Annexes

ANNEX I. BRIEF HISTORY OF THE PROGRAMME

I.1 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]

I.2 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. 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, 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 in collaboration with his associate Bart van Ark.

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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 "Prices, quantities and productivity in industry: a study of transition economies in a comparative perspective", B. van Ark, E. Monnikhof and M. Timmer, *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; or "Output, Input and Productivity Measures at the Industry Level: the EU KLEMS Database", M. O'Mahony and M. Timmer (2009), *Economic Journal*, 119(538).

I.2 International Comparison Project[5]

I.2.1 Research phases

I.4 The ICP started in 1968 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 cooperative 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. Together with his colleagues Alan Heston and Robert Summers, he organised the first three rounds of the project and co-authored three seminal reports[7] on international comparisons of real product and purchasing power. A chronology of the ICP and its offshoot, the European Comparison Programme (ECP), is provided in Annex Table A.

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 coordinated by the Council for Mutual Economic Assistance since 1959[8], the comparisons carried out in the early and late 1960s in Latin America[9] and the comparisons between centrally planned and market economies started by Statistics Austria[10] during the 1960s[11].

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.[12] 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.[13] Phase III comparisons covered 34 countries and had 1975 as the reference year.[14] The results of these and subsequent ICP comparisons were published with the United States as reference country and the international dollar as numéraire.

I.2.2 Going operational and regionalisation

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

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5 It was renamed International Comparison Programme in 1989.

6 At that time it was *United Nations Statistical Office* but its present title, *United Nations Statistics Division*, is used throughout this Annex.

7 See footnotes 12, 13 and 14.

8 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.

9 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.

10 At the time it was *Austrian Central Statistics Office*, but its present title, *Statistics Austria*, is used throughout this Annex.

11 *Comparisons of Levels of Consumption in Austria and Poland*, Conference of European Statisticians, United Nations, New York, 1968.

12 *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.

13 *International Comparisons of Real Product and Purchasing Power*, I. Kravis, A. Heston and R. Summers, The John Hopkins University Press, Baltimore, 1978.

14 *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.

for the European Union[15], 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 different methods to calculate and aggregate PPPs. 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 coordinate 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[16]; and Phase V which covered 64 countries and had 1985 as the reference year[17]. A third round, Phase VI, covering 83 countries and having 1993 as the reference year, was started but not completed.

Box I.1: ICP comparisons 1970 to 2011 (countries by region)

Region	Research phases			Operational phases				
	Phase I 1970	Phase II 1973	Phase III 1975	Phase IV 1980	Phase V 1985	Phase VI 1993	ICP 2005	ICP 2011
Africa	1	1	3	15	22	22	48	52
Middle East	-	-	1	1	-	9	11	13
Asia & Pacific	2	6	9	8	13	16	27	43[a]
N. America	1	1	1	2	2	2	2	2
C. & S. America	1	1	5	16	7	-	11	41[b]
Europe & C. Asia	5	7	15	18	20	34	48	49
Total	**10**	**16**	**34**	**60**	**64**	**83**	**147**	**200**
Published	1975	1978	1982	1986/7	1994	---	2007/8	2013

[a] Includes 15 Pacific islands.
[b] Includes 21 Caribbean islands.

15 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.

16 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.

17 World Comparisons of Purchasing Power and Real Product, 1985: Phase V of the International Comparison Programme, United Nations and Eurostat, New York, 1994.

I.10 Box I.1 summarises the regional distribution of countries that participated in the first six rounds of the ICP. It also gives the years when the global results were published. Until Phase VI, there was on average a six year gap between the reference year and the year of publication. This delay was tolerated while the project was primarily engaged in research, but was considered unacceptable once the project became operational. The project was also heavily criticised for its limited and uneven coverage of the regions. Its nadir was Phase VI when there was no regional comparison in Central and South America and only results for the regional comparisons carried out in Africa[18], the Middle East[19], Asia[20] and Europe[21] were published. As these regional results could not be combined, there were no global results and no global report.

I.2.3 Ryten report[22]

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 (Jacob Ryten) 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). 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.

I.13 The UNSC response to the report was to ask the World Bank – the de facto global coordinator 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 coordination – 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.

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18 Comparisons of Price Levels and Economic Aggregates: The Results of 22 African Countries, M. Mouyelo-Katoula and K. Munnsad, Eurostat, Luxembourg, 1996.

19 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.

20 ESCAP Comparisons of Real Gross Domestic Product and Purchasing Power Parities, 1993, United Nations, Bangkok, 1999.

21 "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.

22 Evaluation of the International Comparison Programme, Jacob Ryten, E/CN.3/19999/8, November 1998.

I.2.4 ICP 2005

I.15 The new round started in 2003 and finished in 2008. Its reference year was 2005. Regional comparisons were organised by the ICP regional coordinating agencies – namely: the African Development Bank, the Asian Development Bank, ESCWA, ECLAC and Statistics Canada, and the Statistical Office of the Commonwealth of Independent States (CISSTAT) and the Federal State Statistical Services of the Russian Federation on Statistics (Rosstat) – and by Eurostat and the OECD[23]. The ICP Global Office was established at the World Bank to provide overall coordination and to ensure technical and procedural uniformity across the regions. The Global Office was also responsible for organising the *ring comparison* which, by comparing a small number of countries from each region across regions, provided the means to link the regional comparisons with each other in one global or worldwide comparison.[24] The regional distribution of countries that took part in ICP 2005 is given in Box I.1. Final results of the regional and global comparisons were published at the end of 2007 and the beginning of 2008.[25]

I.16 ICP 2005 was a success. It covered 147 countries, including major emerging economies such as Brazil, China, India, Indonesia, the Russian Federation and South Africa, and results were published on a timely basis. An important contributory factor was the governance structure that the World Bank put in place prior to the start of the exercise to ensure that the ICP regional coordinating agencies would deliver within a common time frame regional results that would be consistent across regions and which could be combined in a world comparison. Working through the Global Office to attain these objectives were the Executive Board and the Technical Advisory Group. The Executive Board was made up of eminent economists and statisticians and experienced statistical managers. Its role was to provide strategic leadership and make decisions about priorities, standards, overall work programme and budget. It also oversaw the activities of the Global Office which reported to the Board on a regular basis. The Technical Advisory Group was made up of internationally known experts in price statistics or national accounts appointed by the Executive Board. It was responsible for providing technical advice and for resolving conceptual and methodological issues. The governance structure was retained after ICP 2005 to commence preparations for the next round of the ICP.

I.2.5 ICP 2011

I.17 The round will have 2011 as its reference year and is expected to cover some 200 countries. Their distribution by region is shown in Box I.1. Among the 200 expected participants are 15 Pacific islands and 21 Caribbean islands. Price collection in these two groups of islands will take place in 2012 and not 2011. Moreover, the Pacific islands will only collect prices for a limited number of consumer items. There will not be a ring comparison with which to combine regional comparisons in a global comparison. Instead, regional comparisons will be linked through participating countries pricing a selection of products chosen from a global list of core products that has been integrated with their regional product list. The list of core products has been compiled by the Global Office in consultation with regional organisers and covers all component expenditures of GDP for which prices are collected. Publication of the results of the global comparison is planned for the end of 2013. Regional results will be published beforehand.

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23 Strictly speaking, the comparisons organised by Eurostat and the OECD are not regional. They cover countries in North, South and Central America, Asia and the Pacific, Middle East, Central Asia and Europe. These countries are treated as a "region" for ICP management and organisation. Similarly, neither Eurostat nor the OECD are ICP regional coordinating agencies, though they are often referred to as such for ICP purposes.

24 The ring comparison covered eighteen countries spread over five regions: Cameroon, Egypt, Kenya, Senegal, South Africa and Zambia from Africa; Hong Kong China, Malaysia, Philippines and Sri Lanka from Asia; Brazil and Chile from South America; Jordan and Oman from Western Asia; and Estonia, Japan, Slovenia and United Kingdom from Eurostat-OECD. There were no countries from the CIS region. Instead, CIS regional results were first linked to Eurostat-OECD results using the Russian Federation as a bridge country (the Russian Federation had participated in both the CIS comparison and the Eurostat-OECD comparison) and then to the global comparison through the Eurostat-OECD ring countries.

25 *Global Purchasing Power Parities and Real Expenditures: 2005 International Comparison Program*, World Bank, Washington DC, 2008 at http://go.worldbank.org/U6HXIPKWA0. For reports on the regional comparisons in Africa, Asia and the Pacific, South America and Western Asia, refer to http://go.worldbank.org/YBYRDMZT80. The combined results of the 2005 Eurostat-OECD comparison and the 2005 CIS comparison are published in *PPPs and Real Expenditures, 2005 Benchmark year*, OECD, Paris, 2007.

I.3 European Comparison Programme

I.18 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 became responsible for the ECP and published the results of its comparisons, but the actual comparisons were organised by other agencies. This was because the ECP was an amalgam of independent comparisons involving different groups of countries. The Eurostat-OECD PPP Programme was central to the ECP and brought with it coverage beyond Europe through the inclusion of non-European OECD Member Countries.

Box I.2: ECP comparisons 1980 to 1996 (countries by group)

ECP	1980	1985	1990	1993	1996
Group I	18	22	24	24	30
Group II	3	3	6	15	13
Group III	-	-	-	-	9
Total	**21**	**25**	**30**	**39**	**52**

I.19 Box I.2 summarises country participation and organisation during the five rounds of the ECP that were conducted between 1980 and 1996.[26] 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 B and Annex Table C. Group II consisted of countries from central and eastern Europe that were participating in the comparisons coordinated by Statistics Austria specifically for the ECP at the request of the ECE. These countries are listed in Annex Table D.

I.20 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.[27]

I.21 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 E. The Group III comparison was a

[26] "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.

[27] See "Comparisons for countries of central and eastern Europe: an informal report", Alfred Franz, *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

multilateral comparison. It was managed by the OECD with the assistance of CISSTAT, Rosstat 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.22 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.[28] These changes aligned the methodology of Group II with that used in the other two groups.

I.23 The third feature was the start of the break-up of Group II. The Czech Republic, Hungary, Poland and Slovakia – countries which originally had participated in Group II comparisons - moved to Group I as OECD accession countries. The Russian Federation and Slovenia, while remaining in Group II, also participated in the Group I comparisons on an experimental basis. After ECP 1996, Group II no longer existed. EU Candidate Countries from Group II moved to Group I to work with Eurostat. Croatia, FYR of Macedonia and Ukraine also joined Group I, but to work with the OECD. Belarus and Moldova, as CIS countries, joined Group III which since 2000 has been an independent comparison programme organised by CISSTAT and Rosstat. 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 numéraire.

I.24 Although the ECP formally ceased to exist after 1996, the term is still in use as shorthand for the Eurostat PPP Programme.

I.4 Eurostat-OECD PPP Programme

I.25 Annex Table B traces the evolution of the Eurostat PPP Programme. Although EU Member States were involved in a comparison for 1970[29], the first official comparison conducted by Eurostat was for 1975. It covered the nine countries that were EU Member States at that time.[30] Subsequently, until 1990, Eurostat carried out comparisons every five years, in 1980[31], 1985[32] and 1990[33]. 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[34], Austria in 1980[35], 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 Krijnse Locker.

I.26 After 1990, Eurostat adopted the rolling benchmark or rolling survey approach[36] and started making annual comparisons.[37] At the same time, the number of countries covered rose from 14 in

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28 The other option – that is, Group I adopting productivity adjustments – was not considered because, as explained in Chapter 9, Section 9.5, EU Member States and others in Group I considered the productivity adjustments of Group II to be too subjective and not sufficiently rigorous.

29 See "Comparaison réelle du produit intérieur brut des pays de la Communauté européenne", V. Paretti, H. Krijnse Locker and P. Goybet, *Analyse et Prévision*, June 1974, Number 6.

30 Comparison in Real Values of the Aggregates of ESA, 1975, Eurostat, Luxembourg, 1977.

31 Comparison in Real Values of the Aggregates of ESA, 1980, Eurostat, Luxembourg, 1983.

32 Purchasing Power Parities and Gross Domestic Product in Real Terms, Results 1985, Eurostat, 1987.

33 Comparison in Real Values of the Aggregates of ESA, Results for 1990 and 1991, Eurostat, Luxembourg, 1993.

34 Comparison of National Accounts Aggregates between Israel and the European Community, Eurostat, Luxembourg, 1985.

35 Comparison of National Accounts Aggregates between Austria and the European Community, Eurostat, Luxembourg, 1984.

36 Originally called the *rolling benchmark approach*. It is now referred to as the *rolling survey approach*.

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)[38] 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 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* described in Section I.4.4.

I.27 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 C, 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[39] of the OECD's 24 Member Countries.[40]

I.28 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[41] and all 24 OECD Member Countries in 1990[42]. 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 coordinate 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.3.

Box I.3: Eurostat-OECD Comparisons 1980 to 2011

Countries coordinated by:	1980	1985	1990	1993	1996	1999	2002	2005	2008	2011
Eurostat	**13**	**13**	**14**	**16**	**19**	**31**	**31**	**37**	**37**	**37**
- EU Member States	10	10	12	12	15	15	15	25	27	27
- Non-EU OECD countries	3	3	2	4	4	8	8	4	4	4
- Other countries	-	-	-	-	-	8	8	8	6	6
OECD	**5**	**9**	**10**	**8**	**13**	**12**	**11**	**9**	**9**	**10**
- Non-EU OECD countries	5	9	10	8	9	7	7	7	7	9
- Other countries	-	-	-	-	4	5	4	2	2	1
Total	**18**	**22**	**24**	**24**	**32**	**43**	**42**	**46**	**46**	**47**

I.29 When Eurostat adopted the rolling survey 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

37 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.

38 Iceland, Norway and Switzerland, but not Liechtenstein.

39 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.

40 Purchasing Power Parities and Real Expenditures in the OECD, M. Ward, OECD, Paris. 1985.

41 Purchasing Power Parities and Real Expenditures, 1985, OECD, Paris, 1987.

42 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.

capital goods and the resource constraints of countries participating in OECD comparisons, it was decided they would only price capital goods every third year.[43] Since 1990, OECD comparisons have been three yearly – 1993[44], 1996[45], 1999[46], 2002[47], 2005[48] and 2008[49].

I.30 From Box I.3, 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 breakup of ECP Group II.

I.31 From the beginning, Eurostat has published the results of comparisons with the European Union as reference and an artificial currency unit – the *purchasing power standard* (PPS) - as numéraire. (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 numéraire 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 and *OECD dollars* as numéraire. (The OECD dollar, like the PPS, is an artificial currency unit. It is the average of the currencies of all OECD Member Countries.)

I.4.1 EKS-GK controversy

I.32 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 commissioned a study to investigate the relative merits of the GK method and the Gerardi method.[50] The study favoured the GK method and it was used by Eurostat and the OECD for their 1980 and 1985 comparisons.

I.33 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 expenditures on which the indices were based were additive - which EKS real 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

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[43] An important difference between Eurostat and the OECD is that Eurostat funds a major part the data collection in most of its countries. OECD 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.

[44] 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.

[45] Purchasing Power Parities and Real Expenditures, 1996 Results, OECD, Paris, 1999.

[46] Purchasing Power Parities and Real Expenditures, 1999 Results, OECD, Paris, 2002.

[47] Purchasing Power Parities and Real Expenditures, 2002 Results, OECD, Paris, 2004.

[48] Purchasing Power Parities and Real Expenditures, 2005 Results, Eurostat and OECD, Paris, 2007.

[49] http://stats.oecd.org/Index.aspx?DataSetCode=PPP2008

[50] Multilateral Measurements of Purchasing Power and Real GDP, P. Hill, Eurostat, 1982.

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.[51]

I.34 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.[52] 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.[53] 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.

I.4.2 Fixity

I.35 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.36 Fixity has now a more general application than just Eurostat and 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 ICP 2005, the relativities established between countries in their regional comparison remained unchanged when they were included with other regions in the world comparison. This will also be the case when the global results of ICP 2011 are published.

I.4.3 Castles report[54]

I.37 After the publication of the results of the 1993 round, the usefulness and reliability of the Eurostat-OECD PPP Programme were 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 (Ian Castles) 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.

[51] This recommendation was subsequently included in the SNA 93. See paragraph 16.103.

[52] This is the approach adopted in the ESA 95. See paragraphs 10.73 and 10.74.

[53] See footnotes 42 and 44.

[54] *Review of the OECD-Eurostat PPP Programme*, I. Castles, unpublished OECD document, STD/PPP(97)5, September 1997.

I.38 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 measurement 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 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 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.39 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.40 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.41 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.

I.4.4 ECP reform

I.42 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, Slovakia, 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.43 Eurostat was already experiencing difficulties coordinating 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[55] - 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.44 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.45 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.46 The three groups that were introduced in 1999, together with their constituent countries and their leaders, are shown in Annex Table F. In 2004, a new group leader was appointed for the Southern Group, otherwise, as can be seen from Annex Table G, group leaders and the composition of their groups remained unchanged until 2010. A further development in 2004 was the creation of a fourth group covering six countries in the Western Balkans. Slovenia was the group leader and, as it was a member of the Central Group headed by Austria, acted as the bridge country between the two groups. The Western Balkan Group was in effect a semi-detached subgroup of the Central Group. It was not until 2010 when the four groups were reconstituted and renamed that the six Western Balkan Countries were fully integrated. The composition of the four groups is given in Annex Table H.

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[55] At the time, a special, centrally coordinated survey on medical goods and services was part of the Programme.

I.4.5 Recent developments

I.47 The Eurostat-OECD PPP Programme evolves continually and there have been a number of developments since the ECP Reform. Of these, the two most significant from a historical perspective were the publication of a methodological manual[56] in 2006 and the adoption by the European Parliament and Council of the PPP Regulation[57] in 2007.

I.48 Prior to 2006, the methods and procedures employed by the Eurostat-OECD PPP Programme were described in an assortment of reports and papers. But these reports and papers tended to be either too general in their description of the approach followed or too focused on specific methodological issues. There was no single document covering the Programme in detail from start to finish. Practitioners involved directly in the implementation of the Programme found the absence of such a document particularly irksome. To rectify this omission and in anticipation of the PPP Regulation which, when approved, would require the provision of a methodological manual, Eurostat and the OECD prepared the manual published in 2006. It explained the methods and procedures that were employed by the Programme at the time of publication. Although intended primarily for those engaged in the Programme, it was also to serve as a source of information for researchers and other users interested in knowing how PPPs are produced.

I.49 The PPP Regulation established within the European Union the rules governing the collection and validation of data for PPPs as well as the rules governing the calculation and dissemination of PPPs. It provided the legal infrastructure for Eurostat comparisons by clearly defining the roles and responsibilities of Eurostat and the EU Member States as well as the methods and procedures to be followed. As mentioned already, the Regulation required Eurostat to provide a methodological manual describing the methods applied at various stages of PPP compilation. It also required Eurostat to revise the manual whenever a significant change to the methodology is made.

[56] Eurostat-OECD Methodological Manual on Purchasing Power Parities, 2005 edition, European Communities/OECD, 2006.

[57] Regulation (EC) No 1445/2007 of the European Parliament and of the Council of 11 December 2007 establishing common rules for the provision of basic information on Purchasing Power Parities and their calculation and dissemination.

ANNEX TABLES

Table A: Chronology of the International Comparison Programme (ICP) and the European Comparison Programme (ECP)

<table>
<tr><td>1950-1960</td><td colspan="3">1954 and 1958: Experimental comparisons with 9 European countries and United States carried out by the Organisation for European Economic Cooperation (OEEC).</td></tr>
<tr><td>1960-1970</td><td colspan="3">1968: International Comparison Project launched under the University of Pennsylvania and the United Nations Statistical Division (UNSD).</td></tr>
<tr><td>1970-1975</td><td colspan="3">Establishing a methodology to allow worldwide comparisons on a regular basis. Three research phases:
- 1970 ICP Phase I: 10 countries;
- 1973 ICP Phase II: 16 countries;
- 1975 ICP Phase III: 34 countries; first official EU comparison organised by Eurostat covering all 9 Member States.</td></tr>
<tr><td>1975-1980</td><td colspan="3">ICP going operational under UNSD. Regionalisation of the ICP. European Comparison Programme (ECP) launched in 1979 under the European Commission of Europe (ECE). The ECP consisted of two groups: Group I covering Western Europe and non-European OECD countries and organised by Eurostat and the OECD; Group II covering Central and Eastern European Countries organised for the ECE by Statistics Austria. In 1996, Group III covering member countries of the Commonwealth of Independent States (CIS) joined the ECP.</td></tr>
<tr><td rowspan="2"></td><td colspan="2">ECP</td><td rowspan="2">ICP</td></tr>
<tr><td>Group I</td><td>Group II and Group III</td></tr>
<tr><td>1980</td><td>ECP 1980: 18 countries; EKS method applied below the basic heading, GK method applied above.</td><td>ECP 1980: 5 countries; Bilateral comparisons with Austria; Quality and productivity adjustments made.</td><td>ICP Phase IV: 60 countries; CPD method applied below the basic heading, GK method applied above.</td></tr>
<tr><td>1985</td><td>ECP 1985: 22 countries</td><td>ECP 1985: 4 countries</td><td>ICP Phase V: 64 countries</td></tr>
<tr><td>1990</td><td>ECP 1990: 24 countries; Adoption of the EKS method above the basic heading for official results; First time all OECD member countries included.</td><td>ECP 1990: 7 countries</td><td>International Comparison Project renamed International Comparison Programme</td></tr>
<tr><td>1991</td><td>Adoption by Eurostat of the rolling survey approach and annual comparisons of GDP; OECD follows the survey cycle for consumer products but retains a three year cycle for comparisons covering all GDP aggregates.</td><td></td><td></td></tr>
<tr><td>1993</td><td>ECP 1993: 24 countries</td><td>ECP 1993: 16 countries</td><td>ICP Phase VI: 83 countries; regional comparisons but no world comparison</td></tr>
<tr><td>1996-1998</td><td>ECP 1996: 32 countries; Inclusion of some former Group II countries in Group I (OECD accession countries); Castles Report 1997.</td><td>ECP 1996 Group II: 14 countries; Multi-lateral comparison with no quality or productivity adjustments; EKS method applied below and above the basic heading; ECP 1996 Group III: 9 countries; EKS method applied below and above the basic heading; Break up of Group II.</td><td>Ryten Report 1998: Main conclusion being that ICP should be relaunched with better management and more resources at global, regional and national levels.</td></tr>
</table>

	Eurostat-OECD PPP Programme	CIS Comparison Programme	ICP
1999-2000	Eurostat-OECD 1999: 43 countries; ECP Reform: Inclusion of all EU candidate countries in Group I and Division of participating countries into groups; Work on EU PPP Regulation started.	CIS 2000: 12 countries	
2002-2003	Eurostat-OECD 2002: 42 countries		Relaunch of the ICP: Establishment of the Global Office at the World Bank in 2003; 2005 to be reference year.
2005	Eurostat-OECD 2005: 46 countries	CIS 2005: 10 countries	ICP 2005: 147 countries; CPD method applied below the basic heading. EKS method applied above; Regions linked through a comparison of 18 ring or bridge countries.
2006-2007	Eurostat-OECD PPP Manual published in 2006; EU PPP Regulation passed in 2007.		
2008	Eurostat-OECD 2008: 43 countries	CIS 2008 – 5 countries	Results of ICP 2005 published
2011	Eurostat-OECD 2011: 47 countries	CIS 2011 – 9 countries	ICP 2011: 200 countries; Regions linked through all countries pricing a selection of products from a core list of products.

Note: Since the 2005 comparison, OECD publishes combined results for Eurostat-OECD and CIS countries with Russia as the bridge country.

Table B: Eurostat comparisons 1975 to 2011

Country	Five-year comparisons				Annual comparisons							
	1975	1980	1985	1990	1991	1992	1993	1994 to 1996	1997	1998	1999 to 2004	2005 to 2011
Belgium[1]	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
Germany[1,10]	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
Luxembourg[1]	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
Denmark[2]	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
United Kingdom[2]	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
Portugal[4]		x	x	x	x	x	x	x	x	x	x	x
Spain[4,11]		x	x	x	x	x	x	x	x	x	x	x
Austria[5]		x	x	x	x	x	x	x	x	x	x	x
Switzerland[6]				x	x	x	x	x	x	x	x	x
Finland[5]						x	x	x	x	x	x	x
Sweden[5]							x	x	x	x	x	x
Iceland[6,9]								x	x	x	x	x
Norway[6]								x	x	x	x	x
Poland[7]								x	x	x	x	x
Cyprus[7]									x	x	x	x
Malta[7]										x	x	x
Czech Republic[7]											x	x
Estonia[7]											x	x
Hungary[7]											x	x
Latvia[7]											x	x
Lithuania[7]											x	x
Slovakia[7]											x	x
Slovenia[7]											x	x
Bulgaria[8]											x	x
Romania[8]											x	x
Turkey[9]											x	x
Albania												x
Bosnia-Herzegovina												x
Croatia[9]												x
FYR of Macedonia[(9)]												x
Montenegro[9]												x
Serbia												x
Total	**9**	**13**	**13**	**14**	**14**	**15**	**16**	**19**	**20**	**21**	**31**	**37**

[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 Association (EFTA)
[7] Member State since 2004
[8] Member State since 2007
[9] Candidate country
[10] West Germany only before 1992
[11] Participated in the 1975 ICP Phase III, but not as part of the Eurostat comparison.

Table C: OECD comparisons 1980 to 2011

Country	Five-year comparisons			Three-year comparisons						
	1980	1985	1990	1993	1996	1999	2002	2005	2008	2011
Canada	x	x	x	x	x	x	x	x	x	x
Japan	x	x	x	x	x	x	x	x	x	x
Norway[3]	x	x	x	x						
United States	x	x	x	x	x	x	x	x	x	x
Australia		x	x	x	x	x	x	x	x	x
Finland[1]		x	x							
New Zealand		x	x	x	x	x	x	x	x	x
Sweden[2]		x	x							
Turkey[4]		x	x	x	x					
Iceland[3]			x	x						
Mexico					x	x	x	x	x	x
Israel					x	x	x	x	x	x
Russian Federation					x	x	x	x	x	x
Czech Republic[4]					x					
Hungary[4]					x					
Slovakia[4]					x					
Slovenia[4]					x					
Korea						x	x	x	x	x
Croatia						x	x			
FYR of Macedonia						x	x			
Ukraine						x				
Chile										x
Total	4	9	10	8	13	12	11	9	9	10

Moved to Eurostat comparisons in [1] 1992; [2] 1993; [3] 1994; [4] 1999.

Table D: 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 Republic[2]				x	
Estonia				x	x
Latvia				x	x
Lithuania				x	x
Moldova				x	x
Russian Federation				x	x
Slovakia[(2)]				x	
Slovenia				x	x
Ukraine				x	x
Albania					x
FYR of Macedonia					x
Total	5	4	7	16	14

Moved to OECD comparisons in [1] 1985; [2] 1996. Moved to Eurostat comparisons in [3] 1994.

Table E: Group III/CIS comparisons 1996 to 2011

Country	Group III	CIS comparisons				
	1996	2000	2004	2005	2008	2011
Armenia	x	x	x	x	x	x
Azerbaijan	x	x	x	x		x
Belarus	x	x	x	x	x	x
Georgia	x	x	x	x		
Kazakhstan	x	x	x	x	x	x
Kyrgyz Republic	x	x	x	x	x	x
Moldova	x	x	x	x		x
Russian Federation	x	x	x	x	x	x
Tajikistan	x	x	x	x		x
Turkmenistan	x	x				
Turkey	x					
Ukraine	x		x	x		x
Uzbekistan	x	x				
Mongolia	x	x				
Total	**13**	**12**	**10**	**10**	**5**	**9**

Table F: Eurostat country groups and group leaders, 1999 to 2003

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	Slovakia	Spain
United Kingdom	Slovenia	Turkey
	Switzerland	
Group leader	Group leader	Group leader
Finland	Austria	Italy

Table G: Eurostat country groups and group leaders, 2004 to 2009

Northern group	Central group	Southern group	Western Balkan group
Denmark	Austria	Bulgaria	Albania
Estonia	Belgium[1]	Cyprus	Bosnia-Herzegovina
Finland	Czech Republic	France	Croatia[2]
Iceland	Germany	Greece	FYR of Macedonia[2]
Ireland	Hungary	Italy	Montenegro
Latvia	Luxembourg	Malta	Serbia
Lithuania	Netherlands[1]	Portugal	
Norway	Poland	Romania	
Sweden	Slovakia	Spain	
United Kingdom	Slovenia	Turkey	
	Switzerland		
Group leader	Group leader	Group leader	Group leader
Finland	Austria	Portugal	Slovenia

[1]Moved to Northern group in 2006; [2]Moved to Central group in 2006

Table H: Eurostat country groups and group leaders as from 2010

Northern group	Western group	Eastern group	Southern group
Denmark	Belgium	Austria	Albania
Estonia	Czech Republic	Bosnia-Herzegovina	Cyprus
Finland	France	Bulgaria	FYR of Macedonia
Iceland	Germany	Croatia	Greece
Latvia	Ireland	Hungary	Italy
Lithuania	Luxembourg	Montenegro	Malta
Norway	Netherlands	Romania	Portugal
Poland	Switzerland	Serbia	Spain
Sweden	United Kingdom	Slovakia	Turkey
		Slovenia	
Group leader	Group leader	Group leader	Group leader
Finland	Netherlands	Austria	Portugal

ANNEX II. EUROSTAT LEGAL FRAMEWORK

II.1 The Annex presents the two regulations referred to in Chapter 3 that provide the legal basis for Eurostat comparisons, namely:

- Regulation (EC) No 1445/2007 of the European Parliament and of the Council of 11 December 2007 establishing common rules for the provision of basic information on Purchasing Power Parities and their calculation and dissemination.

- Commission Regulation (EU) No 193/2011 of 28 February 2011 implementing Regulation (EC) No 1445/2007 of the European Parliament and of the Council as regards the system of quality control used for Purchasing Power Parities.

The two regulations are reproduced as published in the *Official Journal of the European Union*.

II.2 The first regulation, which is referred to as *the PPP Regulation* throughout the manual, sets out rules for the collection and validation of data required for PPPs and for the calculation and dissemination of PPPs and their related price and volume measures. It comprises fifteen articles and two annexes. The second annex lists the basic headings for which PPPs are to be calculated. It is not included in this Annex to avoid duplication with Annex III where the basic headings are not only listed but defined as well.

II.3 The PPP Regulation requires EU Member States to provide Eurostat with all the detail necessary to evaluate the quality of the basic information supplied for a comparison. It also requires EU Member States to provide quality reports on the price and other surveys for which they are responsible. Although the PPP Regulation sets out the minimum quality standards for the basic information and for the validation of price survey results, it has proved necessary to define further the quality criteria and the structures of the quality reports. This is done in the second regulation.

II.4 The second regulation consists of two articles and an annex. The annex specifies the structure and content of the inventory of sources and methods that EU Member States are required to prepare for Eurostat and the structure and content of the reports that EU Member States have to submit to Eurostat after each survey of consumer prices.

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I

(Acts adopted under the EC Treaty/Euratom Treaty whose publication is obligatory)

REGULATIONS

REGULATION (EC) No 1445/2007 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 11 December 2007

establishing common rules for the provision of basic information on Purchasing Power Parities and for their calculation and dissemination

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 285(1) thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and Social Committee ([1]),

Acting in accordance with the procedure laid down in Article 251 of the Treaty ([2]),

Whereas:

(1) In order to obtain a direct comparison of Gross Domestic Product (GDP) in volume terms between Member States, it is essential for the Community to have Purchasing Power Parities (hereinafter referred to as 'PPPs') which eliminate the differences in the level of prices between Member States.

(2) The Community PPPs need to be produced in accordance with a harmonised methodology, consistent with Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community ([3]) which lays down a framework for the construction of national accounts in the Member States.

(3) Member States are encouraged to produce data for regional PPPs.

(4) Council Regulation (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund ([4]) provides that the regions eligible for funding from the Structural Funds under the convergence objective are to be regions corresponding to level 2 of the common classification of territorial units for statistics within the meaning of Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS) ([5]). The GDP per capita of such regions, measured in PPPs and calculated on the basis of Community figures for the period 2000 to 2002, is less than 75 % of the average GDP of the EU-25 for the same reference period. In the absence of regional PPPs, national PPPs should serve to establish the list of regions which could benefit from the Structural Funds. National PPPs can also be used to determine the amount of funds to be allocated to each region.

(5) Regulation (EC) No 1083/2006 provides that the Member States eligible for funding from the Cohesion Fund are to be those whose gross national income (GNI) per capita, measured in PPPs and calculated on the basis of Community figures for the period 2001 to 2003, is less than 90 % of the average GNI of the EU-25 and which have a programme for meeting the economic convergence conditions referred to in Article 104 of the Treaty.

([1]) OJ C 318, 23.12.2006, p. 45.
([2]) Position of the European Parliament of 26 April 2007 (not yet published in the Official Journal) and Council Decision of 13 November 2007.
([3]) OJ L 310, 30.11.1996, p. 1. Regulation as last amended by Regulation (EC) No 1267/2003 of the European Parliament and of the Council (OJ L 180, 18.7.2003, p. 1).
([4]) OJ L 210, 31.7.2006, p. 25. Regulation as amended by Regulation (EC) No 1989/2006 (OJ L 411, 30.12.2006, p. 6).
([5]) OJ L 154, 21.6.2003, p. 1. Regulation as last amended by Commission Regulation (EC) No 105/2007 (OJ L 39, 10.2.2007, p. 1).

(6) Article 1 of Annex XI to the Staff Regulations of officials of the European Communities, laid down in Regulation (EEC, Euratom, ECSC) No 259/68 of the Council [1] (hereinafter referred to as 'Staff Regulations') provides that, for the purposes of the review provided for in Article 65(1) of the Staff Regulations, the Commission (Eurostat) are to draw up every year before the end of October a report on changes in the cost of living in Brussels, the economic parities between Brussels and certain places in the Member States, and changes in the purchasing power of salaries in national civil services in central government.

(7) Every year the Commission (Eurostat) already collects basic information on PPPs from the Member States on a voluntary basis. This operation has become an established practice in the Member States. However, a legal framework is necessary to ensure the sustainable development, production and dissemination of PPPs.

(8) Provision of preliminary results on a regular basis, as is currently the practice, should be maintained in order to keep the most recent possible figures available.

(9) The measures necessary for the implementation of this Regulation should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [2].

(10) In particular, power should be conferred on the Commission to adapt the definitions, to adjust the basic headings in Annex II and to define quality criteria. Since those measures are of general scope and designed to amend non-essential elements of this Regulation, inter alia by supplementing it with new non-essential elements, they must be adopted in accordance with the regulatory procedure with scrutiny laid down in Article 5a of Decision 1999/468/EC.

(11) Since the objective of this Regulation, namely the establishment of common rules for the provision of basic information on purchasing power parities and for their calculation and dissemination, cannot be sufficiently achieved by the Member States and can therefore be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve that objective.

(12) The Statistical Programme Committee, established by Council Decision 89/382/EEC, Euratom [3], has been consulted in accordance with Article 3 of that Decision,

[1] OJ L 56, 4.3.1968, p. 1. Regulation as last amended by Regulation (EC, Euratom) No 1895/2006 (OJ L 397, 30.12.2006, p. 6).

[2] OJ L 184, 17.7.1999, p. 23. Decision as amended by Decision 2006/512/EC (OJ L 200, 22.7.2006, p. 11).

[3] OJ L 181, 28.6.1989, p. 47.

HAVE ADOPTED THIS REGULATION:

Article 1

Objective

The objective of this Regulation is to establish common rules for the provision of basic information on PPPs, and for their calculation and dissemination.

Article 2

Scope

1. The basic information to be provided shall be those data necessary to calculate and ensure the quality of PPPs.

That basic information shall include prices, GDP expenditure weights and other data listed in Annex I.

Data shall be collected with the minimum frequency provided for in Annex I. More frequent collection of data shall take place only in exceptional and justified circumstances.

2. PPPs shall be calculated from the national annual average prices of goods and services, using basic information relating to the economic territory of the Member States as provided for by the European system of national and regional accounts in the Community (hereinafter referred to as 'ESA 95').

3. PPPs shall be calculated in accordance with the basic headings as listed in Annex II, consistent with the related GDP classifications defined in Regulation (EC) No 2223/96.

Article 3

Definitions

For the purpose of this Regulation the following definitions shall apply:

(a) 'Purchasing Power Parities' ('PPPs') shall mean spatial deflators and currency converters that eliminate the effects of the differences in price levels between Member States thus allowing volume comparisons of GDP components and comparisons of price levels.

(b) 'Purchasing Power Standard' ('PPS') shall mean the artificial common reference currency unit used in the European Union to express the volume of economic aggregates for the purpose of spatial comparisons in such a way that price level differences between Member States are eliminated.

(c) 'Prices' shall mean the purchaser prices paid by the final consumers.

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(d) 'Expenditure weights' shall mean the shares of expenditure components in current-price GDP.

(e) 'Basic heading' shall mean the lowest level of aggregation of items in the GDP breakdown for which parities are calculated.

(f) 'Items' shall mean goods or services precisely defined for use in price observation.

(g) 'Actual and imputed rentals' shall have the meaning attributed to it in Commission Regulation (EC) No 1722/2005 [1].

(h) 'Compensation of employees' shall have the meaning attributed to it in Regulation (EC) No 2223/96.

(i) 'Temporal adjustment factors' shall mean factors used to adjust average prices obtained at the time of survey to annual average prices.

(j) 'Spatial adjustment factors' shall mean factors used to adjust average prices obtained from one or more locations within the economic territory of a Member State to national average prices.

(k) 'Representative items' shall mean those 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.

(l) 'Representativity indicators' shall mean markers or other indicators identifying those items that Member States have selected as representative.

(m) 'Equi-representativity' shall mean a property required of the composition of the item list for a basic heading, each Member State being 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.

(n) 'Transitive' shall mean the property whereby a direct comparison between any two Member States yields the same result as an indirect comparison via any other Member State.

(o) 'Mistake' shall mean a use of incorrect basic information or an inappropriate application of the calculation procedure.

(p) 'Reference year' shall mean a calendar year to which specific annual results refer.

(q) 'Fixity' shall mean that when results are calculated originally for a group of Member States and then later the results are calculated for a wider group of Member States, the PPPs between the original group of Member States shall nevertheless be preserved.

Article 4

Roles and responsibilities

1. The Commission (Eurostat) shall be responsible for:

(a) coordinating the provision of the basic information;

(b) calculating and publishing PPPs;

(c) ensuring the quality of PPPs, in accordance with Article 7;

(d) developing and communicating methodology, in consultation with the Member States;

(e) ensuring that the Member States have the opportunity to comment on PPP results prior to publication and that due account be taken of any such comment; and

(f) drafting and disseminating the methodological manual referred to in point 1.1 of Annex I.

2. Member States shall follow the procedure set out in Annex I when providing basic information.

Member States shall provide written approval of the survey results for which they are responsible, once the process of data validation has been completed, as specified in point 5.2 of Annex I, within a period of no longer than one month.

Member States shall approve the data collection methodology and check the plausibility of data, including items of basic information provided by the Commission (Eurostat).

Article 5

Transmission of basic information

1. Member States shall transmit the basic information listed in Annex I to the Commission (Eurostat) in accordance with the existing Community provisions on transmission of data.

2. The basic information listed in Annex I shall be transmitted in the technical format and within the time periods specified in that Annex.

3. In cases where items of basic information are supplied to Member States by the Commission (Eurostat), the Commission shall transmit a method statement to enable the Member States to conduct a plausibility check.

[1] Commission Regulation (EC) No 1722/2005 of 20 October 2005 on the principles for estimating dwelling services for the purpose of Council Regulation (EC, Euratom) No 1287/2003 on the harmonisation of gross national income at market prices (OJ L 276, 21.10.2005, p. 5).

Article 6

Statistical units

1. The basic information listed in Annex I shall be obtained either from statistical units as defined in Council Regulation (EEC) No 696/93 ([1]) or from other sources which yield data meeting the quality requirements specified in point 5.1 of Annex I. Each Member State shall notify the type of the statistical unit or source to the Commission when transmitting the data.

2. The statistical units called upon by the Member States to provide data or to cooperate in data collection shall allow monitoring of the prices actually charged and shall give honest and complete information at the time it is requested.

Article 7

Quality criteria and control

1. The Commission (Eurostat) and the Member States shall set up a system for quality control based on reports and assessments as specified under point 5.3 of Annex I.

2. Member States shall provide the Commission (Eurostat), at its request, with all information necessary to evaluate the quality of the basic information listed in Annex I.

Member States shall also provide the Commission (Eurostat) with the details and the reasons for any subsequent changes in the methods used or any deviation from the methodological manual specified in Annex I.

3. Member States shall provide the Commission (Eurostat) with quality reports on the surveys for which they are responsible, as specified in Section 5 of Annex I.

4. The common criteria on which the quality control is based and the structure of the quality reports, as specified under point 5.3 of Annex I, shall be laid down in accordance with the regulatory procedure with scrutiny specified in Article 11(3).

Article 8

Periodicity

The Commission (Eurostat) shall calculate PPPs with reference to each calendar year.

Article 9

Dissemination

1. The Commission (Eurostat) shall publish the final annual results no later than 36 months after the end of the reference year.

([1]) Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community (OJ L 76, 30.3.1993, p. 1). Regulation as last amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

Publication shall be based on data available to the Commission (Eurostat) no later than three months before the publication date.

Nothing in this paragraph shall affect the right of the Commission (Eurostat) to publish preliminary results earlier than 36 months after the end of the reference year and the Commission (Eurostat) shall make these publicly available, including on its website.

2. The results published by the Commission (Eurostat) at an aggregated level for each Member State shall include at least the following:

(a) PPPs at the level of GDP;

(b) PPPs for private household consumption expenditure and actual individual consumption;

(c) price level indices relative to the Community average; and

(d) GDP, private household consumption expenditure and actual individual consumption and respective per capita figures in PPS.

3. If results are calculated for a wider group of countries, the PPPs of the Member States shall nevertheless be preserved, in pursuance of the principle of fixity.

4. Published final PPPs shall generally not be revised.

However, in the event of mistakes falling within the scope of Section 10 of Annex I, corrected results shall be published in accordance with the procedure laid down therein.

Exceptional general revisions shall be carried out if, owing to changes to the concepts underlying ESA 95 that affect PPP results, the volume index of GDP for any Member State changes by more than one percentage point.

Article 10

Correction coefficients

Member States shall not be required to undertake surveys solely for the purpose of establishing the correction coefficients to be applied to the remuneration and pensions of Community officials and other servants in accordance with the Staff Regulations.

Article 11

Committee procedure

1. The Commission shall be assisted by the Statistical Programme Committee.

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. Where reference is made to this paragraph, Article 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

Article 12

Implementing measures

1. The measures necessary for the implementation of the provisions of this Regulation, including measures to take account of economic and technical changes, shall be adopted, insofar as this does not involve a disproportionate increase in costs for the Member States, as laid down in paragraphs 2 and 3.

2. The following measures necessary for implementation of this Regulation shall be adopted in accordance with the regulatory procedure referred to in Article 11(2):

(a) the definition of a set of minimum standards in order to achieve the essential comparability and representativity of the data as specified under points 5.1 and 5.2 of Annex I;

(b) the definition of precise requirements as to the methodology to be used as specified in Annex I; and

(c) the establishment and adjustment of detailed descriptions of the content of basic headings, provided that these remain compatible with ESA 95 or any succeeding system.

3. The following measures designed to amend non-essential elements of this Regulation, inter alia by supplementing it with new elements, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 11(3):

(a) the adaptation of the definitions;

(b) the adjustment of the list of basic headings (as specified in Annex II); and

(c) the definition of quality criteria and the structure of the quality reports, pursuant to Article 7(4).

Article 13

Financing

1. The Member States shall receive from the Commission a financial contribution of a maximum of 70 % of the costs eligible under the Commission's grant rules.

2. The amount of such financial contribution shall be fixed as part of the annual budgetary procedures of the European Union. The budget authority shall determine the appropriations available each year.

Article 14

Review and report

The provisions of this Regulation shall be reviewed five years after its entry into force. It shall be revised, if appropriate, on the basis of a Commission report and proposal, submitted to the European Parliament and the Council.

Article 15

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Strasbourg, 11 December 2007.

For the European Parliament	*For the Council*
The President	*The President*
H.-G. PÖTTERING	M. LOBO ANTUNES

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ANNEX I

METHODOLOGY

1. METHODOLOGICAL MANUAL AND WORK PROGRAMME

1.1. A methodological manual will be provided by the Commission (Eurostat), following consultation with the Member States, describing the methods used at the various stages of compiling PPPs, including the methods for estimating missing basic information and for estimating missing parities. The methodological manual will be revised whenever a significant change to the methodology is made. It may introduce new methods to improve data quality, reduce costs or lessen the burden on data suppliers.

1.2. The Commission (Eurostat) will establish, by 30 November each year and in consultation with the Member States, an annual Work Programme for the following calendar year setting out the timetable for the specification and the provision of the basic information required for that year.

1.3. The annual Work Programme will determine the format for provision of data to be used by the Member States, and any other actions necessary in order to accomplish the calculation and publication of PPPs.

1.4. The basic information supplied according to point 1.2 may be revised, but the results for the reference year will be calculated from information available according to the timetable specified in Article 9. Where information is not complete or not available at that date, the Commission (Eurostat) will estimate the missing basic information.

1.5. Should a Member State fail to submit complete basic information, it will specify why the information is incomplete, when it will submit complete information or, if appropriate, why complete information cannot be provided.

2. BASIC INFORMATION

2.1. **Basic information items**

For the purpose of this Regulation, basic information pursuant to Articles 2 and 4 and the minimum frequency of new data supply will comprise and be provided as follows:

Basic information	Minimum frequency
GDP expenditure weights (1)	Annual
Actual and imputed rentals (2)	Annual
Compensation of employees	Annual
Temporal adjustment factors	Annual
Prices of consumer goods and services and related representativity indicators	3 years (3)
Prices of equipment goods	3 years
Prices of construction projects	3 years
Spatial adjustment factors	6 years

(1) These weights shall be consistent with the lowest level of available aggregates from national accounts. If the required detail is not available, the Member State may provide best estimates for the missing positions.
(2) The dwellings stock quantity approach, as described in the methodological manual, may be used instead of the price approach in cases where actual rentals are missing or are statistically unreliable in line with Regulation (EC) No 1722/2005.
(3) The minimum frequency refers to the provision of data for a particular product group, related to the rolling cycle of surveys.

2.2. **Procedure for obtaining basic information**

The Commission (Eurostat), after taking account of the views of the Member States, will determine the sources and data suppliers to be used for each of the above items of basic information. If the Commission (Eurostat) obtains basic information from a data supplier other than a Member State, the latter will be relieved of the obligations set out in points 5.1.4 to 5.1.13.

3. NATIONAL AVERAGE PRICES

3.1. Notwithstanding the provisions of Article 2(2), data collection may be limited to one or more locations within the economic territory. Such data may be used for PPP calculations provided that they are accompanied by appropriate spatial adjustment factors. Such spatial adjustment factors will be used to adjust survey data in the relevant locations to those representative of the national average.

3.2. Spatial adjustment factors will be supplied at basic heading level. They will be no more than six years old at the reference period of the survey.

4. ANNUAL AVERAGE PRICES

Notwithstanding the provisions of Article 2(2), data collection may be limited to a specific period of time. Such data may be used for PPP calculations provided that they are accompanied by appropriate temporal adjustment factors. Such temporal adjustment factors will be used to adjust survey data in this period to those representative of the annual average.

5. QUALITY

5.1. **Minimum standards for basic information**

5.1.1. The list of items to be priced will be designed to comprise items whose specifications ensure comparability between countries.

5.1.2. The list of items to be priced will be designed so that each Member State can indicate at least one representative item which can be priced in at least one other Member State for each basic heading.

5.1.3. The item list will be designed in order to achieve the highest practicable level of equi-representativity so that, as a minimum, each country has to price one representative item for each basic heading and this representative item has to be priced by at least one other country.

5.1.4. Each Member State will price items according to the specifications in the item list.

5.1.5. Each Member State will price a sufficient number of items within each basic heading that are available in its market, even though they may not be considered as representative of that basic heading.

5.1.6. Each Member State will supply prices of at least one representative item within each basic heading. The representative items will be indicated by a representativity indicator.

5.1.7. Each Member State will collect a sufficient number of price quotations for each item priced to ensure a reliable average price per item taking account of its market structure.

5.1.8. The selection of outlet types will be designed to adequately reflect the domestic pattern of consumption within the Member State according to the item.

5.1.9. The outlet selection in a location will be designed to adequately reflect the pattern of consumption of the residents of the location and the availability of items.

5.1.10. Each Member State will supply the Commission (Eurostat) with data on compensation of employees for selected occupations with reference to the sector General Government (S 13) as defined in ESA 95.

5.1.11. Each Member State will supply the Commission (Eurostat) with temporal adjustment factors which allow calculation of PPPs from prices collected at a specific time which adequately reflect the annual average price level.

5.1.12. Each Member State will supply the Commission (Eurostat) with spatial adjustment factors which allow calculation of PPPs with prices collected in specific locations which adequately reflect the national average price level.

5.1.13. Each Member State will supply the Commission (Eurostat) with weights relating to each basic heading as specified in Annex II which reflect the expenditure pattern in the Member State for the reference year.

5.2. **Minimum standards for the validation of price survey results**

5.2.1. Each Member State will, before transmitting the data to the Commission (Eurostat), carry out a review of data validity based on:

— maximum and minimum prices,

— the average price and coefficient of variation,

— the number of priced items per basic heading,

— the number of priced representative items per basic heading, and

— the number of prices observed per item.

5.2.2. An electronic tool containing the algorithms required for the purposes of point 5.2.1 will be supplied by the Commission (Eurostat) to the Member States.

5.2.3. The Commission (Eurostat) will, before finalising the survey results, carry out validity checks, in conjunction with the Member States, based on indicators including:

For each basic heading:

— the number of items priced by each country,

— the number of items attributed a representativity indicator by each country,

— the price level index,

— the results of the previous survey covering the same basic heading, and

— price level indices in PPP terms for each country.

For each item:

— the number of prices observed by each country, and

— the variation coefficients of:

(i) average prices in national currencies,

(ii) price level indices in PPP terms, and

(iii) price level indices in PPP terms for each country.

5.2.4. The Commission (Eurostat) will, before finalising the PPP results at aggregate level, carry out validity checks based on indicators including:

At the level of total GDP and its main aggregates:

— the consistency of GDP expenditure weights and population estimates with published data,

— a comparison of per capita volume indices for current and previous calculations, and

— a comparison of price level indices for current and previous calculations.

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At the level of each basic heading:

— a comparison of the GDP weighting structure for current and previous calculations, and

— estimates of missing data, where relevant.

5.3. **Reporting and assessment**

5.3.1. Each Member State will maintain documentation which gives a full description of the manner in which this Regulation has been implemented. This documentation will be available to the Commission (Eurostat) and the other Member States.

5.3.2. Each Member State will have its PPP process assessed at least once every six years by the Commission (Eurostat). The assessments, planned annually and included in the annual Work Programme, will review compliance with this Regulation. A report, based on the assessments, will be made by the Commission (Eurostat) and be made publicly available, including on its website.

5.3.3. In accordance with Article 7(3), shortly after each consumer price survey, a report by the Member State responsible will be given to the Commission (Eurostat) providing information on the way in which the survey was conducted. The Commission (Eurostat) will provide each Member State with a summary of these reports.

6. CONSUMER PRICE SURVEY PROCEDURE

6.1. Member States will carry out the price surveys according to the Work Programme.

6.2. For each survey, the Commission (Eurostat) will prepare the survey item list, based on proposals which will be made by each Member State for each basic heading.

6.3. The Commission (Eurostat) will provide, together with the item list, in all official languages of the European Union, a translation of all specifications in each survey list.

7. CALCULATION PROCEDURE

7.1. **Calculation of bilateral parities at basic heading level**

(a) The calculation of multilateral Èltetò-Köves-Szulc (hereinafter referred to as 'EKS') parities at basic heading level will be based on a matrix of bilateral parities for each pair of participant countries.

(b) The calculation of bilateral parities will be carried out by reference to the prices observed for, and the representativity indicators attributed to, the underlying items.

(c) The average survey price for each item will be established as the simple arithmetic mean of the price observations recorded for that item.

(d) The national annual average price will be estimated, where necessary, on the basis of the average survey price by using appropriate spatial and temporal adjustment factors.

(e) The ratios of the adjusted average prices will then be calculated, where possible, for items and pairs of participant countries, together with their inverse.

(f) PPPs will then be calculated, where possible, for all pairs of participant countries for the basic heading. For each pair of participant countries, PPPs will be calculated as the weighted geometric mean of:

— the geometric mean of the price ratios of items which are indicated as representative of both countries,

— the geometric mean of the price ratios of items which are indicated as representative of the first country but not of the second country,

— the geometric mean of the price ratios of items which are indicated as representative of the second country but not of the first country,

using weights reflecting the relative representativity of all items priced by both countries.

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7.2. **Estimation of missing bilateral parities**

If for any basic heading the bilateral PPPs cannot be calculated, the missing bilateral PPPs will be estimated, where possible, by using the standard procedure of geometric averaging of indirect parities via third countries. Should the matrix of bilateral PPPs for a basic heading still contain any missing values after this estimation procedure, the calculation of multilateral EKS parities will then not be possible for the countries for which bilateral PPPs are missing. Such missing EKS parities will then be estimated by the Commission (Eurostat), using reference PPPs from similar basic headings or any other appropriate estimation method.

7.3. **The calculation of bilateral parities at aggregate level**

(a) The calculation of bilateral parities at a particular level of national accounts aggregation will be carried out using the EKS parities (see point 7.4), and the GDP expenditure weights, for the underlying basic headings.

(b) A Laspeyres-type parity will then be calculated for the selected level of aggregation as the arithmetic mean of the parities for the underlying basic headings, weighted by the relative percentages (or nominal values) for the second country of each pair of participant countries.

(c) A Paasche-type parity will then be calculated for the selected level of aggregation as the harmonic mean of the parities for the underlying basic headings, weighted by the relative percentages (or nominal values) for the first country of each pair of participant countries.

(d) A Fisher-type parity will then be calculated for the selected level of aggregation as the geometric mean of the Laspeyres-type and Paasche-type parities established for each pair of participant countries.

7.4. **Calculation of transitive multilateral PPPS**

The calculation of transitive multilateral parities will be carried out either at basic heading level or any aggregated level by using the EKS procedure based on a complete matrix of Fisher-type parities between each pair of participant countries as follows:

$$ {}_{t}EKS_{s} = \left(\prod_{i=1}^{z} \frac{{}_{t}F_{i}}{{}_{s}F_{i}} \right)^{\frac{1}{z}}, \forall_{t,s} $$

where $tEKSs$ denotes the EKS parity between country s and country t;

tFs denotes the Fisher-type parity between country s and country t;

z denotes the number of participant countries.

8. TRANSMISSION

8.1. The Commission (Eurostat) will supply to the Member States the templates for electronic transmission of the basic information necessary to calculate PPPs.

8.2. Member States will provide basic information to the Commission (Eurostat) in accordance with the templates.

9. PUBLICATION

In addition to the provisions contained in Article 9(2), the Commission (Eurostat) may publish results at a more detailed level after consultation with the Member States.

10. CORRECTIONS

10.1. When a mistake is discovered by a Member State, it will immediately and on its own initiative provide the Commission (Eurostat) with correct basic information. In addition, a Member State will inform the Commission (Eurostat) of any suspected inappropriate application of the calculation procedure.

10.2. After becoming aware of a mistake, made either by a Member State or the Commission (Eurostat), the Commission (Eurostat) will inform the Member States and recalculate the PPPs within one month.

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10.3. If the mistakes discovered result in a change of at least 0,5 percentage points at the level of per capita GDP in PPS of any Member State, the Commission (Eurostat) will publish a correction as soon as possible, unless such mistakes are discovered later than three months after the results have been published.

10.4. Where a mistake has occurred, the responsible body will take steps to prevent similar future occurrences.

10.5. Revisions carried out after 33 months following the end of the reference year to GDP expenditure weights or to population estimates will not require a correction to be made to PPP results.

1.3.2011 EN Official Journal of the European Union L 56/1

II

(Non-legislative acts)

REGULATIONS

COMMISSION REGULATION (EU) No 193/2011

of 28 February 2011

implementing Regulation (EC) No 1445/2007 of the European Parliament and of the Council as regards the system of quality control used for Purchasing Power Parities

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 1445/2007 of the European Parliament and of the Council of 11 December 2007 establishing common rules for the provision of basic information on Purchasing Power Parities and for their calculation and dissemination [1], and in particular Article 7(4) thereof,

Whereas:

(1) Regulation (EC) No 1445/2007 establishes common rules for the provision of basic information on Purchasing Power Parities and for their calculation and dissemination.

(2) The minimum quality standards for the basic information to be provided by Member States, the minimum quality standards for the validation of price survey results and the reporting and assessment requirements are specified in Section 5 of Annex I to Regulation (EC) No 1445/2007.

(3) It is necessary to further define the common quality criteria and the structure of the quality reports.

(4) The measures provided for in this Regulation are in accordance with the opinion of the European Statistical System Committee,

HAS ADOPTED THIS REGULATION:

Article 1

The common quality criteria and the structure of the quality reports concerning Purchasing Power Parities as provided for by Regulation (EC) No 1445/2007 shall be as set out in the Annex to this Regulation.

Article 2

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 28 February 2011.

For the Commission
The President
José Manuel BARROSO

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(1) OJ L 336, 20.12.2007, p. 1.

L 56/2 EN Official Journal of the European Union 1.3.2011

ANNEX

Common quality criteria and structure of quality reports

1. **Inventory of sources and methods used in the Eurostat PPP exercise ('PPP inventory')**

To fulfil the requirements of paragraph 5.3.1 of Annex I to Regulation (EC) No 1445/2007, each Member State shall provide an inventory of sources and methods used in the Eurostat PPP exercise (hereinafter referred to as the 'PPP inventory').

The structure of the PPP inventory shall be based on the various items of basic information provided in the context of Regulation (EC) No 1445/2007, as follows:

1. Organisation of the national PPP exercise and background information

2. Consumer goods and services

2.1. Consumer goods price surveys

— Includes information on survey organisation, sampling, representativity, validation, temporal and spatial adjustment factors

2.2. Housing services

— Includes information on data sources and their quality, compliance with definitions, any adjustments made

3. Government services (salary survey only)

— Includes information on data sources and their quality, compliance with definitions, any adjustments made

4. Capital goods and services

4.1. Equipment goods

— Includes information on survey organisation, sampling, representativity, validation

4.2. Construction

— Includes information on survey organisation, data sources and their quality, representativity, validation

5. Final expenditure on GDP

— Includes information on data sources and their quality, compliance with definitions, any adjustments made

Each Member State shall provide an update of the PPP inventory in January each year, whenever changes to sources and methods used have occurred during the preceding year.

2. **Consumer goods price survey reports**

To fulfil the requirements of paragraph 5.3.3 of Annex I to Regulation (EC) No 1445/2007, each Member State shall submit a report for each consumer goods price survey. The structure of the report shall be as follows:

1. Pre-survey
2. Price collection
3. Intra-country validation
4. Inter-country validation

The survey reports shall contain information complementary to the PPP inventories.

3. **Quality criteria**

The criteria used in the assessment of the quality of the basic information provided shall be those laid down in Article 12 of Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics ([1]), in combination with the minimum standards laid down in Section 5 of Annex I to Regulation (EC) No 1445/2007.

([1]) OJ L 87, 31.3.2009, p. 164.

ANNEX III. CLASSIFICATION OF GDP EXPENDITURES

III.1 The annex presents the classification of expenditure used for Eurostat and OECD comparisons of GDP. It differs from the classification in Annex II of the PPP Regulation because it has been updated to accommodate the methodological developments that have been introduced into the PPP Programme since 2007 and which will be in place by the end of 2011. The updating has reduced the number of basic headings for construction and education.

III.2 The classification 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 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).

III.3 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.

III.4 These seven main aggregates are broken down into 31 expenditure categories, 66 expenditure groups, 143 expenditure classes and 206 basic headings[3] as shown in Box III.1. Of these aggregation levels, 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.

III.5 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 III.2. The abbreviations used in the classification are listed in Box III.3.

III.6 Individual consumption expenditures by households, NPISHs and government are classified by purpose following COICOP[4], COPNI[5] and COFOG 98[6]. Gross fixed capital formation is classified by type of product according to CPA 96[7]. 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.

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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 version of the classification used for OECD comparisons has 196 basic headings to which the 206 basic headings in the Eurostat version sum exactly. The principal difference between the two versions is that the OECD version has just one basic heading for furniture and one basic heading for NPISHs, whereas the Eurostat version has four basic headings for furniture and six basic headings for NPISHs.

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

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

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

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

III.7 ***Individual consumption expenditure by households*** is broken down by purpose in line with COICOP into 143 basic headings. Expenditures at the basic heading level are defined according to the domestic concept - that is, irrespective of whether the household making the purchase in the country is resident or not. But total individual consumption expenditure by households is required by the national concept - that is, it should refer to expenditures by resident households only. A global adjustment – *net purchases abroad* - is made to achieve this. It is defined as total expenditure in the rest of the world by resident households *less* total expenditure in the economic territory of the country by non-resident households.

III.8 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.[8] 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.

III.9 ***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 and all six basic headings are classified as containing individual services (IS).

III.10 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).

III.11 ***Individual consumption expenditure by government*** is broken down into 21 basic headings. First by purpose - housing, health, recreation and culture, education and social protection - and then, in the case of health, by whether the expenditure is for the purchase of health services from the private sector (in the form of benefits and reimbursements) or the production of health services by government itself. The expenditure on government produced health services is broken down further by cost components as required by the input-price approach[9]. All 21 basic headings are classified as containing individual services (IS).

III.12 ***Collective consumption expenditure by government*** is broken down into seven basic headings by cost components as required by the input-price approach. A distinction is made between *defence services* and *collective services other than defence services*. All seven basic headings are classified as containing collective services (CS).

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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 (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).

9 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 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.

Box III.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**	**44**	**105**	**143**
- .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		1	1	1
- .11 Restaurants and hotels		2	3	4
- .12 Miscellaneous goods and services		7	11	11
- .13 Net purchases abroad		1	1	1
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**	**6**	**11**	**21**
- .01 Housing		1	1	1
- .02 Health		2	7	17
- .03 Recreation and culture		1	1	1
- .04 Education		1	1	1
- .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**	**26**
- .01 Machinery and equipment		2	7	20
- .02 Construction		3	3	3
- .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**	**1**
GDP	**31**	**66**	**143**	**206**

III.13 ***Gross fixed capital formation*** is broken down by type of product in line with CPA 96 into 26 basic headings: twenty for machinery and equipment, three 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 26 basic headings are classified as containing investment goods (IG).

III.14 ***Change in inventories and acquisitions less disposals of valuables*** is broken into two basic headings: *change in inventories* and *acquisitions less disposals of valuables*.

III.15 ***Balance of exports and imports*** comprises one basic heading and is defined as exports of goods and services *less* imports of goods and services.

Box III.2: 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

Box III.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 Bread and cereals [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 Meat [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 Fish and seafood [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 Milk, cheese and eggs [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 Oils and fats [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 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).

11.01.20.0 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 Spirits [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 Wine [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 Beer [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 Tobacco [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 Narcotics [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 Clothing materials [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 repair 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 consumption 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. Purchases of materials made by tenants or owner-occupiers with the intention of undertaking the maintenance 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, 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* 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).

11.04.32.0 **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 supplied by district heating plants (11.04.55.1).

11.04.42.0 Miscellaneous services relating to the dwelling [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 Electricity [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 Gas [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 Liquid fuels [COICOP 04.5.3]

11.04.53.1 Liquid fuels (ND)

Domestic heating and lighting oils.

11.04.54.0 Solid fuels [COICOP 04.5.4]

11.04.54.1 Solid fuels (ND)

Coal, coke, briquettes, firewood, charcoal, peat and the like.

11.04.55.0 Heat energy [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 Furniture and furnishings [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).

1.05.12.0 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, stew pots, 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, floor cloths, 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; *exclude*s 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 Spare parts and accessories for personal transport equipment [COICOP 07 2.1]

11.07.21.1 Spare parts and accessories for personal transport equipment (SD)

Tyres (new, used or retreaded), inner-tubes, 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 Fuels and lubricants for personal transport equipment [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 Maintenance and repair of personal transport equipment [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 Other services in respect of personal transport equipment [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 Passenger transport by railway [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 Passenger transport by road [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 Passenger transport by air [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 Passenger transport by sea and inland waterway [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 Combined passenger transport [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 Other purchased transport services [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 Postal services [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 Telephone and telefax equipment [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 Telephone and telefax services [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 radio-telex services.

11.09.00.0 RECREATION AND CULTURE

11.09.10.0 AUDIO-VISUAL, PHOTOGRAPHIC AND INFORMATION PROCESSING EQUIPMENT

11.09.11.0 Equipment for the reception, recording and reproduction of sound and pictures [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 Photographic and cinematographic equipment and optical instruments [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 **Musical instruments and major durables for indoor recreation [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 **Maintenance and repair of other major durables for recreation and culture [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, 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).

11.09.32.0 **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 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).

11.09.33.0 **<u>Gardens, plants and flowers</u> [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 **<u>Pets and related products</u> [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 **<u>Veterinary and other services for pets</u> [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 **Games of chance [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 **Books [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 **Newspapers and periodicals [COICOP 09.5.2]**

11.09.52.1 **Newspapers and periodicals (ND)**

Newspapers, magazines and other periodicals.

11.09.53.0 **Miscellaneous printed matter, stationery and drawing materials [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 **Package holidays [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; *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 level categories are those of the 1997 International Standard Classification of Education (ISCED 97) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

11.10.10.0 EDUCATION

11.10.11.0 <u>Education</u> [COICOP 10.1.0, 10.2.0, 10.3.0, 10.4.0. 10.5.0]

11.10.11.1 Education (S)

Pre-primary and primary education (ISCED levels 0 and1); general, vocational or technical secondary education (ISCED levels 2 and 3); post-secondary non-tertiary education (ISCED level 4), tertiary education (ISCED levels 5 and 6); education not definable by level; *includes* literacy programmes for students too old for primary school, out-of-school secondary education for adults and young people; out-of-school post-secondary non-tertiary education for adults and young people; 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; education by radio or television broadcasting; *excludes* driving lessons (11.07.24.1); recreational training courses such as sport or bridge lessons given by independent teachers (11.09.41.1), 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).

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 Prostitution [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 Jewellery, clocks and watches [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 Other personal effects [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 Social protection [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 Insurance [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 FISIM [COICOP 12.6.1]

11.12.61.1 FISIM (S)

Financial intermediation services indirectly measured.

11.12.62.0 Other financial services n.e.c. [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 Other services n.e.c. [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 *Net purchases abroad*

11.13.11.1 Net purchases abroad

Purchases by 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) *less* purchases by 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 **Housing [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 **Health [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 Recreation and culture [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 Other services [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 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 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 Health services

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 <u>Gross operating surplus</u>

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 <u>Net taxes on production</u>

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 – CO FOG 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.

The level categories are those of the 1997 International Standard Classification of Education (ISCED 97) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

13.04.10.0 EDUCATION

13.04.11.0 Education

Covers both general government expenditure on education services produced by the private sector and General government expenditure on government-produced education services

13.04.11.1 Education (IS)

Pre-primary and primary education (ISCED levels 0 and1); general, vocational or technical secondary education (ISCED levels 2 and 3); post-secondary non-tertiary education (ISCED level 4), tertiary education (ISCED levels 5 and 6); education not definable by level; *includes* literacy programmes for students too old for primary school, out-of-school secondary education for adults and young people; out-of-school post-secondary non-tertiary education for adults and young people; 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; education by radio or television broadcasting; *excludes* crèches, play schools and other child minding facilities (13.05.11.1); schools for disabled persons where the main aim is to help students overcome their disability rather than to provide a general education (13.05.11.1).

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 Compensation of employees

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 Intermediate consumption

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 Gross operating surplus

14.01.13.1 Gross operating surplus (CS)

Consumption of fixed capital *plus* operating surplus.

14.01.14.0 **Net taxes on production**

14.01.14.1 **Net taxes on production (CS)**

Taxes on production *less* subsidies on production.

14.01.15.0 **Receipts from sales**

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 **Fabricated metal products, except machinery and equipment [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 **General purpose machinery [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 **Special purpose machinery [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 **Other manufactured goods n.e.c. [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 **Road transport equipment [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 **Other transport equipment [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 **Residential buildings [CPA division 45]**

15.02.11.1 **Residential buildings**

Detached, semi-detached and terraced houses; apartment houses with two or more dwelling units *includes* farm houses and dormitories.

15.02.20.0 NON-RESIDENTIAL BUILDINGS

15.02.21.0 Non- residential buildings [CPA division 45]

15.02.21.1 Non-residential buildings

Non-residential farm buildings (stables, barns, granaries, grain bins, tower silos, machine sheds, etc.); industrial buildings (factories, plants, workshops, warehouses, etc.); commercial or administrative buildings (office buildings, bank buildings, parking garages, petrol and service stations, shopping centres and air, rail or road transport terminals); public entertainment buildings (cinemas, theatres, concert halls, dance halls and night clubs; inns, hotels, motels, hostels, restaurants, etc.); educational buildings (schools, colleges, universities, libraries, archives and museums); health buildings (hospitals, clinics, sanatoria, etc.); structures for stadia and sports grounds; other non-residential buildings (religious buildings, prison buildings, etc.).

15.02.30.0 CIVIL ENGINEERING WORKS

15.02.31.0 Civil engineering works [CPA division 45]

15.02.31.1 Civil engineering works

Highways, roads, railways and airfield runways; bridges, elevated highways, tunnels and subways; waterways, harbours, dams and other waterworks; pipelines for oil, gas, water supplies, sewerage or rain water; telecommunication transmission lines; electricity power lines including electricity power lines for railways; 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 Products of agriculture, forestry, fisheries and aquaculture [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 Software [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 Other products n.e.c. [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 Changes in inventories

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 Acquisitions less disposals of valuables

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 Balance of exports and imports

17.01.11.1 Balance of exports and imports

Value (f.o.b.) of exports of goods and services *less* value (c.i.f.) of imports goods and services.

ANNEX IV. QUARANTA EDITING PROCEDURE

IV.1 Introduction

IV.1. Eurostat and the OECD use the Quaranta editing procedure[1] to validate the prices that participating countries report for consumer products, rents, government services and capital goods. The procedure is both an editing tool and an analytical tool. As an editing tool it identifies possible errors that need to be investigated 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 and 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 intra-country editing and verification of individual price observations by product. The second stage involves the Quaranta editing procedure and the inter-country verification of average survey prices by basic heading. The first stage is described in Chapter 5, Section 5.5.7. The second stage is described in the following paragraphs.

IV.2 Standardised price ratios

IV.4 The Quaranta editing procedure is designed to screen the average survey prices reported by countries for possible errors and to assess the reliability of the PPPs they provide. The object is to verify that the prices are for comparable products and that the products have been correctly priced. In other words, to ascertain that countries have interpreted the product specifications the same way and that they have also priced them accurately. The Quaranta editing procedure does this by comparing the average survey prices for the same product across countries and by analysing the dispersion across products and across countries of the price ratios that the average survey prices generate between countries. More specifically, inter-country editing involves detecting possible errors among the average survey prices by identifying outliers among their corresponding price ratios.

IV.5 As participating countries report average survey prices in national currencies, the prices can be compared only if they are converted to a common currency. 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 pre-determined criteria. But prices, even when expressed in the same currency, cannot be compared across products directly. On the other hand, the price ratios of countries pricing a product can be compared with the equivalent price ratios for other products providing that 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 prices are expressed in a common currency.[2]

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1 The procedure is named after its originator, Vincenzo Quaranta of ISTAT, 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 A standardised price ratio equals ($CC\text{-}Price_{1A}$ / [$CC\text{-}Price_{1A}$ * $CC\text{-}Price_{1B}$ * ……… $CC\text{-}Price_{1N}]^{1/N}$)*100 where $CC\text{-}Price_{1A}$ is the average price for product 1 in country A in the common currency. $CC\text{-}Price_{1A}$ is itself equal to $NC\text{-}Price_{1A} / CC_A$ where $NC\text{-}Price_{1A}$ is the average price for product 1 in country A in national currency and CC_A is the currency conversion rate

IV.6 Both exchange rates and PPPs are used in the Quaranta editing procedure to convert the average survey prices to a common currency and both the exchange rate converted prices and the PPP converted prices are used to derive standardised price ratios. The standardised price ratios based on exchange rate converted prices are called *XR-Indices* and the standardised price ratios based on PPP converted prices are called *PPP-Indices*[3]. Both XR-Indices and PPP-Indices are edited and verified. But only PPP-Indices are used to generate the measures of dispersion referred to below.

IV.7 The PPPs used to convert the average survey prices to a common currency are calculated by basic heading with the prices that are being validated for the basic heading. This means that editing starts with PPPs based on prices that have still to be verified. These opening PPPs are preliminary and the flagging of outliers among the PPP-Indices is preliminary as well. Exchange rates, on the other hand, are not determined by the survey price data and remain unaffected by them. It is for this reason that XR-Indices are used in the initial stages of validation. It may appear paradoxical to use XR-Indices to edit prices with which PPPs are to be derived given that PPPs are calculated because exchange rates do not reflect the relative purchasing power of currencies in their national markets, but experience shows that XR-Indices provide a better “feel” for the reliability of the average survey prices reported at the beginning of the validation process. Experience also shows that many of the ratios initially identified as outliers among the XR-Indices are found to be incorrect.[4]

IV.8 The Quaranta editing procedure is an iterative process and can involve several iterations or rounds before being completed. After each round, as incorrect prices are removed or corrected, the PPPs will become more reliable and so too will the flagging of outliers among the PPP-Indices. Thus, as validation progresses, the focus on outliers shifts from those among the XR-Indices to those among the PPP-Indices. The aim of the exercise is to remove, or at least reduce, the outliers among the PPP-Indices. Providing this is achieved, the outliers remaining among the XR-Indices can be ignored. XR-Indices and PPP-Indices that fall outside the range 80 (4/5) to 125 (5/4)[5] are flagged as outliers. The choice of range is arbitrary but substantiated by experience.[6]

IV.3 Measures of dispersion

IV.9 The Quaranta editing procedure also involves analysing the dispersion among the PPP-Indices. For this purpose, three variation coefficients are calculated. The first coefficient – the product variation coefficient - measures dispersion among the PPP-Indices for a product; the second coefficient – the country variation coefficient - measures the dispersion among a country’s PPP-Indices for a basic heading; and the third coefficient – the basic heading variation coefficient - measures dispersion among all PPP-Indices for a basic heading irrespective of product or country.

IV.10 The higher a coefficient’s value the less reliable are the PPP-Indices to which it refers. The critical value for all three variation coefficients is 33 per cent. Again, the choice of critical value is arbitrary but supported by experience. Coefficients with values above 33 per cent are outliers requiring countries to investigate the PPP-Indices that are flagged among the PPP-Indices covered by the coefficient. Besides being editing tools, the coefficients provide the means to monitor progress during validation and, at its conclusion, to assess how effective the whole process of editing and verification has been in reducing the incidence of non-sampling error among the price data. In principle, coefficients should be smaller at the end of validation than they were at the beginning.

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between the national currency of A and the common currency. The currency conversion rate is either the exchange rate or the PPP of the product’s basic heading: $CC_A = XR_A$ *or* PPP_A.

3 Formerly, PPP-Prices and PPP-Indices were referred to as *CUP-Prices* and *CUP-Indices*. CUP stands for *Conventional Unit for expressing Parities*. For Eurostat comparisons, basic heading PPPs are expressed as the number of national currency units per *scaled euro*. How these PPPs are derived is explained in item (10) of Box IVA.

4 XR-Indices are particularly useful in the detection of systematic errors. For example, if a country has supplied prices for electricity at 1 KWh instead of 1000 KWh or monthly salaries instead of annual salaries for government employees, these errors will not be visible in the PPP-Indices because the price structure is still correct, but they will be visible in the XR-Indices because the price levels are not correct.

5 The intervals of the range are not equal in linear or arithmetic terms but they are equal in logarithmic or geometric terms because it is the relative deviations from a geometric mean that are being measured. When a geometric mean is used then equal lower and upper limits should conform to the following rule: lower limit x upper limit equals 1 if expressed as fractions or 10,000 if expressed as percentages.

6 It is probably too narrow for highly heterogeneous groups of countries for which a range of 66 (2/3) to 150 (3/2), also arbitrary, would be more realistic.

IV.4 Quaranta table

IV.11 Central to the Quaranta editing procedure is the *Quaranta table* and central to the Quaranta table is the basic heading.[7] 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. It 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. Box IV.1A contains an example of a basic heading table and Box IV.2A contains an example of a product table. Box IV.2A is incomplete because it only covers one of the seven products specified for the basic heading. The red numbers in brackets have been added to the tables for ease of reference. They, and the acronyms employed in the tables, are explained in Box IV.1B (the basic heading table) and Box IV.2B (the product table).

IV.12 The basic heading table provides summary information for the basic heading that relates either to the basic heading as a whole or to each country covered by the basic heading. For the basic heading (1), it gives the reference year (2), the method used to calculate the PPPs (3), the date when the table was last updated (4), the average expenditure weight (5), the number of items specified (6) and the basic heading variation coefficient (7). For countries (8), it gives: the exchange rate (9), the PPP (10), the price level index (PLI) (11), the expenditure weight (12), the number of items and representative (asterisk) products priced (13) and the country variation coefficient (14).

IV.13 The product table shows for each product (15)(16): the product variation coefficient (17); the average survey prices reported by countries in national currencies (19) - these are the prices being validated and the prices with which the PPPs shown in the basic heading table are calculated; the average survey prices converted to the common currency with exchange rates (24), their geometric mean (25) and the standardised price ratios based on the exchange rate converted prices (26); the average survey prices converted to the common currency with the PPPs for the basic heading (28), their geometric mean (29) and the standardised price ratios based on the PPP converted prices (30). Standardised price ratios with values that are below the predetermined range of acceptability are flagged by **<** , while those with values that are above the predetermined range are flagged by **>** . Outlying XR-Indices are flagged in column (24) and outlying PPP-Indices in column (31). By taking the flagging of both indices into account, useful information can be gained about the consistency of the average survey prices on which they are based.

- No flags for the XR-indices or the PPP indices: price consistency for both, no further validation required;
- XR-indices flagged but no flagging of PPP-indices: apparent inconsistency as regards exchange rate converted prices but PPP converted prices consistent, no further validation required;
- PPP-indices flagged (either with or without the flagging of XR-indices): apparent inconsistency among the PPP-converted prices, validation required.

[7] The Quaranta editing procedure can be applied at any level of aggregation. But basic headings are the building blocks of a comparison. They cover, at least in principle, relatively homogeneous groups of products with more or less uniform price levels. It makes sense to analyse price level differences at the lowest level of aggregation.

Box IV.1A: The basic heading table

QUARANTA TABLE FOR BASIC HEADING: 11.01.11.1 Rice (1)

Reference year: 2009 (2); **Method:** EKS (3); **Last Update:** 30-10-2009 (4);
Average Weight: 100.47 (5); **No of items:** 7 (6); **Variation Coefficient:** 20.3 (7)

Country (8)	XR (9)	PPP (10)	PLI (11)	Weight/ 100,000 (12)	No of Items (13)	Variation Coefficients (14)
AA	132.581	103.093	77.76	578.10	3: *3	8.1
AB	1.00000	1.03543	103.54	42.29	5: *3	19.8
AC	1.95583	2.14482	109.88	41.87	5: *3	8.1
AD	1.00000	1.05295	105.30	16.65	6: *3	15.7
AE	1.95580	1.53971	78.73	156.34	7: *4	20.5
AF	1.51180	1.29090	85.39	38.03	6: *6	28.0
AG	1.00000	1.23603	123.60	59.77	7: *5	18.5
AH	26.7310	22.9730	85.94	65.88	6: *4	10.1
AI	1.00000	1.14770	114.77	49.05	6: *6	17.0
AJ	7.44680	6.49661	87.24	39.38	6: *2	21.0
AK	15.6466	15.7941	100.94	67.19	5: *4	10.0
AL	1.00000	1.38069	138.07	99.20	7: *6	13.4
AM	1.00000	0.892266	89.23	52.12	7: *5	13.5
AN	1.00000	1.02682	102.68	49.48	5: *3	13.6
AO	1.00000	0.879914	87.99	45.58	7: *7	11.0
AP	7.35150	8.35178	113.61	148.41	6: *3	25.9
AQ	281.930	271.822	96.41	86.17	6: *4	14.4
AR	1.00000	1.29782	129.78	8.61	6: *5	17.9
AS	175.570	186.299	106.14	18.83	5: *4	25.0
AT	1.00000	1.34859	134.86	96.81	6: *5	10.0
AU	3.45280	3.30763	95.80	120.14	5: *5	14.0
AV	1.00000	0.942037	94.20	38.41	6: *4	13.4
AW	0.709200	0.652395	91.99	83.85	5: *3	32.9
AX	1.00000	1.18225	118.23	186.72	5: *3	20.1
AY	61.3968	48.3411	78.74	415.11	2: *1	23.2
AZ	1.00000	0.965763	96.58	84.09	7: *7	12.4
BA	1.00000	0.821909	82.19	35.92	3: *1	12.1
BB	8.79430	10.1866	115.83	28.21	4: *3	28.3
BC	4.41030	3.49731	79.30	53.52	3: *4	4.3
BD	1.00000	0.669431	66.94	149.08	7: *4	29.0
BE	4.17000	3.65208	87.58	334.99	6: *5	15.6
BF	94.7674	106.267	112.13	120.76	5: *3	19.3
BG	10.5820	10.4569	98.82	37.85	6: *4	36.8
BH	1.00000	1.19208	119.21	56.99	6: *4	12.0
BI	1.00000	0.965583	96.56	112.60	5: *3	19.9
BJ	2.12510	2.84315	133.79	101.07	4: *3	25.7
BK	0.884440	0.884668	100.03	50.03	6: *4	19.4

Box IV.1B: Reading the basic heading table in Box IVA

Basic Heading Table	
(1)	Basic heading covered by the table.
(2)	Year to which the price data refers.
(3)	Method used to calculate the PPPs for the basic heading.
(4)	Date at which the PPPs included in the table were calculated.
(5)	Average expenditure weight for the basic heading for the group of countries covered by the table. The unweighted arithmetic mean of the national expenditure weights in column **(12)**. It is scaled to 100,000.
(6)	Number of items specified for the basic heading.
[7]	Basic heading variation coefficient or, more precisely, the average product variation coefficient for the basic heading. The unweighted arithmetic mean of the product variation coefficients at **(17)** in the product tables. The average variation of the standardised price ratios of the products priced for the basic heading. (Products priced by only one country will not be included as the coefficient of variation will be zero per cent.)
(8)	Abbreviated names of countries participating in the comparison.
(9)	Exchange rates (XR) of the countries expressed as the number of units of national currency per euro. The exchange rate is 1.00000 for countries in the euro area.
(10)	PPPs for the basic heading calculated as specified in **(3)** and expressed as the number of units of national currency per euro. The PPPs are not based on an individual country but on all countries covered by the basic heading combined as a group. Hence, after calculation, the PPPs are first standardised and then multiplied by a coefficient to scale them to the euro. The scaling coefficient is the unweighted geometric mean of the euro exchange rates in column **(9)**. 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 in column **(19)** of the product tables.
(11)	Price level indices (PLIs). The PPPs in column **(10)** expressed as a percentage of the exchange rates in column **(9)**.
(12)	National expenditure weights scaled to 100,000. That part of a country's actual individual consumption that is spent on the basic heading when both expenditures are expressed in national currency and valued at national price levels.
(13)	Number of items or 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 (*).
(14)	Country variation coefficients for the basic heading. The standard deviation of the PPP-Indices in column **(30)** of the product tables for all products priced by the country for the basic heading, irrespective of whether they are representative or unrepresentative, expressed as a percentage of the arithmetic mean of the indices. (PPP-Indices of products priced by only one country are not included as the PPP-Index will be 100 and there will be no inter-country price variation.)

Box IV.2A: The product table

11.01.11.1.01 ab (15) Long-grain rice, parboiled, WKB (16)

Variation Coefficient: 14.0 (17)

Country	NC-Prices	*	QTS	Variation Coefficients	Wn	XR-Prices (24)	XR-Indices	Wn	PPP-Prices (28)	PPP-Indices	Wn
(18)	(19)	(20)	(21)	(22)	(23)	GM: 2.26 (25)	(26)	(27)	GM: 2.26 (29)	(30)	(31)
AA	245.00	*	18	17.0		1.85	81.9		2.38	105.3	
AB	2.24	-	2	20.1		2.24	99.3		2.16	95.9	
AC	5.14	*	10	7.3		2.63	116.5		2.40	106.2	
AD											
AE	2.78	*	12	10.6		1.42	63.1	<	1.81	80.1	
AF	2.66	*	9	9.0		1.76	78.0	<	2.06	91.3	
AG	3.15	*	43	17.6		3.15	139.6	>	2.55	112.9	
AH	62.30	-	8	5.0		2.33	103.3		2.71	120.2	
AI	3.15	*	10	13.2		3.15	139.5	>	2.74	121.5	
AJ	16.33	-	8	17.0		2.19	97.2		2.51	111.4	
AK	35.03	*	12	7.9		2.24	99.3		2.22	98.3	
AL	3.82	*	22	12.8		3.82	169.4	>	2.77	122.6	
AM	1.75	*	30	5.1		1.75	77.7	<	1.96	87.0	
AN	2.14	*	1	0.0		2.14	94.9		2.08	92.3	
AO	2.17	*	16	24.8		2.17	96.1		2.46	109.2	
AP	20.00	*	7	13.9		2.72	120.6		2.39	106.1	
AQ	599.50	*	12	21.2		2.13	94.3		2.21	97.7	
AR	3.13	*	7	19.4		3.13	138.6	>	2.41	106.7	
AS	428.11	*	10	17.3		2.44	108.1		2.30	101.8	
AT	2.86	*	23	22.6		2.86	127.0	>	2.12	94.1	
AU	7.59	*	23	13.6		2.20	97.5		2.30	101.7	
AV	1.66	*	5	20.9		1.66	73.5	<	1.76	78.0	<
AW	1.32	*	16	13.1		1.86	82.6		2.02	89.7	
AX	2.36	*	18	10.1		2.36	104.7		2.00	88.5	
AY											
AZ	1.78	*	7	36.8	>	1.78	78.8	<	1.84	81.5	
BA	1.96	-	11	22.9		1.96	86.9		2.39	105.7	
BB											
BC											
BD	1.38	*	24	11.4		1.38	61.0	<	2.05	91.0	
BE	7.39	*	42	11.7		1.77	78.6	<	2.02	89.7	
BF	344.45	-	23	19.1		3.63	161.1	>	3.24	143.6	>
BG	22.64	*	19	17.5		2.14	94.9		2.17	95.9	
BH	3.16	*	30	14.4		3.16	140.0	>	2.65	117.3	
BI	2.08	*	10	8.9		2.08	92.4		2.16	95.6	
BJ											
BK	1.65	*	21	23.3		1.86	82.6		1.86	82.6	

Box IV.2B: Reading the product table in Box IV.2A

	Product table
(15)	Product code.
(16)	Product name.
(17)	Product variation coefficient. The standard deviation of the PPP-Indices for a product in column **(30)** expressed as a percentage of the arithmetic mean of the indices. Theoretically, this variation coefficient should be calculated using logarithms because the PPP-Indices are based on the geometric mean of the PPP-Prices. It is calculated using the arithmetic mean and standard deviation of the PPP-Indices for practical reasons.
(18)	Abbreviated names of countries participating in the comparison.
(19)	NC-Prices. Average survey prices in national currency (NC).
(20)	Representativity indicator. Representativity is generally indicated by an asterisk (*). Whether or not the asterisks are used to calculate the PPPs in column **(10)** depends on the method specified at **(3)**.
(21)	Number of price quotations on which the NC-Prices in column **(19)** are based.
(22)	Average survey price variation coefficients: The standard deviation of the price quotations in column **(21)** that underlie the NC-Prices in column **(19)** expressed as a percentage of the arithmetic mean of the price quotations.
(23)	Warning flag. Average survey price variation coefficients in column **(22)** with a value greater than the selected critical value of 33 per cent are flagged by **>** .
(24)	XR-Prices. The NC-Prices in column **(19)** converted to euros with the exchange rates in column **(9)** of the basic heading table.
(25)	Geometric mean of the XR-Prices in column **[24]**. The use of a geometric mean insures invariance with respect to choice of numéraire.
(26)	XR-Indices. Indices based on the XR-Prices in column **(24)**. The XR-Prices expressed as a percentage of their geometric mean at **(25)**. Referred to in the text as *standardised price ratios based on exchange rate converted prices*.
(27)	Warning flag. XR-Indices in column **(26)** with a value that falls outside the range of 80 to 125 are flagged. Values below 80 are flagged by **<** , values above 125 are flagged by **>** .
(28)	PPP-Prices. The NC-Prices in column **(19)** converted to euros with the PPPs in column **(10)** of the basic heading table.
(29)	Geometric mean of the PPP-Prices in column **(28)**. The use of a geometric mean insures invariance with respect to choice of numéraire. It will be the same as the geometric mean of the XR-Prices **(25)** if all countries have priced all items.
[30]	PPP-Indices. Indices based on the PPP-Prices in column **(28)**. The PPP-Prices expressed as a percentage of their geometric mean at **(29)**. Referred to in the text as *standardised price ratios based on PPP converted prices*.
(31)	Warning flag: PPP-Indices in column **(30)** with a value that falls outside the range of 80 to 125 are flagged. Values below 80 are flagged by **<**, values above 125 are flagged by **>** .

IV.14 It is important to remember during each round of inter-country editing that average survey prices with XR-Indices or PPP-Indices 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 are correct or incorrect. When prices are found to be incorrect, participating countries are expected to correct them or to suppress them.

IV.15 Strictly speaking, an outlier that is correct should be retained, but the lack of weights within a basic heading at the product level can make this impractical, particularly as the unweighted procedures applied at the basic heading level assume price variation within a basic heading to be moderate. The retention of an outlier that is correct can therefore create "noise" which impacts not only on the basic heading PPP for the participating country reporting the outlier but also on the basic heading PPPs for the other participating countries. If the outlier refers to a representative product, the effect of the noise can be reduced, at least for the reporting country, by suppressing the representativity indicator. The other option is to suppress the outlier. Neither of these actions would be justified if, within the context of the basic heading, the product is representative of the reporting country or if most of the other countries pricing the product have reported it as unrepresentative (which may explain why it is an outlier in the first place). But, if the outlier is unrepresentative, removing it is probably warranted. Whatever action is taken, it has to be decided jointly by the participating country and Eurostat or the OECD on a case-by-case basis.

IV.5 Coefficients of variation

IV.16 A Quaranta table contains four variation coefficients: three of which are calculated when the table is generated and one which is computed during intra-country validation. Two of the coefficients - the basic heading variation coefficient and the country variation coefficients - are in the basic heading table and two – the product variation coefficient and the price observation variation coefficients – are in the product table. They serve different uses not all of which are immediately relevant to inter-country validation.

- *Basic heading variation coefficient* (7): Measures dispersion among all the PPP-Indices for a basic heading. In doing so, it measures the homogeneity of the price structures of the countries covered by the basic heading and the reliability of the PPPs calculated for the basic heading. The higher the coefficient's value the less homogeneous are the price structures and the less reliable are the PPPs. A coefficient with a value over 33 per cent is an outlier requiring verification.

  Conversely, the closer the coefficient's value is to zero the more homogeneous are the price structures of the countries covered by the basic heading. Yet this does not guarantee the reliability of the basic heading's PPPs. This should be substantiated by additional verification using the basic heading PLIs for countries (11).

  During verification of outliers, priority should be given to basic headings with a coefficient value greater than 33 per cent, especially if they have a large expenditure weight. Basic headings with large expenditure weights will have greater influence on the overall PPPs than basic headings with small expenditure weights.

  Usually the value of the coefficient will fall as validation progresses thereby providing a means of assessing the overall effectiveness of the validation process.

  As a summary measure of price variation among products within the basic heading, it can be used, together with the basic heading weight (5), in the planning of the price 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.

- *Country variation coefficient* (14): Measures dispersion among a country's PPP-Indices for a basic heading. In other words, it measures the variation in a country's price levels among the products it priced for the basic heading and the reliability of its PPP for the basic heading. The higher the coefficient's value the less uniform are the country's price levels and the less reliable are its PPPs. A coefficient with a value over 33 per cent is an outlier and should be investigated.

During verification, countries should give priority to basic headings for which the value of the country variation coefficient is greater than 33 per cent, particularly if the country's expenditure weight for the basic heading is large.

The coefficient can generally be expected to decline in value as validation progresses. This allows a country to assess the effectiveness of its validation.

The country variation coefficient complements the product variation coefficient (see below) by bringing a different perspective to the same set of data. Focusing on countries rather than products can help to detect countries which have suspect data. In this respect, it is useful to compare country coefficients across basic headings.

Together with the country's basic heading weight (12), 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.

- *Product variation coefficient* (17): The most important of the variation coefficients for validation purpose. It measures dispersion among the PPP-Indices for a product. It is an indicator of comparability and accuracy and addresses the questions: have countries pricing the product priced the same product or an equivalent product? and have they priced it correctly? The higher the coefficient's value, the less uniform are the product's price levels and the more suspect is the product's comparability and the accuracy of its pricing across countries. Such products are candidates for splitting or deletion and should be thoroughly investigated.

  During verification, priority should be given to products with a variation coefficient greater than 33 per cent.

- *Price observation variation coefficient* (22): Measures variation in the price observations on which the average price reported for a product by a country is based. It was first used in the Data Entry Table during intra-country validation to identify outliers among a country's average survey prices. Values above 33 per cent are flagged in column (23) indicating that if there are outliers among the product's PPP-Indices, or if the product variation coefficient is over 33 per cent, the price observations may need to be re-visited.

  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 is shown as zero in the Quaranta table.

IV.6 Reading a Quaranta table

IV.17 The Quaranta table is the primary means by which Eurostat and the OECD validate the average survey prices reported by participating countries. It is also an invaluable tool from the perspective of participating countries as it facilitates their involvement in the effective validation of their prices through an understanding of how their prices relate to the prices of other countries and an appreciation of the reasons underlying the data queries from Eurostat and the OECD.

IV.18 The Quaranta table in Box IV.3 covers the basic heading for bread for which three products have been priced by four countries. The table is presented for illustrative purposes only as in reality the product list for the basic heading bread specifies over fifteen products and 37 countries participate in Eurostat comparisons. From the table the following can be seen:

At the basic heading level

- The average weight (5) for the basic heading is 0.9 per cent (922.7 per 100,000) of actual individual consumption. This gives an indication of the importance of the basic heading when compared with the average weight for a basic heading. It can be seen in (12) that the basic heading has a similar importance in each country.
- The variation coefficient for the basic heading (7) is 24.7 per cent. This is below the critical value of 33 per cent so the coefficient is not an outlier. Even so, this does not rule out the need to edit for outliers within the basic heading at the product level.
- The range of the PLIs (11) for the basic heading is large: the max-min ratio is 2.6 (163.8 for country C and 62.8 for country A) indicating that the price level of bread products in country C is over twice that of bread products in country A. While this may well be the case, it should be confirmed. Both countries should have their product prices investigated. A comparison should also be made between the PLIs for bread and the PLIs for other basic headings, such as *other bakery products*, to see whether a similar difference in price levels exists between country A and country C.
- All countries have priced at least one representative product (13). In other words, all countries have satisfied the necessary condition for the calculation of EKS PPPs. Note, however, that the pricing of one representative product within a basic heading is not usually a sufficient condition for the calculation of robust PPPs.
- The country variation coefficients for the basic heading (14) are all below the critical value of 33 per cent except that for country A with a coefficient of 42.5 per cent. This is a further indication that the prices of country A should be re-examined.

At the product level

- The XR-Indices (26) for bread 1 show a large dispersion: a max-min ratio of 5.1 (188 for country C and 37 for country A). Indeed, the XR-Indices of bread 1 for countries A, B and C are flagged in (27) as falling outside the critical range of 80 to 125 as are the XR-Indices of bread 3 for countries C and D.
- Bread 2 and 3 show much less dispersion of the XR-Indices. It is therefore likely that the large range of PLIs in (11) is driven by bread 1 and that the prices from countries A and C for this product need to be investigated.
- The product variation coefficients (17) are all below the critical value of 33 per cent except that for bread 3 with a coefficient of 40.6 per cent. The PPP-Indices (30) for bread 3 for countries A and D are flagged in (31) as falling outside the critical range of 80 to 125, indicating that the prices for bread 3 of both countries require scrutiny. However, it should be realised that the PPP-Indices are preliminary. They depend on the basic heading PPPs that are calculated with the prices collected for the basic heading and which may still contain error. As validation continues and errors are corrected, the basic heading PPPs will become more stable and the flagging of outliers more reliable.
- The assignment of asterisks (20) appears broadly consistent overall. One exception is country A which has a high PPP-Index for bread 3 (182) compared to its PPP-Indices for bread 1 (60) and bread 2 (112). This suggests that bread 3 is not a representative product for country A and that an asterisk should not have been assigned to it. Another possible exception is country D, also for bread 3, for which the situation is reversed. No asterisk is assigned yet the PPP-Index for bread 3 (73) is lower than it is for bread 1 (120) and bread 2 (94). However, as country D's PPP-Index for bread 3 is based on only two price quotations (21), while the PPP-Indices for bread 1 and bread 2 are based on 29 and 12 price quotations respectively, the non-assignment is probably justified.
- The average survey price variation coefficients (22) of country B for bread 1 and of countries B and D for bread 3 are flagged in (23) as being above the critical value of 33 per cent. The coefficients for country B can probably be ignored as the corresponding PPP-Indices are not flagged as outliers in (31). This is not the case with country D for which both the XR-index and the PPP-Index for bread 3 are flagged in (27) and (31) respectively indicating that the

accuracy of the price quotations needs to be reassessed. In fact, the high price variation coefficient (22) of 57.0 in combination with the low number of price observations (21) indicates that the reliability of this average price is low and, unless verification provides justification for its retention, it may be best to delete it.

- Neither the product variation coefficient, the average price variation coefficients, the XR-Indices nor the PPP-Indices of bread 2 are flagged as outliers. No verification is required.

Box IV.3: Editing with a Quaranta table

QUARANTA TABLE FOR BASIC HEADING: 11.01.11.3 Bread (1)

Reference year: 2009 **(2)**; **Method:** EKS **(3)**; **Last Update:** 30(10)2009 **(4)**;
Average Weight: 922.7 **(5)**; **No of items:** 3 **(6)**; **Variation Coefficient:** 24.7 **(7)**

Country (8)	XR (9)	PPP (10)	PLI (11)	Weight /100,000 (12)	No of Items (13)	Variation Coefficients (14)
A	247.690	155.649	62.8	953.4	3:*3	42.5
B	1.00000	1.05012	105.0	958.5	3:*2	15.7
C	117.460	192.415	163.8	843.7	2:*2	12.3
D	1.00000	.925074	92.5	935.4	3:*2	20.5

11.01.11.3.01aa Bread 1 **Variation coefficient: 25.0 (17)**

Country (18)	NC-Prices (19)	* (20)	QTS (21)	Variation Coefficients (22)	Wn (23)	XR-Prices (24) GM: 0.43 (25)	XR-Indices (26)	Wn (27)	PPP-Prices (28) GM: 0.43 (29)	PPP-Indices (30)	Wn (31)
A	40.00	*	10	18.3		0.16	37	<	0.26	60	<
B	0.56	*	6	34.2	>	0.56	128	>	0.53	122	
C	95.92	*	37	18.6		0.82	188	>	0.50	115	
D	0.48	*	29	28.3		0.48	111		0.52	120	

11.01.11.3.01ab Bread 2 **Variation coefficient: 8.5 (17)**

Country (18)	NC-Prices (19)	* (20)	QTS (21)	Variation Coefficients (22)	Wn (23)	XR-Prices (24) GM: 0.78 (25)	XR-Indices (26)	Wn (27)	PPP-Prices (28) GM: 0.91 (29)	PPP-Indices (30)	Wn (31)
A	160.00	*	8	22.4		0.65	83		1.03	112	
B	0.91		4	15.2		0.91	118		0.87	95	
C											
D	0.79	*	12	16.9		0.79	102		0.86	94	

11.01.11.3.01ac Bread 3 **Variation coefficient: 40.6 (17)**

Country (18)	NC-Prices (19)	* (20)	QTS (21)	Variation Coefficients (22)	Wn (23)	XR-Prices (24) GM: 1.42 (25)	XR-Indices (26)	Wn (27)	PPP-Prices (28) GM: 1.42 (29)	PPP-Indices (30)	Wn (31)
A	400.00	*	9	14.4		1.61	114		2.57	182	>
B	1.26	*	5	45.7	>	1.26	89		1.20	85	
C	244.68	*	30	32.6		2.08	147	>	1.27	90	
D	0.95		2	57.0	>	0.95	67	<	1.03	73	<

ANNEX V. CALCULATION AND AGGREGATION OF EKS PPPs

V.1 Introduction

V.1 Countries participating in Eurostat and OECD comparison are required 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 GDP expenditures. They are also required to provide a detailed breakdown of GDP expenditures according to a common classification. This annex, which should be read in conjunction with Chapter 12, follows a worked example to demonstrate how the national annual prices are converted into PPPs and how these PPPs are aggregated using GDP expenditures as weights. The worked example is in two parts: the first describes how PPPs are calculated for a basic heading; the second explains how the PPPs for a basic heading are combined with those of other basic headings to obtain weighted PPPs for each aggregation level up to GDP. To calculate and aggregate basic heading PPPs, Eurostat and the OECD employ the Èltetö-Köves-Szulc (EKS) method.

V.2 Calculation of PPPs for a basic heading

V.2 National annual prices are collected at the level of the basic heading. Usually, a basic heading is the lowest aggregation level 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. Because explicit expenditure weights are not available below the basic heading level, quasi expenditure weights are used instead.

V.3 Participating countries are required to price not only items that are representative of their own 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 market. 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 clearly 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.

V.5 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. Weights of 1 and 0 are used because it has been decided that for Eurostat and 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. Irrespective of the quasi expenditure weights employed, products that are representative of both countries receive double the weight of products that are only representative of one of them. This is because they enter the calculation twice, first for one country and then for the second country.

V.6 There are six stages to the calculation of EKS PPPs for a basic heading:

- Calculation of a matrix of Laspeyres type PPPs.
- Calculation of a matrix of Paasche type PPPs.
- Calculation of a matrix of Fisher type PPPs.
- Completing the matrix of Fisher type PPPs.
- Calculation of the matrix of EKS PPPs.
- Standardising the matrix of EKS PPPs.

V.7 *Type* is used to qualify Laspeyres, Paasche and Fisher for two reasons. The first is that standard Laspeyres, Paasche and Fisher indexes are typically used for temporal comparisons rather than spatial comparisons. Temporal Laspeyres, Paasche and Fisher indexes have a *base period* and a *current period*, whereas spatial Laspeyres, Paasche and Fisher type PPPs have a *base country* and a *partner country*. The second reason is that a standard Laspeyres index is a weighted arithmetic average and a standard Paasche index is a weighted harmonic average, while the Laspeyres and Paasche type PPPs calculated for a basic heading are quasi-weighted geometric averages.[1]

V.8 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. As required, 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.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.2.1 Calculation of a matrix of Laspeyres type PPPs

V.9 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 are taken into account. They receive a weight of 1. All other products 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.10 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.

[1] 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 Section V.3 are, like standard Laspeyres and Paasche indexes, weighted arithmetic and harmonic means respectively.

<u>Base A</u>:

$L_{A/A}$ = 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

<u>Base B:</u>

$L_{A/B}$ = $[(P_{1a}/P_{1b})(P_{2a}/P_{2b})]^{1/2}$ = $[(3.43/17.04)(1.27/15.67)]^{1/2}$ = 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

<u>Base C:</u>

$L_{A/C}$ = 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.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.2.2 Calculation of a matrix of Paasche type PPPs

V.11 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 are taken into account. They receive a weight of 1. All other products 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.12 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.13 Paasche type PPPs can be calculated either directly by following the procedure described in paragraph V.11 or indirectly by applying the identity established in paragraph V.12. 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:

Base A:

$P_{A/A}$ $= P_{2a}/P_{2a} = 1/L_{A/A} = 1/1.0000 = 1.0000$

$P_{B/A}$ $= [(P_{1b}/P_{1a})(P_{2b}/P_{2a})]^{1/2} = 1/L_{A/B} = 1/0.12773 = 7.8293$

$P_{C/A}$ $= P_{2c}/P_{2a} = 1/L_{A/C} = 1/0.00216 = 462.99$

$P_{D/A}$ $= [(P_{1d}/P_{1a})(P_{4d}/P_{4a})]^{1/2} = 1/L_{A/D} = 1/0.28090 = 3.5599$

Base B:

$P_{A/B}$ $= P_{2a}/P_{2b} = 1/L_{B/A} = 1/12.339 = 0.08105$

$P_{B/B}$ $= [(P_{1b}/P_{1b})(P_{2b}/P_{2b})(P_{5b}/P_{5b})]^{1/3} = 1/L_{B/B} = 1/1.0000 = 1.0000$

$P_{C/B}$ $= [(P_{2c}/P_{2b})(P_{3c}/P_{3b})]^{1/2} = 1/L_{B/C} = 1/0.04050 = 24.690$

$P_{D/B}$ $= [(P_{1d}/P_{1b})(P_{3d}/P_{3b})(P_{4d}/P_{4b})(P_{5d}/P_{5b})]^{1/4} = 1/L_{B/D} = 1/1.9310 = 0.51785$

Base C:

$P_{A/C}$ $= P_{2a}/P_{2c} = 1/L_{C/A} = 1/462.99 = 0.00216$

$P_{B/C}$ $= [(P_{1b}/P_{1c})(P_{2b}/P_{2c})]^{1/2} = 1/L_{C/B} = 1/37.335 = 0.02678$

$P_{C/C}$ $= [(P_{2c}/P_{2c})(P_{3c}/P_{3c})]^{1/2} = 1/L_{C/C} = 1/1.0000 = 1.0000$

$P_{D/C}$ $= [(P_{1d}/P_{1c})(P_{3d}/P_{3c})(P_{4d}/P_{4c})]^{1/3} = 1/L_{C/D} = 1/60.144 = 0.01663$

Base D:

$P_{B/D}$ $= [(P_{1b}/P_{1d})(P_{5b}/P_{5d})]^{1/2} = 1/L_{D/B} = 1/0.63534 = 1.5740$

$P_{C/D}$ $= P_{3c}/P_{3d} = 1/L_{D/C} = 1/0.02246 = 44.523$

$P_{D/D}$ $= [(P_{1d}/P_{1d})(P_{3d}/P_{3d})(P_{4d}/P_{4d})(P_{5d}/P_{5d})]^{1/4} = 1/L_{D/D} = 1/1.0000 = 1.0000$

Table V.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.2.3 Calculation of a matrix of Fisher type PPPs

V.14 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.4 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.12, they were computed using just the Laspeyres type PPPs of Table V.2 as follows:

$F_{A/A} = [L_{A/A}.P_{A/A}]^{1/2} = [L_{A/A}/L_{A/A}]^{1/2} = [1.0000/1.0000]^{1/2} = 1.0000$

$F_{B/A} = [L_{B/A}.P_{B/A}]^{1/2} = [L_{B/A}/L_{A/B}]^{1/2} = [12.339/0.12773]^{1/2} = 9.8286$

$F_{A/B} = [L_{A/B}.P_{A/B}]^{1/2} = [L_{A/B}/L_{B/A}]^{1/2} = [0.12773/12.339]^{1/2} = 0.10174$

$F_{C/A} = [L_{C/A}.P_{C/A}]^{1/2} = [L_{C/A}/L_{A/C}]^{1/2} = [462.99/0.00216]^{1/2} = 462.99$

$F_{A/C} = [L_{A/C}.P_{A/C}]^{1/2} = [L_{A/C}/L_{C/A}]^{1/2} = [0.00216/462.99]^{1/2} = 0.00216$

$F_{C/B} = [L_{C/B}.P_{C/B}]^{1/2} = [L_{C/B}/L_{B/C}]^{1/2} = [37.335/0.04050]^{1/2} = 30.361$

$F_{B/C} = [L_{B/C}.P_{B/C}]^{1/2} = [L_{B/C}/L_{C/B}]^{1/2} = [0.04050/37.335]^{1/2} = 0.03294$

$F_{D/B} = [L_{D/B}.P_{D/B}]^{1/2} = [L_{D/B}/L_{B/D}]^{1/2} = [0.63534/1.9310]^{1/2} = 0.57360$

$F_{B/D} = [L_{B/D}.P_{B/D}]^{1/2} = [L_{B/D}/L_{D/B}]^{1/2} = [1.9310/0.63534]^{1/2} = 1.7434$ ………… etc.

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.15 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. Transitivity is obtained by applying the EKS procedure. And for this, the EKS procedure requires the matrix of Fisher type PPPs to be complete. But the matrix in Table V.4 is incomplete. There is no PPP for $F_{D/A}$ or $F_{A/D}$.

V.2.4 Completing the matrix of Fisher type PPPs

V.16 The matrix is incomplete because the Laspeyres type PPP - $L_{D/A}$ - and the Paasche type PPP - $P_{A/D}$ – could not be calculated because country D did not price any products that were representative of country A. Therefore the respective Fisher type PPPs - $F_{D/A}$ and $F_{A/D}$ – could not be calculated either.

V.17 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:

$F_{D/A} = [(F_{D/B}/F_{A/B})(F_{D/C}/F_{A/C})]^{1/2} = [(0.5736/0.10174)(0.01932/0.00216)]^{1/2} = 7.1022$

$F_{A/D} = [(F_{A/B}/F_{D/B})(F_{A/C}/F_{D/C})]^{1/2} = [(0.10174/0.5736)(0.00216/0.01932)]^{1/2} = 0.14080$

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.2.5 Calculation of the matrix of EKS PPPs

V.18 With the EKS procedure, 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.6 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.

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.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.

V.2.6 Standardising the matrix of EKS PPPs

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. As these PPPs are now transitive, the ratios between the PPPs for each base are the same. In order to obtain a set of PPPs that has the group of countries as a base – thereby ensuring a neutral presentation - 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.

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	29.2040	29.2040	29.2040	29.2040
EKS_D	0.5297	0.5297	0.5297	0.5297

V.21 The matrix of standardised EKS PPPs of Table V.7 reduces to the vector of standardised EKS PPPs in Table V.7A.

Table V.7A: Vector of standardised EKS PPPs

	A	B	C	D
EKS	0.0746	0.8667	29.204	0.5297

V.3 Aggregation of basic heading PPPs

V.22 There are five stages to the calculation of EKS PPPs for an aggregate:

- Calculation of a matrix of Laspeyres type PPPs.
- Calculation of a matrix of Paasche type PPPs.
- Calculation of a matrix of Fisher type PPPs.[2]
- 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)

V.24 The matrix of Table V.8 shows standardised EKS PPPs by basic heading and by country. The PPPs have been calculated following the procedures described in the previous section. The PPPs for each basic heading come from a separate vector of standardised EKS PPPs. The PPPs for basic heading v are those from the vector of standardised EKS PPPs of Table V.7A.

[2] The matrix of Fisher type PPPs is usually complete at the aggregate level. If, however, it is not, it is completed as described in Section V.2.4 for a basic heading.

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.25 The matrix of Table V.9 contains expenditure values in national currencies by basic heading and by country.

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.3.1 Calculation of a matrix of Laspeyres type PPPs

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.

V.27 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:

$L1_{A/D}$ $= [(PPP_{va}/PPP_{vd})E_{vd} + (PPP_{wa}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$= [(0.0746/0.5297)120 + (0.0731/0.6945)180] / (120 + 180) = 0.11948$

$L1_{B/D}$ $= [(PPP_{vb}/PPP_{vd})E_{vd} + (PPP_{wb}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$= [(0.8667/0.5297)120 + (0.9504/0.6945)180] / (120 + 180) = 1.4756$

$L1_{C/D}$ $= [(PPP_{vc}/PPP_{vd})E_{vd} + (PPP_{wc}/PPP_{wd})E_{wd}] / (E_{vd} + E_{wd})$

$= [(29.204/0.5297)120 + (20.725/0.6945)180] / (120 + 180) = 39.958$

$L1_{D/D}$ $= [(PPP_{vd}/PPP_{vd})E_{vd} + (PPP_{wd}/PPP_{wd})E_{wd}]/(E_{vd} + E_{wd})$

$= [(0.5297/0.5297)120 + (0.6945/0.6945)180] / (120 + 180) = 1.0000$

Table V.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.28 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.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.29 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.

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.30 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:

$$L3_{B/A} = [L1_{B/A}\,(E_{va} + E_{wa}) + L2_{B/A}\,(E_{xa} + E_{ya} + E_{za})] \,/\, (E_{va} + E_{wa} + E_{xa} + E_{ya} + E_{za})$$

$$= [12.725\,(5 + 20) + 12.296\,(15 + 35 + 25)] \,/\, (5 + 20 + 15 + 35 + 25) = 12.403$$

V.3.2 Calculation of a matrix of Paasche type PPPs

V.31 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.12, 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:

<u>Base A</u>

$P1_{A/A} = 1/L1_{A/A} = 1/1.0000 = 1.0000$

$P1_{B/A} = 1/L1_{A/B} = 1/0.07982 = 12.534$

$P1_{C/A} = 1/L1_{A/C} = 1/0.00326 = 306.70$

$P1_{D/A} = 1/L1_{A/D} = 1/0.11948 = 8.3698$

<u>Base B</u>

$P1_{A/B} = 1/L1_{B/A} = 1/12.725 = 0.07860$

$P1_{B/B} = 1/L1_{B/B} = 1/1.0000 = 1.0000$

$P1_{C/B} = 1/L1_{B/C} = 1/0.04141 = 24.140$

$P1_{D/B} = 1/L1_{B/D} = 1/1.4756 = 0.67779$

Base C		Base D	
$P1_{A/C}$	$= 1/L1_{C/A} = 1/305.13 = 0.00328$	$P1_{A/D}$	$= 1/L1_{D/A} = 1/9.0210 = 0.11085$
$P1_{B/C}$	$= 1/L1_{C/B} = 1/25.543 = 0.03915$	$P1_{B/D}$	$= 1/L1_{D/B} = 1/0.69315 = 1.4427$
$P1_{C/C}$	$= 1/L1_{C/C} = 1/1.0000 = 1.0000$	$P1_{C/D}$	$= 1/L1_{D/C} = 1/0.02929 = 34.131$
$P1_{D/C}$	$= 1/L1_{C/D} = 1/39.958 = 0.02502$	$P1_{D/D}$	$= 1/L1_{D/D} = 1/1.0000 = 1.0000$

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.32 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.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.3.3 Calculation of a matrix of Fisher type PPPs

V.33 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, 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:

$F_{A/A} = [L_{A/A}.P_{A/A}]^{1/2} = [L_{A/A}/L_{A/A}]^{1/2} = [1.0000/1.0000]^{1/2} = 1.0000$

$F_{B/A} = [L_{B/A}.P_{B/A}]^{1/2} = [L_{B/A}/L_{A/B}]^{1/2} = [12.725/0.07982]^{1/2} = 12.629$

$F_{A/B} = [L_{A/B}.P_{A/B}]^{1/2} = [L_{A/B}/L_{B/A}]^{1/2} = [0.07982/12.725]^{1/2} = 0.07921$

$F_{C/A} = [L_{C/A}.P_{C/A}]^{1/2} = [L_{C/A}/L_{A/C}]^{1/2} = [305.13/0.00326]^{1/2} = 305.91$

$F_{A/C} = [L_{A/C}.P_{A/C}]^{1/2} = [L_{A/C}/L_{C/A}]^{1/2} = [0.00326/305.13]^{1/2} = 0.00327$

$F_{D/A} = [L_{D/A}.P_{D/A}]^{1/2} = [L_{D/A}/L_{D/A}]^{1/2} = [9.0210/0.11948]^{1/2} = 8.6894$

$F_{A/D} = [L_{A/D}.P_{A/D}]^{1/2} = [L_{A/D}/L_{D/A}]^{1/2} = [0.11948/9.0210]^{1/2} = 0.11508$

$F_{C/B} = [L_{C/B}.P_{C/B}]^{1/2} = [L_{C/B}/L_{B/C}]^{1/2} = [25.543/0.04141]^{1/2} = 24.831$

$F_{B/C} = [L_{B/C}.P_{B/C}]^{1/2} = [L_{B/C}/L_{C/B}]^{1/2} = [0.04141/25.543]^{1/2} = 0.04025$ ………… etc.

Table V.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.34 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.

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.35 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 procedure.

V.3.4 Calculation of the matrix of EKS PPPs

V.36 With the EKS procedure, 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:

$EKS1_{A/A} = F_{A/A} = 1.00000$

$EKS1_{B/A} = [(F_{B/A}/F_{A/A})(F_{B/B}/F_{A/B})(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

$= [(F_{B/A})^2(F_{B/C}/F_{A/C})(F_{B/D}/F_{A/D})]^{1/4}$

$= [(12.62913)^2(0.04025/0.00327)(1.45905/0.11508)]^{1/4} = 12.563$

$EKS1_{C/A} = [(F_{C/A})^2(F_{C/B}/F_{A/B})(F_{C/D}/F_{A/D})]^{1/4}$

$= [(305.9139)^2(24.83137/0.07921)(36.93008/0.11508)]^{1/4} = 311.52$

$EKS1_{D/A} = [(F_{D/A})^2(F_{D/B}/F_{A/B})(F_{D/C}/F_{A/C})]^{1/4}$

$= [(8.68941)^2(0.68538/0.07921)(0.02707/0.00326)]^{1/4} = 8.5778$

$EKS1_{A/B} = [(F_{A/B})^2(F_{A/C}/F_{B/C})(F_{A/D}/F_{B/D})]^{1/4}$

$= [(0.07921)^2(0.00326/0.04025)(0.11508/1.45905)]^{1/4} = 0.07963$

$EKS1_{C/B} = [(F_{C/B})^2(F_{C/A}/F_{B/A})(F_{C/D}/F_{B/D})]^{1/4}$

$= [(24.83137)^2(305.9135/12.62913)(36.93008/1.45905)]^{1/4} = 24.796$

$EKS1_{D/B} = [(F_{D/B})^2(F_{D/A}/F_{B/A})(F_{D/C}/F_{B/C})]^{1/4}$

$= [(0.68538)^2(8.68941/12.62913)(0.02707/0.04025)]^{1/4} = 0.68277$ ………… etc.

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.37 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.

V.38 The EKS PPPs for aggregate 2 of Table V.20 and the EKS PPPs for aggregate 3 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.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.3.5 Standardising the matrix of EKS PPPs

V.39 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. As these PPPs are now transitive, the ratios between the PPPs foe each base are the same. 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:

$$EKS1_A = EKS1_{A/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$$
$$= 1.000 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.0739$$
$$EKS1_B = EKS1_{B/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$$
$$= 12.563 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.9281$$
$$EKS1_C = EKS1_{C/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$$
$$= 311.52 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 23.01$$
$$EKS1_D = EKS1_{D/A} / (EKS1_{A/A} \times EKS1_{B/A} \times EKS1_{C/A} \times EKS1_{D/A})^{1/4}$$
$$= 8.5778 / (1.000 \times 12.563 \times 311.52 \times 8.5778)^{1/4} = 0.6337 \text{ ………… etc.}$$

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
$EKS1_C$	23.0100	23.0100	23.0100	23.0100
$EKS1_D$	0.6337	0.6337	0.6337	0.6337

V.40 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.

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
$EKS2_C$	26.9800	26.9800	26.9800	26.9800
$EKS2_D$	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	25.8600	25.8600	25.8600
$EKS3_D$	0.5980	0.5980	0.5980	0.5980

V.41 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

ANNEX VI. DIFFERENCES BETWEEN EUROSTAT AND OECD COMPARISONS

VI.1 Introduction

VI.1 The original purpose of the PPP Programme was to compare the GDPs of EU Member States and OECD Member Countries, but this has since been broadened to countries that have an association with the European Union or the OECD other than membership.[1] The Programme comprises comparisons organised by Eurostat and comparisons organised by the OECD. Eurostat comparisons cover European countries and are made every year. OECD comparisons cover non-European countries and are made every three years. Eurostat comparisons include all EU Member States, but OECD comparisons do not include all OECD Member Countries which are predominantly European. Consequently joint comparisons that cover both European and non-European countries – thereby enabling European and non-European Member Countries of OECD to be compared with each other - are also made every three years.

VI.2 Responsibility for the joint comparisons is shared between Eurostat and the OECD. Eurostat co-ordinates the collection and validation of data in European countries and calculates their PPPs and real expenditures. The OECD does the same for non–European countries. The OECD is also responsible for combining the PPPs and real expenditures for European countries with those for non-European countries when it calculates the PPPs and real expenditures for all countries included in the joint 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.

VI.2 Timetable and organisation

VI.3 The principal difference between Eurostat and OECD comparisons is their frequency. It arises because of the different institutional arrangements that exist between the two organisations and their members.[2] Price collections in European countries are, with one or two exceptions, partially funded by Eurostat. Price collections in non-European 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 non-European countries. Three-yearly comparisons also allow participants greater flexibility in implementation.

VI.4 Eurostat and the OECD follow the rolling survey approach for the price surveys of consumer goods and services.[3] The approach involves continuous data collection over a three-year period. Other surveys have other frequencies as shown in Box VI.1. Non-European countries conduct these surveys every third year whereas European countries conduct them every year or, as in the case of the price surveys for equipment goods, every second year.

VI.5 Because of their large number, European countries are divided into four smaller, more manageable country groups for the surveys of consumer prices. Each group is coordinated by a group leader and it is the group leaders together with Eurostat who oversee the consumer price surveys. All other surveys are managed centrally by Eurostat. Non-European countries are not broken down into country groups. All surveys are co-ordinated by the OECD. Because non-European countries are linked to European countries at the product level, the OECD is also responsible for

1 Participating countries are listed Chapter 3, Box 3.2.

2 An important institutional difference is the PPP Regulation underlying Eurostat comparisons. The Regulation clearly defines the roles and responsibilities of Eurostat and the EU Member States as well as the methods and procedures to be followed. OECD comparisons have no such specific legal support.

3 The rolling survey approach is described in Chapter 3, Box 3.1A and Box 3.1B.

ensuring that there are sufficient overlaps between the product lists priced by non-European countries and those priced by European countries.

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

Data	Survey	Frequency of collection	
		Eurostat	OECD
Prices	01. Food, drinks and tobacco	Every three years	Every three years
	02. Personal appearance	..	..
	03. House and garden	..	..
	04. Transport, restaurants and hotels	..	..
	05. Services	..	..
	06. Furniture and health[2]	..	..
	07. Equipment goods	Every two years	..
	08. Construction projects	Every year	..
	09. Compensation of government employees[3]	..	..
	10A. Housing	..	..
Quantity and quality indicators	10B. Housing[4]	..	..
	11. Education	..	..
Expenditures	12. GDP expenditure weights	..	..
Other	13. Spatial adjustment factors[5]	Every six years[6]	
	14. Temporal adjustment factors	Every year	Every year
	15. Global rate for VAT paid on capital goods[5]	..	
	16. Global rate for tips to waiters and hairdressers[5]	..	
	17. Annual average exchange rates	..	Every three years
	18. Annual average resident population	..	..

[1] Eurostat comparisons are made every year while OECD comparisons are made every three years.
[2] Pharmaceutical products, medical goods, therapeutic appliances and out-patient medical services but not inpatient medical services.
[3] Collective services and government-produced hospital services.
[4] Countries with small or unrepresentative rent markets provide data on the housing stock instead of prices.
[5] Not required from countries participating in OECD comparisons as they report national prices with non-deductible VAT and tips as appropriate.
[6] Spatial adjustment factors are reported each year but only for the consumer price surveys conducted in that year. They have to be updated at least once every six years.

VI.3 Expenditures

VI.6 Eurostat and the OECD use the same classification of GDP expenditures. The classification follows the definitions, concepts, classifications and accounting rules of the SNA 93[4] and the ESA 95[5]. The Eurostat version of the classification has 206 basic headings; the OECD version has 196. Eurostat's 206 sum exactly to the OECD's 196. The main difference between the two versions is that the OECD version has just one basic heading for furniture and one basic heading for non-profit institutions serving households (NPISHs), whereas the Eurostat version has four basic headings for furniture and six basic headings for NPISHs.

VI.7 European countries report the details of their final expenditures annually. Non-European countries report their detailed expenditures every three years. Both groups of countries experience difficulties providing expenditures at the basic heading level. Non-European countries find it particularly difficult to identify the expenditures of NPISHs. They have also had difficulties providing breakdowns of health and education expenditures. But these difficulties are expected to disappear because the output based approaches adopted for health and education require much simpler breakdowns of expenditure.

VI.4 Consumer goods and services

VI.8 Non-European countries observe the same cycle of price surveys as European countries. But, as OECD comparisons are only made every third year, at the end of the cycle, non-European countries do not adhere strictly to the survey schedule established for European countries. Both groups of countries conduct two price surveys a year, but non-European countries have greater leeway as to when they collect and report prices. There are no intermediate deadlines for non-European countries within a cycle because the OECD, unlike Eurostat, does not publish results on an annual basis. Non-European countries report prices at diversely different times and this delays editing. The validation of the various surveys takes considerably longer for non-European countries than it does for European countries.

VI.9 Non-European countries are not as actively involved in product selection as European countries. Before each price survey, European countries first carry out a pre-survey to ascertain how their markets have evolved in the three years since the survey was last held. Group leaders then draft a product list based on the replies to the pre-survey questionnaire which countries can modify online and at group meetings. Non-European 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 non-European countries. The specifications for these additional products are developed by the countries and the OECD together. If the products are also representative for European 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". Generally there are only few stand alone P products. It depends on the survey.

VI.10 The product lists for non-European countries consist of the product lists of the four Eurostat country groups after they have been edited by the OECD and the list of additional P products. When editing the product lists of the country groups, the OECD tends to remove products that are either specific to one country group or an overlap product between two country groups and to retain products that overlap three or four country groups. Specifications that are considered to be too Eurocentric are also removed. After editing, non-European countries are faced with product lists that are some ten to twenty per cent longer than those faced by European countries, but they have a greater choice of products which improves representativity. To guide non-European 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

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.

of the OECD or the product has a generic specification which the OECD feels that non-European countries should at least consider pricing. In general, when selecting products to price, non-European countries are required to give priority to European-non-European overlap products. To facilitate this, non-European countries are permitted more flexibility when pricing brand and model specifications. European countries have to price the brands and models specified. Often it is not possible for non-European countries to find these brands or models on their markets.[6] When this happens, non-European countries are allowed to price brands and models that are equivalent to those specified.

VI.11 European countries report individual prices observations. For the majority of countries, these price observations have been collected in the capital city. European countries reporting capital city prices have to provide spatial adjustment factors with which to convert their capital city prices to national prices. Non-European 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.12 To enable Eurostat to obtain annual average prices for seasonal food products, European countries are expected to supply monthly quantity weights in addition to temporal adjustment factors. Non-European 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.13 European 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. Non-European countries report national average prices on the understanding that they edit the price observations on which the averages are based before reporting them. Non-European countries have a much simpler electronic reporting form to complete than European countries.

VI.5 Housing

VI.14 European countries complete the rent survey every year. Non-European countries complete the survey every three years. Both groups of countries report actual and imputed rents that are national annual averages. European countries are required to report either rent per square metre or rent per dwelling, but preferably both; non-European countries are only required to report rent per dwelling.

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 non-European countries. The definitions of these additional dwellings specify either the number of bedrooms or, like Eurostat definitions, the number of rooms.

VI.16 The OECD reporting form on the quantity and quality of the housing stock does not make a distinction between houses and apartments as does the Eurostat reporting form. Eurostat requires the breakdown for validation. It does not distinguish between houses and apartments when calculating the volume indices for those European countries that cannot provide rent data.

6 In general, markets are less homogeneous among non-European countries than they are among European countries. More specifically, many of the brands specified are European brands that are not available in non-European countries or, if available, are not representative. Even so for some products, such as cars and electronic goods, European and non-European markets are beginning to converge.

VI.6 Health, education and collective services other than defence

V1.17 European countries provide data on the compensation of employees paid by general government to a selection of occupations in health and in collective services other than defence every year. Non-European 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. Usually the data required are extracted from government payroll statistics.

VI.18 In addition to the compensation of employees paid to each occupation, European and non-European countries provide the actual hours worked by employees in each occupation. Eurostat uses this information to standardise the working hours of occupations in both health and collective services other than defence. The OECD only uses it to standardise the working hours of occupations in collective services other than defence.

VI.19 For the basic heading collective services other than defence, occupations are divided into two groups: those in public order and safety and those in other collective services not elsewhere classified. European countries provide percentage shares (of either expenditure or numbers employed) for the two groups. Non-European countries do not provide the percentage shares and their PPPs for the basic heading are unweighted.

VI.20 Both Eurostat and the OECD apply the output approach for education in line with the frequency of their comparisons. Both will also adopt the output-price approach for health when it is introduced.

VI.7 Capital goods

VI.21 European countries survey construction prices every year and the prices of equipment goods every two years. Non-European countries survey the prices of capital goods every three years. Both groups of countries follow the same approach.

VI.22 Equipment good prices are collected through specification pricing. European countries price the brands and models specified, but non-European countries generally price products that are equivalent to those specified.[7] The basis of the price collections in the two groups of countries is the product list drawn up by Eurostat. There is also a supplementary product list for non-European countries that has been drawn up by the OECD. It contains products specifically representative of non-European 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 three additional projects that improve its representativity for non-European countries. These are a North American single-family house, a Japanese single-family house and a Japanese factory.

VI.24 European countries report national average prices for capital goods that refer to the survey months of the survey year which are April, May and June for equipment goods and May, June and July for construction. The prices are net of non-deductible taxes and data on non-deductible taxes are provided later as part of a separate exercise. Non-European 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 equipment goods priced is taken into account for European countries but not for non-European countries. The

[7] For the reasons given in footnote 6.

representativity of the construction projects priced is not taken into account for either group of countries.

VI.8 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 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 joint comparison.[8] The Geary Khamis or GK method is also used to aggregate PPPs for joint comparisons. The GK results are secondary to the EKS results and only the indices that assist inter-country analysis of price and volume structures are published. Box VI.2 provides an outline of the GK method.[9]

VI.9 Presentation of results

VI.27 Eurostat disseminates the results of its comparisons and the OECD disseminates the results of joint comparisons[10] using a similar set of standard tables. Eurostat tables cover more analytical categories than do OECD tables; they also cover more country groups.[11] The principal difference between the two presentations concerns the reference country and the numéraire. Results of Eurostat comparison are presented with the European Union as reference country and the purchasing power standard (PPS) as numéraire. Results of joint comparisons are presented with the OECD as reference country and the OECD dollar as numéraire.

VI.10 Updating PPPs

VI.28 Eurostat uses the rolling survey approach to makes annual comparisons for European countries. The annual comparisons provide PPPs and real expenditures for each level of aggregation up to GDP. The OECD makes such detailed calculations only once every three years. For the years between these three-yearly benchmark calculations, the OECD estimates PPPs for non-European countries for three aggregates - GDP, actual individual consumption (AIC) and household final consumption expenditure - by extrapolation. The extrapolators are the implicit price deflators for the three aggregates that the OECD extracts from its in-house national accounts database. The OECD subsequently links the PPPs for non-European countries with Eurostat's PPPs for European OECD Member Countries.

VI.29 In addition to estimating annual PPPs for non-benchmark years for GDP, AIC and household final consumption expenditure, the OECD also estimates monthly price level indices (PLIs) for household final consumption expenditure for its Member Countries. The PLIs are based on extrapolations of the PPPs for household final consumption expenditure from the latest benchmark calculation. The price deflators used as extrapolators are the overall consumer price indices of Member Countries.

8 How fixity is obtained at the basic heading level and at the aggregate level is described in Chapter 12, Section 12.2.6.

9 See also Annex VIII on aggregation methods.

10 The OECD does not disseminate detailed results separately either for non-European countries or for the OECD as a whole.

11 Differences in standard tables, analytical categories and country groups are detailed in Chapter 13, Section 13.2.

Box VI.2: The Geary Khamis method

The original GK method provides a way of calculating PPPs from price and quantity data for individual products when such data are available. It entails valuing a matrix of quantities using a vector of international prices which is obtained by averaging national prices, after they have been converted to a common currency and a uniform price level by global PPPs, across the group of countries being compared. International prices and global PPPs are derived simultaneously. Technically, the method is defined through the system of interrelated linear equations (1) and (2) below:

(1) and (1a)

$$P_i = \frac{\sum_{j=1}^{M} (p_{ij} / PPP_j) q_{ij}}{\sum_{j=1}^{M} q_{ij}}$$

$$P_i = \frac{\sum_{j=1}^{M} (p_{ij} q_{ij}) / PPP_j}{\sum_{j=1}^{M} q_{ij}}$$

and

(2) and (2a)

$$PPP_j = \frac{\sum_{i=1}^{N} p_{ij} q_{ij}}{\sum_{i=1}^{N} P_i q_{ij}}$$

$$PPP_j = \frac{\sum_{i=1}^{N} p_{ij} q_{ij}}{\sum_{i=1}^{N} p_{ij} q_{ij} /(p_{ij} / P_i)}$$

Let p_{ij} and q_{ij} denote the price and quantity of product *i* in country *j* and let P_i denote the international average price of product *i*. PPP_j is the PPP for an aggregate that includes the products *i = 1…n* for country *j*; *N* is the number of products; and *M* is the number of countries. These equations are used for all products and all countries 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 (see equations (1a) and (2a)). 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.

GK PPPs are commensurable, base country invariant and transitive. They provide real expenditures that are additive. It is sufficient to calculate GK international average prices (PPPs) from the equations above and GK real expenditures for basic headings only. The real expenditure for an aggregate is obtained by summing the real expenditures on its constituent basic headings. The PPPs for the aggregate are derived by dividing the national expenditure on the aggregate by the real expenditure on the aggregate. The volume measures derived from GK real expenditures satisfy the average test.

The GK method treats countries as members of a group, each with weights equal to its shares of basic heading volumes for the group. One disadvantage of this is that a change in the composition of the group can change significantly the average international prices as well as the relationships between countries.

Another more important disadvantage is that the real expenditures are subject to the Gerschenkron effect because the average international prices gravitate to the prices of large or rich countries. The Gerschenkron effect can be large.

GK results are considered to be better suited to inter-country comparisons of price and volume structures than to inter-country comparisons of price and volume levels of individual aggregates.

ANNEX VII. INTERNATIONAL COMPARISON PROGRAMME

VII.1 Introduction

VII.1 This annex provides a summary of the methods used in the inter-country price and volume comparisons of GDP expenditures organised by the International Comparison Programme (ICP).[1] It concentrates on the methods used in the 2011 round, the results of which are due to be published at the end of 2013. Since the 2011 round is in full progress at the time of writing this annex, the methodology may still develop. A short history of the ICP can be found in Annex I.

VII.2 Governance and organisation

VII.2 The 2011 round of the ICP is managed and coordinated by the Global Office which is situated in the headquarters of the World Bank in Washington DC. Monitoring the work programme and budget of the Global Office and providing strategic leadership is the Executive Board made up of established economists and experienced statistical managers. The Board meets twice a year, generally back-to-back with another meeting such as the United Nations Statistical Commission. Between meetings the Board is kept informed about programme implementation through a mid-year progress report prepared by the Global Office. Helping the Global Office to resolve conceptual and methodological issues is the Technical Advisory Group composed of international experts in index numbers, price statistics and national accounts. The Group meets twice a year, usually in tandem with the meetings of regional coordinating agencies mentioned below.

VII.3 The ICP is organised by region. There are six regions in the 2011 round of which five – Africa, Asia-Pacific, the Commonwealth of Independent States (CIS), Latin America & Caribbean and Western Asia – are ICP regions overseen by the Global Office. The sixth "region" is the Eurostat-OECD PPP Programme. The methodology employed by Eurostat and the OECD is, with a few exceptions, basically the same as that used in the five ICP regions, but the Eurostat-OECD PPP Programme has its own work plan and schedule. Eurostat, the OECD and the Global Office work closely together to ensure that the countries in the sixth region can be included in a global comparison with those in the five ICP regions. A memorandum of understanding to this effect exists between them.[2]

VII.4 Each ICP region carries out a regional comparison following a timetable common to all five regions and using methods compatible with those employed in the other regions. This ensures that the results of the regional comparison can be combined in a timely fashion with the results of other regional comparisons in a global comparison. The price and other data required for the regional comparison are supplied by the national statistical institutes (NSIs) of the countries participating in the regional comparisons.[3] The activities of the NSIs are guided by a regional coordinating agency (RCA).[4] The RCA is responsible for liaison with the NSIs, the Global Office and other RCAs; the compilation of regional product lists; the coordination of price collections and the estimation of detailed GDP expenditures, the supervision of data validation; and the calculation and dissemination of the results of the regional comparison. RCAs hold regular meetings with the NSIs of their region to

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1 A more detailed review of ICP methodology can be found in the ICP Book Measuring the Real Size of the World Economy: The Framework, Methodology, and Results of the International Comparison Program (ICP), edited by the World Bank, forthcoming. See http://siteresources.worldbank.org/ICPEXT/Resources/ICP_2011.html

2 In addition to the countries in the six regions, there are two other categories of countries participating in the ICP. These are the Pacific islands and individual countries not associated with any region and referred to as *singleton countries.*

3 Country participation in ICP 2011: Africa 52; Asia 23; CIS 10, Latin America 18; Western Asia 14; Eurostat-OECD 47; other 39 (15 Pacific islands, 21 Caribbean islands, 3 singleton countries) - 203 countries in total but as three countries (Egypt, Russian Federation and Sudan) are participating in two comparisons the total is actually 200 countries.

4 The regional coordinating agencies are: African Development Bank; Asian Development Bank; Federal State Statistical Service of the Russian Federation and Interstate Statistical Committee of the Commonwealth of Independent States; United Nations Economic Commission for Latin America and the Caribbean; United Nations Economic and Social Commission for Western Asia.

explain the methods and procedures to be followed and the metadata to be provided, to finalise product lists, to validate price and expenditure data and to review and approve comparison results.

VII.5 Responsibility for making sure that the regional comparisons can be combined in a global comparison and then combining them rests with the Global Office. To this end the Global Office convenes meetings of the RCAs twice a year, in spring and autumn. The meetings focus on methodological developments, data and metadata requirements, implementation and timetable – particularly the situation with regard to the collection, estimation and validation of data for both regional and global comparisons – and difficulties encountered. The meetings provide important input to the progress reports that the Global Office prepares periodically for the Executive Board.

VII.3 Linking regional comparisons

VII.6 With some exceptions, the regions participating in the 2011 round will be combined into a global comparison by means of a set of *core products* that are priced in all regions. Core products allow direct comparisons to be made between countries in different regions. The Global Office is responsible for preparing the lists of core products in consultation with RCAs and NSIs. Being comparable and available across regions are essential requirements of core products. It is also desirable that they are representative in as many regions as possible. The Global Office is also responsible for the inter-regional validation of the prices that countries in each region report for core products.

VII.7 Core product lists are used for the five types of products for which prices are collected: consumer goods and services, housing, government services, equipment goods and construction. The Global Office prepares a core product list for each. RCAs prepare regional product lists for consumer goods and services only; they do not compile regional product lists for housing, government services, equipment and construction. For these four types of products, the Global Office's core product lists are adopted, after modifications for regional circumstances, as regional product lists. The CIS region is an exception to this. It compiles its own regional product lists for housing, government and capital goods to which it adds core products from the Global Office's core product lists as necessary. The same procedure is followed by Eurostat and the OECD.

VII.8 For consumer goods and services, RCAs add to their regional product lists a subset of core products that they, in consultation with the region's NSIs, have selected from the Global Office's core product list. Global Office guidelines for the selection require RCAs to ensure that there are sufficient core products for each basic heading so that each country in their region can price at least one core product per basic heading and that more than one country can price each core product in a basic heading. In principle, this is not an unrealistic objective as the global core list contains around 600 products, an average of just over five products per basic heading. For their part, NSIs are expected to price one core product and three regional products per basic heading as a minimum.

VII.9 The prices of core products are used in the calculation of regional PPPs as well as in the calculation of global PPPs. RCAs and NSIs are responsible for the intra-regional validation of the prices of core products as well as the prices of regional products. RCAs are expected to provide the Global Office with validated quarterly and annual national average prices for all the core products priced in their region, in addition to basic heading regional PPPs, in order to calculate the links between regional comparisons needed for the global comparison. Eurostat and the OECD are also expected to comply with this requirement, except for the provision of quarterly average prices.

VII.4 Classification of expenditures

VII.10 The classification of GDP expenditures used for the ICP is an abridged version of the classification used for the Eurostat-OECD PPP Programme. It is therefore in line with the definitions, concepts, classifications and accounting rules of the SNA 93[5] and the ESA 95[6]. The Eurostat-OECD version of the classification has 206 basic headings, the ICP version has 152. The 206 basic headings sum to the 152 exactly. One of the two main differences between the two versions concerns individual consumption expenditure by households for which Eurostat and the OECD have 143 basic headings and the ICP has 110. The other concerns machinery and equipment under gross fixed capital formation for which the Eurostat and OECD have twenty basic headings and the ICP has eight.

VII.5 Data collection

VII.5.1 Consumer goods and services

VII.11 The NSIs of countries participating in an ICP regional comparison are expected to collect prices for consumer goods and services from a sample of outlets suitably stratified to provide national average prices. Both rural and urban locations should be covered and the types of outlets selected should reflect the purchasing habits of the population. Price collection, which covers the whole basket of consumer products, should be quarterly with a view to providing annual national average prices.[7] Quarterly price collection requires quarterly intra-country validation and inter-country validation and adds a new dimension – changes over time – to the validation process.

VII.12 Countries participating in Eurostat and OECD comparisons price the basket of consumer goods and services over three years following the rolling survey approach and not every quarter as do ICP countries. Eurostat countries report individual price observations. The price observations are point-in-time prices usually collected in the capital city. Eurostat averages the price observations and converts the average prices obtained to national annual average prices with spatial and temporal adjustment factors provided by countries. OECD countries report national average prices. These too are point-in-time prices. The OECD converts them to annual averages with temporal adjustment factors supplied by countries.

VII.5.2 Housing

VII.13 There are two Global Office questionnaires for housing: one for the direct calculation of PPPs by the price approach, the other for the direct calculation of volumes by the quantity approach. The questionnaire for the price approach is for countries that have representative and nationwide rent markets and estimate imputed rents in their national accounts by the stratification method. The 2011 questionnaire lists 64 dwellings specified by type, size, facilities, age and location. RCAs are expected to prune the list to suit their region. NSIs completing the questionnaire are required to report the annual rent - both actual and imputed - for each dwelling on the regional questionnaire, preferably by location. In the first instance, existing data sources should be mined before mounting a rent survey especially for the ICP.

VII.14 The questionnaire for the quantity approach is for all countries, especially those that have unrepresentative and localised rent markets and are unable to estimate imputed rents by the stratification approach. It is designed to collect quantitative and qualitative data on the housing stock. Dwellings are specified by type of dwelling, type of construction and location. For each specification NSIs are asked to report the total number of dwellings, rooms, occupants and usable surface area as

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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 For each product priced, at least three price observations are required from each location where the product is available for each quarter.

well as the total land area occupied by the dwellings specified. Also to be reported for each specification are the number of dwellings with different types of facilities. Data should be for the latest year available.

VII.15 The ICP methodology is close to that of Eurostat and the OECD. The two differ in the characteristics included in a specification. For example, Eurostat and the OECD specify size by number of rooms (or bedrooms) and not by area as they did formerly. Also they no longer specify the age of the structure. Both the price approach questionnaire and the quantity approach questionnaire used by Eurostat and the OECD are simpler than those of the Global Office, but the countries covered by the ICP are much more heterogeneous than those participating in the Eurostat-OECD PPP Programme.

VII.5.3 Government services

VII.16 The government services covered specifically by the ICP and the Eurostat-OECD PPP Programme are health, education and collective services. Health and education services are either purchased from market producers or obtained free or at prices that are not economically significant from government as a non-market producer. Collective services are not purchased, they are non-market services provided free to the community as a whole by government. For health and education services purchased from market producers, the ICP applies the output-price approach. For health and education services provided by non-market producers, the ICP applies the input-price approach. The input-price approach is also used by the ICP for collective services. Eurostat and OECD employ the same approaches as the ICP for health and collective services, but not for education. For education it uses an output method – that is, a quantity method with quality adjustments – that makes no distinction between market and non-market and provides volume measures directly. The method is explained in detail in Chapter 8.

V.17 For the output-price approach, the Global Office has compiled lists of core products for health and education. NSIs are expected to collect the prices paid to market producers for the core products. The prices should be the total prices when two independent buyers are involved in the purchase as can sometimes be the case with medical goods and services. Prices for health products should be collected quarterly throughout the reference year. Prices for education should be collected in the first quarter following the reference year.

V.18 For the input-price approach, the Global Office has prepared a questionnaire to collect the compensation that government pays to its employees engaged in non-market production of health, education and collective services. The 2011 questionnaire specifies 44 occupations: 18 in health, 16 in education and 31 in collective services including defence (some occupations are common to all three services). Compensation of employees is defined in line with the SNA 93 and ESA 95 and the basis of its derivation are government wage and salary scales. NSIs are required to report the compensation paid to employees at four career levels: when starting and after five, ten and 20 years of service. The Global Office recommends making productivity adjustments when the input price approach is used. Eurostat and the OECD do not make productivity adjustments. Productivity adjustments for government will be made for all countries when estimating inter-regional linking factors for the global comparison.

V.19 The list of health products used for the Eurostat-OECD PPP Programme is similar to the global core list but more extensive. For example, the global list specifies 43 pharmaceutical products, while the Eurostat-OECD list specifies over 150 (of which a minimum of 50 have to be priced). Conversely, the questionnaire for the survey of compensation of government employees used by Eurostat and OECD is shorter than the ICP questionnaire. It covers only 26 occupations: nine in health and 17 in collective services other than defence. Seventeen of the occupations are common to both questionnaires. The compensation of employees to be reported for an occupation is the average extracted from government payroll statistics. No account is taken of career levels.

VII.5.4 Equipment goods

V.20 The methodology followed by the ICP is the same as that followed by the Eurostat-OECD PPP Programme. The core list for the 2011 round compiled by the Global Office consists of 77 products and 177 item specifications – a rough average of over two item specifications per product.[8] Of the 177 items specifications, 125 are brand and model specific and 52 are generic. For brand and model specifications, NSIs are expected to price the brand and model specified. For generic specifications, NSIs are expected to price the product with technical characteristics that best match the technical characteristics specified. All items priced should be new, second hand items are not to be priced. The prices reported should be mid-year national prices and should include trade margins, transport costs, assembly and installation costs, discounts and non-deductible taxes[9].

VII.5.5 Construction

VII.21 The ICP and the Eurostat-OECD PPP Programme employ different methods for construction. Both start with the same three basic headings: residential buildings, non-residential buildings and civil engineering work. Both have the same objective: to calculate PPPs for each basic heading and to aggregate the basic heading PPPs to obtain overall PPPs for construction. And both use the same weights to aggregate basic heading PPPs: the expenditure weights from the national accounts. The point of departure is the calculation of PPPs for the basic headings.

VII.22 The ICP uses input prices or, more precisely, the unit prices that the contractor pays for materials, equipment hire and labour. For each basic heading, the Global Office has compiled a list of the materials to be purchased, the equipment to be hired and the labour to be employed. NSIs are required to provide a unit price for each type of material, equipment and labour specified for the basic heading. In addition to unit prices, the NSIs are expected to provide the resource mix for each basic heading - in other words, the percentage shares of materials, equipment and labour in the total costs for the type of structure covered by the basic heading. NSIs are also expected to provide for each basic heading contractor’s mark-ups for general and preliminary expenses, overhead costs and profit as well as the overall percentage addition for architect and engineering services. The unit prices are used to calculate unweighted PPPs separately for materials, equipment and labour for each basic heading. These PPPs are then combined using resource mix percentages as weights to provide overall PPPs for each basic heading. The approach does not take into account differences in productivity or the quality of output between countries. The Global Office is considering an adjustment based on total factor productivity levels.

VII.23 The Eurostat-OECD PPP Programme uses output prices. Participating countries price seven construction projects (three residential buildings, two non-residential buildings and two civil engineering works). The construction projects are defined in bills of quantities that specify the elementary components for which unit prices are to be reported. For each elementary component a quantity is given which, when multiplied by the unit price, gives the total price for the component. By summing the total prices of the elementary components, an overall price for the project is obtained. PPPs for basic headings are calculated with the overall prices of their projects. Elementary components are composite products combining materials, equipment and labour. Besides covering the cost of these items, the unit price of a component also includes a share of the contractor’s general and preliminary expenses, overhead costs and profit. The unit prices thus are output prices and, when multiplied by their quantities and summed, give an overall output price for the project (after it has been adjusted for architect and engineering fees). Considerable time is spent during validation to ensuring that countries have interpreted the elementary components the same way and have priced them to a constant quality. The unit prices are based on tender prices which are bids for work to be undertaken in the future. As such they are price forecasts and are influenced by the nature and duration of the project as well as by the tendering practices in different countries. The approach is also expensive requiring the hiring of construction experts to do the pricing.

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8 The 2011 Eurostat-OECD product list for equipment goods contains 233 products and 549 item specifications. Participating countries are required to select 90 products and price 150 items as a minimum.

9 Countries participating in Eurostat comparisons report prices net of non-deductible taxes. Data on non-deductible taxes are reported later as part of a separate exercise. Countries participating in OECD comparisons report prices with non-deductible taxes included.

VII.24 In order to be able to link the construction PPPs from Eurostat and OECD to those of the ICP, a number of countries that participate in the Eurostat-OECD PPP Programme have agreed to also report the prices needed for the ICP method.

VII.6 Calculation of PPPs at regional level

VII.25 The calculation of the global PPPs is a two-step process, following the regional organisation of the ICP. Each region is responsible for the calculation and dissemination of its own PPPs. The PPPs from all regions are then combined into a global comparison by means of the core products described above. In doing so, the PPPs as calculated by each region are *fixed*, that means that the PPPs between countries within a region do not change when they are combined in the global comparison. The principle is the same as the fixity principle applied to the PPPs of the 27 EU Member States when they are combined with the PPPs of non-member countries.

VII.26 In this section, the calculation methods at regional level are described. The next section describes how the regional PPPs are combined into a global comparison.

VII.6.1 Basic heading PPPs: CPD method

VII.27 The ICP recommends to their regions the use of the *Country Dummy Product* (CPD) *method* for the calculation of the basic heading PPPs; the Eurostat-OECD PPP Programme uses the *Èltetö-Köves-Szulc* (EKS) *method*. The EKS method is described in Chapter 12 and Annex V. The CPD method is described below.

VII.28 The CPD is the multilateral method applied by the ICP to obtain transitive PPPs at the basic heading level through regression analysis.[10] The method treats the calculation of PPPs as a matter of statistical inference, an estimation problem rather than an index number problem. Its underlying hypothesis is that, apart from random disturbance, the pattern of relative prices of the different products within a given basic heading is the same in all countries. In other words, it is assumed that there is a common set of prices for the countries being compared. It is also assumed that each country has its own overall average 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 any country and the common pattern of relative prices can be estimated using classical least square methods.

VII.29 More specifically, the CPD 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:

$$\begin{aligned}\ln p_{ij} = {} & \eta_1 D_{1j} + \eta_2 D_{2j} + \ldots + \eta_m D_{mj} + \\ & \pi_1 D^*_{i1} + \pi_2 D^*_{i2} + \ldots + \pi_n D^*_{in} + u_{ij}\end{aligned} \qquad (1)$$

p_{ij} is the price of the *i*th product in country *j*. 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} equals 1 if the price observation p_{ij} concerns the i^{th} product, otherwise D_{ij} equals zero. D^*_{ij} equals 1 if the price observation p_{ij} belongs to country *j*, otherwise D^*_{ij} equals 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: $PPP_{k/j} = exp\ (\pi_k - \pi_j)$.

10 The CPD method was proposed by Robert Summers in "International price comparisons based upon incomplete data", *The Review of Income and Wealth*, Vol. 19, March 1973.

VII.30 The CPD has been criticised because it does not follow the traditional index number approach to calculating PPPs and so does not address the index number problems involved.[11] The method is also criticised because the underlying assumption - that the pattern of relative prices within a basic heading is the same in all countries irrespective of whether or not the product is representative: in other words, all products are equally important in all countries - is unrealistic. But the CPD can be modified to take account of representativity. A general factor of representativity of products (γ) can be included directly in the original CPD formula (1) as an additional dummy variable.[12]

$$\begin{aligned} \ln p_{ij} = {} & \eta_1 D_{1j} + \eta_2 D_{2j} + \ldots + \eta_m D_{mj} + \\ & + \pi_1 D^*_{i1} + \pi_2 D^*_{i2} + \ldots + \pi_n D^*_{in} + \gamma D_{ij} + u_{ij} \end{aligned} \qquad (2)$$

This is the called the *Country Product Representativity Dummy* (CPRD) *method*.[13] Another approach is to use a weighted CPD in which representative products receive a higher weight in the regression than non-representative products. For example, representative products could have the weight of 2 or 3 and unrepresentative products a weight of 1. The choice of weights is arbitrary as it is with the EKS. However, the weights of 1 for a representative product and 0 for an unrepresentative product used in the EKS cannot be used in a weighted CDP because the assignment of 0 to prices of unrepresentative products will remove them from the calculation.

VII.6.2 CPD and EKS approaches compared

VII.31 Both the EKS and the CPD provide PPPs that satisfy the properties of commensurability, invariance, transitivity and characteristicity. Both the EKS and the CPD (through its variants) take account of the representativity of the products priced for a comparison.

VII.32 The EKS views the calculation of PPPs as an index number problem.[14] It starts with a binary approach and subsequently moves to a multilateral approach. The object is to maximise consistency between multilateral and binary PPPs – 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 maximisation refers to general consistency – that is, consistency for the whole set of participating countries rather than for individual pairs of countries. Additionally, because of its binary approach, the EKS can be data demanding because in theory direct binary PPPs based on bilateral product lists are required between each pair of participating countries. In practice, there may be an imbalance in the matching of representative products priced between a single pair of countries making it 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.[15]

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[11] 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”.

[12] The inclusion of a variable for representativity in the CPD was first suggested by J. Cuthbert and M. Cuthbert, in “On aggregation methods of purchasing power parities”, *OECD Department of Economics and Statistics Working papers*, No. 56, November 1988, http://www.oecd.org/dataoecd/15/26/2002058.pdf

[13] As proposed by P. Hill in “The estimation of PPPs for basic headings within regions”, Chapter 11, *ICP Handbook,* http://siteresources.worldbank.org/ICPINT/Resources/270056-1183395201801/icp_Ch11rev.doc.

[14] It can also be formulated as a stochastic method such as the CPD. See footnote 12 for reference.

[15] This is not the only example of price data being ignored. As explained in Chapter 12, 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 unrepresentative 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.

VII.33 The CPD considers the calculation of PPPs to be a question of statistical inference.[16] 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 CPD produces PPPs that are immediately transitive. In this respect, it is considered to be more transparent than the EKS. The method also allows sampling errors to be estimated for the PPPs. However, the sampling errors depend on how equations (5) and (6) are specified and their use in practice is limited.

VII.34 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 because both methods lead to simple geometric means in these circumstances. Experimental applications of the EKS, EKS-S, CPD and CPRD methods with actual data suggest that in practice the differences in results are usually not significant. In fact, calculating PPPs according to different methods is a useful way of verifying the input data: if large differences in the results of different methods exist this may point at potential issues with either the prices or the representativity indicators.

VII.6.3 Aggregation of basic heading PPPs

VII.35 With one exception, the ICP aggregates basic heading PPPs with the EKS method. The exception is the regional comparison for Africa for which basic heading PPPs are aggregated with the Iklé method. As explained in Annex VIII, the Iklé method provides real expenditures that are additive and close to EKS real expenditures which are not additive. As an additive method, Iklé real expenditures are not free of the Gerschenkron effect, but, as their closeness to EKS real expenditures demonstrates, the effect is less pronounced than it is with other additive methods such as the Geary-Khamis method. The Eurostat-OECD PPP Programme aggregates basic heading PPPs with the EKS method, as described in Chapter 12 and Annex V.

VII.7 Calculation of PPPs at global level

VII.36 The basic heading PPPs for the five ICP regions and the Eurostat-OECD PPP programme are combined as follows:

- The starting point is the 2011 average prices for the global core list products for all countries, with their corresponding representativity[17] indicators, and the matrices of basic heading PPPs and expenditures for all regions.
- All global core list product prices of countries are converted into a regional numéraire by dividing them by the regional PPP for the corresponding basic heading.
- For each basic heading, a CPD-type regression is carried out in which a dummy variable is included for each region instead of each country.
- The coefficients of the regional dummy variables for each basic heading are the *regional linking factors*. They provide estimates of the relative price levels of the regions as a whole and are used to link the PPPs for the six regions.

The result is a matrix of basic heading PPPs for all countries in the global comparison. Moreover, the method ensures that the regional basic heading PPPs are fixed when combined in the global comparison. There are different ways of taking the representativity on board. Either a version of the CPRD method described above in which dummies are included for representativity could be used or

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[16] It can also be formulated as an index number method. In Annex 2 of the paper cited below Sergey Sergeev points out that the economics of the regression equation are not obvious making the CPD appear as a stochastic 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 an alternative formulation of the CPD method that makes possible its presentation as an index number method. *Equi-representativity and Some Modifications of the EKS Method at the Basic Heading Level* at the Joint Consultation on the ECP, ECE, Geneva, 2003. http://www.unece.org/fileadmin/DAM/stats/documents/2003/03/ecp/wp.8.e.pdf

[17] Called *importance* in ICP.

a version of the weighted CPD in which representative products receive a higher weight in the regression could be applied. The weighted CPD has been recommended by the Global Office for ICP 2011.

VII.37 To aggregate these PPPs to higher levels, the *Country Approach with Redistribution* (CAR) *procedure* is followed:

- The EKS method is applied to aggregate the basic heading PPPs for all countries to any defined aggregate (such as individual consumption expenditure by households or GDP).
- For each region, the share in the global volume (real expenditures) of the aggregate is calculated.
- The volume share of each region in the global calculation is broken down by country on the basis of the volume shares calculated in each regional comparison and indirect PPPs are calculated. This way, all intra-regional aggregated results remain fixed.

ANNEX VIII. A COMPARISON OF DIFFERENT AGGREGATION METHODS

VIII.1 Of the many methods that have been developed to calculate and aggregate basic heading PPPs[1], the manual focuses on those that are relevant to the Eurostat-OECD PPP Programme. Chapter 12 and Annex V explain the calculation and aggregation methods used for Eurostat and OECD comparisons and Annex VII summarises the methods used by the International Comparison Programme. Annex VII also compares the methods employed by the two Programmes to calculate basic heading PPPs. This annex considers aggregation methods that have been employed either for a Eurostat or an OECD comparison or for an ICP comparison.

VIII.2 There are four methods meeting this criterion:

- **Èltetö-Köves-Szulc (EKS) method[2]**: used in all Eurostat and OECD comparisons since 1990 and in the ICP global comparison and in all but one of the ICP regional comparisons for 2005.
- **Geary-Khamis (GK) method[3]**: used in Eurostat and OECD comparisons for 1980 and 1985 and in all ICP comparisons from 1970 to 1993.
- **Gerardi Unit-Country-Weight (Gerardi) method[4]**: used in the 1975 Eurostat comparison of EU Member States.
- **Iklé method[5]**: used in the 2005 ICP regional comparison for Africa.

All four methods provide multilateral PPPs that have the properties listed in Chapter 12, Section 12.2.1: commensurability, base country invariance, transitivity and characteristicity (although the degree to which characteristicity is met depends on the homogeneity of the price structures of the countries being compared).

VIII.3 The EKS method is different from the other three methods in that unlike them it is not an additive aggregation method[6]. EKS multilateral PPPs are obtained by first calculating binary PPPs between each pair of participating countries and then averaging them. They provide non-additive real expenditures that are free of the Gerschenkron effect which is seen as one of the principal advantages of the method. Because the real expenditures are not additive, PPPs have to be calculated for each level of aggregation. Moreover, EKS price indices and volume indices do not satisfy the average test. Nor are the PPPs and real expenditures suitable for comparing price and volume structures across countries. EKS PPPs and real expenditures are considered to be best suited to inter-country comparisons of the price and volume levels of individual aggregates.

VIII.4 The GK method, the Gerardi method and the Iklé method are additive aggregation methods. [7] Basic heading real expenditures are obtained using a vector of average international prices to value

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1 See footnote 1 of Chapter 12 for references.

2 "On a problem of index number computation relating to international comparisons", O. Èltetö and P. Köves, *Statisztikai Szemle*, No. 42, 1964; and "Indices for multiregional comparisons", B. Szulc, Przeglad Statystyczny 3, 1964. Referred to as the GEKS method in recent literature because the formula was first proposed by Gini in "On the circular test of index numbers", *International Review of Statistics*, Vol. 9, No. 2, 1931.

3 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. See also Annex VI, Box VI.2.

4 "Selected problems of inter-country comparisons on the basis of the experience of the EEC", D. Gerardi, *The Review of Income and Wealth*, Vol. 28, 1982.

5 "A new approach to the index number problem", D.M. Iklé, *Quarterly Journal of Economics*, Vol. 86, 1972.

6 An aggregation method is additive if, for each country being compared, it provides real expenditures for basic headings that sum to the real expenditures of the aggregates of which they are components.

7 Additive methods generally require the simultaneous calculation of international prices and global PPPs. Prices and PPPs are defined by a system of interrelated equations expressing international prices as a function of the global PPPs. Both the GK method and the Iklé method are defined in this way, the Gerardi method is not. The GK and Iklé methods obtain the vector of international prices by averaging national prices across participating countries after they have been converted to a

a matrix of basic heading national expenditures at a uniform price level. The basic heading real expenditures are additive, they can be summed to provide real expenditures and PPPs for each level of aggregation up to GDP. The real expenditures are not free from the Gerschenkron effect, though the severity of the effect varies with the method. The presence of the Gerschenkron effect is seen as a major weakness of additive methods and their PPPs and real expenditures are considered to be second best to those of the EKS method when comparing the price and volume levels of individual aggregates across countries. The volume indices of additive aggregation methods satisfy the average test. Additivity is required when analysing the price and volume structures of different countries.

VIII.5 To compare the four methods, volume indices for GDP per capita have been calculated for the 37 countries covered by the Eurostat comparison for 2010. The calculations were made with fixity and the indices that resulted are shown ranked in descending order in Box VIII.1. For most countries, there are no significant differences between the four sets of indices. This is to be expected since they refer to GDP rather than to its component expenditures. Differences are likely to be more pronounced at lower levels of aggregation.

VIII.6 The Gerardi indices and the Iklé indices are similar to each other and both are closer to the EKS indices than the GK indices. The differences tend to be larger for countries at the top or bottom of the table, giving evidence of the Gerschenkron effect. The Gerschenkron effect is applicable only to aggregation methods that use either a reference price structure to obtain volumes or a reference volume structure to obtain PPPs. For methods, such as the GK, Gerardi and Iklé, that employ 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. In other words, its GDP per capita will increase relative to the GDP per capita of countries with price structures close to the reference price structure.

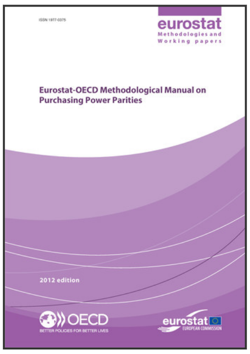
VIII.7 The Gerschenkron effect is expected to narrow the gap between high income countries and low income countries. This happens when the economies of the high income countries are large relative to those of other countries in the comparison. Countries with large economies will have greater weight when prices are averaged across countries to derive the reference price structure. As a result, the reference price structure will be more characteristic of their price structures than of the price structures of countries with small economies and less weight.

VIII.8 The data in Box VIII.1 show that low income countries have higher volume indices in the three additive methods than in the EKS. For the high income countries the opposite would have been expected, but this is not the case of Luxembourg, Norway and Switzerland. This is due to the specific economic structures of these three countries, which are quite different from those of other European countries, and to their economies being relatively small and having a low weight.

common currency with global PPPs and weighted. The GK method uses quantity shares as weights. The Iklé method uses expenditure shares as weights. In addition, GK international prices are arithmetic means while Iklé international prices are harmonic means. The Iklé method is designed to prevent prices in countries with large expenditures dominating the average prices. With the Gerardi method international prices are calculated as the geometric mean of the national prices of participating countries expressed in national currencies. When a geometric mean is used, the pattern of relative average prices is the same whether or not the national prices are converted into a common currency. It avoids the problem of calculating PPPs with which to convert national prices to a common currency before averaging them.

Box VIII.1: Per capita volume indices for GDP for the 37 countries participating in the 2010 Eurostat comparison calculated with fixity by four different aggregation methods (EU27=100)

Countries	Per capita volume indices				Percentage difference with the EKS		
	EKS	Geary Khamis	Gerardi	Iklé	Geary Khamis	Gerardi	Iklé
Luxembourg	272	286	302	290	5.1	11.3	6.9
Norway	181	188	196	195	3.7	8.3	7.6
Switzerland	147	151	158	157	2.4	7.5	6.9
Netherlands	133	132	133	132	-1.1	0.2	-0.4
Ireland	128	127	130	127	-0.7	1.9	-0.5
Denmark	127	127	128	127	-0.2	1.0	0.3
Austria	126	125	127	126	-0.7	0.8	0.2
Sweden	123	123	125	124	0.0	1.4	0.9
Belgium	119	118	119	119	-0.4	0.2	0.1
Germany	118	116	118	118	-1.3	0.4	0.0
Finland	115	115	114	115	-0.6	-1.0	-0.5
United Kingdom	112	111	112	112	-0.7	-0.2	0.3
Iceland	111	112	113	114	0.4	1.7	2.1
France	108	107	107	107	-0.9	-1.0	-0.6
Italy	101	100	101	101	-0.6	0.0	0.2
Spain	100	101	99	99	0.2	-1.1	-1.0
Cyprus	99	100	98	98	1.3	-1.1	-1.1
Greece	90	90	88	88	0.8	-2.1	-1.9
Slovenia	85	84	83	83	-1.2	-1.8	-2.2
Malta	83	86	83	82	3.4	-0.1	-1.4
Portugal	80	81	79	80	0.9	-0.9	-0.5
Czech Republic	80	80	78	78	-0.2	-1.6	-1.7
Slovakia	74	75	73	73	1.8	-0.7	-0.5
Hungary	65	66	65	64	2.5	-0.2	-0.8
Estonia	64	65	63	63	1.3	-1.3	-1.9
Poland	63	65	63	63	3.6	0.5	0.7
Croatia	61	62	59	59	1.7	-2.7	-3.2
Lithuania	58	59	57	57	2.9	-0.3	0.0
Latvia	51	54	51	51	4.4	0.2	0.1
Turkey	49	53	51	50	6.8	2.8	2.2
Romania	46	51	48	48	11.4	5.6	5.0
Bulgaria	44	50	47	47	14.1	7.8	6.6
Montenegro	41	49	44	44	17.9	7.2	6.0
FYR Macedonia	36	42	39	38	16.4	8.2	7.1
Serbia	35	40	37	37	14.5	6.0	5.6
Bosnia-Herzegovina	31	34	32	32	12.5	5.2	4.7
Albania	28	34	31	31	19.6	10.0	9.9
EU27	100	100	100	100			



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