche type PPPs calculated for aggregates in Part IIA are, like traditional Laspeyres and Paasche indexes, weighted arithmetic and harmonic means respectively.

Table V.1: Matrix of national annual prices

Product	Country							
	A		B		C		D	
1	P_{1a}	3.43	P_{1b}	17.04*	P_{1c}	633	P_{1d}	9.57*
2	P_{2a}	1.27*	P_{2b}	15.67*	P_{2c}	588*	P_{2d}	- -
3	P_{3a}	- -	P_{3b}	27.27	P_{3c}	443*	P_{3d}	9.95*
4	P_{4a}	2.25	P_{4b}	20.93	P_{4c}	755	P_{4d}	10.22*
5	P_{5a}	- -	P_{5b}	15.75*	P_{5c}	- -	P_{5d}	11.32*

V.7. The starting point of the calculation is the price matrix for the basic heading such as that of Table V.1. The matrix contains each country's national annual prices in national currency for a selection of products covered by the basic heading. The representative products for each country are indicated by an asterisk (*). For example, product 1 is representative for countries B and D; product 2 is representative for countries A, B and C; and so on. Each country has at least one representative product which is priced in at least one other country. Prices for products 2 and 3 are not available for country D and country A respectively; product 5 is not priced by either country A or country C.

Table V.2: Matrix of Laspeyres type PPPs

A		B		C		D	
$L_{A/A}$	1.0000	$L_{A/B}$	0.12773	$L_{A/C}$	0.00216	$L_{A/D}$	0.28090
$L_{B/A}$	12.339	$L_{B/B}$	1.0000	$L_{B/C}$	0.04050	$L_{B/D}$	1.9310
$L_{C/A}$	462.99	$L_{C/B}$	37.335	$L_{C/C}$	1.0000	$L_{C/D}$	60.144
$L_{D/A}$	- -	$L_{D/B}$	0.63534	$L_{D/C}$	0.02246	$L_{D/D}$	1.0000

V.8. The Laspeyres type PPP for a basic heading between any pair of countries is defined as the quasi-weighted geometric mean of the price relatives between the two countries for the products that are representative of the base country. In other words, only products that are representative of the base country have a weight of "1" and products that are only representative of the partner country have a weight of "0". Hence, when A is the base country, the price relatives for product 2 are computed; when B is the base country, the price relatives for products 1, 2 and 5 are computed; and so on. When there is more than one representative product, a simple geometric average of the price relatives is taken.

V.9. The Laspeyres type PPPs of Table V.2 were calculated with the national annual prices and asterisks (the representative products) of Table V.1 as follows.

Base A:

$L_{A/A}$ = P_{2a}/P_{2a} = 1.27/1.27 = 1.0000

$L_{B/A}$ = P_{2b}/P_{2a} = 15.67/1.27 = 12.339

$L_{C/A}$ = P_{2c}/P_{2a} = 588/1.27 = 462.99

Base B:

$L_{A/B}$ = $[(P_{1a}/P_{1b})(P_{2a}/P_{2b})]^{1/2}$ = $[(3.43/17.04)(1.27/15.67)]^{1/2}$ = 0.12773

$L_{B/B}$ = $[(P_{1b}/P_{1b})(P_{2b}/P_{2b})(P_{5b}/P_{5b})]^{1/3}$ = $[(17.04/17.04)(15.67/15.67)(15.75/15.75)]^{1/3}$ = 1.0000

$L_{C/B}$ = $[(P_{1c}/P_{1b})(P_{2c}/P_{2b})]^{1/2}$ = $[(633/17.04)(588/15.67)]^{1/2}$ = 37.335

$L_{D/B}$ = $[(P_{1d}/P_{1b})(P_{5d}/P_{5b})]^{1/2}$ = $[(9.57/17.04)(11.32/15.75)]^{1/2}$ = 0.63534

Base C:

$L_{A/C}$ $= P_{2a}/P_{2c} = 1.27/588 = 0.00216$

$L_{B/C}$ $= [(P_{2b}/P_{2c})(P_{3b}/P_{3c})]^{1/2} = [(15.67/588)(27.27/443)]^{1/2} = 0.04050$

$L_{C/C}$ $= [(P_{2c}/P_{2c})(P_{3c}/P_{3c})]^{1/2} = [(588/588)(443/443)]^{1/2} = 1.0000$

$L_{D/C}$ $= P_{3d}/P_{3c} = 9.95/443 = 0.02246$

<u>Base D:</u>

$L_{A/D}$ $= [(P_{1a}/P_{1d})(P_{4a}/P_{4d})]^{1/2} = [(3.43/9.57)(2.25/10.22)]^{1/2} = 0.28090$

$L_{B/D}$ $= [(P_{1b}/P_{1d})(P_{3b}/P_{3d})(P_{4b}/P_{4d})(P_{5b}/P_{5d})]^{1/4}$

          $= [(17.04/9.57)(27.27/9.95)(20.93/10.22)(15.75/11.32)]^{1/4} = 1.9310$

$L_{C/D}$ $= [(P_{1c}/P_{1d})(P_{3c}/P_{3d}(P_{4c}/P_{4d})]^{1/3} = [(633/9.57)(443/9.95)(755/10.22)]^{1/3} = 60.144$

$L_{D/D}$ $= [(P_{1d}/P_{1d})(P_{3d}/P_{3d}(P_{4d}/P_{4d})(P_{5d}/P_{5d})]^{1/4}$

          $= [(9.57/9.57)(9.95/9.95)(10.22/10.22)(11.32/11.32)]^{1/4} = 1.0000$

Table V.3: Matrix of Paasche type PPPs

A		B		C		D	
$P_{A/A}$	1.0000	$P_{A/B}$	0.08105	$P_{A/C}$	0.00216	$P_{A/D}$	- -
$P_{B/A}$	7.8293	$P_{B/B}$	1.0000	$P_{B/C}$	0.02678	$P_{B/D}$	1.5740
$P_{C/A}$	462.99	$P_{C/B}$	24.690	$P_{C/C}$	1.0000	$P_{C/D}$	44.523
$P_{D/A}$	3.5599	$P_{D/B}$	0.51785	$P_{D/C}$	0.01663	$P_{D/D}$	1.0000

V.10.   The Paasche type PPP for a basic heading between any pair of countries is defined as the quasi-weighted geometric mean of the price relatives between the two countries for the products that are representative of the partner country. In other words, only products that are representative of the partner country have a weight of "1" and products that are only representative of the base country have a weight of "0". Hence, when A is the partner country, the price relatives for product 2 are computed; when B is the partner country, the price relatives for products 1, 2 and 5 are computed; and so on. When there is more than one representative product, a simple geometric average of the price relatives is taken.

V.11.   It can be seen from Table V.1 that $P_{B/A}$ – the Paasche type PPP when B is the partner country and A is the base country - is equal to $[(P_{1b}/P_{1a})(P_{2b}/P_{2a})]^{1/2}$. It can also be seen that $L_{A/B}$ - the Laspeyres type PPP when A is the partner country and B is the base country – is equal to $[(P_{1a}/P_{1b})(P_{2a}/P_{2b})]^{1/2}$. $L_{A/B}$ and $P_{B/A}$ are based on the same representative products. $L_{A/B}$ is the transpose of $P_{B/A}$ (and vice versa). Its reciprocal – $1/L_{A/B}$ – is equal to $[(P_{1b}/P_{1a})(P_{2b}/P_{2a})]^{1/2}$ which is equal to $P_{B/A}$.

V.12.   Paasche type PPPs can be calculated either directly by following the procedure described in paragraph V.10 or indirectly by applying the identity established in paragraph V.11. The Paasche type PPPs of Table V.3 were obtained by transposing the matrix of Laspeyres type PPPs of Table V.2 and taking the reciprocals of the transposed PPPs as follows:

<u>Base A:</u>

$P_{A/A}$ $= P_{2a}/P_{2a} = 1/L_{A/A} = 1/1.0000 = 1.0000$

$P_{B/A}$ $= [(P_{1b}/P_{1a})(P_{2b}/P_{2a})]^{1/2} = 1/L_{A/B} = 1/0.12773 = 7.8293$

$P_{C/A}$ $= P_{2c}/P_{2a} = 1/L_{A/C} = 1/0.00216 = 462.99$

$P_{D/A}$ $= [(P_{1d}/P_{1a})(P_{4d}/P_{4a})]^{1/2} = 1/L_{A/D} = 1/0.28090 = 3.5599$

<u>Base B:</u>

$P_{A/B}$ $= P_{2a}/P_{2b} = 1/L_{B/A} = 1/12.339 = 0.08105$

$P_{B/B}$ $= [(P_{1b}/P_{1b})(P_{2b}/P_{2b})(P_{5b}/P_{5b})]^{1/3} = 1/L_{B/B} = 1/1.0000 = 1.0000$

$P_{C/B}$ $= [(P_{2c}/P_{2b})(P_{3c}/P_{3b})]^{1/2} = 1/L_{B/C} = 1/0.04050 = 24.690$

$P_{D/B}$ $= [(P_{1d}/P_{1b})(P_{3d}/P_{3b})(P_{4d}/P_{4b})(P_{5d}/P_{5b})]^{1/4} = 1/L_{B/D} = 1/1.9310 = 0.51785$

<u>Base C:</u>

$P_{A/C}$ $= P_{2a}/P_{2c} = 1/L_{C/A} = 1/462.99 = 0.00216$

$P_{B/C}$ $\quad= [(P_{1b}/P_{1c})(P_{2b}/P_{2c})]^{1/2} = 1/L_{C/B} = 1/37.335 = 0.02678$

$P_{C/C}$ $\quad= [(P_{2c}/P_{2c})(P_{3c}/P_{3c})]^{1/2} = 1/L_{C/C} = 1/1.0000 = 1.0000$

$P_{D/C}$ $\quad= [(P_{1d}/P_{1c})(P_{3d}/P_{3c})(P_{4d}/P_{4c})]^{1/3} = 1/L_{C/D} = 1/60.144 = 0.01663$

Base D:

$P_{B/D}$ $\quad= [(P_{1b}/P_{1d})(P_{5b}/P_{5d})]^{1/2} = 1/L_{D/B} = 1/0.63534 = 1.5740$

$P_{C/D}$ $\quad= P_{3c}/P_{3d} = 1/L_{D/C} = 1/0.02246 = 44.523$

$P_{D/D}$ $\quad= [(P_{1d}/P_{1d})(P_{3d}/P_{3d})(P_{4d}/P_{4d})(P_{5d}/P_{5d})]^{1/4} = 1/L_{D/D} = 1/1.0000 = 1.0000$

Table V.4: Matrix of Fisher type PPPs

A		B		C		D	
$F_{A/A}$	1.0000	$F_{A/B}$	0.10174	$F_{A/C}$	0.00216	$F_{A/D}$	- -
$F_{B/A}$	9.8286	$F_{B/B}$	1.0000	$F_{B/C}$	0.03294	$F_{B/D}$	1.7434
$F_{C/A}$	462.99	$F_{C/B}$	30.361	$F_{C/C}$	1.0000	$F_{C/D}$	51.747
$F_{D/A}$	- -	$F_{D/B}$	0.57360	$F_{D/C}$	0.01932	$F_{D/D}$	1.0000

V.13. The Fisher type PPP for a basic heading between any pair of countries is defined as the unweighted geometric mean of their Laspeyres type PPP for the basic heading and their Paasche type PPP for the basic heading. Direct application of this definition would require the Fisher type PPPs of Table V.3 to be calculated using the Laspeyres type PPPs of Table V.2 and the corresponding Paasche type PPPs of Table V.3. But, because of the identity established in paragraph V.11, they were computed using just the Laspeyres type PPPs of Table V.2 as follows:

$F_{A/A}$ $\quad= [L_{A/A}.P_{A/A}]^{1/2} = [L_{A/A}/L_{A/A}]^{1/2} = [1.0000/1.0000]^{1/2} = 1.0000$

$F_{B/A}$ $\quad= [L_{B/A}.P_{B/A}]^{1/2} = [L_{B/A}/L_{A/B}]^{1/2} = [12.339/0.12773]^{1/2} = 9.8286$

$F_{A/B}$ $\quad= [L_{A/B}.P_{A/B}]^{1/2} = [L_{A/B}/L_{B/A}]^{1/2} = [0.12773/12.339]^{1/2} = 0.10174$

$F_{C/A}$ $\quad= [L_{C/A}.P_{C/A}]^{1/2} = [L_{C/A}/L_{A/C}]^{1/2} = [462.99/0.00216]^{1/2} = 462.99$

$F_{A/C}$ $\quad= [L_{A/C}.P_{A/C}]^{1/2} = [L_{A/C}/L_{C/A}]^{1/2} = [0.00216/462.99]^{1/2} = 0.00216$

$F_{C/B}$ $\quad= [L_{C/B}.P_{C/B}]^{1/2} = [L_{C/B}/L_{B/C}]^{1/2} = [37.335/0.04050]^{1/2} = 30.361$

$F_{B/C}$ $\quad= [L_{B/C}.P_{B/C}]^{1/2} = [L_{B/C}/L_{C/B}]^{1/2} = [0.04050/37.335]^{1/2} = 0.03294$

$F_{D/B}$ $\quad= [L_{D/B}.P_{D/B}]^{1/2} = [L_{D/B}/L_{B/D}]^{1/2} = [0.63534/1.9310]^{1/2} = 0.57360$

$F_{B/D}$ $\quad= [L_{B/D}.P_{B/D}]^{1/2} = [L_{B/D}/L_{D/B}]^{1/2} = [1.9310/0.63534]^{1/2} = 1.7434 .... etc.$

V.14. The Fisher type PPPs of Table V.4 satisfy the country reversal test – that is, $F_{B/A}.F_{A/B} = 1$; $F_{C/A}.F_{A/C} = 1$, etc. But they are not transitive – that is, $F_{B/A}/F_{C/A} \neq F_{B/C}$; $F_{A/B}/F_{C/B} \neq F_{A/C}$, etc. Also, the matrix is incomplete. There is no PPP for $F_{D/A}$ or $F_{A/D}$.

V.15. The matrix is incomplete because the Laspeyres type PPP - $L_{D/A}$ - and the Paasche type PPP - $P_{A/D}$ – could not be calculated and therefore the respective Fisher type PPPs - $F_{D/A}$ and $F_{A/D}$ – could not be calculated either. $L_{D/A}$ and $P_{A/D}$ could not be calculated because country D did not price any products that were representative of country A.

V.16. As the missing Fisher type PPPs could not be calculated, they were estimated instead. This was done by taking the geometric mean of all the indirect Fisher PPPs connecting - or bridging - the countries for which PPPs were missing as follows:

$F_{D/A}$ $\quad= [(F_{D/B}/F_{A/B})(F_{D/C}/F_{A/C})]^{1/2} = [(0.5736/0.10174)(0.01932/0.00216)]^{1/2} = 7.1022$

$F_{A/D}$ $\quad= [(F_{A/B}/F_{D/B})(F_{A/C}/F_{D/C})]^{1/2} = [(0.10174/0.5736)(0.00216/0.01932)]^{1/2} = 0.14080$

Table V.5: Completed matrix of Fisher type PPPs

A		B		C		D	
$F_{A/A}$	1.0000	$F_{A/B}$	0.10174	$F_{A/C}$	0.00216	$F_{A/D}$	0.14080
$F_{B/A}$	9.8286	$F_{B/B}$	1.0000	$F_{B/C}$	0.03294	$F_{B/D}$	1.7434
$F_{C/A}$	462.99	$F_{C/B}$	30.361	$F_{C/C}$	1.0000	$F_{C/D}$	51.747
$F_{D/A}$	7.1022	$F_{D/B}$	0.57360	$F_{D/C}$	0.01932	$F_{D/D}$	1.0000

V.17.　In the completed matrix of Fisher type PPPs of Table V.5, only the PPPs $F_{D/A}$ and $F_{A/D}$ are transitive. This is because of the way they were estimated. The other PPPs, which are the original Fisher type PPPs from Table V.4, are not transitive. Overall transitivity is obtained by applying the EKS method.

Table V.6: Matrix of EKS PPPs

A		B		C		D	
$EKS_{A/A}$	1.0000	$EKS_{A/B}$	0.08605	$EKS_{A/C}$	0.00255	$EKS_{A/D}$	0.14080
$EKS_{B/A}$	11.621	$EKS_{B/B}$	1.0000	$EKS_{B/C}$	0.02968	$EKS_{B/D}$	1.6363
$EKS_{C/A}$	391.57	$EKS_{C/B}$	33.694	$EKS_{C/C}$	1.0000	$EKS_{C/D}$	55.133
$EKS_{D/A}$	7.1022	$EKS_{D/B}$	0.61113	$EKS_{D/C}$	0.01814	$EKS_{D/D}$	1.0000

V.18.　With EKS method, the transitive PPP for any two countries is derived by taking the unweighted geometric mean of the Fisher type PPP calculated between the pair directly and all the PPPs that can be calculated between the pair indirectly when each of the other countries is used as a bridge. The EKS PPPs of Table V.5 were computed following this procedure using the Fisher type PPPs in Table V.5 to provide the direct and indirect PPPs required:

$EKS_{A/A}$　　　$= F_{A/A} = 1.0000$

$EKS_{B/A}$　　　$= [(F_{B/A}/F_{A/A})(F_{B/B}/F_{A/B})(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

　　　　　　　$= [(F_{B/A})^2(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

　　　　　　　$= [(9.8286)^2(0.03294/0.00216)(1.7434/0.14080)]^{1/4} = 11.621$

$EKS_{C/A}$　　　$= [(F_{C/A})^2(F_{C/B}/F_{A/B})(F_{C/D}/F_{A/D})]^{1/4}$

　　　　　　　$= [(462.99)^2(30.361/0.10174)(51.747/0.14080)]^{1/4} = 391.57$

$EKS_{D/A}$　　　$= [(F_{D/A})^2(F_{D/B}/F_{A/B})(F_{D/C}/F_{A/C})]^{1/4}$

　　　　　　　$= [(7.1022)^2(0.57360/0.10174)(0.01932/0.00216)]^{1/4} = 7.1022$

$EKS_{A/B}$　　　$= [(F_{A/B})^2(F_{A/C}/F_{B/C})(F_{A/D}/F_{B/D})]^{1/4}$

　　　　　　　$= [(0.10174)^2(0.00216/0.03294)(0.14080/1.7434)]^{1/4} = 0.08605$

$EKS_{C/B}$　　　$= [(F_{C/B})^2(F_{C/A}/F_{B/A})(F_{C/D}/F_{B/D})]^{1/4}$

　　　　　　　$= [(30.361)^2(462.99/9.8286)(51.747/1.7434)]^{1/4} = 33.694$

$EKS_{D/B}$　　　$= [(F_{D/B})^2(F_{D/A}/F_{B/A})(F_{D/C}/F_{B/C})]^{1/4}$

　　　　　　　$= [(0.57360)^2(7.1022/9.8286)(0.01932/0.03294)]^{1/4} = 0.61113$ ………… etc.

V.19.　Transitivity requires that the direct PPP between each pair of countries is equal to the indirect PPP derived via any third country. For example, $EKS_{B/A}$ should equal $EKS_{B/C}/EKS_{A/C}$ or $EKS_{B/D}/EKS_{A/D}$. That the EKS PPPs of Table V.6 meet this requirement is demonstrated below:

$EKS_{B/A}$　　　$= EKS_{B/C} / EKS_{A/C} = 0.02968/0.00255 = 11.621$

$EKS_{B/A}$　　　$= EKS_{B/D} / EKS_{A/D} = 1.6363/0.14080 = 11.621$

$EKS_{C/A}$　　　$= EKS_{C/B} / EKS_{A/B} = 33.694 /0.08605 = 391.57$

$EKS_{C/A}$　　　$= EKS_{C/D} / EKS_{A/D} = 55.133 /0.14080 = 391.57$

$EKS_{D/A}$　　　$= EKS_{D/B} / EKS_{A/B} = 0.61113/0.08605 = 7.1022$

$EKS_{D/A}$ $= EKS_{D/C} / EKS_{A/C} = 0.01814/0.00255 = 7.1022$

$EKS_{A/B}$ $= EKS_{A/C} / EKS_{B/C} = 0.00255/0.02968 = 0.08605$

$EKS_{A/B}$ $= EKS_{A/D} / EKS_{B/D} = 0.14080/1.6363 = 0.08605$

$EKS_{C/B}$ $= EKS_{C/A} / EKS_{B/A} = 391.57/11.621 = 33.694$

$EKS_{C/B}$ $= EKS_{C/D} / EKS_{B/D} = 55.133/1.6363 = 33.694$ ………… etc.

Table V.7: Matrix of standardised EKS PPPs

	A	B	C	D
EKS_A	0.0746	0.0746	0.0746	0.0746
EKS_B	0.8667	0.8667	0.8667	0.8667
EKS_C	29.204	29.204	29.204	29.204
EKS_D	0.5297	0.5297	0.5297	0.5297

V.20.   In the matrix of EKS PPPs of Table V.6, the PPPs in each column are expressed with the corresponding country as a base. For example, in column A country A is the base - $EKS_{A/A}$, $EKS_{B/A}$, $EKS_{C/A}$ and $EKS_{D/A}$; in column B country B is the base - $EKS_{A/B}$, $EKS_{B/B}$, $EKS_{C/B}$ and $EKS_{D/B}$; and so on. In order to obtain a set of PPPs that has the group of countries as a base – thereby ensuring base country invariance - it is necessary to standardise the PPPs in the matrix. This is done by dividing each PPP by the geometric mean of the PPPs in its column. The standardised PPPs of Table V.7 were computed following this procedure:

EKS_A $= EKS_{A/A} / (EKS_{A/A} \times EKS_{B/A} \times EKS_{C/A} \times EKS_{D/A})^{1/4}$

$= 1.000 / (1.000 \times 11.621 \times 391.57 \times 7.1022)^{1/4} = 0.0746$

EKS_B $= EKS_{B/A} / (EKS_{A/A} \times EKS_{B/A} \times EKS_{C/A} \times EKS_{D/A})^{1/4}$

$= 11.621 / (1.000 \times 11.621 \times 391.57 \times 7.1022)^{1/4} = 0.8667$

EKS_C $= EKS_{C/A} / (EKS_{A/A} \times EKS_{B/A} \times EKS_{C/A} \times EKS_{D/A})^{1/4}$

$= 391.56 / (1.000 \times 11.621 \times 391.57 \times 7.1022)^{1/4} = 29.204$

EKS_D $= EKS_{D/A} / (EKS_{A/A} \times EKS_{B/A} \times EKS_{C/A} \times EKS_{D/A})^{1/4}$

$= 7.1022 / (1.000 \times 11.621 \times 391.57 \times 7.1022)^{1/4} = 0.5297$

EKS_A $= EKS_{A/B} / (EKS_{A/B} \times EKS_{B/B} \times EKS_{C/B} \times EKS_{D/B})^{1/4}$

$= 0.08605 / (0.08605 \times 1.000 \times 33.694 \times 0.61113)^{1/4} = 0.0746$

EKS_B $= EKS_{B/B} / (EKS_{A/B} \times EKS_{B/B} \times EKS_{C/B} \times EKS_{D/B})^{1/4}$

$= 1.000 / (0.08605 \times 1.000 \times 33.694 \times 0.61113)^{1/4} = 0.8667$

EKS_C $= EKS_{C/B} / (EKS_{A/B} \times EKS_{B/B} \times EKS_{C/B} \times EKS_{D/B})^{1/4}$

$= 33.694 / (0.08605 \times 1.000 \times 33.694 \times 0.61113)^{1/4} = 29.204$

EKS_D $= EKS_{D/B} / (EKS_{A/B} \times EKS_{B/B} \times EKS_{C/B} \times EKS_{D/B})^{1/4}$

$= 0.61113 / (0.08605 \times 1.000 \times 33.694 \times 0.61113)^{1/4} = 0.5297$ ………… etc.

V.21.   The matrix of standardised EKS PPPs of Table V.8 reduces to the following vector of standardised EKS PPPs.

	A	B	C	D
EKS	0.0746	0.8667	29.204	0.5297

PART II A: AGGREGATION OF BASIC HEADING PARITIES: EKS METHOD

Stages of calculation

V.22. There are five stages to the calculation of EKS PPPs for an aggregate:

- The calculation of a matrix of Laspeyres type PPPs.
- The calculation of a matrix of Paasche type PPPs.
- The calculation of Fisher type PPPs.
- The calculation of the matrix of EKS PPPs.
- Standardising the matrix of EKS PPPs.

V.23. The starting points of the calculation are the matrix of basic heading EKS PPPs and the matrix of expenditures on the basic headings. For the worked example, the matrices cover five basic headings – v, w, x, y and z. The worked example shows how EKS PPPs are calculated for three aggregates, though only the calculations for aggregate 1 are described in detail. The three aggregates are:

- Aggregate 1 = v + w
- Aggregate 2 = x + y + z
- Aggregate 3 = v + w + x + y + z (the overall PPPs)

Table V.8: Matrix of basic heading EKS PPPs

Basic Heading	Country							
	A		B		C		D	
v	PPP_{va}	0.0746	PPP_{vb}	0.8667	PPP_{vc}	29.204	PPP_{vd}	0.5297
w	PPP_{wa}	0.0731	PPP_{wb}	0.9504	PPP_{wc}	20.725	PPP_{wd}	0.6945
x	PPP_{xa}	0.0739	PPP_{xb}	1.1382	PPP_{xc}	25.129	PPP_{xd}	0.4730
y	PPP_{ya}	0.0695	PPP_{yb}	0.8758	PPP_{yc}	27.803	PPP_{yd}	0.5908
z	PPP_{za}	0.0745	PPP_{zb}	0.7454	PPP_{zc}	26.833	PPP_{zd}	0.6708

V.24. The matrix of Table V.8 shows EKS PPPs by basic heading and by country. The PPPs have been calculated following the procedures described in Part I. The PPPs for each basic heading come from a separate vector of standardised EKS PPP. The PPPs for basic heading v are those from the vector of standardised EKS PPPs of paragraph V.21 in Part I.

Table V.9: Matrix of basic heading expenditures

Basic Heading	Country							
	A		B		C		D	
v	E_{va}	5	E_{vb}	110	E_{vc}	2000	E_{vd}	120
w	E_{wa}	20	E_{wb}	240	E_{wc}	5300	E_{wd}	180
x	E_{xa}	15	E_{xb}	300	E_{xc}	3500	E_{xd}	200
y	E_{ya}	35	E_{yb}	450	E_{yc}	10000	E_{yd}	250
z	E_{za}	25	E_{zb}	500	E_{zc}	6500	E_{zd}	250

V.25. The matrix of Table V.9 contains expenditure values in national currencies by basic heading and by country.

Table V.10: Matrix of Laspeyres type PPPs for aggregate 1

A		B		C		D	
$L1_{A/A}$	1.0000	$L1_{A/B}$	0.07982	$L1_{A/C}$	0.00326	$L1_{A/D}$	0.11948
$L1_{B/A}$	12.725	$L1_{B/B}$	1.0000	$L1_{B/C}$	0.04141	$L1_{B/D}$	1.4756
$L1_{C/A}$	305.13	$L1_{C/B}$	25.543	$L1_{C/C}$	1.0000	$L1_{C/D}$	39.958
$L1_{D/A}$	9.0210	$L1_{D/B}$	0.69315	$L1_{D/C}$	0.02929	$L1_{D/D}$	1.0000

V.26. The Laspeyres type PPP for an aggregate between any pair of countries is defined as the weighted arithmetic average of the EKS PPPs between the two countries for the basic headings constituting the aggregate with the expenditures on the basic headings of the base country being used as weights. The Laspeyres type PPPs for aggregate 1 of Table V.10 were calculated using the EKS PPPs of Table V.8 and the expenditure values of Table V.9 for the basic headings v and w as follows:

Base A:

$L1_{A/A}$ $= [(PPP_{va}/PPP_{va})E_{va} + (PPP_{wa}/PPP_{wa})E_{wa}] / (E_{va} + E_{wa})$

$= [(0.0746/0.0746)5 + (0.0731/0.0731)20] / (5 + 20) = 1.0000$

$L1_{B/A}$ $= [(PPP_{vb}/PPP_{va})E_{va} + (PPP_{wb}/PPP_{wa})E_{wa}] / (E_{va} + E_{wa})$

$= [(0.8667/0.0746)5 + (0.9504/0.0731)20] / (5 + 20) = 12.725$

$L1_{C/A}$ $= [(PPP_{vc}/PPP_{va})E_{va} + (PPP_{wc}/PPP_{wa})E_{wa}] / (E_{va} + E_{wa})$

$= [(29.204/0.0746)5 + (20.725/0.0731)20] / (5 + 20) = 305.13$

$L1_{D/A}$ $= [(PPP_{vd}/PPP_{va})E_{va} + (PPP_{wd}/PPP_{wa})E_{wa}] / (E_{va} + E_{wa})$

$= [(0.5297/0.0746)5 + (0.6945/0.0731)20] / (5 + 20) = 9.0210$

Base B:

$L1_{A/B}$ $= [(PPP_{va}/PPP_{vb})E_{vb} + (PPP_{wa}/PPP_{wb})E_{wb}] / (E_{vb} + E_{wb})$

$= [(0.0746/0.8667)110 + (0.0731/0.9504)240] / (110 + 240) = 0.07982$

$L1_{B/B}$ $= [(PPP_{vb}/PPP_{vb})E_{vb} + (PPP_{wb}/PPP_{wb})E_{wb}]/(E_{vb} + E_{wb})$

$= [(0.8667/0.8667)110 + (0.9504/0.9504)240]/(110 + 240) = 1.0000$

$L1_{C/B}$ $= [(PPP_{vc}/PPP_{vb})E_{vb} + (PPP_{wc}/PPP_{wb})E_{wb}] / (E_{vb} + E_{wb})$

$= [(29.204/0.8667)110 + (20.725/0.9504)240] / (110 + 240) = 25.543$

$L1_{D/B}$ $= [(PPP_{vd}/PPP_{vb})E_{vb} + (PPP_{wd}/PPP_{wb})E_{wb}] / (E_{vb} + E_{wb})$

$= [(0.5297/0.8667)110 + (0.6945/0.9504)240] / (110 + 240) = 0.69315$

Base C:

$L1_{A/C}$ $= [(PPP_{va}/PPP_{vc})E_{vc} + (PPP_{wa}/PPP_{wc})E_{wc}] / (E_{vc} + E_{wc})$

$= [(0.0746/29.204)2000 + (0.0731/20.725)5300] / (2000 + 5300) = 0.00326$

$L1_{B/C}$ $= [(PPP_{vb}/PPP_{vc})E_{vc} + (PPP_{wb}/PPP_{wc})E_{wc}] / (E_{vc} + E_{wc})$

$= [(0.8667/29.204)2000 + (0.9504/20.725)5300] / (2000 + 5300) = 0.04141$

$L1_{C/C}$ $= [(PPP_{vc}/PPP_{vc})E_{vc} + (PPP_{wc}/PPP_{wc})E_{wc}]/(E_{vc} + E_{wc})$

$= [(29.204/29.204)2000 + (20.725/20.725)5300]/(2000+5300) = 1.0000$

$L1_{D/C}$ $= [(PPP_{vd}/PPP_{vc})E_{vc} + (PPP_{wd}/PPP_{wc})E_{wc}] / (E_{vc} + E_{wc})$

$= [(0.5297/29.204)2000 + (0.6945/20.725)5300] / (2000 + 5300) = 0.02929$

Base D:

$L1_{A/D}$ $= [(PPP_{va}/PPP_{vd})E_{vd} + (PPP_{wa}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$= [(0.0746/0.5297)120 + (0.0731/0.6945)180] / (120 + 180) = 0.11948$

$L1_{B/D}$ $= [(PPP_{vb}/PPP_{vd})E_{vd} + (PPP_{wb}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$= [(0.8667/0.5297)120 + (0.9504/0.6945)180] / (120 + 180) = 1.4756$

$L1_{C/D}$ $= [(PPP_{vc}/PPP_{vd})E_{vd} + (PPP_{wc}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$$= [(29.204/0.5297)120 + (20.725/0.6945)180] / (120 + 180) = 39.958$$

$$L1_{D/D} \quad = [(PPP_{vd}/PPP_{vd})E_{vd} + (PPP_{wd}/PPP_{wd})E_{wd}]/(E_{vd} + E_{wd})$$

$$= [(0.5297/0.5297)120 + (0.6945/0.6945)180] / (120 + 180) = 1.0000$$

Table V.11: Matrix of Laspeyres type PPPs for aggregate 2

A		B		C		D	
$L2_{A/A}$	1.0000	$L2_{A/B}$	0.08413	$L2_{A/C}$	0.00267	$L2_{A/D}$	0.12632
$L2_{B/A}$	12.296	$L2_{B/B}$	1.0000	$L2_{B/C}$	0.03270	$L2_{B/D}$	1.6138
$L2_{C/A}$	374.75	$L2_{C/B}$	31.126	$L2_{C/C}$	1.0000	$L2_{C/D}$	46.272
$L2_{D/A}$	8.2485	$L2_{D/B}$	0.70255	$L2_{D/C}$	0.02204	$L2_{D/D}$	1.0000

V.27. The Laspeyres type PPPs for aggregate 2 of Table V.11 were computed with the EKS PPPs of Table V.8 and the expenditure values of Table V.9 for the basic headings x, y and z following the procedure used for aggregate 1.

Table V.12: Matrix of Laspeyres type PPPs for aggregate 3

A		B		C		D	
$L3_{A/A}$	1.0000	$L3_{A/B}$	0.08319	$L3_{A/C}$	0.00283	$L3_{A/D}$	0.12426
$L3_{B/A}$	12.403	$L3_{B/B}$	1.0000	$L3_{B/C}$	0.03503	$L3_{B/D}$	1.5721
$L3_{C/A}$	357.35	$L3_{C/B}$	29.905	$L3_{C/C}$	1.0000	$L3_{C/D}$	44.378
$L3_{D/A}$	8.4416	$L3_{D/B}$	0.70056	$L3_{D/C}$	0.02398	$L3_{D/D}$	1.0000

V.28. The Laspeyres type PPPs for aggregate 3 of Table V.12 were computed using the EKS PPPs of Table V.8 and the expenditure values of Table V.9 for the basic headings v, w, x, y and z following the procedure described for aggregate 1. They could also have been calculated as the weighted averages of the PPPs for aggregate 1 of Table V.10 and the corresponding PPPs for aggregate 2 of Table V.11. For example:

$$L3_{B/A} \quad = [L1_{B/A} (E_{va} + E_{wa}) + L2_{B/A} (E_{xa} + E_{ya} + E_{za})] / (E_{va} + E_{wa} + E_{xa} + E_{ya} + E_{za})$$

$$= [12.725 (5 + 20) + 12.296 (15 + 35 + 25)] / (5 + 20 + 15 + 35 + 25) = 12.403$$

Table V.13: Matrix of Paasche type PPPs for aggregate 1

A		B		C		D	
$P1_{A/A}$	1.0000	$P1_{A/B}$	0.07860	$P1_{A/C}$	0.00328	$P1_{A/D}$	0.11085
$P1_{B/A}$	12.534	$P1_{B/B}$	1.0000	$P1_{B/C}$	0.03915	$P1_{B/D}$	1.4427
$P1_{C/A}$	306.70	$P1_{C/B}$	24.140	$P1_{C/C}$	1.0000	$P1_{C/D}$	34.131
$P1_{D/A}$	8.3689	$P1_{D/B}$	0.67779	$P1_{D/C}$	0.02502	$P1_{D/D}$	1.0000

V.29. The Paasche type PPP for an aggregate between any pair of countries is defined as the weighted harmonic average of the EKS PPPs between the two countries for the basic headings constituting the aggregate with the expenditures on the basic headings of the partner country being used as weights. But, for the reason given in paragraph V.11 in Part I, the Paasche type PPPs for aggregate 1 of Table V.13 were obtained by transposing the matrix of Laspeyres type PPPs of Table V.10 and taking the reciprocals of the transposed PPPs as follows:

Base A

$P1_{A/A}$ $= 1/L1_{A/A} = 1/1.0000 = 1.0000$

$P1_{B/A}$ $= 1/L1_{A/B} = 1/0.07982 = 12.534$

$P1_{C/A}$ $= 1/L1_{A/C} = 1/0.00326 = 306.70$

$P1_{D/A}$ $= 1/L1_{A/D} = 1/0.11948 = 8.3698$

Base C

$P1_{A/C}$ $= 1/L1_{C/A} = 1/305.13 = 0.00328$

$P1_{B/C}$ $= 1/L1_{C/B} = 1/25.543 = 0.03915$

$P1_{C/C}$ $= 1/L1_{C/C} = 1/1.0000 = 1.0000$

$P1_{D/C}$ $= 1/L1_{C/D} = 1/39.958 = 0.02502$

Base B

$P1_{A/B}$ $= 1/L1_{B/A} = 1/12.725 = 0.07860$

$P1_{B/B}$ $= 1/L1_{B/B} = 1/1.0000 = 1.0000$

$P1_{C/B}$ $= 1/L1_{B/C} = 1/0.04141 = 24.140$

$P1_{D/B}$ $= 1/L1_{B/D} = 1/1.4756 = 0.67779$

Base D

$P1_{A/D}$ $= 1/L1_{D/A} = 1/9.0210 = 0.11085$

$P1_{B/D}$ $= 1/L1_{D/B} = 1/0.69315 = 1.4427$

$P1_{C/D}$ $= 1/L1_{D/C} = 1/0.02929 = 34.131$

$P1_{D/D}$ $= 1/L1_{D/D} = 1/1.0000 = 1.0000$

Table V.14: Matrix of Paasche type PPPs for aggregate 2

A		B		C		D	
$P2_{A/A}$	1.0000	$P2_{A/B}$	0.08133	$P2_{A/C}$	0.00267	$P2_{A/D}$	0.12123
$P2_{B/A}$	11.886	$P2_{B/B}$	1.0000	$P2_{B/C}$	0.03213	$P2_{B/D}$	1.4234
$P2_{C/A}$	374.97	$P2_{C/B}$	30.577	$P2_{C/C}$	1.0000	$P2_{C/D}$	45.365
$P2_{D/A}$	7.9166	$P2_{D/B}$	0.61965	$P2_{D/C}$	0.02161	$P2_{D/D}$	1.0000

Table V.15: Matrix of Paasche type PPPs for aggregate 3

A		B		C		D	
$P3_{A/A}$	1.0000	$P3_{A/B}$	0.08063	$P3_{A/C}$	0.00280	$P3_{A/D}$	0.11846
$P3_{B/A}$	12.022	$P3_{B/B}$	1.0000	$P3_{B/C}$	0.03344	$P3_{B/D}$	1.42760
$P3_{C/A}$	353.91	$P3_{C/B}$	28.542	$P3_{C/C}$	1.0000	$P3_{C/D}$	41.695
$P3_{D/A}$	8.0474	$P3_{D/B}$	0.63559	$P3_{D/C}$	0.02253	$P3_{D/D}$	1.0000

V.30. The Paasche type PPPs for aggregate 2 of Table V.14 and the Paasche type PPPs for aggregate 3 of Table V.15 were obtained by transposing the Laspeyres type PPPs of Table V.11 and Table V.12 respectively and taking the reciprocals of the transposed PPPs.

Table V.16: Matrix of Fisher type PPPs for aggregate 1

A		B		C		D	
$F1_{A/A}$	1.0000	$F1_{A/B}$	0.07921	$F1_{A/C}$	0.00327	$F1_{A/D}$	0.11508
$F1_{B/A}$	12.629	$F1_{B/B}$	1.0000	$F1_{B/C}$	0.04025	$F1_{B/D}$	1.4590
$F1_{C/A}$	305.91	$F1_{C/B}$	24.831	$F1_{C/C}$	1.0000	$F1_{C/D}$	36.930
$F1_{D/A}$	8.6894	$F1_{D/B}$	0.68538	$F1_{D/C}$	0.02708	$F1_{D/D}$	1.0000

V.31. The Fisher type PPP for an aggregate between any pair of countries is defined as the unweighted geometric mean of their Laspeyres type PPP for the aggregate and their Paasche type PPP for the aggregate. But, as explained in paragraph V.13 in Part I, the Fisher type PPPs for aggregate 1 of Table V.16 were not calculated directly using the Laspeyres type PPPs of Table V.10 and the corresponding Paasche type PPPs of Table V.13. Instead, they were computed using just the Laspeyres type PPPs of Table V.10 as follows:

$F_{A/A}$ $= [L_{A/A}.P_{A/A}]^{1/2} = [L_{A/A}/L_{A/A}]^{1/2} = [1.0000/1.0000]^{1/2} = 1.0000$

$F_{B/A}$ $\quad = [L_{B/A}.P_{B/A}]^{1/2} = [L_{B/A}/L_{A/B}]^{1/2} = [12.725/0.07982]^{1/2} = 12.629$

$F_{A/B}$ $\quad = [L_{A/B}.P_{A/B}]^{1/2} = [L_{A/B}/L_{B/A}]^{1/2} = [0.07982/12.725]^{1/2} = 0.07921$

$F_{C/A}$ $\quad = [L_{C/A}.P_{C/A}]^{1/2} = [L_{C/A}/L_{A/C}]^{1/2} = [305.13/0.00326]^{1/2} = 305.91$

$F_{A/C}$ $\quad = [L_{A/C}.P_{A/C}]^{1/2} = [L_{A/C}/L_{C/A}]^{1/2} = [0.00326/305.13]^{1/2} = 0.00327$

$F_{D/A}$ $\quad = [L_{D/A}.P_{D/A}]^{1/2} = [L_{D/A}/L_{D/A}]^{1/2} = [9.0210/0.11948]^{1/2} = 8.6894$

$F_{A/D}$ $\quad = [L_{A/D}.P_{A/D}]^{1/2} = [L_{A/D}/L_{D/A}]^{1/2} = [0.11948/9.0210]^{1/2} = 0.11508$

$F_{C/B}$ $\quad = [L_{C/B}.P_{C/B}]^{1/2} = [L_{C/B}/L_{B/C}]^{1/2} = [25.543/0.04141]^{1/2} = 24.831$

$F_{B/C}$ $\quad = [L_{B/C}.P_{B/C}]^{1/2} = [L_{B/C}/L_{C/B}]^{1/2} = [0.04141/25.543]^{1/2} = 0.04025$ .... etc.

Table V.17: Matrix of Fisher Type PPPs for aggregate 2

A		B		C		D	
$F2_{A/A}$	1.0000	$F2_{A/B}$	0.08272	$F2_{A/C}$	0.00267	$F2_{A/D}$	0.12375
$F2_{B/A}$	12.090	$F2_{B/B}$	1.0000	$F2_{B/C}$	0.03241	$F2_{B/D}$	1.5156
$F2_{C/A}$	374.86	$F2_{C/B}$	30.850	$F2_{C/C}$	1.0000	$F2_{C/D}$	45.816
$F2_{D/A}$	8.0808	$F2_{D/B}$	0.65980	$F2_{D/C}$	0.02183	$F2_{D/D}$	1.0000

Table V.18: Matrix of Fisher type PPPs for aggregate 3

A		B		C		D	
$F3_{A/A}$	1.0000	$F3_{A/B}$	0.08189	$F3_{A/C}$	0.00281	$F3_{A/D}$	0.12133
$F3_{B/A}$	12.211	$F3_{B/B}$	1.0000	$F3_{B/C}$	0.03422	$F3_{B/D}$	1.4980
$F3_{C/A}$	355.62	$F3_{C/B}$	29.215	$F3_{C/C}$	1.0000	$F3_{C/D}$	43.016
$F3_{D/A}$	8.2421	$F3_{D/B}$	0.66755	$F3_{D/C}$	0.02325	$F3_{D/D}$	1.0000

V.32. The Fisher type PPPs for aggregate 2 of Table V.17 and the Fisher type PPPs for aggregate 3 of Table V.18 were obtained using the Laspeyres type PPP of Table V.11 and Table V.12 respectively following the same procedure as that used for aggregate 1.

V.33. The Fisher type PPPs of Tables V.16, V.17 and V.18 satisfy the country reversal test – that is, $F_{B/A}.F_{A/B} = 1$; $F_{C/A}.F_{A/C} = 1$, etc. But they are not transitive – that is $F_{B/A}/F_{C/A} \neq F_{B/C}$; $F_{A/B}/F_{C/B} \neq F_{A/C}$, etc. Transitivity is obtained by applying the EKS method.

Table V.19: Matrix of EKS PPPs for aggregate 1

A		B		C		D	
$EKS1_{A/A}$	1.0000	$EKS1_{A/B}$	0.07963	$EKS1_{A/C}$	0.00321	$EKS1_{A/D}$	0.11655
$EKS1_{B/A}$	12.563	$EKS1_{B/B}$	1.0000	$EKS1_{B/C}$	0.04031	$EKS1_{B/D}$	1.4646
$EKS1_{C/A}$	311.52	$EKS1_{C/B}$	24.796	$EKS1_{C/C}$	1.0000	$EKS1_{C/D}$	36.317
$EKS1_{D/A}$	8.5778	$EKS1_{D/B}$	0.68277	$EKS1_{D/C}$	0.02753	$EKS1_{D/D}$	1.0000

V.34. With EKS method, the transitive PPP for any two countries is obtained by taking the unweighted geometric mean of the Fisher type PPP calculated between the pair directly and all PPPs that can be calculated between the pair indirectly when each of the other countries is used as a bridge. The EKS PPPs for aggregate 1 of Table V.19 were computed following this procedure using the Fisher type PPPs in Table V.16 to provide the direct and indirect PPPs required:

$EKS1_{A/A}$ $\quad = F_{A/A} = 1.00000$

$EKS1_{B/A}$ $= [(F_{B/A}/F_{A/A})(F_{B/B}/F_{A/B})(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

$\qquad\qquad = [(F_{B/A})^2(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

$\qquad\qquad = [(12.62913)^2(0.04025/0.00327)(1.45905/0.11508)]^{1/4} = 12.563$

$EKS1_{C/A}$ $= [(F_{C/A})^2(F_{C/B}/F_{A/B})(F_{C/D}/F_{A/D})]^{1/4}$

$\qquad\qquad = [(305.9139)^2(24.83137/0.07921)(36.93008/0.11508)]^{1/4} = 311.52$

$EKS1_{D/A}$ $= [(F_{D/A})^2(F_{D/B}/F_{A/B})(F_{D/C}/F_{A/C})]^{1/4}$

$\qquad\qquad = [(8.68941)^2(0.68538/0.07921)(0.02707/0.00326)]^{1/4} = 8.5778$

$EKS1_{A/B}$ $= [(F_{A/B})^2(F_{A/C}/F_{B/C})(F_{A/D}/F_{B/D})]^{1/4}$

$\qquad\qquad = [(0.07921)^2(0.00326/0.04025)(0.11508/1.45905)]^{1/4} = 0.07963$

$EKS1_{C/B}$ $= [(F_{C/B})^2(F_{C/A}/F_{B/A})(F_{C/D}/F_{B/D})]^{1/4}$

$\qquad\qquad = [(24.83137)^2(305.9135/12.62913)(36.93008/1.45905)]^{1/4} = 24.796$

$EKS1_{D/B}$ $= [(F_{D/B})^2(F_{D/A}/F_{B/A})(F_{D/C}/F_{B/C})]^{1/4}$

$\qquad\qquad = [(0.68538)^2(8.68941/12.62913)(0.02707/0.04025)]^{1/4} = 0.68277$ .... etc.

V.35. Transitivity requires that the direct PPP between each pair of countries is equal to the indirect PPP derived via any third country. For example, $EKS1_{B/A}$ should equal $EKS1_{B/C}$ / $EKS1_{A/C}$ or $EKS1_{B/D}$ / $EKS1_{A/D}$. That the EKS PPPs for aggregate 1 of Table V.19 meet this requirement is demonstrated below:

$EKS1_{B/A}$ $= EKS1_{B/C} / EKS1_{A/C} = 0.04031/0.00321 = 12.563$

$EKS1_{B/A}$ $= EKS1_{B/D} / EKS1_{A/D} = 1.4646/0.11655 = 12.563$

$EKS1_{C/A}$ $= EKS1_{C/B} / EKS1_{A/B} = 24.796/0.07963 = 311.52$

$EKS1_{C/A}$ $= EKS1_{C/D} / EKS1_{A/D} = 36.317/0.11655 = 311.52$

$EKS1_{D/A}$ $= EKS1_{D/B} / EKS1_{A/B} = 0.68277/0.07963 = 8.5778$

$EKS1_{D/A}$ $= EKS1_{D/C} / EKS1_{A/C} = 0.02753/0.00321 = 8.5778$

$EKS1_{A/B}$ $= EKS1_{A/C} / EKS1_{B/C} = 0.00321/0.04031 = 0.07963$

$EKS1_{A/B}$ $= EKS1_{A/D} / EKS1_{B/D} = 0.11655/1.4646 = 0.07963$

$EKS1_{C/B}$ $= EKS1_{C/A} / EKS1_{B/A} = 311.52/12.563 = 24.796$

$EKS1_{C/B}$ $= EKS1_{C/D} / EKS1_{B/D} = 36.317/1.4646 = 24.796$ .... etc.

Table V.20: Matrix of EKS PPPs for aggregate 2

A		B		C		D	
$EKS2_{A/A}$	1.0000	$EKS2_{A/B}$	0.08234	$EKS2_{A/C}$	0.00268	$EKS2_{A/D}$	0.12377
$EKS2_{B/A}$	12.144	$EKS2_{B/B}$	1.0000	$EKS2_{B/C}$	0.03254	$EKS2_{B/D}$	1.5030
$EKS2_{C/A}$	373.23	$EKS2_{C/B}$	30.733	$EKS2_{C/C}$	1.0000	$EKS2_{C/D}$	46.193
$EKS2_{D/A}$	8.0797	$EKS2_{D/B}$	0.66531	$EKS2_{D/C}$	0.02165	$EKS2_{D/D}$	1.0000

Table V.21: Matrix of EKS PPPs for aggregate 3

A		B		C		D	
$EKS3_{A/A}$	1.0000	$EKS3_{A/B}$	0.08174	$EKS3_{A/C}$	0.00281	$EKS3_{A/D}$	0.12157
$EKS3_{B/A}$	12.236	$EKS3_{B/B}$	1.0000	$EKS3_{B/C}$	0.03440	$EKS3_{B/D}$	1.4876
$EKS3_{C/A}$	355.64	$EKS3_{C/B}$	29.065	$EKS3_{C/C}$	1.0000	$EKS3_{C/D}$	43.236
$EKS3_{D/A}$	8.2254	$EKS3_{D/B}$	0.67224	$EKS3_{D/C}$	0.02313	$EKS3_{D/D}$	1.0000

V.36. The EKS PPPs for aggregate 2 of Table V.20 and the EKS PPPs of Table V.21 were obtained following the procedure described in paragraph V.35 and using the Fisher type PPPs in Table V.17 and Table V.18 to provide the direct and indirect PPPs required.

Table V.22: Matrix of standardised EKS PPPs for aggregate 1

	A	B	C	D
$EKS1_A$	0.0739	0.0739	0.0739	0.0739
$EKS1_B$	0.9281	0.9281	0.9281	0.9281
$EKS1_C$	23.01	23.01	23.01	23.01
$EKS1_D$	0.6337	0.6337	0.6337	0.6337

V.37. In the matrix of EKS PPPs for aggregate 1 of Table V.19, the PPPs in each column are expressed with the corresponding country as a base. For example, in column A country A is the base – $EKS1_{A/A}$, $EKS1_{B/A}$, $EKS1_{C/A}$ and $EKS1_{D/A}$; in column B country B is the base – $EKS1_{A/B}$, $EKS1_{B/B}$, $EKS1_{C/B}$ and $EKS1_{D/B}$; and so on. In order to obtain a set of PPPs that has the group of countries as a base – thereby ensuring base country invariance - it is necessary to standardise the PPPs in the matrix. This is done by dividing each PPP by the geometric mean of the PPPs in its column. The standardised EKS PPPs for aggregate 1 of Table V.22 were computed following this procedure:

$EKS1_A$ $= EKS1_{A/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$

                $= 1.000 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.0739$

$EKS1_B$ $= EKS1_{B/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$

                $= 12.563 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.9281$

$EKS1_C$ $= EKS1_{C/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$

                $= 311.52 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 23.01$

$EKS1_D$ $= EKS1_{D/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$

                $= 8.5778 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.6337$ ………… etc.

Table V.23: Matrix of standardised EKS PPPs for aggregate 2

	A	B	C	D
$EKS2_A$	0.0723	0.0723	0.0723	0.0723
$EKS2_B$	0.8779	0.8779	0.8779	0.8779
$EKS2_C$	26.98	26.98	26.98	26.98
$EKS2_D$	0.5841	0.5841	0.5841	0.5841

Table V.24: Matrix of standardised EKS PPPs for aggregate 3

	A	B	C	D
$EKS3_A$	0.0727	0.0727	0.0727	0.0727
$EKS3_B$	0.8896	0.8896	0.8896	0.8896
$EKS3_C$	25.86	25.86	25.86	25.86
$EKS3_D$	0.5980	0.5980	0.5980	0.5980

V.38. The standardised EKS PPPs of Table V.23 and V.24 were obtained by standardising the EKS PPPs Tables V.20 and V.21 respectively following the procedure described in paragraph V.37.

V.39.   The three matrices of standardised EKS reduce to three vectors of standardised EKS PPPs:

	A	B	C	D
Aggregate 1	0.0739	0.9281	23.01	0.6337
Aggregate 2	0.0723	0.8779	26.98	0.5841
Aggregate 3	0.0727	0.8896	25.86	0.5980

PART II B: AGGREGATION OF BASIC HEADING PARITIES: GK METHOD

Introduction

V.40.   The Geary-Khamis (GK) method requires that a set of theoretical prices - one average price for each basic heading - and a set of overall PPPs – one average PPP for each country - are calculated simultaneously. To do this, the round-iteration system of computation is followed in the worked example. Starting with an initial set of arbitrary determined overall PPPs, an initial set of theoretical prices is derived. The initial set of theoretical prices is then used to obtain a new – or second - set of overall PPPs, which, in turn, is used to derive a new – or second - set of theoretical prices. The process is repeated. The second set of theoretical prices is then used to obtain a new – or third - set of overall PPPs, which, in turn, is used to derive a new - or third - set of theoretical prices. The process continues until the sets of overall PPPs and theoretical prices no longer change. The number of rounds required before convergence occurs depends on the number of countries and the initial set of overall PPPs used to start the process.

V.41.   The starting points of the calculation are the matrix of basic heading EKS PPPs, the matrix of expenditures on the basic headings and the matrix of notional quantities. For the worked example, the matrices cover five basic headings – v, w, x, y and z. The worked example shows how GK PPPs are calculated for the same three aggregates that were covered in Part IIA: aggregate 1 (v + w), aggregate 2 (x + y + z) and aggregate 3 (v + w + x + y + z). Unlike EKS PPPs, GK PPPs for aggregates 1 and 2 cannot be determined independently of the overall GK PPPs for aggregate 3. The worked example focuses on the calculation of the overall PPPs.

Table V.25: Matrix of basic heading EKS PPPs

Basic Heading	Country							
	A		B		C		D	
v	PPP_{va}	0.0746	PPP_{vb}	0.8667	PPP_{vc}	29.204	PPP_{vd}	0.5297
w	PPP_{wa}	0.0731	PPP_{wb}	0.9504	PPP_{wc}	20.725	PPP_{wd}	0.6945
x	PPP_{xa}	0.0739	PPP_{xb}	1.1382	PPP_{xc}	25.129	PPP_{xd}	0.4730
y	PPP_{ya}	0.0695	PPP_{yb}	0.8758	PPP_{yc}	27.803	PPP_{yd}	0.5908
z	PPP_{za}	0.0745	PPP_{zb}	0.7454	PPP_{zc}	26.833	PPP_{zd}	0.6708

Overall PPPs	$PPP1_A$	0.0731	$PPP1_B$	0.9151	$PPP1_C$	25.941	$PPP1_D$	0.5918

V.42.   The matrix of Table V.25 shows EKS PPPs by basic heading and by country. These are the same PPPs that were used for Part IIA (see Table V.8 and paragraph V.24). The Table also shows the initial vector of overall PPPs – $PPP1_A$, $PPP1_B$, $PPP1_C$ and $PPP1_D$ - that was used to kick start the process of iteration for the worked example. These overall PPPs are simple arithmetic averages of the basic heading PPPs. But they did not need to be. There is no fixed rule. Exchanges rates or another set of figures, such as a series of "1s", could have been used instead. The round-iteration method would have yielded identical final results for the overall PPPs and the same structure of final theoretical prices if the initial overall PPPs for the worked example had been assigned other values.

Table V.26: Matrix of basic heading expenditures

Basic Heading	Country							
	A		B		C		D	
v	E_{va}	5	E_{vb}	110	E_{vc}	2000	E_{vd}	120
w	E_{wa}	20	E_{wb}	240	E_{wc}	5300	E_{wd}	180
x	E_{xa}	15	E_{xb}	300	E_{xc}	3500	E_{xd}	200
y	E_{ya}	35	E_{yb}	450	E_{yc}	10000	E_{yd}	250
z	E_{za}	25	E_{zb}	500	E_{zc}	6500	E_{zd}	250
Total	E_A	100	E_B	1600	E_C	27300	E_D	1000

V.43. The matrix of Table V.26 contains expenditure values in national currencies by basic heading and by country. These expenditure values are the same as those used for Part IIA (see Table V.9). The matrix also shows each country's total expenditure on all five basic headings – E_A, E_B, E_C and E_D.

Table V.27: Matrix of notional quantities

Basic Heading	Country									
	A		B		C		D		Total	
v	Q_{va}	67.0	Q_{vb}	127.1	Q_{vc}	68.5	Q_{vd}	226.5	Q_V	489.0
w	Q_{wa}	273.6	Q_{wb}	252.5	Q_{wc}	255.7	Q_{wd}	259.2	Q_W	1041.0
x	Q_{xa}	203.0	Q_{xb}	263.6	Q_{xc}	139.3	Q_{xd}	422.8	Q_X	1028.7
y	Q_{ya}	503.6	Q_{yb}	513.8	Q_{yc}	359.7	Q_{yd}	423.2	Q_Y	1800.2
z	Q_{za}	335.6	Q_{zb}	670.8	Q_{zc}	242.2	Q_{zd}	372.7	Q_Z	1621.3

V.44. The notional quantities of Table V.27 were obtained by dividing the basic heading expenditures of Table V.26 by the corresponding EKS PPPs of Table V.25 as follows:

Q_{va} $= E_{va}/PPP_{va} = 5/0.0746 = 67.0$

Q_{wa} $= E_{wa}/PPP_{wa} = 20/0.0731 = 273.6$

Q_{xa} $= E_{xa}/PPP_{xa} = 15/0.0739 = 203.0$

Q_{ya} $= E_{ya}/PPP_{ya} = 35/0.0695 = 503.6$

Q_{za} $= E_{za}/PPP_{za} = 25/0.0745 = 335.6$

Q_{vb} $= E_{vb}/PPP_{vb} = 110/0.8667 = 127.1$

Q_{wb} $= E_{wb}/PPP_{wb} = 240/0.9504 = 252.5$

Q_{yb} $= E_{yb}/PPP_{yb} = 300/1.1382 = 263.6$ ………… etc.

V.45. The quantities are notional because they are without units, though for each basic heading the "unit of quantity" is the same. The quantities are not commensurate across basic headings – that is, they cannot be sum down rows to provide a meaningful total by country. But they are commensurate across countries and can be summed across columns to provide a total quantity for each basic heading – Q_V, Q_W, Q_X, Q_Y and Q_Z.

Progression of a round

V.46. Each round starts with a vector of <u>overall PPPs</u> from the previous round – or, in the case of the opening round, a vector of overall PPPs that have been arbitrary determined (see paragraph V.42). The overall PPPs are used to produce a matrix of <u>intermediate real expenditures</u> which in turn is used to estimate a vector of <u>theoretical prices</u>. The theoretical prices are subsequently used to produce a second matrix of <u>intermediate real expenditures</u> which in turn is used to estimate the vector of <u>overall PPPs</u> for the next round. The rounds continue until the vectors of overall PPPs and theoretical prices no longer change. Note that the difference between the first matrix of intermediate real expenditures and the second matrix of real expenditure is that in the first matrix the real expenditures are valued using overall PPPs while in the second they are valued using theoretical prices.

ROUND ONE

Table V.28: Matrix of intermediate real expenditures 1

Basic Heading	Country									
	A		B		C		D		Total	
v	$V1_{va}$	68.4	$V1_{vb}$	120.2	$V1_{vc}$	77.1	$V1_{vd}$	202.8	$V1_V$	468.5
w	$V1_{wa}$	273.5	$V1_{wb}$	262.3	$V1_{wc}$	204.3	$V1_{wd}$	304.2	$V1_W$	1044.3
x	$V1_{xa}$	205.1	$V1_{xb}$	327.8	$V1_{xc}$	134.9	$V1_{xd}$	338.0	$V1_X$	1005.9
y	$V1_{ya}$	478.7	$V1_{yb}$	491.7	$V1_{yc}$	385.5	$V1_{yd}$	422.5	$V1_Y$	1778.4
z	$V1_{za}$	341.9	$V1_{zb}$	546.4	$V1_{zc}$	250.6	$V1_{zd}$	422.5	$V1_Z$	1561.3
Total	$V1_A$	1367.6	$V1_B$	1748.4	$V1_C$	1052.4	$V1_D$	1689.8	$V1_{TOT}$	5858.2

V.47. The intermediate real expenditures of Table V.28 were calculated by dividing the matrix of basic heading expenditures of Table V.26 by the vector of overall PPPs of Table V.25 as follows:

$V1_{va}$ = E_{va}/PPP_A = 5/0.0731 = 68.4

$V1_{vb}$ = E_{vb}/PPP_B = 110/0.9151 = 120.2

$V1_{vc}$ = E_{vc}/PPP_C = 2000/25.941 = 77.1

$V1_{vd}$ = E_{vd}/PPP_D = 120/0.5918 = 202.8

$V1_V$ = $V1_{va} + V1_{vb} + V1_{vc} + V1_{vd}$ = 68.4 + 120.2 + 77.1 + 202.8 = 468.5

$V1_{wa}$ = E_{wa}/PPP_A = 20/0.0731 = 273.5

$V1_{wb}$ = E_{wb}/PPP_B = 240/0.9151 = 262.3

$V1_{wc}$ = E_{wc}/PPP_C = 5300/25.941 = 204.3 .... etc.

V.48. In other words, the vector of <u>overall PPPs</u> has been used to convert the matrix of basic heading expenditures that is valued in national currencies into a matrix of intermediate real expenditures that is valued at a common but unspecified currency. The matrix can be summed across columns and down rows to give totals by basic heading and by country. The vector - $V1_V$, $V1_W$, $V1_X$, $V1_Y$ and $V1_Z$ - is use in the next step of the round: the estimation of theoretical prices.

Table V.29: Theoretical prices 1

Basic heading	Total intermediate real expenditures 1		Total notional quantities		Theoretical prices 1	
v	$V1_V$	468.5	Q_V	489.0	$P1_V$	0.958
w	$V1_W$	1044.3	Q_W	1041.0	$P1_W$	1.003
x	$V1_X$	1005.9	Q_X	1028.7	$P1_X$	0.978
y	$V1_Y$	1778.4	Q_Y	1800.2	$P1_Y$	0.988
z	$V1_Z$	1561.3	Q_Z	1621.3	$P1_Z$	0.963

V.49. The theoretical prices of Table V.29 were obtained by dividing the vector of total intermediate real expenditures by the vector of total notional quantities. For example, $P1_{V =} V1_V/Q_V$ = 468.5/489.0 = 0.958. The intermediate real expenditures were taken from the "total column" of Table 28 and the notional quantities from the "total column" of Table V.27. The theoretical prices are expressed in the common unspecified currency of Table V.28. The vector - $P1_V$, $P1_W$, $P1_X$, $P1_Y$ and $P1_Z$ - is used in the next step of the round: the calculation of the second matrix of intermediate real expenditure.

Table V.30: Matrix of intermediate real expenditures 2

Basic Heading	Country									
	A		B		C		D		Total	
v	$V2_{va}$	64.2	$V2_{vb}$	121.7	$V2_{vc}$	65.6	$V2_{vd}$	217.0	$V2_V$	468.5
w	$V2_{wa}$	274.4	$V2_{wb}$	253.3	$V2_{wc}$	256.5	$V2_{wd}$	260.0	$V2_W$	1044.3
x	$V2_{xa}$	198.5	$V2_{xb}$	257.7	$V2_{xc}$	136.2	$V2_{xd}$	413.5	$V2_X$	1005.9
y	$V2_{ya}$	497.5	$V2_{yb}$	507.6	$V2_{yc}$	355.3	$V2_{yd}$	418.0	$V2_Y$	1778.4
z	$V2_{za}$	323.2	$V2_{zb}$	646.0	$V2_{zc}$	233.3	$V2_{zd}$	358.9	$V2_Z$	1561.3
Total	$V2_A$	1357.8	$V2_B$	1786.3	$V2_C$	1046.9	$V2_D$	1667.3	$V2_{TOT}$	5858.2

V.50.   The intermediate real expenditures of Table V.30 were calculated by multiplying the matrix of notional quantities of Table V.27 by the vector of theoretical prices of Table V.29 as follows:

$V2_{va}$ $= Q_{va}.P1_V = 67.0 \times 0.958 = 64.2$

$V2_{wa}$ $= Q_{wa}.P1_W = 273.6 \times 1.003 = 274.4$

$V2_{xa}$ $= Q_{xa}.P1_X = 203.0 \times 0.978 = 198.5$

$V2_{ya}$ $= Q_{ya}.P1_Y = 503.6 \times 0.988 = 497.5$

$V2_{za}$ $= Q_{za}.P1_Z = 335.6 \times 0.963 = 323.2$

$V2_A$ $= V2_{va} + V2_{wa} + V2_{xa} + V2_{ya} + V2_{za} = 64.2 + 274.4 + 198.5 + 497.5 + 323.2 = 1357.8$

$V2_{vb}$ $= Q_{vb}.P1_V = 127.1 \times 0.958 = 121.7$

$V2_{wb}$ $= Q_{wb}.P1_W = 252.5 \times 1.003 = 253.3$

$V2_{xb}$ $= Q_{xb}.P1_X = 263.6 \times 0.978 = 257.7$ ………… etc.

V.51.   In other words, the vector of theoretical prices has been used to convert the matrix of notional quantities into a matrix of intermediate real expenditures valued in the common unspecified currency of Table V.28. The matrix can be summed across columns and down rows to give totals by basic heading and by country. The vector - $V2_A$, $V2_B$, $V2_C$ and $V2_D$ - is used in the next step of the round: the estimation of overall PPPs.

Table 31: Overall PPPs 2

Country	Total basic heading expenditures		Total intermediate real expenditures 2		Overall PPPs 2	
A	E_A	100	$V2_A$	1357.8	$PPP2_A$	0.0737
B	E_B	1600	$V2_B$	1786.3	$PPP2_B$	0.8957
C	E_C	27300	$V2_C$	1046.9	$PPP2_C$	26.078
D	E_D	1000	$V2_D$	1667.3	$PPP2_D$	0.5998

V.52.   The overall PPPs of Table V.31 were obtained by dividing the vector of total basic heading expenditures by the vector of total intermediate real expenditures. For example, $PPP2_A = E_A/V2_B = 100/1357.8 = 0.0737$. The basic heading expenditures were taken from the "total row" of Table 26 and the intermediate real expenditures from the "total row" of Table V.30. The vector – $PPP2_A$, $PPP2_B$, $PPP2_C$ and $PPP2_D$ – is carried over to the next round to use in the calculation of the first matrix of intermediate real expenditures for that round.

ROUND TWO

Table V.32: Matrix of intermediate real expenditures 3

Basic Heading	Country									
	A		B		C		D		Total	
v	$V3_{va}$	67.9	$V3_{vb}$	122.8	$V3_{vc}$	76.7	$V3_{vd}$	200.1	$V3_V$	467.5
w	$V3_{wa}$	271.6	$V3_{wb}$	267.9	$V3_{wc}$	203.2	$V3_{wd}$	300.1	$V3_W$	1042.9
x	$V3_{xa}$	203.7	$V3_{xb}$	334.9	$V3_{xc}$	134.2	$V3_{xd}$	333.5	$V3_X$	1006.3
y	$V3_{ya}$	475.2	$V3_{yb}$	502.4	$V3_{yc}$	383.5	$V3_{yd}$	416.8	$V3_Z$	1777.9
z	$V3_{za}$	339.4	$V3_{zb}$	558.2	$V3_{zc}$	249.3	$V3_{zd}$	416.8	$V3_D$	1563.7
Total	$V3_A$	1357.8	$V3_B$	1786.3	$V3_C$	1046.9	$V3_D$	1667.3	$V3_{TOT}$	5858.2

V.53. The intermediate real expenditures of Table V.32 were calculated by dividing the matrix of basic heading expenditures of Table V.26 by the vector of overall PPPs of Table V.31.

Table V.33: Theoretical prices 2

Basic heading	Total intermediate real expenditures 3		Total notional quantities		Theoretical prices 2	
v	$V3_V$	467.5	Q_V	489.0	$P2_V$	0.956
w	$V3_W$	1042.9	Q_W	1041.0	$P2_W$	1.002
x	$V3_X$	1006.3	Q_X	1028.7	$P2_X$	0.978
y	$V3_Y$	1777.9	Q_Y	1800.2	$P2_Y$	0.988
z	$V3_Z$	1563.7	Q_Z	1621.3	$P2_Z$	0.965

V.54. The theoretical prices of Table V.33 were obtained by dividing the vector of total intermediate real expenditures of Table V.32 by the vector of total notional quantities of Table V.27.

Table V.34: Matrix of intermediate real expenditures 4

Basic Heading	Country									
	A		B		C		D		Total	
v	$V4_{va}$	64.1	$V4_{vb}$	121.5	$V4_{vc}$	65.4	$V4_{vd}$	65.4	$V4_V$	467.5
w	$V4_{wa}$	274.1	$V4_{wb}$	253.0	$V4_{wc}$	256.2	$V4_{wd}$	259.6	$V4_W$	1042.9
x	$V4_{xa}$	198.6	$V4_{xb}$	257.8	$V4_{xc}$	136.2	$V4_{xd}$	413.6	$V4_X$	1006.3
y	$V4_{ya}$	497.4	$V4_{yb}$	507.4	$V4_{yc}$	355.2	$V4_{yd}$	417.9	$V4_Y$	1777.9
z	$V4_{za}$	323.7	$V4_{zb}$	647.0	$V4_{zc}$	233.6	$V4_{zd}$	359.5	$V4_Z$	1563.7
Total	$V4_A$	1357.7	$V4_B$	1786.7	$V4_C$	1046.7	$V4_D$	1667.1	$V4_{TOT}$	5858.2

V.55. The intermediate real expenditures of Table V.34 were calculated by multiplying the matrix of notional quantities of Table V.27 by the vector of theoretical prices of Table V.33.

Table V.35: Overall PPPs 3

Country	Total expenditures		Total intermediate real expenditures 4		Overall PPPs 3	
A	E_A	100	$V4_A$	1357.7	$PPP3_A$	0.0737
B	E_B	1600	$V4_B$	1786.7	$PPP3_B$	0.8955
C	E_C	27300	$V4_C$	1046.7	$PPP3_C$	26.082
D	E_D	1000	$V4_D$	1667.1	$PPP3_D$	0.5998

V.56. The overall PPPs of Table V.35 were obtained by dividing the vector of total expenditures of Table V.26 by the vector of total real expenditures of Table V.34.

ROUND THREE

Table V.36: Matrix of intermediate real expenditures 5

Basic Heading	Country									
	A		B		C		D		Total	
v	$V5_{va}$	67.9	$V5_{vb}$	122.8	$V5_{vc}$	76.7	$V5_{vd}$	200.1	$V5_v$	467.5
w	$V5_{wa}$	271.5	$V5_{wb}$	268.0	$V5_{wc}$	203.2	$V5_{wd}$	300.1	$V5_w$	1042.8
x	$V5_{xa}$	203.7	$V5_{xb}$	335.0	$V5_{xc}$	134.2	$V5_{xd}$	333.4	$V5_x$	1006.3
y	$V5_{ya}$	475.2	$V5_{yb}$	502.5	$V5_{yc}$	383.4	$V5_{yd}$	416.8	$V5_y$	1777.9
z	$V5_{za}$	339.4	$V5_{zb}$	558.3	$V5_{zc}$	249.2	$V5_{zd}$	416.8	$V5_z$	1563.8
Total	$V5_a$	1357.7	$V5_b$	1786.7	$V5_c$	1046.7	$V5_d$	1667.1	$V5_{tot}$	5858.2

V.57. The intermediate real expenditures of Table V.36 were calculated by dividing the matrix of basic heading expenditures of Table V.26 by the vector of overall PPPs of Table V.35.

Table V.37: Theoretical prices 3

Basic heading	Total intermediate real expenditures 5		Total notional quantities		Theoretical prices 3	
v	$V5_v$	467.5	Q_V	489.0	$P3_V$	0.956
w	$V5_w$	1042.8	Q_W	1041.0	$P3_W$	1.002
x	$V5_x$	1006.3	Q_X	1028.7	$P3_X$	0.978
y	$V5_Y$	1777.9	Q_Y	1800.2	$P3_Y$	0.988
z	$V5_Z$	1563.8	Q_Z	1621.3	$P3_Z$	0.965

V.58. The theoretical prices of Table V.37 were obtained by dividing the vector of total intermediate real expenditures of Table V.36 by the vector of total notional quantities of Table V.27. They are the same as the theoretical prices of the previous round (see Table V.33).

Table V.38: Matrix of intermediate real expenditures 6

Basic Heading	Country									
	A		B		C		D		Total	
v	$V6_{va}$	64.1	$V6_{vb}$	121.5	$V6_{vc}$	65.4	$V6_{vd}$	216.5	$V6_V$	467.5
w	$V6_{wa}$	274.1	$V6_{wb}$	253.0	$V6_{wc}$	256.2	$V6_{wd}$	259.6	$V6_W$	1042.8
x	$V6_{xa}$	198.6	$V6_{xb}$	257.8	$V6_{xc}$	136.2	$V6_{xd}$	413.6	$V6_X$	1006.3
y	$V6_{ya}$	497.3	$V6_{yb}$	507.4	$V6_{yc}$	355.2	$V6_{yd}$	417.9	$V6_Y$	1777.9
z	$V6_{za}$	323.7	$V6_{zb}$	647.0	$V6_{zc}$	233.6	$V6_{zd}$	359.5	$V6_Z$	1563.8
Total	$V6_A$	1357.7	$V6_B$	1786.7	$V6_C$	1046.7	$V6_D$	1667.1	$V6_{TOT}$	5858.2

V.59. The intermediate real expenditures of Table V.38 were calculated by multiplying the matrix of notional quantities of Table V.27 by the vector of theoretical prices of Table V.37.

Table V.39: Overall PPPs 4

Country	Total expenditures		Total intermediate real expenditures 6		Overall PPPs 4	
A	E_A	100	$V6_A$	1357.7	$PPP3_A$	0.0737
B	E_B	1600	$V6_B$	1786.7	$PPP3_B$	0.8955
C	E_C	27300	$V6_C$	1046.7	$PPP3_C$	26.082
D	E_D	1000	$V7_D$	1667.1	$PPP3_D$	0.5998

V.60. The overall PPPs of Table V.39 were obtained by dividing the vector of total expenditures of Table V.26 by the vector of total real expenditures of Table V.38. They are the same as the overall PPPs of the previous round (see Table V.35).

V.61. Both theoretical prices and the overall PPPs of round three are the same as those in round two and the iteration procedure is completed. The theoretical prices of Table V.37 and the overall PPPs of Table V.39 are final. Similarly, the intermediate real expenditures of Table V.38 are not intermediate, but final.

V.62. These final real expenditures are additive. It is therefore possible to calculate the PPP for any given aggregate by dividing the sum of the expenditures on the constituent basic headings from Table V.26 by the sum of the corresponding final real expenditures from Table V.38 as follows:

Aggregate 1 (v + w)

$PPP1_A$ $= (E_{va} + E_{wa})/(V6_{va} + V6_{wa}) = (5 + 20)/(64.1 + 274.1) = 0.0739$

$PPP1_B$ $= (E_{vb} + E_{wb})/(V6_{vb} + V6_{wb}) = (110 + 240)/(121.5 + 253.0) = 0.9346$

$PPP1_C$ $= (E_{vc} + E_{wc})/(V6_{vc} + V6_{wc}) = (2000 + 5300)/(65.4 + 256.2) = 22.699$

$PPP1_D$ $= (E_{vd} + E_{wd})/(V6_{vd} + V6_{wd}) = (120 + 180)/(216.5 + 259.6) = 0.6322$

Aggregate 2 (x + y + z)

$PPP1_A$ $= (E_{xa} + E_{ya} + E_{za})/(V6_{xa} + V6_{ya} + V6_{za}) = (15 + 35 + 25)/(198.6 + 497.3 + 323.7) = 0.0736$

$PPP1_B$ $= (E_{xb} + E_{yb} + E_{zb})/(V6_{xb} + V6_{yb} + V6_{zb}) = (300 + 450 + 500)/(257.8 + 507.4 + 647.0) = 0.8851$

$PPP1_C$ $= (E_{xc} + E_{yc} + E_{zc})/(V6_{xc} + V6_{yc} + V6_{zc}) = (3500 + 10000 + 6500)/(136.2 + 355.2 + 233.6) = 27.586$

$PPP1_D$ $= (E_{xd} + E_{yd} + E_{zd})/(V6_{xd} + V6_{yd} + V6_{zd}) = (200 + 250 + 250)/(413.6 + 417.9 + 359.5) = 0.5877$

V.63. The PPPs for aggregate 3 (v + w + x + y + z) – that is, the overall PPPs – have been calculated already. They are the overall PPPs of Table V.39.

ANNEX VI: DIFFERENCES BETWEEN EUROSTAT AND OECD COMPARISONS

Introduction

VI.1.   Eurostat-OECD comparisons are a combination of two comparisons each involving a separate group of countries.[1] One comparison, the Eurostat comparison, covers the EU Member States and EU associated countries[2]. The other comparison, the OECD comparison, covers the non-European OECD Member Countries and a number of European countries that are not members of either the European Union or the OECD. In this annex, countries participating in Eurostat comparisons are called "Eurostat countries" and countries participating in OECD comparisons are called "OECD countries"[3].

VI.2.   Eurostat co-ordinates the collection and validation of data in Eurostat countries and calculates their PPPs and real final expenditures. The OECD does the same for OECD countries. The OECD is also responsible for combining the PPPs and real final expenditures for Eurostat countries with those for OECD countries when it calculates the PPPs and real final expenditures for all countries included in a Eurostat-OECD comparison. Eurostat and the OECD use the same methodology for their comparisons, but there are differences in their approaches. Most of these have already been identified either in the text or in footnotes to the text in the relevant chapters of the manual. This annex provides a summary of the differences between the two comparisons.

Timetable and organisation

VI.3.   Eurostat comparisons are made every year while OECD comparisons are made every three years. This is the principal difference between the two comparisons. It arises because of the different institutional arrangements that exist between the two organisations and their members. Price collections in Eurostat countries[4] are either partially or wholly funded by Eurostat. Price collections in OECD countries are funded by the countries themselves. Data requirements of three-yearly comparisons are less demanding than are those of annual comparisons. By making comparisons every three years, the OECD reduces the financial burden and the response burden on OECD countries. Three-yearly comparisons also allow participants greater flexibility in implementation.

VI.4.   Eurostat and the OECD follow the rolling benchmark approach for their comparisons.[5] The approach involves continuous data collection over a three-year period or cycle. A cycle consists of fifteen surveys: ten price surveys and five other surveys. Depending on the frequency that surveys are conducted, comparisons can be made either every year or every three years. Box VI.1 lists the surveys, their frequency and their organiser. From the Box, it can be seen that OECD countries do not apply the rolling benchmark approach in its entirety. The price surveys for consumer goods and services are spread over three years as they are for Eurostat countries. But the remaining surveys occur only every third year whereas for Eurostat countries they take place every year or, as in the case of the price surveys for capital goods, every other year.

VI.5.   Because of their large number, Eurostat countries are divided into smaller, more manageable country groups for the surveys of consumer prices. One of the countries in the group acts as group leader and it is the group leader who organises the consumer price surveys for the country group. All other surveys are managed centrally by Eurostat. OECD countries are not broken down into country groups. All surveys are co-ordinated by the OECD. It serves as the group leader and as the centre. Because OECD countries are linked to Eurostat countries at the product level, the OECD is also responsible for ensuring that there are sufficient overlaps between the product lists priced by OECD countries and those priced by Eurostat countries.

Expenditures

VI.6.   Eurostat and the OECD use the same classification of final expenditure on GDP. The classification follows the definitions, concepts, classifications and accounting rules of the SNA 93[6] and the ESA 95[7]. Eurostat countries report the details of their final expenditure annually. OECD countries report their detailed expenditures every three years. Both groups of countries experience difficulties providing expenditures at the basic heading level. OECD countries find it particularly difficult to identify the expenditures of non-profit institutions serving households and to break down the expenditures on health and education. When OECD countries report expenditures at an aggregation level above the basic heading level and the OECD is unable to disaggregate these expenditures further[8], the unweighted PPPs for OECD countries are calculated at the aggregation level at which the expenditures are reported and not at the basic heading level.

Box VI.1: Data requirements of Eurostat and OECD comparisons

Data	Survey	Frequency of collection for		Organised by
		Eurostat countries	OECD countries	
Prices	01. Food, drinks and tobacco	Every three years	Every three years	Group leader or OECD
	02. Personal appearance	..	..	..
	03. House and garden	..	..	..
	04. Transport, restaurants and hotels	..	..	..
	05. Services	..	..	..
	06. Furniture and health	..	..	..
	07. Equipment goods	Every two years	..	Eurostat or OECD
	08. Construction projects	..	..	..
	09. Actual and imputed rents[(1)]	Every year	..	..
	10. Compensation of employees	..	..	..
Expenditure weights	11. Final expenditure on GDP	..	..	..
Other	12. Annual average exchange rates	..	..	..
	13. Mid-year resident population	..	..	..
	14. Temporal adjustment factors	..	Every year	..
	15. Spatial adjustment factors	Every six years	Not required	..

[(1)] Countries with small or unrepresentative rent markets provide data on the housing stock instead of prices.

Consumer goods and services

VI.7.   OECD countries observe the same cycle of price surveys as Eurostat countries. But, as OECD comparisons are only made every third year, at the end of the cycle, OECD countries do not adhere strictly to the survey schedule established for Eurostat countries. Both groups of countries conduct two price surveys a year, but OECD countries have greater leeway as to when they collect and report prices. There are no intermediate deadlines for OECD countries within a cycle because the OECD, unlike Eurostat, does not publish survey results. OECD countries report prices at diversely different times and this delays editing. The validation of the various surveys takes considerably longer for OECD countries than it does for Eurostat countries.

VI.8.   OECD countries are not as actively involved in product selection as Eurostat countries. Before each price survey, Eurostat countries first carry out a pre-survey to ascertain how their markets have evolved in the three years since the survey was last held. They then attend a group meeting to finalise the product list that the group leader has drafted based on their replies to the pre-survey questionnaire. OECD countries meet once a year to discuss, among other things, the product lists for forthcoming surveys. There are no pre-surveys beforehand. Instead, using the experience gained from the last time the surveys were conducted, the OECD identifies those basic headings where there is a need to add products that are representative for OECD countries. The specifications for these additional products are developed by the countries and the OECD together. If the products are also representative for Eurostat countries, they are added to Eurostat product lists. Otherwise, they stand alone as "P products" – that is, their code numbers have the single suffix "P".

VI.9.   The product lists for OECD countries consist of the product lists of the three Eurostat country groups plus the list of additional P products. OECD countries are faced with product lists that are much longer than those faced by Eurostat countries, but they have a greater choice of products which improves representativity. To guide OECD countries in their selection of products to be priced, the OECD adds a "P" to the suffixes of some of the Eurostat products. This indicates that either the product has been included on the Eurostat list at the request of the OECD or the product has a generic specification which the OECD feels that OECD countries should at least consider pricing. In general, when selecting products to price, OECD countries are required to give priority to overlap products. To facilitate this, OECD countries are permitted more flexibility when pricing brand and model specifications. Eurostat countries have to price the brands and models specified. Often it is not possible for OECD countries to find these brands or models on their markets.[9] When this happens, OECD countries are allowed to price brands and models that are equivalent to those specified.

VI.10. Eurostat countries report individual prices observations. For the majority of countries, these price observations have been collected in the capital city. Eurostat countries reporting capital city prices have to provide spatial adjustment factors with which to convert their capital city prices to national prices. OECD countries report national average prices, so spatial adjustment factors are not required. Both groups of countries report point-in-time prices, so both have to provide temporal adjustment factors with which to convert the point-in-time prices to annual prices.

VI.11. To enable Eurostat to obtain annual average prices for seasonal food products, Eurostat countries are expected to supply monthly quantity weights in addition to temporal adjustment factors. OECD countries are required to report annual average prices for seasonal food products. It is left to the countries to decide how the averages are derived.

VI.12. Eurostat countries report their individual price observations by means of an electronic reporting form that is programmed to edit the price observations entered on it. This enables the intra-country editing of the price observations to be reviewed by the country and by the group leader. OECD countries report national average prices on the understanding that they edit the price observations on which the averages are based before reporting them. OECD countries have a much simpler electronic reporting form to complete than Eurostat countries.

VI.13. To edit the national average prices reported by OECD countries, the OECD uses a simplified version of the Quaranta table that Eurostat and the group leaders employ to edit the average survey prices of Eurostat countries. The principal difference between the two versions is that the variation coefficients of the Eurostat version are omitted from the OECD version.

Rents

VI.14. Eurostat countries complete the rent survey every year. OECD countries complete the survey every three years. Both groups of countries report actual and imputed rents that are national annual averages.

VI.15. The OECD reporting form for actual and imputed rents covers a longer list of dwellings than the Eurostat reporting form. This is to accommodate the various circumstances of OECD countries. The definitions of these additional dwellings specify numbers of rooms or numbers of bedrooms. They do not specify the age of dwelling or the useable floor space as do the Eurostat definitions.

VI.16. The OECD reporting form on the quantity and quality of the dwelling stock does not make a distinction between houses and apartments as does the Eurostat reporting form.

Government services

Vi.17. Eurostat countries provide data on the compensation of employees paid by general government to a selection of occupations in defence, collective services other than defence, health and education every year. OECD countries provide such data once every three years. Both groups of countries report compensation of employees for the same list of occupations and both groups report compensation of employees that are national annual averages.

Vi.18. The majority of OECD countries do not determine the compensation of employees paid for a selected occupation as recommended in Chapter 5 of the manual – that is, by first identifying the modal category for an occupation within a grade and then establishing the step within the model category according to the seniority specified for the occupation. (Many Eurostat countries also experience difficulties applying the recommended approach.) In some countries, government salary scales as described in Chapter 5 do not exist, while in others, seniority is irrelevant as progression through grades, categories and steps depends on performance rather than years of service. Often the data required are extracted from government payroll statistics.

VI.19. In addition to the compensation of employees paid to each occupation, Eurostat and OECD countries provide the actual hours worked by employees in each occupation. Eurostat uses this information to standardise the working hours of occupations in defence, collective services other than defence, and health. The OECD only uses it to standardise the working hours of occupations in collective services other than defence. Neither Eurostat nor the OECD standardise the working hours of occupations in education.

VI.20. Unlike Eurostat countries, OECD countries do not provide the percentage shares of selected occupations within their basic headings and their PPPs for these basic headings are unweighted. Such weights are difficult to obtain and are considered unreliable. Lack of detailed expenditure data also means that the PPPs for education for OECD countries are not broken down by level of education.

Capital goods

VI.21. Eurostat countries survey the prices of capital goods every two years. OECD countries survey them every three years. Both groups of countries follow the same approach.

VI.22. Equipment good prices are collected through specification pricing. Eurostat countries price the brands and models specified, but OECD countries generally price products that are equivalent to those specified.[10] The basis of the price collections in the two groups of countries is the product list drawn up by Eurostat. There is also a supplemen-

tary product list for OECD countries that has been drawn up by the OECD. It contains products specifically representative of OECD countries.

VI.23. Construction prices are obtained by countries pricing a set of standard construction projects each of which is defined in a bill of quantities. The OECD set of projects is larger than the Eurostat set. It contains four additional projects that improve its representativity for OECD countries. These are a North American single-family house, a Japanese single-family house, an Australasian single-family house and a Japanese factory.

VI.24. Eurostat countries report national average prices for capital goods that refer to April of the survey year. The prices are net of non-deductible taxes and data on non-deductible taxes is provided later as part of a separate exercise. OECD countries also report national average prices for capital goods. But the prices refer to July of the survey year and include non-deductible taxes.

VI.25. When the PPPs for capital goods are calculated, the representativity of the products priced is taken into account for Eurostat countries, but not for OECD countries.

Calculation and aggregation of PPPs

VI.26. Eurostat and the OECD use the Èltetö-Köves-Szulc or EKS method to calculate and aggregate PPPs. Both apply the same reference PPPs for basic headings for which no prices are collected. The EKS PPPs and real final expenditures are the official results for Eurostat comparisons and for OECD comparisons. The results of the two comparisons are "fixed" when they are combined in a Eurostat-OECD comparison. The Geary Khamis or GK method is also used to aggregate PPPs for Eurostat-OECD comparisons. The GK results are secondary to the EKS results and only the indices that assist the analysis of price and volume structures are published.

Presentation of results

VI.27. The results of Eurostat-OECD comparisons are published jointly. To do this, Eurostat and the OECD have adopted a standard set of tables covering the same analytical categories, the same countries and the same country groups. But, for their users, each has retained their own numéraire and reference country. The publication has two parts: one presenting the results with the European Union (EU 25) as reference country and the euro as numéraire; the other presenting the results with the OECD (OECD 30) as reference country and the US dollar as numéraire.

VI.28. Eurostat also disseminates results for Eurostat countries through its public database. The database covers more analytical categories than the joint publication. The OECD does not disseminate detailed results separately either for OECD countries or for the OECD as a whole.

Updating PPPs for GDP between benchmark calculations

VI.29. As the OECD makes benchmark calculations every three years, it estimates PPPs for GDP for the years between benchmark calculations by global extrapolation – that is, extrapolation at the level of GDP. Eurostat, following the rolling benchmark approach, makes benchmark calculations every year. Even so, seven months before the new benchmark calculation is first made, it makes a "nowcast". This involves the extrapolation of PPPs at aggregation levels below GDP and the aggregation of the extrapolated PPPs by the EKS method to obtain PPPs for GDP.

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[1]   Box 2.3 of Chapter 2 lists the countries participating in the 2005 Eurostat-OECD comparison.

[2]   The EU Candidate Countries – Bulgaria, Croatia, Romania and Turkey – and the EFTA countries - Iceland, Norway and Switzerland.

[3]   Box 2.4 of Chapter 2 shows the OECD to be responsible for two groups of countries. The first group has the OECD as group leader. The second group has Slovenia as group leader. "OECD countries" refers to countries in the first group: Australia, Canada, Israel, Japan, Korea, Mexico, New Zealand, Russian Federation and United States. Countries in the second group are a sub-group of Eurostat's Central group and, although overseen by the OECD, are Eurostat countries in all but name.

[4]   Other than the EFTA countries.

[5]   The rolling benchmark approach is described in Box 2.2 of Chapter 2.

[6]   *System of National Accounts 1993,* Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank, 1993.

[7]   *European System of Accounts 1995,* Eurostat, Luxembourg, 1996.

[8]   See paragraphs 3.45 and 3.46 of Chapter 3.

[9]   In general, markets are less homogeneous among OECD countries than they are among Eurostat countries. More specifically, many of the brands specified are European brands that are not available in OECD countries or, if available, are not representative.

[10]   For the reasons given in footnote 9.

ANNEX VII: GLOSSARY OF TERMS AND ABBREVIATIONS

Actual collective consumption	The final consumption expenditure of general government on collective services. A measure of the services that general government provides to the community as a whole and which households consume collectively. Also referred to as "collective consumption expenditure".
Actual individual consumption	The total value of the individual consumption expenditures by households, NPISHs and general government. A measure of the individual goods and services that households actually consume as opposed to what they actually purchase.
Additivity	The values of the national accounts aggregates of countries participating in a comparison are equal to the sum of the values of their components when both aggregates and components are valued at current national prices. Additivity requires this identity to be preserved when the values of the aggregates and their components are valued at international prices. An aggregation method is additive if, for each country being compared, it provides real values for basic headings that sum to the real values of the aggregates of which they are components. An additive aggregation method provides volumes that satisfy the average test for volumes.
Aggregate	A set of transactions relating to a specified flow of goods and services in a given period, such as the total purchases made by resident households on consumer goods and services or the total expenditure by government on collective services or the total value of gross fixed capital formation. The term "aggregate" is also used to mean the value of the specified set of transactions.
Aggregation	The procedure of computing PPPs above the basic heading level. The process of weighting, summing and averaging basic heading PPPs to obtain PPPs for each level of aggregation up to and including GDP.
Analytical categories	The main aggregates, the expenditure categories, the expenditure groups and expenditure classes for which the results of a comparison are published.
Asterisk (*)	The indicator used in Eurostat and OECD comparisons to identify a representative product. See also "representativity indicators".
Asterisk product	A representative product so called because, when reporting prices, countries participating in Eurostat and OECD comparisons assign asterisks (*) to identify which of the products they have priced are representative. See also "representativity indicators".
Average test for PPPs	A test that requires the PPP for an aggregate to lie between the smallest and the largest of its component PPPs.
Average test for volumes	A test that requires the per capita volume index for an aggregate to lie between the smallest and the largest of its component per capita volume indices.
Balance of exports and imports	The f.o.b. value of exports of goods and services less the f.o.b. value of imports of goods and services. When no distinction between goods and services is required, it may be defined as the f.o.b. value of exports of goods and services less the c.i.f. value of imports of goods and services.
Base-country invariance	The property whereby the relativities between the PPPs, the price level indices and the

volume indices of countries are not affected by either the choice of currency as numéraire or the choice of reference country.

Basic heading	"The lowest level of aggregation of items in the GDP breakdown for which parities are calculated." In theory, a basic heading is defined as a group of similar well-defined goods or services. In practice, it is defined by the lowest level of final expenditure for which explicit expenditure weights can be estimated. Thus, an actual basic heading can cover a broader range of products than is theoretically desirable. Basic headings are the building blocks of a comparison. It is at the level of the basic heading that expenditures are defined, products selected, prices collected, prices edited and PPPs first calculated and averaged.
Basic price	The amount received by the producer from the purchaser for a unit of good or service produced as output. It includes subsidies on products and other taxes on production. It excludes taxes on products, other subsidies on production, supplier's retail and wholesale margins and separately invoiced transport and insurance charges. Basic prices are the prices most relevant for decision-making by suppliers (producers).
Basket	A term often used for the common list of well-defined goods and services from which countries participating in a comparison make a selection of products to price for the purpose of compiling PPPs. Also referred to as "product list" and "item list".
Bias	A systematic error in a PPP or volume index. Bias can arise for a number of reasons including failure to respect either representativity or comparability or consistency, the price collection and measurement procedures followed, and the calculation and aggregation formula employed.
Bilateral comparison	See "binary comparison".
Bill of quantities	The product specification that details the operations required to build a standard construction project. It covers the costs of inputs (labour, materials and plant), subcontracting, preliminaries and overheads. It also covers contractor's profit or loss, architect's and engineer's fees and non-deductible taxes. A bill of quantities is structured to provide a weighted price for each component specified which, when summed across components, provide the purchasers' price for the standard construction project described.
Binary comparison	A price or volume comparison between two countries that draws upon data only for those two countries. Also referred to as a "bilateral comparison".
Binary PPP	A PPP between two countries calculated using only the prices and weights for those two countries.
Brand and model specification	See "product specification".
Bridge country	A country that provides the link or bridge between two separate comparisons involving different groups of countries. The bridge country participates in both comparisons and by doing so enables the countries in one comparison to be compared with the countries in the other comparison and vice versa.

Change in inventories	The acquisition, less disposals, of stocks of raw materials, semi-finished goods and finished goods that are held by producer units prior to their being further processed or sold or otherwise used. Inventories also cover all raw materials and goods stored by government as strategic reserves. Semi-finished goods include work-in-progress - that is, goods and services that are only partially completed and whose production process will be continued by the same producer in a period following the accounting period. Work-in-progress is particularly important for production processes with long gestation periods, such as the construction of large-scale civil engineering works, the manufacture of aeroplanes and ships, and reforestation. Also covered by work-in-progress is the natural growth prior to harvest of agricultural crops and the natural growth in livestock raised for slaughter.
Characteristicity	The property that requires transitive multilateral comparisons between members of a group of countries to retain the essential features of the intransitive binary comparisons that existed between them before transitivity. A transitive multilateral comparison between a pair of countries is influenced by the price and quantity data of all other participating countries. Characteristicity requires that the impact of these influences should be kept to a minimum when they are introduced into the intransitive binary comparison. In other words, the multilateral PPP between two countries should deviate as little as possible from their binary PPP.
Characteristics	The physical and economic attributes of a product that serve to identify it and enable it to be located under some heading of a product classification. The technical parameters and price determining properties of a product listed in a product specification.
C.i.f. price	*Cost, insurance and freight price*. The price of a good delivered at the customs frontier of the importing country or the price of a service delivered to a resident. It includes any insurance and freight charges incurred to that point. It excludes any import duties or other taxes on imports and trade and transport margins within the importing country.
Circularity	See "transitivity".
COFOG	*Classification of the functions of government*. COFOG allows a range of transactions by general government - including outlays on final consumption expenditure, intermediate consumption, gross fixed capital formation and capital and current transfers – to be classified by function or purpose. A major use of COFOG is to identify which final consumption expenditures of general government benefit households individually and which benefit households collectively.
COICOP	*Classification of individual consumption according to purpose*. COICOP classifies the individual consumption expenditures of three institutional sectors - households, NPISHs and general government – by the ends that they wish to achieve through these expenditures. Individual consumption expenditures are those which are made for the benefit of individual households. All final consumption expenditures by households and NPISHs are defined as individual, but only the final consumption expenditures by general government on individual services are treated as individual.
Collective consumption expenditure	See "actual collective consumption".

Collective services	Services provided by general government that benefit the community as a whole. Such services include general public services, defence, public order and safety, economic affairs, environment protection, and housing and community amenities. They also include the overall policy-making, planning, budgetary, co-ordinating responsibilities of government ministries overseeing individual services and government research and development for individual services. These activities cannot be identified with specific individual households and are considered to benefit households collectively.
Commensurability	The property that requires the results of a comparison to be invariant to changes in units of measurement for prices and quantities.
Commodities	See "products".
Comparability	The requirement that countries price products that are identical or, if not identical, equivalent. Products are said to be comparable if they have identical or equivalent physical and economic characteristics – that is, if they have the same or similar technical parameters and price determining properties. In this context, equivalence or similarity between products is defined as meeting the same needs with equal efficiency so that purchasers are indifferent between them and are not prepared to pay more for one than for the other. The pricing of comparable products ensures that the differences in prices between countries for a product reflect "pure" price differences and are not affected by differences in quality. If the requirement is not respected, differences in quality will be mistaken for price differences leading to an underestimation or overestimation of price levels and a corresponding overestimation and underestimation of volume levels.
Comparative price levels	These are the ratios of PPPs to exchange rates. They provide a measure of the differences in price levels between countries by indicating for a given basic heading or aggregate the number of units of the common currency needed to buy the same volume of the basic heading or aggregate in each country. At the level of GDP they provide a measure of the differences in the general price levels of countries.
Comparison(s)	One of two terms used in the manual as a contraction of "international price and volume comparison(s) of GDP". The other term is "international comparison(s)".
Comparison resistant	A term first used to describe non-market services which are difficult to compare across countries because: they have no economically-significant prices with which to value outputs, their units of output cannot be otherwise defined and measured, the institutional arrangements for their provision and the conditions of payment differ from country to country, and their quality varies between countries but the differences cannot be identified and quantified. Increasingly, the term is being used to describe capital goods and many market services whose complexity, variation and country specificity make it difficult for them to be price comparably across countries.
Compensation of employees	All payments in cash and in kind made by employers to employees in return for work done by them during the accounting period. These payments comprise: gross wages and salaries in cash and in kind, employers' actual social contributions, and imputed social contributions.
Component	A subset of goods and/or services that make up some defined aggregate.

Consistency	The requirement that the prices collected by countries are consistent with the prices underlying their estimates of final expenditure on GDP. In most cases this means that they should be national annual purchasers' prices. As the basis of a comparison is the identity – expenditure = price x volume - and volumes are obtained by dividing expenditures by prices, using prices that do not correspond to those used to derive the expenditures will result in the volumes being either underestimated or overestimated.
Consumption of fixed capital	The reduction in the value of the fixed assets used in production during the accounting period resulting from physical deterioration, normal obsolescence or normal accidental damage.
COPNI	*Classification of the purposes of non-profit institutions serving households*. COPNI allows outlays by NPISHs, including outlays on final consumption expenditure, to be classified by function or purpose. By convention, all final consumption expenditures of NPISHs are treated as individual consumption. A major use of COPNI is to ensure that the individual consumption expenditures of NPISHs are classified consistently with those of households and general government.
CPA	*The standard classification of products by activity within the European Economic Community*. CPA classifies products by their physical characteristics as goods or by their intrinsic nature as services and by originating activity. Originating activities are those defined by NACE.
CPD method	*Country-product-dummy method*. The multilateral method used by the ICP to obtain transitive PPPs at the basic heading level through regression analysis. It treats the calculation of PPPs as a matter of statistical inference, an estimation problem rather than an index number problem. The underlying hypothesis is that, apart from random disturbance, the PPPs for individual products within a basic heading are all constant between any given pair of countries. In other words, it is assumed that the pattern of relative prices of the different products within a given basic heading is the same in all countries. It is also assumed that each country has its own overall price level for the basic heading and it is that which fixes the levels of absolute prices of the products in the basic heading for the country. By treating the prices observed in the countries for the basic heading as random samples, the PPPs between each pair of countries and the common pattern of relative prices can be estimated using classical least square methods. The method allows sampling errors to be estimated for the PPPs.
Deductible VAT	The value added tax payable on purchases of goods and services intended for intermediate consumption, gross fixed capital formation or for resale which producers are permitted to deduct from their own VAT liability to the government in respect of VAT invoiced to their customers. See also "VAT" and "non-deductible VAT".
Deflation	The division of the current value of some aggregate by a price index - described as a "deflator" - in order to value its quantities at the prices of the price reference-period.
Direct price comparison	A price comparison between two or more countries that is made by comparing the prices for a representative sample of comparable products. PPPs are generally derived from direct price comparisons. Also referred to as the "price approach".
Direct volume comparison	A volume comparison between two or more countries that is made by comparing the volumes (or quantities) of a representative sample of comparable products. Volume comparisons are not generally made directly, but indirectly as shown under "indirect volume comparison". Also referred to as the "quantity approach".
Discount	A deduction from the list or offer price of a good or a service that is available to specific customers under specific conditions. Examples include cash discounts, prompt payment

discounts, volume discounts, trade discounts and advertising discounts.

Durable good	A good that can be used repeatedly or continuously over a period of considerably more than one year and has a substantially higher purchasers' price than semi-durable goods and non-durable goods.

Economically significant price	A price that has a significant influence on the amounts producers are willing to supply and on the amounts purchasers wish to buy. This is the basic price for producers and the purchasers' price for purchasers.

Economic territory	The geographical territory of a country plus any territorial enclaves in the rest of the world. By convention, it includes embassies, military bases and ships and aircraft abroad.

ECP	*European comparison programme*. The ICP regional programme for Europe carried out under the auspices of the United Nations Economic Commission for Europe. It is organised by Eurostat, the OECD, the Interstate Statistical Committee of the Commonwealth of Independent States and the State Committee of the Russian Federation on Statistics.

EKS method	*Èltetö-Köves-Szulc method*. The method used by Eurostat and the OECD to calculate PPPs for basic headings and to aggregate basic heading PPPs to obtain PPPs for each level of aggregation up to and including GDP. Strictly speaking, the EKS is a procedure whereby any set of intransitive binary index numbers are made transitive while respecting characteristicity. The procedure is independent of the method used to calculate the intransitive binary indices. But in the manual, "EKS" covers both the way the intransitive binary PPPs are calculated and the procedure to make them transitive and multilateral. Basically, the method used to obtain the intransitive binary PPPs for a basic heading or aggregate involves calculating first a matrix of Laspeyres type PPPs, then a matrix of Paasche type PPP and finally, by taking the geometric mean of the two, a matrix of Fisher type PPPs. The Fisher type PPPs are made transitive and multilateral by applying the EKS procedure which involves replacing the Fisher type PPP between each pair of countries by the geometric mean of itself squared and all the corresponding indirect Fisher type PPPs between the pair obtained using the other countries as bridges. The resulting EKS PPPs provide real final expenditures that are not additive, nor subject to the Gerschenkron effect. Within the context of Eurostat-OECD comparisons, EKS results are considered to be better suited to comparisons across countries of the price and volume levels of individual aggregates. EKS results are the official results of Eurostat-OECD comparisons. See also "Laspeyres type PPP" and "Paasche type PPP" because their formulation depends on whether they are being used to calculate basic heading PPPs or to aggregate basic heading PPPs.

EKS-S method	*Èltetö-Köves-Szulc-Sergeev method*. A variant of the EKS method for calculating PPPs for basic headings that, under certain circumstances, is better able to handle the asymmetry in the number of representative products priced by countries. With the EKS method, the Fisher type index is calculated as the geometric mean between two PPPs: the PPPs based on products representative in the first country and the PPPs based on products representative in the second country. Products representative in both countries are used for both PPPs. With the EKS-S method, the "Fisher type index" between two countries is calculated as the geometric mean of three PPPs: the PPPs based on products representative in both countries, the PPPs based on products representative in the first country but not the second, and the PPPs based on products representative in the second country but not the first. Symmetry is obtained by giving equal weight in the calculation to the two PPPs that are based on products representative of only one country.

Employers' actual social contributions	Payments actually made by employers to social security funds, insurance enterprises or autonomous pension funds for the benefit of their employees.
Equi-representativity	"The property whereby the composition of the item list for a basic heading is such that each country is able to price that number of representative items which is commensurate with the heterogeneity of products and price levels covered by the basic heading and its expenditure on the basic heading." The object is to obtain PPPs that are both unbiased and reliable. See "representativity".
Error	The difference between the observed value of a PPP or volume index and its "true" value. Errors maybe random or systematic. Random errors are generally referred to as "errors". Systematic errors are called "biases".
ESA 95	*European system of accounts 1995.* A version of the SNA 93 appropriate to the circumstances and needs of the European Union. The SNA 93 provides guidelines and makes recommendations for global implementation. The ESA 95 specifies how these guidelines and recommendations should be interpreted and implemented by EU Member States. It has legal status in the European Union. See also "SNA 93".
Expenditure categories	The level of aggregation between main aggregates and expenditure groups.
Expenditure classes	The level of aggregation between expenditure groups and basic headings.
Expenditure groups	The level of aggregation between expenditure categories and expenditure classes.
Expenditure weights	"The shares of expenditure components in current-price GDP."
Factor reversal test	A test that requires the product of a price index and a quantity index, when both indexes are of the same type, to be equal to the value index. For example, Fisher price and quantity indexes satisfy this test. Laspeyres and Paasche indexes do not.
Final consumption expenditure	The expenditure on goods and services used up by individual households or the community to satisfy their individual or collective needs or wants.
Final consumption expenditure of government	See "government final consumption expenditure".
Final consumption expenditure of households	See "individual consumption expenditure by households".
Final consumption expenditure of NPISHs	See "individual consumption expenditure by NPISHs".
Final expenditure on GDP	The total value of the final consumption expenditures of households, NPISHs and general government plus gross capital formation plus the balance of exports and imports.

Fisher type PPP	The PPP for a basic heading or an aggregate between two countries that is defined as the geometric mean of the Laspeyres type PPP and the Paasche type PPP for the basic heading or the aggregate. See also "Laspeyres type PPP" and "Paasche type PPP" because their formulation depends on whether they are being used to calculate basic heading PPPs or to aggregate basic heading PPPs.
FISIM	*Financial intermediation services indirectly measured*. An indirect measure of the value of the financial intermediation services that financial institutions provide clients but for which they do not charge explicitly.
Fixity	"When results are calculated originally for a group of countries and then later the results are calculated for a wider group of countries, the PPPs between the original group of countries shall nevertheless be preserved." The convention whereby the price and volume relativities between a group of countries that were established in a comparison covering just that group of countries remain unchanged, or fixed, when the countries of the group are included in comparisons with a wider group of countries. For example, the price and volume relativities for EU Member States established by Eurostat remain unchanged when the EU Member States are included in a comparison covering OECD Member Countries. If fixity was not observed, there would be two sets of results for EU Member States. The two set would not necessarily be in agreement because the relative position of countries can change as the composition of the group of countries being compared changes. Fixity ensures that Eurostat, the OECD and participating countries have only one set of results to explain to users.
F.o.b. price	*Free on board price*. The price of a good delivered at the customs frontier of the exporting country. It includes the freight and insurance charges incurred to that point and any exports duties or other taxes on exports levied by the exporting country.
GDP	*Gross domestic product*. It can be estimated using three alternative approaches which, in theory, yield the same result, namely: the production approach – which sums all the value added generated by the country's resident institutional sectors during the accounting period; the expenditure approach – which sums all the final expenditures incurred by the country's resident institutional sectors during the accounting period; and the income approach – which sums all the factor incomes paid by the country's resident institutional sectors engaged in domestic production during the accounting period.
General government	The institutional sector that consists of central, regional, state and local government units together with social security funds imposed and controlled by those units. It includes non-profit institutions engaged in non-market production that are controlled and mainly financed by government units or social security funds. Also referred to as "government".
Generic specification	See "product specification".
Gerschenkron effect	Applicable only to aggregation methods that use either a reference price structure - that is, each country's quantities are valued by a uniform set of prices - or a reference volume structure – that is, each country's prices are used to value a uniform set of quantities - to compare countries. For methods employing a reference price structure, a country's share of total GDP - that is, the total for the group of countries being compared - will rise as the reference price structure becomes less characteristic of its own price structure. For methods employing a reference volume structure, a country's share of total GDP will fall as the reference volume structure becomes less characteristic of its own volume structure. The Gerschenkron effect arises because of the negative correlation between prices and volumes.

GFCE	*Government final consumption expenditure.* The actual and imputed final consumption expenditure incurred by general government on individual goods and services and collective services. The total value of individual consumption expenditure and collective consumption expenditure by general government. Also referred to as "final consumption expenditure of government".
GFCF	*Gross fixed capital formation.* The total value of acquisitions less disposals of fixed assets by resident institutional units during the accounting period plus the additions to the value of non-produced assets realised by the productive activity of resident institutional units.
GK method	*Geary-Khamis method.* An average price method first used by the ICP to compute PPPs and real final expenditures above the basic heading. It entails valuing a matrix of quantities using a vector of international prices. The vector is obtained by averaging national prices across participating countries after they have been converted to a common currency with PPPs and weighted by quantities. The PPPs are obtained by averaging within participating countries the ratios of national and international prices weighted by expenditure. The international prices and the PPPs are defined by a system of interrelated linear equations that require solving simultaneously. The GK method produces PPPs that are transitive and real final expenditures that are additive. It has a number of disadvantages. One is that a change in the composition of the group can change significantly the international prices as well as the relationships between countries. Another is that the real final expenditures are subject to the Gerschenkron effect which can be large. Within the context of Eurostat-OECD comparisons, GK results are considered to be better suited to the analysis of price and volume structures across countries. Eurostat and the OECD published in their joint publication an annex with a selection of GK results chosen specifically for such structural analysis.
Goods	Physical objects for which a demand exists, over which ownership rights can be established and whose ownership can be transferred from one institutional unit to another by engaging in transactions on the market. They are in demand because they may be used to satisfy the needs or wants of households or the community or used to produce other goods or services.
Gross capital formation	The total value of gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables.
Gross operating surplus	The surplus or deficit accruing from production before taking any account of: (a) consumption of fixed capital; (b) any interest, rent or similar charges payable on financial or tangible non-produced assets borrowed or rented by the enterprise; or (c) any interest, rent or similar charges receivable on financial or tangible non-produced assets owned by the enterprise.
Gross value added (at basic prices)	The value of output at basic prices less the value of intermediate consumption at purchasers' prices. It is a measure of the contribution to GDP made by an individual producer, industry or sector.
Gross wages and salaries	The wages and salaries in cash and in kind paid by enterprises to employees before the deduction of taxes and social contributions payable by employees.
Household	A small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly food and housing. A household can consist of only one person.
Household final consumption	See "individual consumption expenditure by households".

expenditure

ICP	*International comparison project* prior to 1989 and *International comparison programme* since 1989. It started as a research project in the 1960s with the ultimate goal of establishing a regular programme of worldwide PPP comparisons of GDP. Comparisons were organised for 1970, 1973, 1975, 1980, 1985 and 1993. They covered 10, 16, 34, 60, 64 and 83 countries respectively. Responsibility for these comparisons was shared by the United Nations Statistics Division and the University of Pennsylvania. The World Bank is the current global co-ordinator of the ICP and a comparison covering around 150 countries is being organised for 2005.
Imputed expenditure	Some transactions which it is desirable to include in GDP do not take place in money terms and so cannot be measured directly. Expenditures on these non-monetary transactions are obtained by imputing a value to them. The values to be imputed are defined by national accounting conventions. These vary from case to case and are described in the SNA 93 and the ESA 95.
Imputed rents	See "owner-occupied housing".
Imputed social contributions	The imputations that need to be made when employers provide social benefits themselves directly to their employees, former employees or dependents out of their own resources without involving an insurance enterprise or autonomous pension fund, and without creating a special fund or segregated reserve for the purpose.
Indirect comparison	A price or volume comparison between two countries made through a third country. For example, in the case of countries A, B and C, the PPP between A and C is obtained by dividing the PPP between A and B by the PPP between C and B as follows: $PPP_{A/C} = PPP_{A/B} / PPP_{C/B}$.
Indirect volume comparison	A volume comparison between two countries made by dividing the expenditure ratio by the price ratio. The indirect volume comparison between country A and country B for product I is $(P_{IA}Q_{IA} / P_{IB}Q_{IB}) / P_{IA}/P_{IB} = Q_{IA} / Q_{IB}$ where the P's are the prices and the Q's the volumes (quantities) of the product. Volume comparisons are usually made indirectly.
Individual consumption expenditure by government	The actual and imputed final consumption expenditure incurred by general government on individual goods and services. Also referred to as "social transfers in kind".
Individual consumption expenditure by households	The actual and imputed final consumption expenditure incurred by households on individual goods and services. It also includes expenditure on individual goods and services sold at prices that are not economically significant. By definition, all final consumption expenditures of households are for the benefit of individual households and are individual. Also referred to as "final consumption expenditure of households" and "household final consumption expenditure".
Individual consumption expenditure by NPISHs	The actual and imputed final consumption expenditure incurred by NPISHs on individual goods and services. In practice, most final consumption expenditures of NPISHs are individual in nature and so, for simplicity, all final consumption expenditures of NPISHs are treated by convention as individual. Also referred to as "final consumption expenditure of NPISHs" and "social transfers in kind".
Individual good or service	A consumption good or service acquired by a household and used to satisfy the needs and wants of members of that household.

Individual services	A term used to describe the services (and goods) provided to individual households by NPISHs and general government. Such services include housing, health, recreation and culture, education and social protection. They do not include the overall policy-making, planning, budgetary, co-ordinating responsibilities of government ministries overseeing individual services. Nor do they include government research and development for individual services. These activities cannot be identified with specific individual households and are considered to benefit households collectively. They are classified under collective services.
Input price approach	The approach used to obtain PPPs for non-market services. Because there are no economically significant prices with which to value the outputs of these services, national accountants follow the convention of estimating the expenditures on non-market services by summing the costs of the inputs required to produce them. PPPs for non-market services are calculated with input prices as these are the prices that are consistent with the prices underlying the estimated expenditures.
Institutional sectors	The SNA 93 and the ESA 95 identify five institutional sectors: non-financial corporations, financial corporations, general government, households and NPISHs.
Intermediate consumption	The value of the goods and services, other than fixed assets, that are used or consumed as inputs by a process of production.
International comparison(s)	One of two terms used in the manual as a contraction of "international price and volume comparison(s) of GDP". The other term is "comparison(s)".
International prices	A term used in association with additive aggregation methods. In the course of expressing the expenditures on basic headings in a common currency, additive aggregation methods value the expenditures at international prices, where an international price for a basic heading is defined as the average of the national prices for the basic heading prevailing in participating countries. The average may be weighted or unweighted, PPP adjusted or unadjusted. It may be an average of prices or an average of price structures. In the GK method, for example, the average is defined as a quantity-weighted arithmetic average of the national prices adjusted by the global PPPs across all countries.
ISCED-97	*International standard classification of education 1997*. The classification used in the collection, compilation and presentation of national and international education statistics and indicators. It covers all organised and sustained learning activities for infants, children, youth and adults including those with special needs.
ISCO-88	*International standard classification of occupations 1988*. ISCO-88 classifies occupations according to two main concepts: the kind of work done - that is, the job; and the ability to carry out the tasks and duties of the job - that is, the skill.
Item	"A good or service precisely defined for use in price observation." A good or service defined by an item specification and included on an item list. Countries select the items they price from among the items included on the item list. Also referred to as "product".
Item list	See "basket". Also referred to as "product list".
Item specification	See "product specification".

Laspeyres type PPP	A PPP for a basic heading or an aggregate between two countries, country B and country A, where the reference country is country A and the weights are those of country A. At the basic heading level, the PPP is defined as a quasi-weighted geometric average of the price relatives between country B and country A for the products representative of country A. At an aggregate level, the PPP is defined as the weighted arithmetic average of the PPPs between country B and country A for the basic headings covered by the aggregate with the expenditure shares of country A being used as weights
List prices	See "offer prices".
Main aggregates	The level of aggregation immediately below GDP. There are seven main aggregates of which the most important are individual consumption expenditure by households, individual consumption expenditure by government, collective consumption expenditure by government and gross fixed capital formation.
Market price	The amount of money a willing buyer pays to acquire a good or service from a willing seller. The actual price for a transaction agreed on by the transactors. The net price inclusive of all discounts, surcharges and rebates applied to the transaction. From the seller's point of view the market price is the basic price; from the buyer's point of view the market price is the purchasers' price. Also referred to as "transaction price".
Matched products or models method	The pricing of identical products or models across countries to ensure that the price differences observed are not affected by differences in quality. The object is to price to constant quality. Price differences for perfectly matched products are "pure" price differences. See also "specification pricing".
Mistake	"A use of incorrect basic information or inappropriate application of the calculation procedure."
Multilateral comparison	A price or volume comparison of more than two countries simultaneously that produces consistent relations among all pairs of countries - that is, one that satisfies the transitivity requirement.
NACE	*Nomenclature générale des activités économiques dans les Communautés européennes.* The acronym for the *General industrial classification of economic activities within the European Communities.* NACE allows enterprises and establishments to be classified according to economic activity based on the class of goods produced or services rendered.
National annual price	A price that has been averaged both over all localities of a country so as to take account of regional variations in prices and over the days, weeks, months or quarters of the reference year so as to allow for seasonal variations in prices as well as general inflation and changes in price structures.
National expenditures	National final expenditures on GDP that are valued at national price levels and expressed in national currencies.
National final expenditures	See "national expenditures".
Net purchases abroad	Purchases by resident households outside the economic territory of the country less purchases by non-residential households in the economic territory of the country.

Nominal final expenditures	National final expenditures on GDP that have been converted to a common currency with exchange rates. Expenditures so converted remain valued at national price levels and reflect both volume and price differences between countries. Also referred to as "nominal values".
Nominal values	See "nominal final expenditures".
Non-deductible VAT	The value added tax payable by purchasers that is not deductible from their own VAT liability, if any. See also "VAT" and "deductible VAT".
Non-durable good	A good that can only be used once or that has a lifetime of considerably less than one year.
Non-market service	A service that is provided free or at a price that is not economically significant to households by NPISHs and/or by general government.
Non-observed economy	Activities that are hidden because they are illegal or because they are legal but carried out clandestinely or because they are undertaken by households for their own use. Also activities that are missed because of deficiencies in the statistical system. Such deficiencies include out-of-date survey registers, surveys having too high reporting thresholds or high rates of non-response, poor survey editing procedures, no surveying of informal activities such as street trading, etc.
Non-profit institutions	Legal or social entities created for the purpose of producing goods and services whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them.
NPISHs	*Non-profit institutions serving households.* Non-profit institutions which are not predominantly financed and controlled by government, whose main resources are voluntary contributions by households and which provide goods or services to households free or at prices that are not economically significant.
Numéraire	A term used for the currency unit selected to be the common currency in which PPPs and real and nominal final expenditures are expressed. The numéraire may be an actual currency unit such as the Euro and the US dollar or an "artificial" currency unit such as the PPS and the OECD dollar.
Observation	An individual price, or one of a number of individual prices, collected for an item at an outlet.
OECD dollar	The name given by users to the artificial currency unit in which the PPPs and real final expenditures for the OECD 30 are expressed – namely, "US dollars at average OECD price levels". "US dollars at average OECD price levels" are US dollars that have the same purchasing power over the whole of the OECD 30. Their purchasing power is a weighted average of the purchasing power of the national currencies of OECD Member Countries. As such they reflect the average price level in the OECD 30 or, more precisely, the weighted average of the price levels of Member Countries. "US dollars at average OECD price levels" or "OECD dollars" are defined by equating the total real final expenditure of the OECD 30 on a specific basic heading, aggregate or analytical category to the total nominal final expenditure of the OECD 30 on the same basic heading, aggregate or analytical category.
Offer prices	The prices that sellers display as the prices at which they are prepared to sell their products. The prices of products as quoted in the seller's price list, catalogue, internet site,

advertisements, etc. They are not necessarily transaction prices. Depending on the country and/or the product, they may or may not include delivery and installation costs, VAT and other indirect taxes on products, discounts, surcharges and rebates, invoiced service charges and voluntary gratuities. Also referred to as "list prices".

Other subsidies on production	See "subsidies on production".

Other taxes on production	See "taxes on production".

Outlet	A shop, market, service establishment, internet site, mail order service or other place from where goods and/or services can be purchased and from where the purchasers' or list prices of the products sold can be obtained.

Outlier	A term that is generally used to describe any extreme value in a set of survey data. Can also mean an extreme value that has been verified as being correct.

Overlap products	Products that appear on the product lists of two or more separate groups of countries for the purpose of combining the groups in a single multilateral comparison. The use of overlap products is an alternative to linking groups of countries through bridge countries.

Owner-occupied housing	Dwellings owned by the households that live in them. Owner-occupiers use the dwellings to produce housing services for themselves. The imputed rents of these housing services should be valued at the estimated rent that a tenant pays for a dwelling of the same size and quality in a comparable location with similar neighbourhood amenities. When markets for rented accommodation are virtually non-existent or unrepresentative, the value of imputed rents has to be derived by some other objective procedure such as the user-cost method.

Paasche - Laspeyres spread	The ratio of an index using the weights of the partner country to an index using the weights of the base country in a binary comparison. The ratio of the Paasche type index to the Laspeyres type index in a binary comparison.

Paasche type PPP	A PPP for a basic heading or an aggregate between two countries, country B and country A, where the reference country is country A and the weights are those of country B. At the basic heading level, the PPP is defined as a quasi-weighted geometric average of the price relatives between country B and country A for the products representative of country B. At an aggregate level, the PPP is defined as the weighted harmonic average of the PPPs between country B and country A for the basic headings covered by the aggregate with the expenditure shares of country B being used as weights.

Parity	See "PPP".

PPP or PPPs	*Purchasing power parity* or *parities*. "Spatial deflators and currency converters, which eliminate the effects of the differences in price levels between countries, thus allowing volume comparisons of GDP components and comparisons of price levels." PPPs are calculated in three stages: first for individual products, then for groups of products or basic headings and, finally, for groups of basic headings or aggregates. The PPPs for basic headings are unweighted averages of the PPPs for individual products. The PPPs for aggregates are weighted averages of the PPPs for basic headings. The weights used are the expenditures on the basic headings. PPPs at all stages are price relatives. They show how many units of currency A need to be spent in country A to obtain the same volume of a product or a basic heading or an aggregate that X units of currency B purchases in country B. In the case of a single product, the "same volume" means "identical volume". But in the case of the complex assortment of goods and services that make up an aggregate such as GDP, the "same volume" does not mean an "identical basket of goods and services". The composition of the basket will vary between countries according to their economic, social and cultural differences, but each basket will provide equivalent satisfaction or utility. Also referred to as "parity" or "parities".
PPP similarity index	See "price similarity index".
PPS	*Purchasing power standard.* The name given by Eurostat to the artificial currency unit in which the PPPs and real final expenditures for the EU 25 are expressed – namely, "euros based on the EU 25". "Euros based on the EU 25" are euros that have the same purchasing power over the whole of the EU 25. Their purchasing power is a weighted average of the purchasing power of the national currencies of EU Member States. As such they reflect the average price level in the EU 25 or, more precisely, the weighted average of the price levels of Member States. PPS are defined by equating the total real final expenditure of the EU 25 on a specific basic heading, aggregate or analytical category to the total nominal final expenditure of the EU 25 on the same basic heading, aggregate or analytical category.
Pre-survey	The preparatory survey carried out by participating countries prior to a price survey. Countries visit outlets, including those that will be visited during the actual price collection, to ascertain the availability, the comparability and the representativity of the products specified in a pre-survey questionnaire. Their responses to the pre-survey questionnaire are used to draw up the product list for the price survey.
Price approach	See "direct price comparison".
Price relative	The ratio of the price of an individual product in one country to the price of that same product in some other country. It shows how many units of currency A need to be spent in country A to obtain the same quantity and quality – that is, the same volume - of the product that X units of currency B purchases in country B.
Price similarity index	The similarity of the structure of prices between any pair of countries is measured by the correlation coefficient that is obtained by regressing the internal price structure of one country against the corresponding internal price structure of the other country. Internal price structures can be expressed as a vector of the ratios of product prices to the price of a reference product. In practice, the correlation coefficient is obtained by regressing the basic heading PPPs of the first country against the corresponding basic heading PPPs of the second country. The basic heading PPPs are interpreted as notional prices.
Productivity adjustment	An adjustment made to the prices paid by non-market producers for labour, capital and intermediate inputs so that they correspond to a common level of multi-factor productivity. In practice, an adjustment made to the prices (compensation of employees) paid by non-market producers for labour so that they represent the same level of labour productivity. Productivity adjustments are not made in Eurostat-OECD comparisons.

Product list	See "basket". Also referred to as "item list".
Products	Goods and services that are the result of production. They are exchanged and used for various purposes: as inputs in the production of other goods and services, as final consumption or for investment. Also referred to as "goods and services" or "commodities" or "items".
Product specification	A description or list of the characteristics that can be used to identify a product selected for pricing. Its purpose is to ensure that countries price comparable items. A product specification can be either brand and model specific - that is, a specification in which a particular brand and model, or a cluster of comparable brands (and possibly models), is stipulated - or generic - that is, a specification where only the relevant price determining and technical characteristics are given and no brand, or cluster of brands, is designated.
Production boundary	Includes: (a) the production of all individual or collective goods or services that are supplied, or intended to be supplied, to units other than their producers (including the production of goods or services used up in the process of producing such goods or services); (b) the own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation; (c) the own-account production of housing services by owner-occupiers and of domestic and personal services produced by employing paid domestic staff.
Purchaser's price	The amount paid by the purchaser in order to take delivery of a unit of a good or service at the time and place required by the purchaser. It excludes any VAT (or similar deductible tax on products) which the purchaser can deduct from his own VAT liability in respect of VAT invoiced to his customers. It includes supplier's retail and wholesale margins, separately invoiced transport and insurance charges and any VAT (or similar deductible tax on products) which the purchaser cannot deduct from his own VAT liability. In the case of equipment goods it will also include installation costs if applicable. Purchasers' prices are the prices most relevant for decision-making by buyers.
Quality adjustment	An adjustment to the prices of a product whose characteristics are broadly similar but not the same in all countries pricing it. The aim of the adjustment is to remove from the price differences observed between countries that part of the difference which is due to the difference in the characteristics of the product priced. The adjustment is made so that the price differences between countries reflect only "pure" price differences. Quality adjustments are not made in Eurostat-OECD comparisons.
Quantity approach	See "direct volume comparison".
Quantity similarity index	The similarity of the structure of quantities between any pair of countries is measured by the correlation coefficient that is obtained by regressing the internal quantity structure of one country against the corresponding internal quantity structure of the other country. Internal quantity structures can be expressed as a vector of the ratios of product quantities to the quantity of a reference product. In practice, the correlation coefficient is obtained by regressing the basic heading volumes (real final expenditures) of the first country against the corresponding basic heading volumes (real final expenditures) of the second country. The basic heading volumes (real final expenditures) are interpreted as notional quantities.

Quaranta editing procedure	The inter-country validation procedure used by Eurostat and the OECD to edit the average survey prices reported by participating countries for a basic heading. For each basic heading covered by a price survey, the procedure screens the average survey prices for possible errors and evaluates the reliability of the price ratios they provide. It does this by comparing the average survey prices for the same product across countries (the average survey prices having been expressed in the same currency unit for this purpose) and by analysing the dispersion of the price ratios across countries and across products (the price ratios having been standardised for this purpose). It is thus both an editing tool and an analytical tool. As an editing tool it identifies outliers among the average survey prices that need to be returned to participating countries for verification. As an analytical tool it provides a range of variation coefficients that can be used to assess the reliability of completed price surveys and assist the planning of future price surveys.
Real final expenditures	National final expenditures on GDP that have been converted to a common currency and valued at a uniform price level with PPPs. Expenditures so converted reflect only volume differences between countries. Also referred to as "real values".
Real values	See "real final expenditures".
Rebate	A discount paid to the purchaser after the transaction has occurred.
Reference country	The country, or group of countries such as the European Union or the OECD, for which the value of the PPP is set at 1.00 and the value of the comparative price level index and of the volume index is set at 100.
Reference year	"A calendar year to which the annual results refer." The year for which the comparison is made.
Reference PPPs	PPPs that are use for basic headings for which no prices are collected. They are based on prices collected for other basic headings. Reference PPPs serve as proxies for the PPPs that would have been calculated had prices been collected for the basic headings for which no prices were collected.
Relative price levels	These are defined as the ratios of specific PPPs to the corresponding overall PPP for GDP. They indicate whether the price level for a given basic heading or aggregate is higher or lower relative to the general price level in the country. They facilitate the comparison of price structures across countries. Strictly speaking, relative price levels should based on PPPs that have been calculated using an aggregation method that is additive.
Representative items	"Those (items) which are, or are considered to be, in terms of relative total expenditure within a basic heading, among the most important items purchased in national markets." Also referred to as "representative products" or "asterisk products".
Representative product	See "representativity".

Representativity	A concept that relates to individual products within the same basic heading and to the product list for a basic heading.
	Representativity of a product within a basic heading is defined in terms of a specific country. A product is either representative or unrepresentative of the price level in country A for a given basic heading irrespective of the relative importance of the basic heading with respect to other basic headings. It is representative if, in country A, the price level of the product is close to the average for all products within the basic heading. Usually, though not necessarily, the purchases of the product will account for a significant proportion of the total purchases of all products covered by the basic heading. If not, the product will at least be sold in sufficient quantities for its price level to be typical for the basic heading.
	Representativity of the product list for a basic heading is defined in terms of all countries participating in the comparison. The product list should be equally representative – or equi-representative - of all participating countries. In general, representative products have lower price levels than unrepresentative products. Therefore, if the product list for the basic heading is not equally representative of all participating countries, the price levels for the basic heading will be overestimated for countries pricing a smaller number of representative products and underestimated for countries pricing a larger number of representative products. This does not mean that all countries should have the same number of representative products for each basic heading providing this is taken into account when calculating PPPs for the basic heading. But it does mean that each country should be able to price that number of representative products which is commensurate with the heterogeneity of products covered by the basic heading and its expenditure on the basic heading.
Representativity indicators	"Indicators, given by each country, marking those items that have been selected as representative items." Countries are expected to price their representative products and a selection of unrepresentative products - that is, products representative of other countries. When reporting prices, countries are required to identify which of the products they have priced are representative. They do this by assigning representativity indicators. See also "asterisk" and "asterisk product".
Resident population	The average number of people present in the economic territory of a country during the reference year.
Rolling benchmark approach	The approach that allows PPPs and real final expenditures to be calculated annually when price collection is spread over a number of years (three in the case of Eurostat-OECD comparisons). The starting point is the complete matrix of basic heading PPPs by participating country for the reference year, t. In the subsequent year, t+1, some of the basic heading PPPs are replaced by new PPPs calculated using prices collected during t+1, while the basic heading PPPs that have not been replaced are advanced to t+1 with price indices specific to these basic headings. All the basic heading PPPs in the matrix now refer to t+1. Aggregating the matrix with expenditure weights for t+1 gives PPPs and real final expenditures for each level of aggregation up to the level of GDP with which a comparison can be made for the new reference year, t+1. By continuing the cycle of replacement, extrapolation and aggregation through t+2, t+3, t+4, etc., comparisons can be made for the reference years t+2, t+3, t+4, etc.
Seasonal products	Products for which both prices and the quantities sold vary significantly throughout the year. Typically, the patterns of variation are repeated from one year to the next. Seasonal products vary from country to country.

Semi-durable good	A goods that differs from a non-durable good in that it can be used repeatedly or continuously over a period longer than a year and that differs from a durable good in that its expected lifetime of use, though longer than a year, is often significantly shorter and that its purchasers' price is substantially less.
Services	Outputs produced to order and which cannot be traded separately from their production. Ownership rights cannot be established over services and by the time their production is completed they must have been provided to the consumers. An exception to this rule is a group of industries, generally classified as service industries, some of whose outputs have characteristics of goods. These industries are those concerned with the provision, storage, communication and dissemination of information, advice and entertainment in the broadest sense of those terms. The products of these industries, where ownership rights can be established, may be classified either as goods or services depending on the medium by which these outputs are supplied.
SNA 93	*System of national accounts 1993*. A coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules.
Social transfers in kind	Individual goods and services provided as transfers in kind to individual households by government units (including social security funds) and NPISHs. The goods and services can be purchased on the market or produced as non-market output by government units or NPISHs. See also "individual consumption expenditure by government" and "individual consumption expenditure by NPISHs".
Spatial adjustment factors	"Factors used to adjust average prices obtained from one or more pricing locations within the economic territory of a Member State to national average prices."
Specification pricing	The pricing methodology whereby a list of precisely-defined products is selected in consultation with the countries participating in the comparison with a view to having comparable products priced in each country. Products are fully defined in terms of all characteristics which influence their transaction prices. The objective is to price to constant quality in order to produce price relatives that reflect "pure" price differences.
Subsidies on production	Subsidies on goods and services produced as outputs by resident enterprises that become payable as a result of the production of these goods or services - that is, subsidies payable per unit of good or service produced - plus subsidies that resident enterprises may receive as a consequence of engaging in production - for example, subsidies to reduce pollution or to increase employment. The former are called "subsidies on products". The latter are called "other subsidies on production".
Subsidies on products	See "subsidies on production".
Surcharges	An addition to the list price of a good or service. Generally of a short duration reflecting unusual cost or supply pressures affecting the seller.
Symmetric index	An index that treats the two countries being compared symmetrically by giving equal importance to the price and expenditure data of both countries. The price and expenditure data for both countries enter into the index number formula in a balanced or symmetric way.

Taxes on production	Taxes on the goods and services produced as outputs by resident enterprises that become payable as a result of the production of these goods or services - that is, taxes payable per unit of good or service produced such as excise duties and non-deductible VAT - plus taxes that resident enterprises may pay as a consequence of engaging in production - taxes such as payroll taxes and taxes on motor vehicles. The former are called "taxes on products". The latter are called "other taxes on production".
Taxes on products	See "taxes on production".
Temporal adjustment factors	"Factors used to adjust average prices obtained at the time of survey to annual average prices." Also the factors applied in the rolling benchmark approach to move basic heading PPPs calculated for t to t+1 and t+2.
Transaction	The buying and selling of a product on terms mutually agreed by the buyer and seller.
Transaction price	See "market price".
Transitivity	"The property whereby the direct PPP between any two countries yields the same result as an indirect comparison via any other country." For example, in the case of the three countries A, B and C, the ratio of the PPP between A and B and the PPP between C and B is equal to the PPP between countries A and C as follows: $PPP_{A/C} = PPP_{A/B} / PPP_{C/B}$. Also referred to as "circularity".
Unique product	A product that is only manufactured once to the specification of an individual customer.
Unit value	The total value of the purchases/sales for a set of homogeneous products divided by the sum of the quantities purchased/sold. It is a quantity weighted average of the different prices at which the products are purchased/sold. Unit values are often calculated for sets of products that are similar, though not perfectly homogeneous, provided that they are all measured in the same quantity units – for example, motor vehicles. Thus differences in unit values over time (or between countries) may be due to changes (or differences) in the mix of products purchased/sold rather than to changes (or differences) in prices. This is referred to as the "unit value mix problem".
User-cost method	The method of estimating the value of imputed rentals by summing the relevant cost items: intermediate consumption (current maintenance and repairs, insurance), consumption of fixed capital, other taxes on production and net operating surplus (nominal rate of return on the capital invested in the dwelling and land).
Valuables	Produced assets that are not used primarily for production or consumption, that are expected to appreciate or at least not decline in real value, that do not deteriorate over time in normal conditions, and that are acquired and held primarily as stores of values.
VAT	*Value added tax*. A tax on products collected in stages by enterprises. It is a wide-ranging tax usually designed to cover most or all goods and services. Producers are obliged to pay to government only the difference between the VAT on their sales and the VAT on their purchases for intermediate consumption or capital formation. VAT is not usually levied on exports. See also "deductible VAT" and "non-deductible VAT".

Volume index

A weighted average of the relative levels in the quantities of a specified set of goods and services between two countries. The quantities have to be homogeneous while the relative levels for the different goods and services must be weighted by their economic importance as measured by their values in one or other or both countries.

Volume similarity index

See "quantity similarity index".

STATISTICS

Eurostat-OECD Methodological Manual on Purchasing Power Parities

For the last twenty-five years, Eurostat and the OECD have worked together comparing the price and volume levels of the GDPs of EU member states and OECD member countries using purchasing power parities (PPPs).

This manual has three aims:

- to explain to those engaged directly in the Eurostat-OECD PPP Programme – that is, to practitioners in Eurostat, the OECD and the national statistical institutes of participating countries – the why and the how and the when of the international price and volume comparisons of GDP organised by Eurostat and the OECD;

- to enable these practitioners to brief their senior management and significant users – such as politicians, journalists, academics and the like – on the why and how of the Programme and, more importantly, to advise them on the use and interpretation of comparison results; and

- to provide a point of reference accessible to teachers, students and other members of the general public interested in PPPs and related statistics.

The full text of this book is available on line via these links:

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