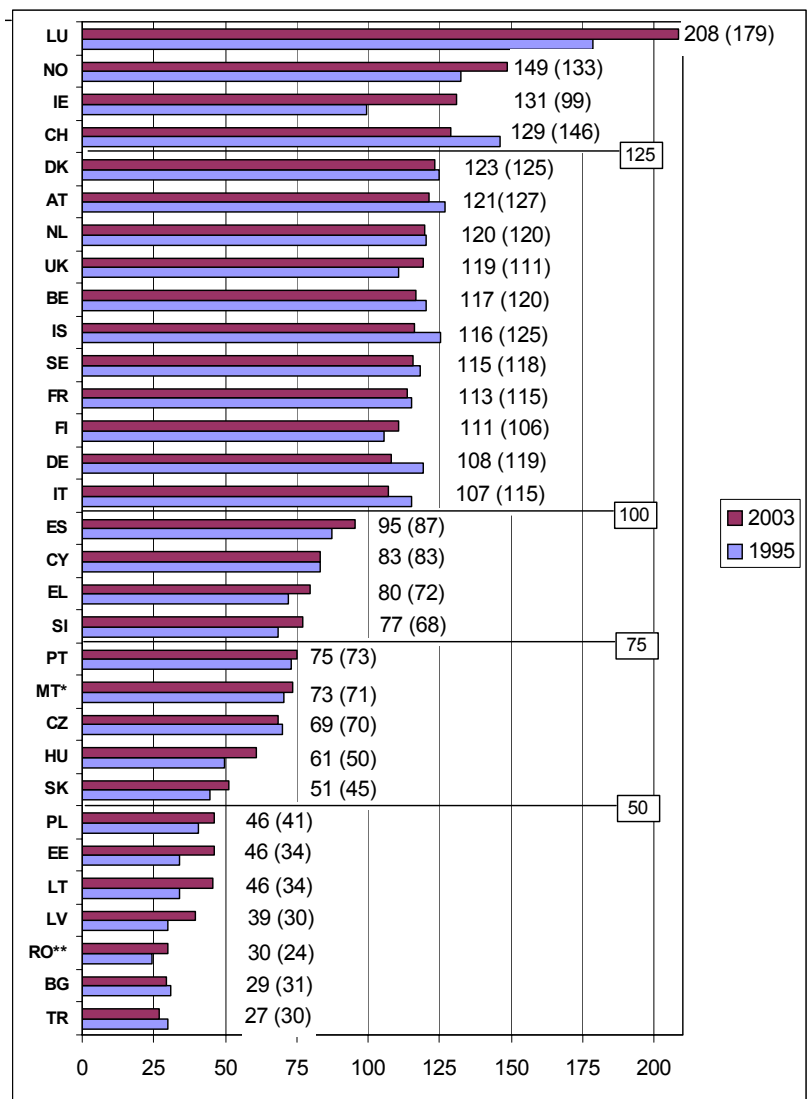


Purchasing Power Parities and related economic indicators for EU, Candidate Countries and EFTA¹

Data 1991 to 2003, including final results of the revision 1995 – 2000

This article presents long time series of Purchasing Power Parities and related economic indicators at the level of Gross Domestic Product (GDP) and Final Consumption Expenditure of Households (HFCE) for the 31 countries⁽²⁾ participating in the Eurostat coordinated group of the European Comparison Programme (ECP).

Chart 1: Per capita volume index at the level of total GDP revised 1995 and 2003 nowcast results, EU-25=100



* Data for Malta refer to 1999 and 2003

** Data for Romania refer to 1998 and 2003

Note: The figures outside the brackets refer to 2003. The ones in the brackets refer to 1995. The grouping refers to 2003.

⁽¹⁾ Excluding Liechtenstein

⁽²⁾ The 25 EU Member States, the 3 Candidate Countries, Iceland, Norway and Switzerland

Statistics
in focus

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Prices and purchasing
power parities

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The ECP – in which Eurostat closely co-operates with the OECD – is aimed at making annual volume comparisons of the main National Accounts (NA) aggregates; GDP and its components.

In this article, as distinct from standard PPP publications, four different types of data are

presented at the same time. In addition to nowcast, preliminary and final data stemming from the regular PPP dissemination calendar, revised data series are put forward. The differences in the status of data presented here are highlighted in Box 1.

Box 1: Differences in the status of data in the publication

The data presented in this paper for 2003 are updated extrapolations at aggregated level (Nowcast). The data for 2002 are preliminary results. Preliminary results for every given year are published 12 months after the end of the reference year. At that time, the results of the two consumer price surveys for the reference year as well as preliminary data for all other input data are available.

Final data are published 24 months after the end of the reference year. Collected prices do not change between the preliminary data and the final data but all other input data and particularly GDP expenditure weights that are used in the aggregation of PPPs are subject to revisions. 24 months after the end of the reference year other input data have stabilized sufficiently for the calculation of the final PPPs. In this publication 2001 PPPs are final. Preliminary data 2003 and final data 2002 will be published in December 2004.

The data referring to the years from 1995 to 2000 are revised. The revision of PPPs was done at the most detailed level for all of the 31 countries from 1999 to 2000 and only for the EU15 and the EFTA countries from 1995 to 1998. For the other countries these years were extrapolated backwards using 1999 revised PPP and implicit price deflators of GDP. The data presented here are final revision results, which can deviate from the preliminary ones published by December 2003 (SIF theme2/64/2003).

The years 1991 to 1994 for the EU15 and the EFTA countries are backwards extrapolations using the revised figures for 1995 and implicit price deflators.

The data differences are summarised as follows:

	EU15 and EFTA3	NMS10 and CC3
1991-1994	Backwards extrapolated PPPs	Not available
1995-1998	Results of the revision	Backwards extrapolated PPPs
1999-2000	Results of the revision	
2001	Final data	
2002	Preliminary data	
2003	Nowcast	

Purchasing Power Parities

Purchasing Power Parities (PPPs) are currency conversion rates that are applied to convert economic indicators in national currency to an artificial common currency, called Purchasing Power Standard (PPS), which equalises the purchasing power of different national currencies.

Table 3 shows parities from 1991 to 2003 at the levels of GDP and HFCE. These PPPs are used to convert countries' GDP or HFCE at national currencies to remove the effect of different price levels and to enable meaningful volume comparisons between countries.

Box 2: Product level PPPs

In their simplest form PPPs are price relatives that show the ratio of the prices in national currencies of the same product in different countries. E.g., if the price of a loaf of bread in France is 1.87 euros and in the United Kingdom it is 0.95 pounds, then the PPP for bread between France and the United Kingdom is 1.97 euros to the pound. This means that for every pound spent on bread in the United Kingdom, 1.97 euros would have to be spent in France to obtain the same volume of bread. Therefore, to compare the volumes of bread purchased in the two countries, either the expenditure on bread in France can be converted to pounds by dividing it by 1.97 or the expenditure on bread in the United Kingdom can be converted to euros by multiplying it by 1.97. PPPs, however, are not published at the product level, but various higher levels of aggregation up to GDP. This is due to the fact that, for cost reason, the PPP programme is built to deliver justifiable results only at highly aggregated level.

Per capita volume indices

The **per capita volume indices**, shown in **Chart 1**, **Table 1** and **Table 4**, represent the real volume of GDP and in Table 4 HFCE in per capita terms. The indices in Chart 1 and Table 1 are expressed in relation to the European Union (EU25=100)¹. If the per capita GDP/HFCE volume index of a country is higher than 100, that country's level of GDP/HFCE in per capita terms is higher than the EU average and vice versa.

Although the indices are available for all the participating countries they are not intended to rank countries strictly. They only provide an indication of the comparative order of magnitude of the per capita volume in one country in relation to others. It is therefore preferable to use these indices for dividing countries into groups of a comparable level as shown in **Table 2**. To even underline this point, the countries are shown within groups in alphabetical order of the codes.

In 2003, based on the updated nowcast PPPs for the GDP, the grouping of the participant countries was the following:

Group I ($\geq 126\%$ of the EU25 average): Switzerland, Ireland, Luxembourg, Norway;

Group II ($\geq 101\%$ and $< 125\%$ of the EU25 average): Austria, Belgium, Germany, Denmark, Finland, France, Iceland, Italy, the Netherlands, Sweden and the United Kingdom;

Group III ($\geq 76\%$ and $< 100\%$ of the EU25 average): Cyprus, Greece, Spain and Slovenia;

Group IV ($\geq 51\%$ and $< 75\%$ of the EU25 average): Czech Republic, Hungary, Malta, Portugal and Slovakia;

Group V ($< 50\%$ of the EU25 average): Bulgaria, Estonia, Lithuania, Latvia, Poland, Romania and Turkey.

In 2003 the per capita GDP volume indices varied from 39 (Latvia) to 208 (Luxembourg) within the EU25. For the three EU Candidate Countries - Bulgaria, Romania and Turkey - the index showed a volume below 30% of the EU25 average.

The per capita GDP is for Luxembourg by far the highest among the participants. One of the reasons for this is the large share of cross-border workers in

total employment: while contributing to GDP, they are not taken into consideration as part of the resident population which is used to calculate GDP per head.

GDP per capita volume indices are mainly constructed to compare countries within a given year and they should not be over-interpreted when compared over time, particularly when it comes to small changes from year to year. When compared over a longer time period the per capita GDP indices show a relatively stable pattern. Moving from a group to another is relatively rare. Over the period from 1995 to 2002, only Ireland has significantly changed its grouping, moving from 99% of the EU average in 1995 to the highest group ($\geq 126\%$) with an index of 137 in 2002.

The revised figures show that Germany, France, Italy and the United Kingdom recorded practically the same level, in relation to the EU average, of GDP per capita in PPS for the years 1997 to 2000. Yet there are significant developments for the individual countries if one looks over the whole period 1991 to 2003. For the United Kingdom an upward tendency is visible, while Germany and Italy show slight downward tendencies. France, on the other hand, remains at about 13 to 15 % points above the EU average in all years. However, all four countries belong to the same group in all years.

For Greece and Spain a certain catching-up with the average of the EU can be observed between 1991 and 2003. The same can be said about a number of New Member States, namely Estonia, Latvia, Lithuania, Hungary, Slovenia and Slovakia.

In summary, two major observations can be made concerning the revision and resulting series. Firstly, the level of GDP per head in PPS has been revised consistently for the years under revision, reflecting better now, in individual years, countries' relative position to the EU average and to other countries than in the results before (e.g. Denmark, Germany, France, Sweden, Iceland and Switzerland). Secondly, new data show much more logical development over time, even if over time comparison is not the main purpose for which PPPs have been developed. Formerly observed "jumps", have been removed successfully (e.g. Belgium, Denmark, France and the United Kingdom). It can be concluded that the revision has well addressed the criticism raised with regard to the reliability of PPPs and related economic indicators, particularly when it comes to the development over time in comparison with the National Accounts.

⁽¹⁾ After the recent EU enlargement, data are now presented in relation to the average of the enlarged Union (EU25). Groupings of countries have been adapted accordingly. Long time series are still presented with reference to EU15 because of lacking of information for the New Member States before 1995.

Table 1: GDP per capita in PPS (EU25=100), 1995 – 2003

	1995	1996	1997	1998	1999	2000	2001	2002p	2003n
Belgium (BE)	120	118	117	116	116	117	117	116	117
Czech Republic (CZ)	70	72	70	67	66	65	66	67	69
Denmark (DK)	125	126	126	125	127	127	126	123	123
Germany (DE)	119	118	116	114	113	112	110	109	108
Estonia (EE)	34	36	39	40	39	42	43	45	46
Greece (EL)	72	72	72	72	72	72	74	77	80
Spain (ES)	87	88	88	89	92	92	92	94	95
France (FR)	115	114	115	115	114	114	115	115	113
Ireland (IE)	99	103	113	117	122	126	129	137	131
Italy (IT)	115	115	113	114	112	111	110	108	107
Cyprus (CY)	83	82	81	81	82	84	86	84	83
Latvia (LV)	30	31	33	34	34	35	37	39	39
Lithuania (LT)	34	35	37	39	38	39	41	43	46
Luxembourg (LU)	179	177	185	193	208	218	213	208	208
Hungary (HU)	50	49	51	52	53	54	56	58	61
Malta (MT)	:	:	:	:	78	78	76	75	73
Netherlands (NL)	120	120	121	121	121	122	124	122	120
Austria (AT)	127	127	125	124	125	126	123	121	121
Poland (PL)	41	42	44	45	46	46	46	45	46
Portugal (PT)	73	73	74	75	77	77	77	77	75
Slovenia (SI)	68	70	71	72	74	73	75	76	77
Slovak Republic (SK)	45	46	47	48	47	48	49	52	51
Finland (FI)	106	106	111	114	112	114	114	111	111
Sweden (SE)	118	118	116	115	118	120	116	115	115
United Kingdom (UK)	111	112	114	114	113	114	115	117	119
<hr/>									
Bulgaria (BG)	31	28	26	26	26	27	29	29	29
Romania (RO)	:	:	:	27	26	25	27	28	30
Turkey (TR)	30	31	33	32	30	30	26	27	27
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Iceland (IS)	125	128	127	128	128	126	125	119	116
Norway (NO)	133	140	142	134	142	162	158	149	149
Switzerland (CH)	146	140	142	141	136	135	131	129	129

Table 2: Grouping of the ECP participating countries according to GDP per capita in PPS, EU25=100, 1995 – 2003

	126% and more of EU25 average	101% -125% of EU25 average	76% -100% of EU25 average	51% -75% of EU25 average	50% and less of EU25 average
1995	AT CH LU NO	BE DE DK FI FR IS IT NL SE UK	CY ES IE	CZ EL PT SI	BG EE HU LT LV PL SK TR
1996	AT CH DK IS LU NO	BE DE FI FR IE IT NL SE UK	CY ES	CZ EL PT SI	BG EE HU LT LV PL SK TR
1997	CH DK IS LU NO	AT BE DE FI FR IE IT NL SE UK	CY ES	CZ EL HU PT SI	BG EE LT LV PL SK TR
1998	CH IS LU NO	AT BE DE DK FI FR IE IT NL SE UK	CY ES	CZ EL HU PT SI	BG EE LT LV PL RO SK TR
1999	CH DK IS LU NO	AT BE DE FI FR IE IT NL SE UK	CY ES MT PT	CZ EL HU SI	BG EE LT LV PL RO SK TR
2000	AT CH DK IE IS LU NO	BE DE FI FR IT NL SE UK	CY ES MT PT	CZ EL HU SI	BG EE LT LV PL RO SK TR
2001	CH DK IE LU NO	AT BE DE FI FR IS IT NL SE UK	CY ES MT PT	CZ EL HU SI	BG EE LT LV PL RO SK TR
2002	CH IE LU NO	AT BE DE DK FI FR IS IT NL SE UK	CY EL ES PT SI	CZ HU MT SK	BG EE LT LV PL RO TR
2003	CH IE LU NO	AT BE DE DK FI FR IS IT NL SE UK	CY EL ES SI	CZ HU MT PT SK	BG EE LT LV PL RO TR

Note to Table 1 and 2: For 1995-1998 the data for the 10 New Member States are based on backwards extrapolations. Malta is for these years not included in EU25.

Price level indices, price dispersion and price convergence

Price level indices (PLIs), see **Table 5**, are obtained as the ratio of PPP to the exchange rate for each country and they present a comparison of the price levels with respect to the EU average. A value over 100 indicates a higher general price level than the EU average; a value under 100 indicates a lower general price level. In a country with an index above 100, the use of exchange rates would overestimate the volumes; while the opposite holds if the PLI is lower than 100.

PLIs also indicate the degree to which a country's exchange rate reflects its general price level vis-à-vis the general price level of the reference country: a value over 100 indicates that the exchange rate understates the general price level; a value under 100 indicates that the exchange rate overstates the general price level.

Table 5 shows PLIs for GDP and HFCE. Like the volume indices PLIs are not intended to rank countries strictly, but to provide the order of magnitude.

In 2002 the PLIs for HFCE were between 43 (Slovakia) and 131 (Denmark) among the EU Member States. When considering all participating countries in the ECP the range was wider: from 39 (Romania) to 145 (Norway).

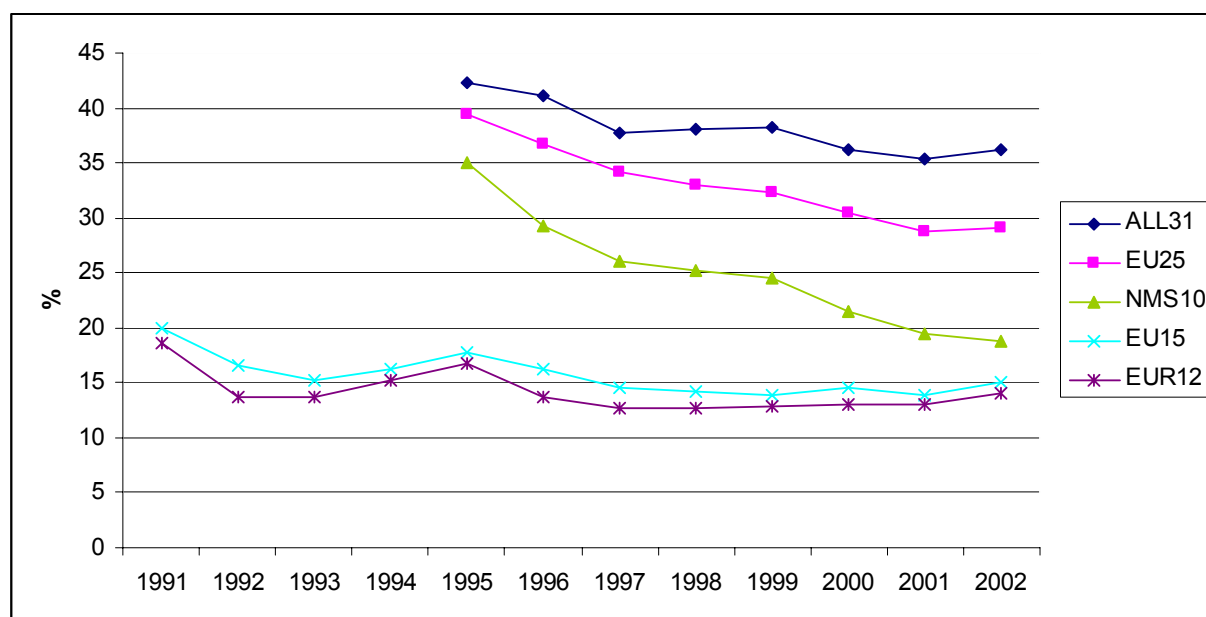
The New Member States and the three Candidate Countries all have PLIs well below the EU-15 average; the highest index being that of Cyprus (83 in 2002).

In general, PLIs for HFCE are less dispersed in the EU than in the whole set of 31 countries. This is confirmed by the coefficient of variation, which is a measure of dispersion, of different country groups. The coefficient was 29% for the EU25, 15% for the EU15 and 19% for the New Member States in 2002. For the whole set of countries the price dispersion was noticeable higher, showing 38% in 2002.

From the now revised time series it can be seen that the PLIs are moving closer to each others – general price levels of all participating countries have been converging over the range of years displayed in **Table 5**. This can be verified also from the coefficients of variations, which went down, for example for the New Member States from 35% (1995) to 19% (2002) (estimated figures).

For both, GDP and HFCE, the New Member States have witnessed increase of their relative price levels over the period from 1995 to 2002, and they are getting closer to the EU15 average though in Slovenia the general price level has been very stable in relation to the EU15 average. However, the deterioration of their relative position in price levels has been generally compensated by the increase in real volumes as shown in the previous section of this article.

Chart 2: Price convergence for selected country groups
Coefficient of variation of PLIs for HFCE



Revision of Purchasing Power Parities 1995-2000

PPPs and related economic indicators for 1995 to 2000 have been revised by Eurostat. This article presents the final results of this revision at aggregated level. More detailed results at the level of analytical categories are available on request from Eurostat.

This major revision, involving 16 months of work by Eurostat and the national statistical institutes of the 31 countries participating in the Eurostat co-ordinated group of the European Comparison Programme, was undertaken in order

- to have a consistent time series of national accounts (NA), aggregates and detailed weights, underlying the calculations;
- to ensure consistency of the prices used in PPP with those underlying the values in NA;
- to obtain consistency over time of the practical approaches used by the price statisticians, particularly for difficult cases.

Traditionally, PPPs have been seen as snapshots in time, which, once established, are never revised. This snapshot theory, however, is not entirely satisfactory. It has some advantages like simplicity for users and less workload for data producers, but the disadvantage is that it leads to data sets that become both internally and externally inconsistent when time elapses.

Inconsistencies arise because of the three forms of input data which the overall PPP calculations depend on - price survey results, GDP and expenditure weights and other input data (e.g. rents and salaries in General Government) - only price survey results have a snapshot character; i.e., once collected, prices cannot be re-collected or revised. NA related input data - e.g. GDP weights - are subject to regular revisions according to the national timetables. These national revision timetables are not (yet) harmonised across the EU; although, the annex B of the ESA95 regulation defines the points in time when certain information has to be delivered to Eurostat. However, regular NA revisions up to 24 months are and can be taken into account in establishing the PPP. The regular Eurostat production calendar of PPP has been adjusted to the transmission programme of ESA95 (see Box 3, overleaf).

Another type of NA revisions - so called major revisions e.g. because of considerable methodological changes - have so far not been taken into account in the PPP. One such change was the switch from ESA79 to ESA95, which is the most important reason for the revision of European PPP.

The introduction of ESA95 did not occur at once in all its parts and not in all countries at the same point in time. For the original 15 Member States the main aggregates had to be delivered in April 1999 but some of the detailed tables only two years later. Some Member States have had derogations to its implementation, some of which stretch into 2005. The other countries introduced ESA95 progressively over the pre-accession period.

Consequently, the comparability of volume indicators over time or even between countries within one given year was affected, which was widely criticised by economists, politicians and in the media - giving Eurostat further assurance of the need of the revision.

Another justification for the revision was the situation of the EU Candidate Countries, who, during the same period as the ESA95 switchover was made, upgraded their NA systems from older systems - such as Material Product System (MPS), SNA68 or even own national systems - to European standards. And who all, in addition, became fully participating members of the European comparison project at the same era. Only few of the Candidate Countries participated fully in PPP price surveys in years before 1999. Therefore, there was a need to review respective re-trapolation of the PPP in the light of revised deflators coming from the revised NA.

In summary, for the majority of the participating countries, the reference year 2000 was seen as the first year where the PPP input data coming from the NA were based uniformly on ESA95. Moreover, since the reference year 1999, all Candidate Countries have fully participated in the price surveys according to the Eurostat survey cycle. Eurostat, therefore, believed that it was the right time to make the PPP revision in order to achieve consistency with ESA95 and improve spatial and temporal comparability of volume indicators, such as GDP per head in PPS.

Another type of major revision allowed for was the incorporation of the results of the latest population census.

At the same time, inconsistencies detected in the process of reviewing input data and executing the revision calculations were corrected. Particularly, important improvements were made in two areas. Firstly, the consistency over time and between countries of other input data - rents and government salaries - was studied and checked against Eurostat's guidelines for data collection.

Box 3: Regular annual PPP revisions at Eurostat

PPPs are established on an annual basis, therefore only annual revisions apply. According to the regular publication calendar, PPPs are released as preliminary estimates 12 months after the end of the reference year (T) and revised to final data after 24 months. In addition, an early estimate of PPP, a so-called nowcast is published - at a high aggregation level - 5 months after the end of the reference year. This regular PPP revision / release calendar is in line with the data delivery timetable for NA data as given in the ESA95 regulation⁽¹⁾ The current regular Eurostat revision calendar for PPP is summarised as follows:

T+5 months: now-cast of PPP for the year T, based on the first GDP and main aggregates estimates for T (available T+4 months)⁽²⁾ and extrapolated prices of T-1;

T +12 months: preliminary PPP for the year T, based on the first estimate of detailed GDP expenditure weights (available T+9 months), the first consumer price survey of T; and first estimates of other input data

T+24 months: final PPP for the year T, based on revised detailed GDP expenditure weights (available T+21 months), both consumer price surveys for T and revised data for all other input data

In addition, the changes of the level of GDP and other aggregated expenditure data are taken into account with regard to volume indicators, as the PPP are always applied to the latest available NA data. These revisions of NA aggregates are frequently done in one or more of the 31 participating countries, affecting the relative position of the country and the EU average.

The weights underlying the PPP calculations, however, are not always fully consistent with the latest aggregated GDP data to which the PPP are applied. This is due to a built-in feature of the NA compilation and revision process, where more aggregated data may be revised more often than the detailed expenditure weights, which are usually revised only once a year and submitted to Eurostat with delays of T+9, T+21 months etc. To obtain full consistency the PPP calculation should be re-run after each ESA95 data delivery to Eurostat. Obviously, this is not feasible and thus, establishing and revising PPP in line with the NA delivery calendar for detailed expenditure weights and applying these PPP always to the latest available aggregated data is a compromise between up-to-dateness of data, stability of data and workload.

An interesting finding was that the interpretation of PPP as a "snapshot in time" had led to less emphasis on the temporal consistency of the input data at the national and Eurostat level. In addition, changing interpretations of guidelines at national level seemed to be a major source for breaks in the time series of input data. Secondly, the conceptual consistency between the prices collected for the PPP and the prices underlying the GDP expenditure weights was reviewed and improved.

For the EU Member States and three EFTA countries the revision was made at the same level of detail as the regular annual PPP calculation for the years 1995

and 2000. Earlier years have been revised by extrapolation using implicit deflators from National Accounts data or CPIs later on.

In the case of the New Member States and Candidate Countries, a detailed revision of the PPP was limited to the years 1999 and 2000 because of the absence of detailed input data; for the moment their ESA95 based NA series are relatively short and, even more importantly, they have fully participated in the PPP price surveys only from the reference year 1999. For the EU Candidate Countries PPPs from 1995 to 1999 were re-trapolated using 1999 PPPs and implicit price deflator.

⁽¹⁾ ESA95; *European System of Accounts 1995, Council Regulation (EC) 2223/1996 of 25 June 1996*

⁽²⁾ According to latest EU legislation concerning data delivery from Member States to Eurostat, the t+4 months deadline has been changed in July 2003 to T+70 days for early delivery of aggregated NA data. As soon as all countries are able to fulfil this requirement, the nowcast could be published earlier, too.

Table 3: PPPs, 1 PPS in national currency / euro fixed for euro-zone countries

GDP													
	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p	2003n
BE	1.00422	1.00803	1.04099	1.04157	1.03908	1.02584	1.02813	1.03006	1.02621	1.00318	0.988693	0.982144	0.993461
CZ**	:	:	:	:	12.7009	13.3466	14.0844	15.3851	15.5719	15.6391	16.0656	15.8753	15.4434
DK	9.63435	9.62143	9.68675	9.65698	9.68161	9.55468	9.48765	9.45391	9.18470	9.15460	9.18868	9.36636	9.43599
DE	1.09175	1.11299	1.14578	1.15108	1.15707	1.12824	1.11555	1.11340	1.09608	1.06840	1.07365	1.06798	1.07168
EE**	:	:	:	:	5.49385	6.61037	7.11342	7.62261	7.77150	7.87097	8.33475	8.69752	8.95630
EL	0.437228	0.487171	0.553576	0.603189	0.652473	0.683621	0.707802	0.736391	0.743375	0.745261	0.763732	0.757135	0.781638
ES	0.705847	0.731036	0.758875	0.772585	0.798716	0.802647	0.809817	0.813060	0.800565	0.808049	0.825146	0.829142	0.856289
FR	1.07697	1.06609	1.08320	1.07941	1.08123	1.06155	1.03338	1.02781	1.01338	0.996287	0.990001	0.987457	1.00081
IE	0.873676	0.871807	0.910542	0.907483	0.921204	0.922391	0.921022	0.966966	1.00623	1.03806	1.08381	1.09656	1.13933
IT	0.795724	0.807411	0.833282	0.845075	0.874433	0.888315	0.894842	0.887780	0.883790	0.879579	0.900893	0.917524	0.940571
CY**	:	:	:	:	0.463624	0.456652	0.456907	0.460495	0.460293	0.459966	0.457064	0.470935	0.498315
LV**	:	:	:	:	0.217943	0.242326	0.252514	0.259713	0.266050	0.269722	0.275080	0.279957	0.287878
LT**	:	:	:	:	1.29337	1.51041	1.67689	1.73210	1.68298	1.63629	1.59947	1.56363	1.58259
LU	1.04286	1.04991	1.10486	1.12116	1.13030	1.12428	1.12835	1.11955	1.07304	1.07574	1.09689	1.10407	1.12344
HU**	:	:	:	:	68.6733	80.5632	92.9846	102.982	109.175	116.875	121.150	128.330	135.435
MT	:	:	:	:	:	:	:	:	0.267289	0.266350	0.274882	0.274175	0.279599
NL	1.00534	0.998624	1.01028	1.01283	1.01805	1.00525	1.00053	1.00784	1.01085	1.00669	1.01103	1.02688	1.04634
AT	1.02455	1.03037	1.05323	1.06030	1.07067	1.05108	1.03863	1.04074	1.01651	0.995209	1.01203	1.01578	1.02915
PL**	:	:	:	:	1.31198	1.50653	1.67165	1.83356	1.90638	1.98142	2.03387	2.04006	2.07296
PT	0.558557	0.604166	0.644213	0.677300	0.690168	0.699399	0.704912	0.715912	0.708949	0.708163	0.723937	0.733237	0.748439
SI**	:	:	:	:	109.167	117.233	124.274	131.451	136.143	141.385	150.033	159.314	167.346
SK**	:	:	:	:	15.1200	15.2695	15.8729	16.4216	17.0898	17.4924	17.9256	18.0197	19.5069
FI	1.06912	1.05264	1.07233	1.06963	1.10417	1.08404	1.06421	1.07583	1.07255	1.06586	1.07395	1.09744	1.11513
SE	10.3584	10.1636	10.3970	10.4267	10.6190	10.4014	10.3927	10.4876	10.2030	10.0070	10.2768	10.4333	10.5935
UK	0.677956	0.684389	0.698369	0.695235	0.703041	0.701561	0.691402	0.701482	0.703293	0.688633	0.686313	0.681835	0.698353
CC-3													
BG**	:	:	:	:	0.0210376	0.0449648	0.458163	0.557690	0.565296	0.588588	0.616510	0.645789	0.669714
RO**	:	:	:	:	:	:	:	3377.55	4876.66	6849.72	9157.29	11072.4	13128.1
TR**	:	:	:	:	26189	45082.7	79729	137724	209442	295020	466562	668650	845350
EFTA													
IS	81.2163	80.0636	81.5959	83.0998	84.7304	84.0629	84.7767	87.5784	88.5871	90.6063	97.7336	103.173	107.130
NO	10.4486	10.0787	10.2376	10.0257	10.1590	9.97926	10.0652	10.3543	10.0564	9.81092	10.0309	10.2256	10.3897
CH	2.24033	2.22497	2.26775	2.26872	2.25132	2.24042	2.13633	2.10531	2.10575	2.06566	2.08757	2.05075	2.04851
HFCE													
	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p	
BE	1.04715	1.03313	1.04845	1.04631	1.04625	1.02428	1.03025	1.03052	1.04132	1.01826	0.992419	0.987416	
CZ**	:	:	:	:	13.6927	14.305	14.8973	15.9924	16.0894	16.1846	16.5596	16.3421	
DK	9.73842	9.61674	9.70646	9.75974	9.79403	9.65018	9.49712	9.42901	9.15401	9.16729	9.40128	9.71181	
DE	1.05291	1.06514	1.09428	1.09519	1.0982	1.07041	1.06284	1.05995	1.04	1.01592	1.03308	1.04004	
EE**	:	:	:	:	6.09519	7.37491	7.76231	8.29458	8.61769	8.56613	9.04252	9.51171	
GR	0.482728	0.5411	0.611232	0.662009	0.710862	0.744629	0.765571	0.791116	0.79694	0.797972	0.815922	0.79733	
ES	0.724631	0.747991	0.779732	0.798224	0.824106	0.830282	0.833188	0.834863	0.812576	0.818117	0.821342	0.824438	
FR	1.12079	1.11362	1.12909	1.12578	1.1309	1.11047	1.06633	1.05682	1.04867	1.02917	1.01779	0.996913	
IE	0.959331	0.956958	0.96784	0.970175	0.981884	0.987946	0.965013	1.00026	1.03624	1.07377	1.11976	1.18355	
IT	0.794214	0.81204	0.847988	0.868668	0.90696	0.92047	0.915359	0.913075	0.907198	0.903909	0.921893	0.945546	
CY**	:	:	:	:	0.477627	0.47166	0.468148	0.465752	0.465188	0.466079	0.466845	0.476605	
LV**	:	:	:	:	0.253266	0.283505	0.29831	0.307633	0.306391	0.309802	0.315063	0.315106	
LT**	:	:	:	:	1.54334	1.76031	1.86618	1.93845	1.88852	1.83927	1.83646	1.77386	
LU	1.01359	1.02361	1.05175	1.05415	1.05818	1.03237	1.03511	1.03215	0.980972	0.970776	0.993705	0.996993	
HU**	:	:	:	:	69.3241	82.2107	93.9865	105.212	113.441	121.107	128.814	133.243	
MT	:	:	:	:	:	:	:	:	0.291989	0.290721	0.293748	0.293845	
NL	0.994082	0.994019	1.00427	1.00878	1.00745	0.993855	0.992783	1.0017	1.00685	1.00218	1.00324	1.01848	
AT	1.04138	1.04811	1.07293	1.07632	1.08035	1.05871	1.04446	1.04164	1.00416	0.981753	0.990078	1.01556	
PL**	:	:	:	:	1.41179	1.62596	1.80269	1.97488	2.05648	2.17167	2.23086	2.21707	
PT	0.591547	0.626692	0.663483	0.68337	0.701402	0.705945	0.705923	0.718738	0.712199	0.706145	0.719691	0.735363	
SI**	:	:	:	:	114.4	120.36	126.946	134.499	139.61	145.409	154.011	164.144	
SK**	:	:	:	:	14.8407	15.0293	15.4267	16.0981	17.0949	18.1048	18.6662	18.5556	
FI	1.22186	1.22813	1.27281	1.25266	1.24261	1.21015	1.18283	1.18986	1.19128	1.18315	1.18541	1.22687	
SE	10.6199	10.5027	11.0688	11.0896	11.2183	10.9951	10.967	10.9621	10.5832	10.297	10.455	10.7488	
UK	0.67005	0.682216	0.696705	0.69434	0.706544	0.700637	0.693712	0.70368	0.707109	0.687491	0.686001	0.675941	
CC-3													
BG**	:	:	:	:	0.027572	0.058401	0.613609	0.699713	0.699086	0.709512	0.745027	0.783138	
RO**	:	:	:	:	:	:	:	4089.56	5854.13	8038.24	10524.6	12342.7	
TR**	:	:	:	:	28954.5	46880	82703.5	149060	231807	334928	510906	704368	
EFTA													
IS	92.7219	93.3087	96.2697	95.8701	96.2707	94.2927	95.2814	97.3513	95.2725	95.2884	105.599	112.508	
NO	10.4293	10.3649	10.5139	10.3877	10.4744	10.2456	10.4692	10.5554	10.4376	10.4173	10.6881	10.8658	
CH	2.28051	2.29862	2.35233	2.30757	2.3103	2.24196	2.18622	2.15589	2.18384	2.13207	2.14437	2.11767	

* Data for 1991-1994 are based on backwards extrapolated PPPs

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** Data for 1995-1998 are based on backwards extrapolated PPPs

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Note: The PPPs are shown with the same accuracy for all countries and years of six significant digits.

Table 4: Per capita volume indices of GDP/HFCE in PPS, EU15=100

	GDP													HFCE											
	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p	2003n	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p
EU25	:	:	:	:	90**	91**	91**	91**	91	91	91	91	92	:	:	:	:	90**	90**	90**	91**	91	91	91	91
BE	108	109	108	109	109	107	107	105	105	106	107	106	107	101	101	101	102	102	102	100	99	96	97	100	99
CZ***	:	:	:	:	63	65	63	61	60	59	60	62	63	:	:	:	:	52	55	55	53	52	52	52	53
DK	110	109	110	113	113	114	114	113	116	115	115	112	113	93	94	95	99	99	99	100	100	100	95	91	88
DE	109	110	109	109	108	107	105	104	103	102	101	100	99	111	112	113	112	112	111	109	108	108	107	105	102
EE***	:	:	:	:	31	32	35	36	36	38	39	41	42	:	:	:	:	27	30	33	33	32	34	35	37
EL	69	68	67	67	65	65	66	65	65	66	67	71	73	78	78	78	78	78	77	77	77	75	74	75	79
ES	79	79	79	79	79	79	80	81	84	83	84	86	87	82	82	81	81	81	80	80	82	85	84	86	88
FR	106	106	106	105	104	103	104	104	104	104	105	105	104	99	99	99	98	97	97	97	97	96	95	96	99
IE	78	79	82	84	90	94	102	106	111	115	118	125	120	71	72	74	76	77	79	84	86	87	89	89	88
IT	105	105	104	104	104	104	102	103	102	101	100	98	98	107	108	104	104	104	103	104	105	104	104	102	100
CY***	:	:	:	:	75	75	73	74	75	76	78	77	76	:	:	:	:	81	82	82	85	84	89	90	89
LV***	:	:	:	:	27	28	30	31	31	32	34	36	36	:	:	:	:	26	29	30	30	30	31	33	35
LT***	:	:	:	:	31	32	34	36	34	35	37	40	42	:	:	:	:	31	32	34	35	35	36	37	39
LU	160	160	165	165	161	161	168	175	189	199	194	190	191	148	141	143	145	143	145	143	145	148	149	152	153
HU***	:	:	:	:	45	45	46	47	48	49	52	53	56	:	:	:	:	42	40	40	40	41	42	44	47
MT	:	:	:	:	:	:	:	:	71	71	69	69	67	:	:	:	:	:	:	:	:	75	75	74	74
NL	108	108	109	108	109	109	110	110	110	111	113	111	110	95	94	95	94	95	96	96	96	96	96	98	97
AT	115	115	116	115	114	115	113	113	114	114	112	111	111	106	107	108	109	109	111	110	111	112	111	107	
PL***	:	:	:	:	37	38	40	41	42	42	42	42	42	:	:	:	:	36	39	41	41	42	42	43	44
PT	67	67	66	65	66	66	67	68	70	70	71	71	69	69	72	73	72	71	72	72	73	75	75	74	74
SI***	:	:	:	:	62	63	65	65	67	67	68	69	70	:	:	:	:	61	63	63	63	65	64	64	63
SK***	:	:	:	:	40	42	43	43	43	44	45	47	47	:	:	:	:	38	40	41	43	42	41	43	46
FI	100	95	94	95	96	96	101	103	102	104	104	102	101	79	75	72	73	74	76	78	78	77	78	79	78
SE	109	106	105	106	107	107	106	104	108	109	106	105	106	92	90	87	87	86	85	85	84	87	88	86	84
UK	95	94	97	99	100	101	104	103	103	104	105	107	109	105	104	107	108	109	112	114	114	114	116	118	122
CC-3																									
BG***	:	:	:	:	28	25	24	24	24	25	26	26	27	:	:	:	:	27	26	23	23	24	25	26	26
RO***	:	:	:	:	:	:	:	24	23	23	24	26	27	:	:	:	:	:	:	:	26	25	24	26	28
TR***	:	:	:	:	27	28	30	29	27	28	24	25	25	:	:	:	:	31	32	35	33	31	31	27	27
EFTA																									
IS	122	118	118	117	113	116	115	117	116	115	114	109	106	109	103	98	98	98	101	100	102	108	108	98	91
NO	110	112	115	118	120	127	129	121	129	147	144	136	136	91	92	94	96	97	102	100	99	99	99	97	96
CH	142	139	139	135	132	127	129	128	124	123	120	118	118	142	139	138	137	131	130	129	128	122	120	118	117

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* Data for 1991-1994 based on backwards extrapolated PPPs

** Excluding Malta

*** Data for 1995-1999 are based on backwards extrapolated PPPs

Table 5: Comparative price level indices, EU15=100

	GDP													HFCE											
	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p	2003n	1991*	1992*	1993*	1994*	1995	1996	1997	1998	1999	2000	2001	2002p
EU25	:	:	:	:	95**	95**	95**	96**	95	96	96	96	96	:	:	:	:	96**	96**	96**	96**	96	96	97	96
BE	96	98	104	106	109	105	102	102	103	100	99	98	99	100	100	105	106	109	105	103	102	104	102	99	99
CZ***	:	:	:	:	37	39	39	42	42	44	47	52	48	:	:	:	:	39	42	41	44	44	45	49	53
DK	122	123	128	128	132	130	127	126	124	123	123	126	127	123	123	128	129	134	131	127	126	123	123	126	131
DE	104	108	116	117	121	116	111	111	110	107	107	107	107	100	103	111	111	115	110	106	105	104	102	103	104
EE***	:	:	:	:	37	43	45	48	50	50	53	56	57	:	:	:	:	41	48	49	53	55	55	58	61
EL	66	67	70	71	73	76	78	76	78	75	76	76	78	73	75	78	78	80	83	84	82	83	81	82	80
ES	91	92	85	81	82	83	81	81	80	81	83	83	86	94	94	87	84	84	86	84	83	81	82	82	82
FR	101	102	107	108	109	107	103	102	101	100	99	99	100	105	107	112	112	114	112	106	105	105	103	102	100
IE	90	90	90	90	89	92	97	97	101	104	108	110	114	98	99	95	96	95	98	102	100	104	107	112	118
IT	100	98	88	85	79	88	90	88	88	88	90	92	94	100	99	89	88	82	91	92	91	91	90	92	95
CY***	:	:	:	:	78	77	78	80	80	80	79	82	85	:	:	:	:	81	80	80	81	80	81	81	83
LV***	:	:	:	:	32	35	38	39	43	48	49	48	45	:	:	:	:	37	41	45	47	49	55	56	54
LT***	:	:	:	:	25	30	37	39	39	44	45	45	46	:	:	:	:	29	35	41	43	44	50	51	51
LU	100	102	110	114	118	115	112	111	107	108	110	110	112	97	99	105	107	111	106	103	103	98	97	99	100
HU***	:	:	:	:	42	42	44	43	43	45	47	53	53	:	:	:	:	42	42	44	44	45	47	50	55
MT	:	:	:	:	:	:	:	:	63	66	68	67	66	:	:	:	:	:	:	:	:	69	72	73	72
NL	96	97	102	103	107	104	100	100	101	101	101	103	105	95	96	102	103	106	102	99	99	101	100	100	102
AT	98	100	106	108	112	108	103	103	102	100	101	102	103	99	101	108	109	113	108	104	103	100	98	99	102
PL***	:	:	:	:	41	44	45	47	45	49	55	53	47	:	:	:	:	45	48	49	50	49	54	61	57
PT	63	69	69	69	71	72	71	71	71	71	72	73	75	66	72	71	70	72	72	71	71	71	71	72	74
SI***	:	:	:	:	70	68	69	71	70	68	69	71	72	:	:	:	:	74	70	70	72	72	70	71	73
SK***	:	:	:	:	39	39	42	42	39	41	41	42	47	:	:	:	:	38	39	40	41	39	42	43	43
FI	127	108	95	103	115	111	108	107	107	107	107	110	112	145	126	113	120	129	123	120	118	119	118	119	123
SE	138	135	114	114	114	122	120	118	116	118	111	114	116	142	139	121	121	120	129	127	123	120	122	113	117
UK	97	93	90	90	85	86	100	104	107	113	110	108	101	96	92	89	89	85	86	100	104	107	113	110	107
CC-3																									
BG***	:	:	:	:	24	20	24	28	29	30	32	33	34	:	:	:	:	31	26	32	36	36	36	38	40
RO***	:	:	:	:	:	:	:	34	30	34	35	35	35	:	:	:	:	:	:	:	41	36	40	40	39
TR***	:	:	:	:	44	44	46	47	47	51	42	46	50	:	:	:	:	48	45	48	51	52	58	46	49
EFTA																									
IS	111	107	103	100	100	99	105	110	115	125	112	120	124	127	125	121	115	114	111	118	122	123	131	121	131
NO	130	125	123	120	123	122	126	122	121	121	125	136	130	130	129	127	124	126	125	131	125	126	128	133	145
CH	126	122	131	140	146	143	130	130	132	133	138	140	135	129	126	136	142	149	143	133	133	136	137	142	144

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* Data for 1991-1994 based on backwards extrapolated PPPs

** Excluding Malta

*** Data for 1995-1999 are based on backwards extrapolated PPPs

➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Use of Purchasing Power Parities

PPP is a concept that is not immediately and easily understood. This has generated misunderstandings as sometimes PPPs are used for purposes for which they are not suited. In essence PPPs are price comparison in space and therefore the most recommended applications are spatial ones – i.e. comparisons of PPP converted indicators across countries at a given point in time. The most common usages of PPPs are to generate comparable volume measures in per capita terms across countries and to calculate general price level indices. They can be also used in other areas such as labour productivity comparisons at GDP level and in measuring the relative size of economies.

The differences in values of GDP between countries, even when revalued in a common currency using exchange rates, do not only correspond to a “volume of goods and services” component but also to a “level of prices” component, which can sometimes assume sizeable proportions. Exchange rates are determined by many factors, which reflect demand and supply on the currency markets, such as international trade and interest rate differentials. In other words, exchange rates usually reflect other elements than price differences alone. To obtain a pure comparison of volumes, it is essential to use special conversion rates (spatial deflators) which remove the effect of price level differences between countries. Purchasing Power Parities (PPPs) are such currency conversion rates that convert economic indicators expressed in national currencies to an artificial common currency, called Purchasing Power Standard (PPS). This conversion equalises the purchasing power of different national currencies.

Despite being designed for spatial comparisons, PPPs and related economic indicators can be used for inter-temporal comparisons but with certain limitations and with necessary care. In addition, the sampling of items and price collection for PPPs are not designed to capture the pure price change over time as in the case of consumer price indices but price differentials over space. In effect, GDPs converted using PPP should be understood more like current price volume series.

Finally, it needs to be underlined that PPP-based indices cannot be used to establish a strict ranking of countries because PPPs are statistical constructs rather than precise measures. They provide only an indication of the relative order of magnitude in a country in relation to others in the comparison. Therefore, these indicators are best used to assign countries to groups as, for example, in all Eurostat and OECD publications on PPP. In Table 1 below the uses of PPP-based data are divided into three groups, “recommended uses”, “uses with limitations” and “non-recommended uses” in a summary form.

Table 6: Uses and limitations of PPP-based data

Recommended uses	<ul style="list-style-type: none"> ▪ Spatial volume comparisons of GDP, GDP per head, GDP per hour worked, size of economies ▪ Grouping of countries by volume index of GDP ▪ Spatial comparisons of relative price levels
Use with limitations	<ul style="list-style-type: none"> ▪ Inter-temporal analysis of relative GDP per capita or relative prices ▪ Analysis of price convergence ▪ Cost of living index across countries ▪ Use of PPP established for expenditure categories for the deflation of other values, as e.g. household income.
Non-recommended uses	<ul style="list-style-type: none"> ▪ As a precision tool to establish rankings between countries ▪ As a way of constructing national growth rates ▪ As a measure to generate output and productivity comparisons by industry (unless there are industry-specific PPPs) ▪ As a measure to undertake price level index comparisons at detailed level. ▪ As an indicator for the over- or undervaluation of a currency ▪ As equilibrium exchange rates

To know more about:

“Purchasing Power Parities and Real Expenditures, 1999 Benchmark Year”, OECD 2002

“Nowcasting of PPP”, Eurostat paper for the CONFERENCE OF EUROPEAN STATISTICIANS, Consultation on the European Comparison Programme, Geneva, 2003

“Purchasing Power Parities and related economic indicators for EU, Acceding and Candidate Countries and EFTA. Revised 1995 – 2000, final 2001 and preliminary 2002 results” Statistics in Focus 64/2003, Eurostat, 2003

Further information:

➤ Databases

New Cronos, Theme 2, Domain: price

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