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COMPARISON IN REAL TERMS OF THE GROSS DOMESTIC PRODUCT FOR THE EUROPEAN UNION, ICELAND, NORWAY, SWITZERLAND AND POLAND

- RESULTS FOR 1996

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1. Overview

Market exchange rates are commonly used for international comparisons of economic aggregates expressed in nominal values. However, they do not allow a real comparison of the volume of goods and services produced and used in different countries because exchange rates quite often reflect other elements than price level differences alone.

The calculation of *purchasing power parities* (PPPs) makes it possible to eliminate the combined impact of price level differences and other elements from the comparison and thus obtain a real

volume comparison between countries of, for example, Gross Domestic Product (GDP) per capita, one of the main indicators of economic activity.

The results for 1996 which are presented in the following table clearly demonstrate this. In general, the use of market exchange rates overestimates the real volume of GDP of countries where price levels are high, and vice versa. Use of PPPs for the conversion of national figures reveals striking differences between nominal values and real volumes, such as Switzerland (-30%), Denmark and Sweden (-19%), Portugal (+47%) and Poland (+150%). However, differences in per capita volumes of goods and services consumed remain quite significant. For example, the per capita GDP of Greece is only 41% of Luxembourg, or 60% of Germany, when measured in PPP-based real volumes.

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**Comparison in real terms of the Gross Domestic Product for the
European Union, Iceland, Norway, Switzerland and Poland
- Results for 1996**

1	2 <u>Exchange rate</u>	3 <u>Purchasing power parity</u>	4 <u>Price level index</u>	5 <u>GDP per capita value index</u>	6 <u>GDP per capita volume index</u>
B	39.30	40.05	102	115	113
DK	7.359	9.150	124	141	114
D	1.910	2.159	113	125	111
EL	305.5	231.5	76	51	67
E	160.7	134.0	83	65	78
F	6.496	7.084	109	114	105
IRL	0.7934	0.7246	91	86	94
I	1959	1735	89	90	102
L	39.30	42.94	109	178	163
NL	2.140	2.263	106	111	105
A	13.43	14.73	110	124	113
P	195.8	133.6	68	47	69
FIN	5.828	6.480	111	106	96
S	8.515	10.59	124	125	101
UK	0.8138	0.7071	87	85	98
IS	84.66	83.8	99	118	119
N	8.197	10.20	124	157	126
CH	1.568	2.239	143	180	126
PL	3.377	1.364	40	15	38

Column 2 Exchange rate (1 ECU = ... National currency units)

Column 3 Purchasing power parities (1 PPS = ... National currency units)

Column 4 Price level index (EU15 = 100)

Column 5 GDP per capita value index, based on ECU values (EU15 = 100)

Column 6 GDP per capita volume index, based on PPS values (EU15 = 100)

N.B.

These results are based on the estimates of GDP nominal values in national currency and of population levels that were available in Eurostat in December 1997. The results presented here are subject to sampling and other errors; small differences between the measures are unlikely to be statistically significant

3. Commentary on the results

Columns 2 and 3 of the table show the exchange rates and the purchasing power parities for the different countries. The ratio between the PPP and the exchange rate is an indicator of the relative price level in each country. For comparison purposes, this ratio is shown in relation to the Community average in Column 4. If the figure is higher than 100, the country concerned is relatively expensive as compared to the Community average, and the use of market exchange rates overestimates the volumes; the opposite is true if the price level index is lower than 100.

Column 4 reveals differences between the various price levels of 68 to 124 for EU countries and of 40 to 143 for all countries. This clearly demonstrates the importance of using PPPs instead of market exchange rates for comparing the economies of different countries.

Other significant indicators for international comparisons are the per capita GDP indexes in Columns 5 and 6 which represent the relation between the per capita GDP of each country and the average per capita GDP of the EU. It is worth noting that the index can be significantly different according to whether market exchange rates (Column 5) or PPPs (Column 6) are used.

Thus, Denmark, for which the per capita value index is 141 if the calculation is based on data in ECU, changes to a volume index of 114 if the conversion factor is PPP. This is related to its high

price level index (124). The opposite phenomenon can be observed for Greece and Portugal for which per capita value indices of 51 and 47 respectively change to per capita volume indices of 67 and 69. The 1 : 4 ratio of per capita GDP between Portugal and Switzerland for data in ECU is no more than 1 : 2 if the conversion factor is PPP. This result alone shows the need to have purchasing power parities as a tool to obtain real volume comparisons between countries.

Volume indices should not be used to establish a strict ranking of countries; in fact they only give an indication of the comparative *order of magnitude* (in volume terms) of economic activity in each country in relation to others. Thus, when comparing per capita volume indices for Sweden and Italy (101 and 102 respectively), the conclusion which can be drawn is that per capita GDP in volume terms in these two countries is of the same order of magnitude, and that a comparison of the per capita value indices for these two countries computed using exchange rates (125 and 90 respectively) gives a biased view, due to the difference in price levels.

4. Methodological summary

PPPs are obtained using the price ratios between the different countries for a basket of goods and services which are both comparable and representative. The individual price ratios are aggregated, according to well defined criteria, up to the GDP global parity level.

Switzerland, Iceland and Norway participate in the Eurostat annual comparison programme as EFTA countries. Poland joined this programme in 1993 on an experimental basis and, from 1994, has been a full member. Ten more countries have since joined the comparison programme: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia and Slovenia. The first combined results for the

enlarged group will be for 1999.

For 1996, Eurostat, the Statistical Office of the European Communities, calculated purchasing power parities for the Member States, Iceland, Norway, Switzerland and Poland.

This note presents only the main results for per capita GDP. More detailed results will be published later in the year, as will results from a wider comparison with other OECD countries (eg. USA, Japan).

To know more about:

Publication **"Comparison in real terms of the aggregates of ESA - 1996 results"**
(in preparation).

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