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Linking of regions in the ECP 1996 and 1999-2000

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LINKING OF REGIONS IN THE ECP 1996 AND 1999-2000

The circumstances in the ECP are different in the 1996 and in the 1999-2000 comparisons. In 1996 there were three groups that used their own classifications and product lists. Moreover, there were several countries that participated in more than one comparison and could be used in linking the groups. In this respect the situation was unique because normally, there is only one choice available when linking regional comparisons.

In the ECP 1999-2000 the framework is simpler. There are only two groups, the Eurostat-OECD group and the CIS group, and they can be linked only via the Russian Federation.

Due to the changed situation, this paper has been divided strictly into two parts. Part I describes very briefly linking procedures in the ECP 1996 and part II describes current plans for the ECP 1999-2000.

ECP 1996

1. The ECP results for 1996 were produced by linking the results of three groups, where Group I consisted of countries participating in the Eurostat-OECD comparison Programme, Group II of countries that were on the responsibility of Austria and Group III of CIS countries plus Mongolia. The results were linked after applying fixity which means that results for Group I and II are the same as in the internal Group I and II comparisons. Fixity is applied also for those Group III countries that did not participate in other comparisons.

2. Adopting the fixity was primarily a practical solution. It is simple, does not cause proliferation of results, and perhaps most importantly, remote countries with very different price structures do not distort sub-regional results. Huge differences between countries can be seen in Annex 1, which shows Laspeyres-Paasche ratios between all pairs of countries. Ratios between the most and least developed countries are often fully out of proportion - GDP might be several times larger if prices of a partner country are used compared to results based on own prices.

3. Several countries participated in more than one comparison, and their data were used in the linking of the groups. In the results, a choice had to be made which of their results were used in the ECP. Complying with advice from countries, the outcome was:

Country	Participation	Result adopted in the ECP
Austria	I, II	I=II
Turkey	I, III	I
Russian Federation	I, II, III	II
Slovenia	I, II	II
Belarus	II, III	II
Republic of Moldova	II, III	II

4. Being the link for the Groups I and II, the results for Austria are the same in the two comparisons. Other link options would have been Russia and Slovenia. Their use as links would have produced slightly different results for all group II countries and two sets of results for Austria, one based on the Group I comparison and another based on the Group II comparison. Austria was chosen as the link in the main because the participation of Russia and Slovenia in Group I was of an experimental nature.

5. There were four possible countries to be used in linking Group III to the other groups. Finally, all of them, Russia, Turkey, Belarus and Moldova, were used. This means that the Group III countries were linked via all four countries and the result is a geometric average of results at all levels of GDP. The advantage of using all countries is that the results become less influenced by specific features of the link country.

6. There are maybe hundreds of possibilities to combine the three regional comparison results but only one could be chosen. The large number of possibilities is because there is more than one subject area where choices have to be made, and combining these options in different ways increases considerably the total number of alternatives. These options are not discussed further here but the discussion below focuses only on two questions:

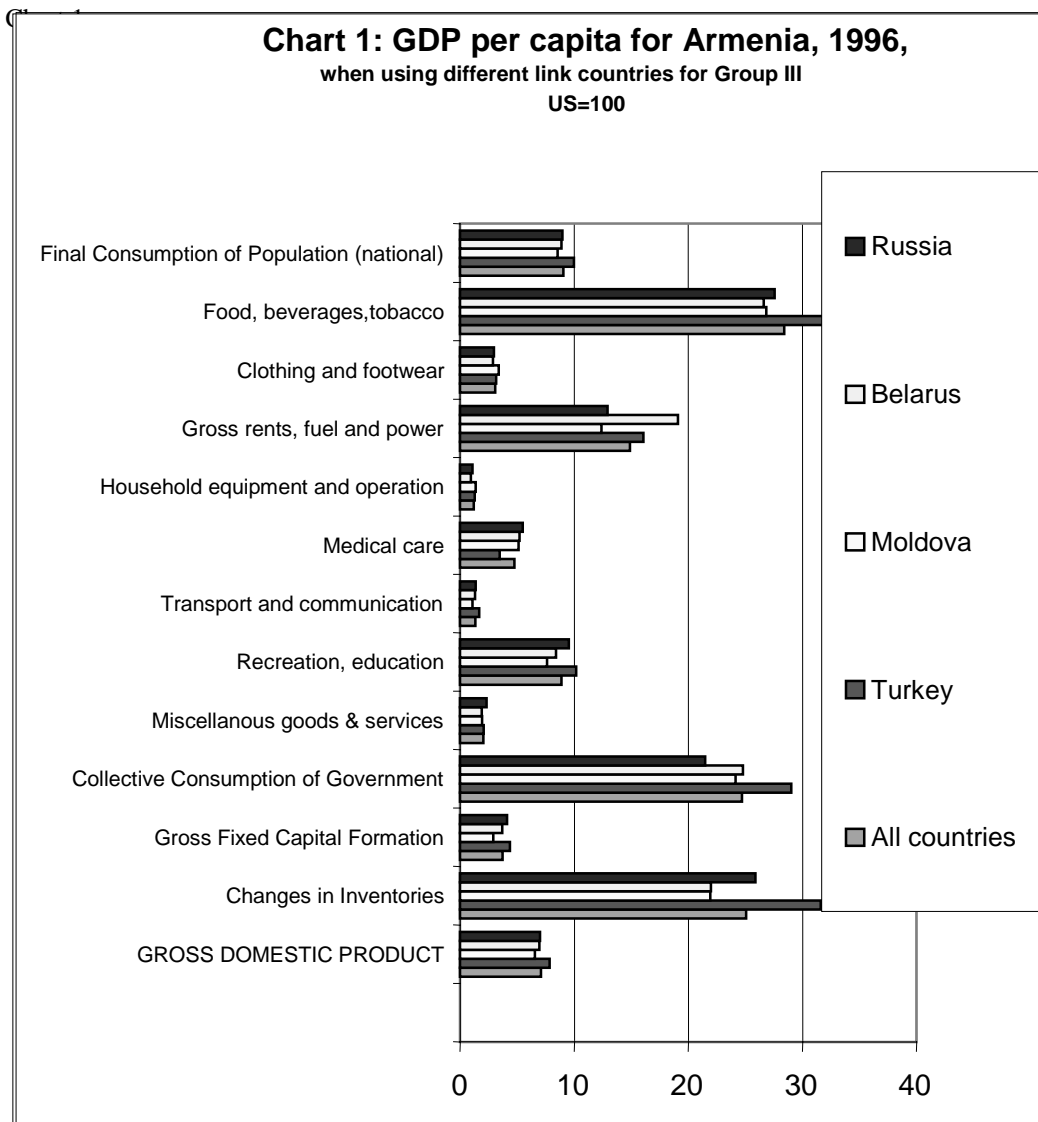
- 1) What is the importance of the choice of the link country or countries for the results?
- 2) How would the results change if, instead of applying fixity, ECP results are computed by free EKS processing covering all 52 countries?

Influence of the choice of link countries

7. The choice of link countries will have an effect on the results. Results for all countries in the group to be linked are higher or lower depending whether the results for the link country are relatively high or low in the groups to be combined. The choice would be irrelevant; only if the mutual results between the link countries in the two comparisons were identical. This will not happen in practice.

8. In the linking of Groups I and II, experimental calculations were made using each of the three candidates (AUT, RUS and SLV) as links and all of them. However, as already noted, the participation of Russia and Slovenia in Group I was of an experimental nature and using them as links was not seriously considered. An advantage of linking via Austria is also that results between Austria and Group II countries are the same in the ECP and in the internal Group II comparison.

9. More alternatives were considered in linking Group III to Group I+II. The significance of various options is shown in Chart 1. Armenia has been used here as an example but the choice influences all Group III countries in exactly the same way. The chart shows that GDP of Group III countries is highest when using Turkey as the link. This implies that GDP for Turkey related to GDP for Russia, Belarus and Moldova is higher in Group I+II than in the Group III comparison. Lowest results are obtained when linking via Moldova. The use of all four countries as links, that is taking a geometric average of the four results, was seen as a “safe” choice where any extremes were eliminated.



Influence of the fixity on results

10. The adoption of fixity in the ECP means that results for countries in different groups remain the same when the groups are combined. In other words, results for each regional comparison are computed separately by the desired breakdown, and then the three sets of results are combined using link countries as bridges. A clear advantage in using fixity is that results for regional comparisons remain unchanged and, on the other hand, countries in the aggregations are more similar.

11. In spite of the huge differences between countries, the option of free EKS aggregation was also tested where data for all 52 countries were aggregated at the same time by using as detailed basic heading breakdown as possible. Such a joint breakdown consisted of 87 basic headings. The procedure consisted of the following stages:

- 1) Basic heading expenditures and PPPs for Groups I and II countries were aggregated to a joint basic heading breakdown (164 basic headings) and the groups were combined.
- 2) The resulting expenditures and PPPs for Group I+II were aggregated to the ECP basic heading breakdown (87 basic headings), and similarly expenditures and PPPs for Group III countries were aggregated to the same breakdown. Then the groups were combined.

3) Results for Group I+II+III were computed for all aggregation levels by using the EKS method.

12. Annex 2 shows by main aggregates of GDP the difference between results based on the fixity and on the free EKS processing. The OECD total is used as the reference. The table shows that the EKS aggregation gives higher GDP for most CIS countries. This is also the case for Eastern European countries but not for all of them. Within GDP, differences are, as can be expected, biggest for Collective consumption of government. This reflects problems in the measurement of non-market services.

13. In general, taking into account how incomparable countries in the top and bottom of ranking are, it might be surprising that the difference between the results is not bigger. The reason for relatively modest differences is perhaps that countries at both ends of scale are internally quite similar. Consequently, developed countries have a neutral effect on the results for less developed countries and vice versa.

ANNEX 2

Per capita volume indices of GDP and its main components, 1996.
OECD=100. Results based on fixity and free EKS processing
OECD = 100

	GDP			Final Consumption of the Population			Collective Consumption of Government			Gross Fixed Capital Formation		
	Fixity	Free	Difference	Fixity	Free	Difference	Fixity	Free	Difference	Fixity	Free	Difference
Luxembourg	160	165	-4	142	142	0	99	97	1	169	169	-1
USA	140	138	2	149	148	1	146	150	-5	122	123	-1
Norway	128	136	-7	103	104	-1	124	129	-5	148	147	1
Switzerland	125	124	1	116	113	3	97	104	-7	145	145	0
Japan	121	122	-1	106	106	1	73	70	3	190	188	2
Iceland	118	115	3	122	118	4	105	103	2	106	107	-1
Denmark	116	118	-2	118	116	2	71	69	2	98	100	-2
Canada	114	114	1	113	113	0	103	104	-1	112	110	1
Belgium	112	115	-3	106	109	-2	120	107	12	101	101	0
Austria	111	110	1	105	105	1	109	104	5	138	137	1
Germany	107	108	0	108	109	-1	73	72	1	111	110	1
Australia	107	108	-1	106	107	-1	117	116	0	106	106	-1
Netherlands	106	111	-5	96	99	-3	116	115	1	102	103	-2
France	103	103	0	100	100	0	115	119	-4	100	99	0
Italy	102	103	-1	100	100	0	101	99	2	87	86	1
Sweden	100	102	-2	94	92	2	118	126	-8	78	79	-1
UK	98	99	-1	102	105	-2	119	121	-2	80	80	0
Finland	96	99	-3	88	87	0	94	90	4	90	91	-2
Ireland	92	98	-6	78	79	-1	68	61	6	82	80	2
New Zealand	88	89	-1	88	87	1	83	84	-1	87	88	-1
Israel	87	86	2	83	83	0	172	176	-5	122	123	-1
Spain	77	76	0	74	73	0	109	102	7	74	73	1
Portugal	70	69	1	73	73	-1	122	106	16	70	73	-3
Greece	67	63	4	70	69	1	117	111	6	63	61	2
Slovenia	66	65	1	63	63	0	94	87	7	66	65	0
Czech rep.	64	66	-2	61	60	1	117	117	0	73	74	-2
Hungary	47	49	-2	46	46	0	102	103	-2	32	33	0
Slovak rep.	45	46	-2	42	42	0	99	100	-1	54	56	-1
Mexico	36	37	-1	37	37	0	37	34	3	23	24	0
Poland	35	35	-1	37	37	0	60	58	2	25	26	0
Russian federation	34	33	1	30	30	0	93	84	9	18	19	-1
Estonia	33	34	0	36	37	-1	100	93	8	24	24	0
Romania	33	31	2	38	36	2	55	52	2	17	17	0
Croatia	32	32	0	34	34	0	101	92	10	24	24	0
Turkey	30	31	-1	31	32	-1	57	55	2	29	29	-1
Lithuania	29	29	0	33	33	0	61	57	4	17	18	-1
Belarus	26	25	1	25	24	0	58	55	2	19	19	-1
Latvia	25	26	-1	28	28	-1	81	78	3	14	14	0
Bulgaria	25	24	1	30	29	1	51	49	1	7	7	0
Kazakhstan	22	22	0	24	24	0	39	37	2	10	10	0
FYROM	21	21	0	26	26	0	36	34	2	11	11	0
Ukraine	17	17	0	18	18	0	47	45	2	7	7	0
Turkmenistan	15	14	1	6	7	-1	24	19	5	19	21	-2
Georgia	15	16	-1	19	18	0	54	47	6	4	4	0
Albania	14	14	0	18	17	1	29	29	0	11	12	0
Kyrgyzstan	11	12	-1	13	14	-1	47	39	8	5	6	0
Moldova	11	11	0	13	14	0	23	23	1	4	4	0
Uzbekistan	10	11	-1	11	12	-1	39	35	3	7	7	0
Armenia	10	11	-1	13	14	0	36	32	4	5	5	0
Azerbaijan	10	10	-1	12	13	0	35	29	6	6	7	0
Mongolia	7	7	0	7	6	1	21	30	-9	3	4	0
Tajikistan	5	6	-1	4	4	-1	15	17	-1	1	1	0

Group I and II linked via Austria

Group I+II and III linked via RUS, TUR, BLR, MDA

ECP 1999-2000

Participating countries and production of results

1. The Annex 1 shows that the European Comparison Programme covered 52 countries in 1996. Of these countries only Albania is not included in either the 1999 or the 2000 comparison. On the other hand, there are three newcomers to the Programme, Cyprus, Malta and China. This means that:

- 44 countries participate in the 1999 comparison.
- 43 countries participate in the 2000 comparison.

2. It is important for the users to have results for all countries for the same year, either 1999 or 2000, and preferably for both years.

Comparison for 1999

3. Results for all countries can be combined in mid 2001 when results for the various country groups participating in the 1999 comparison become available. Countries of which PPPs and volumes could be integrated with the results are Albania and the CIS group.

For the CIS group the main options are:

- Deriving results by updating the 1996 results at the GDP level
- Deriving results from 1996 at a detailed level of GDP by using price indices (or implicit price indices of GDP)
- Countries provide detailed GDP expenditure data for 1999 and price data collected for the 2000 comparison are backdated to 1999 when possible.

Albania can be integrated by updating the 1996 results at the GDP level.

4. The options to integrate the CIS countries were discussed at the ECP Consultation, in Geneva, October 2000. It was decided at the meeting to investigate these options and to make the final decision later on.

Comparison for 2000

5. The procedure for getting full coverage of countries for 2000 is straightforward. For countries not participating in the benchmark comparison for 2000 results are updated at the GDP level by using implicit price indices of GDP.

Linking

6. It is important that only one set of ECP results will be finally released. Therefore, the results for the regional comparisons should be taken as the starting point when combining various groups. In other words, the groups of countries should be linked in such a way that results within the groups remain unchanged. The steps to be taken **in the 1999 comparison** could be as follows (see Annex 2):

- 1) Results are calculated for the EU 15.
- 2) Results are calculated for the whole Eurostat group of 31 countries. Results for the 15 EU member countries are replaced by the internal comparison results (1) and results for the remaining 16 countries are adjusted accordingly.
- 3) Results are calculated for the OECD 30. Results for the 23 European OECD member countries are replaced by the European group results (2) and results for the remaining 7 non-European member countries are adjusted accordingly.
- 4) Results are calculated for all OECD countries and European countries + Israel. Results for countries that are either OECD members or belong to the Eurostat group are replaced by the results obtained in the internal comparisons (2 and 3).
- 5) Results are calculated for all OECD countries, European countries (+ Israel) and the CIS group. Results for OECD members and European countries (+ Israel) are replaced by results obtained from (4) and results for countries in the CIS group are adjusted accordingly.
- 6) China is linked separately to the OECD 30.

7. It is assumed in the schema that detailed results for 1999 are produced also for the CIS group. In that case it could be considered to apply fixity within the group (possibly even applying fixity also inside the CIS group because of Mongolia). The group could be linked to other countries via the Russian Federation.

8. In the 2000 comparison, the field is simpler because benchmark results will be available only for the Eurostat group and the CIS group. Within the Eurostat group the calculation procedure is the same as in the 1999 comparison and as the last step the CIS group will be linked to the Eurostat group by applying fixity.

9. Experience from the 1996 comparison showed that results are not very sensitive for the various ways to link countries. However, it is useful to carry out again tests for verifying whether this is valid also in the 1999 and 2000 comparisons. The final decisions can be made after the tests.

ANNEX 1

Countries participating in the European Comparison Programme in 1996-2000

		1996	1999	2000
	Austria	x	x	x
	Belgium	x	x	x
	Denmark	x	x	x
	Finland	x	x	x
	France	x	x	x
	Germany	x	x	x
	Greece	x	x	x
	Ireland	x	x	x
	Italy	x	x	x
	Luxembourg	x	x	x
	Netherlands	x	x	x
	Portugal	x	x	x
	Spain	x	x	x
	Sweden	x	x	x
	United Kingdom	x	x	x
Eurostat group	Czech Republic	x	x	x
	Hungary	x	x	x
	Iceland	x	x	x
	Norway	x	x	x
	Poland	x	x	x
	Slovakia	x	x	x
	Switzerland	x	x	x
	Turkey	x	x	x
	Bulgaria	x	x	x
	Cyprus		x	x
	Estonia	x	x	x
	Latvia	x	x	x
	Lithuania	x	x	x
	Malta		x	x
	Romania	x	x	x
	Slovenia	x	x	x
Other European countries	Albania	x		
	O Croatia	x	x	
	O FYROM	x	x	
	O Ukraine	x	x	
	O Russian Federation	x	x	
CIS group	Russian Federation	x		x
	Armenia	x		x
	Azerbaijan	x		x
	Belarus	x		x
	Georgia	x		x
	Kazakhstan	x		x
	Kyrgyzstan	x		x
	Republic of Moldova	x		x
	Tajikistan	x		x
	Turkmenistan	x		x
	Uzbekistan	x		x
	<i>Mongolia</i>	x		x
Non-European countries	O Australia	x	x	
	O Canada	x	x	
	O Japan	x	x	
	O Korea		x	
	O Mexico	x	x	
	O New Zealand	x	x	
	O United States	x	x	
	O China		x	
	O Israel	x	x	
Total		52	44	43

o = countries coordinated by the OECD in 1999

ANNEX 2

Linking the countries in the 1999 comparison

	EU 15	Other OECD/Europe	Non-OECD CCs	OECD/non-Europe	Other Europe+Israel	CIS group	China
EU 15	EU 15						
Eurostat group 31	EU 15	Other OECD/Europe	Non-OECD CCs				
OECD 30	EU 15	Other OECD/Europe		OECD/non-Europe			
Europe+OECD	EU 15	Other OECD/Europe	Non-OECD CCs	OECD/non-Europe	Other Europe+Israel		
Europe+OECD+CIS group	EU 15	Other OECD/Europe	Non-OECD CCs	OECD/non-Europe	Other Europe+Israel	CIS group	
OECD 30+China	EU 15	Other OECD/Europe		OECD/non-Europe			China

Explanations: The calculations start from the top and continue stage by stage down. Each calculation is based on the free EKS method but results for the shadowed areas are then replaced by the results in the previous stage and results for the non-shadowed areas are adjusted.

Note: In this framework, results for the non-European OECD countries and for the EU candidate countries that are not OECD members are based on different procedures and are not strictly comparable. Also China has been linked directly to the OECD and its results are therefore not fully comparable with the non-OECD countries.