

To point 6 of Agenda:

**Recent methodological issues**

# **Equi-representativity and some modifications of the EKS method at the basic heading level**

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## Why we need a modification of the EKS method at the BH level ?

- **ECP Reform** => inclusion of the CC in the Eurostat comparison (more heterogeneous set)
- **Criticisms of several experts (WB ICP)** => present EKS method yields biased BH-PPPs by some circumstances
- **Forthcoming ICP 2004** => to be competitive for the possible use in other ICP Regions, the ECP approaches should be cleaned from the deficiencies



## What means „equi-representativity“ (key concept of the EKS method) in reality?

- **Equal number of items for each country ?**
  - Equal number of country items in common multilateral basket ?
  - **Equal number of priced items in all countries ?**
  - **Equal number of asterisked items in all countries?**
- =====
- **Impossible and not necessary**

## Premises of „equi-representativity“:

- multilateral itemlist should contain representative products for each country
- multilateral set of collected prices should contain prices for representative products for each country

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**However: the term “equi-representativity” should refer not to the product baskets or to no. of priced items but rather to the method of the BH-PPP calculation**



## What means „equi-representativity“ in reality:

**Equi-representativity** means that the applied **computational procedures** principally **enable to calculate** on the basis of common set of items **the PPPs** **which are representative** (non-biased) for each participating country

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**It is necessary and possible**

## What are necessary features to obtain „equi-representativity“ ?

- **Attribution of the sign of representativity** (within the BHs = **asterisk \***) **to the priced items**  
The correct attribution of asterisks is very important in the context of equi-representativity =>  
**=> All countries should follow the same rules**
- **Principle of graduality**  
It is not necessary to compare bilaterally each country with each country.  
**The countries with (very) different consumption patterns can be compared indirectly, via the third (more similar) countries**

## General simplified premise:

Item list should include at the least one representative item for each country and this product is priced, at least, in one other country.

This is a necessary but not always sufficient precondition (see an example below):

	Country A	Country B	Country C
Product 1	Price A1 *	Price B1	---
Product 2	Price A2	---	Price C2 *
Product 3	----	Price B3 *	Price C3

# Two-stage traditional procedure

**Laspeyres-type parity** - geometric mean of the price ratios  
for the items representative of the denominator country:

$$(1) \quad L(j / h) = \left( \prod_{i=1}^k \frac{{}_{*h} P_j^i}{{}_{*h} P_h^i} \right)^{1/k} = \left( \prod_{i=1}^{(n11+n01)} \frac{{}_{*h} P_j^i}{{}_{*h} P_h^i} \right)^{1/(n11+n01)}$$

**Paasche-type parity** - geometric mean of the price ratios  
for the items representative of the numerator country

$$(2) \quad P(j / h) = \left( \prod_{l=1}^m \frac{{}_{*j} P_j^l}{{}_{*j} P_h^l} \right)^{1/m} = \left( \prod_{l=1}^{(n11+n10)} \frac{{}_{*j} P_j^l}{{}_{*j} P_h^l} \right)^{1/(n11+n10)}$$

**Parity of Fisher/Tornqvist - type:**

$$\text{F-PPP}(j / h) = [(L(j/h) * P(j/h)]^{1/2}$$

## How many item sets are used in reality?



Laspeyres-type parity – a composition of sets (\*\*) and (-\*):

$$L(j / h) = \left[ \left( \prod_{i1=1}^{n11} \frac{(**h*j) P_j^{i1}}{(**h*j) P_h^{i1}} \right) * \left( \prod_{i2=1}^{n01} \frac{(**h-j) P_j^{i2}}{(**h-j) P_h^{i2}} \right) \right]^{1/(n11+n01)}$$

Paasche-type parity - a composition of sets (\*\*) and (\*-)

$$P(j / h) = \left[ \left( \prod_{i1=1}^{n11} \frac{(**h*j) P_j^{i1}}{(**h*j) P_h^{i1}} \right) * \left( \prod_{i3=1}^{n10} \frac{(*-h*j) P_j^{i3}}{(*-h*j) P_h^{i3}} \right) \right]^{1/(n11+n10)}$$

## Traditional approach in a non-traditional form:

Calculation of Parity-Total as a weighted  
composition of three PPPs in an implicit form:

$$\text{PPP-Total} = \text{PPP}(**)^{w^{**}} \times \text{PPP}(-*)^{w^{-*}} \times \text{PPP}(*-)^{w^{*-}}$$

Weights for the item sets

**Set of items (\*\*):**

$$DS(**) = 0.5 * n_{11} * \left( \frac{1}{n_{11} + n_{10}} + \frac{1}{n_{11} + n_{01}} \right) = 0.5 * n_{11} * \frac{(2 * n_{11} + n_{10} + n_{01})}{(n_{11} + n_{10}) * (n_{11} + n_{01})}.$$

Items representative in both countries (\*\*) are included in the calculation twice and they bring double contribution (they should yield the most reliable price ratios in accordance with the concept of representativity).

**Set of items (\*-):**

$$DS(*-) = 0.5 * \left( \frac{n_{10}}{n_{11} + n_{10}} \right)$$

**Set of items (-\*):**

$$DS(-*) = 0.5 * \left( \frac{n_{01}}{n_{11} + n_{01}} \right)$$

## General premises of procedure

- Basic heading comprises more or less homogeneous products => Variation of partial PPPs within the BH and within item sets (\*\*; -\*; \*-) should be not very high
- Parity for the set (\*\*) is “true”; for the set (\*-) – underestimated; for the set (-\*) - overestimated
- Bias (underestimation / overestimation) of partial PPPs relatively “true” PPP is more or less equal for all unilaterally representative items (\*-) / (-\*) => It means that PPP(-\*) and PPP(\*-) are deviated from PPP(\*\*) in different directions but approx. with the same amplitude (symmetrical situation)

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**If these premises are distorted systematically within a comparison (asymmetrical situation) then the whole approach at BH level (starting from the creating of item list) should be revised**



When present procedure guarantees  
equi-representativity (unbiased PPP-Total)?

**Weights for two sets of unilaterally  
representative items [(-\*) & (\*-)] should be equal**

$$DS(*-) = 0.5 * \left( \frac{n_{10}}{n_{11} + n_{10}} \right) = DS(-*) = 0.5 * \left( \frac{n_{01}}{n_{11} + n_{01}} \right)$$

**It is achieved in two cases only**

a) if  **$n_{10} = n_{01}$**

or

b) if  **$n_{11} = 0$**

**The equi-representativity is distorted in other cases**



## Modified approach (EKS-S<sup>1)</sup> method) => => two new features:

1) Explicit calculation of Parity-Total as a weighted composition of three PPPs for the sets (\*\*), (\*-), (-\*):

$$\text{PPP-Total} = \text{PPP}(**)^{w^{**}} \times \text{PPP}(*-)^{w^{*-}} \times \text{PPP}(-*)^{w^{-*}}$$

2) Weights for the item sets:

Set of items (\*\*):

$$DM(**) = \frac{2 * n_{11}}{2 * n_{11} + n_{10} + n_{01}}$$

Sets of items (\*-) & (-\*) receives equal weights:

$$DM(*-) = DM(-*) = 0.5 * \left( \frac{n_{10} + n_{01}}{2 * n_{11} + n_{10} + n_{01}} \right)$$

1) The name “EKS-S” (EKS-Sergeev) for the modified method was given by the recent Eurostat PPP WP (LUX; November '02)

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## Summary: binary PPPs by the EKS-S and traditional EKS methods

Availability of PPPs for different sets of items			Method of calculation (obtaining) of the final binary PPP for respective basic heading	
PPP(**)	PPP(*-)	PPP(-*)	Modified EKS-S method	Traditional EKS method
Yes	Yes	Yes	Geometric mean (GM) from all three PPPs with weights (DM)  If $n_{10} = n_{01} \Rightarrow$ the results are equal	Geometric mean of Laspeyres & Paasche PPPs (with possible examination of L/P ratio)
Yes	Yes	No	PPP (**) only	-- “ -- (GM of L & P)
Yes	No	Yes	PPP (**) only	-- “ -- (GM of L & P)
Yes	No	No	PPP (**)	PPP (**)
No	Yes	Yes	Simple geometric mean from PPP(*-) and PPP(-*)	Geometric mean of Laspeyres & Paasche PPPs (with possible examination of L/P ratio)
No	Yes	No	Missing value	Missing value
No	No	Yes	Missing value	Missing value
No	No	No	Missing value	Missing value

\*) The versions where both methods produce the same results are highlighted

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## E88-1 “Greece-France”: BH 110441 „Cheese“

		Greece (DRA)		France (FF)		PPP
		Aster.	Price	Aster.	Price	"DRA/FF"
11441A	Camembert		2093	*	38.9	53.80
11441B	Brie		1356	*	42.0	32.29
11441E	Gouda - Holland		706	*	43.0	16.42
11441F	Gouda type	*	665	*	41.3	16.10
11441G	Edam - Holland	*	671	*	38.4	17.47
11441K	Emmenthal		1342	*	60.5	22.18
11441N	Cheddar type		1137	*	65.1	17.47
11441O	Grated Parmesan		1804	*	77.1	23.40
11441Q	Feta	*	462	*	69.5	6.65
11441S	Mozzarella		1245	*	57.2	21.77
11441V	Processed cheese		987	*	39.8	24.80

Geometric mean = 20.45

	No. of items
N11 (**)	3
N10 (-*)	8
N01 (*-)	0
<b>Total</b>	<b>11</b>

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## E88-1 “Greece-France”: BH 110441 „Cheese“

### Traditional method

PPP - P "DRA/FF"	=	12.32
PPP - L "DRA/FF"	=	20.45
PPP - F "DRA/FF"	=	<b>15.87</b>
L/P ratio	=	1.659

### Weights (%) for item sets

63.64	**
36.36	-*
0.00	*-
100.00	

### Modified method

Index 1	PPP **	"DRA/FF"	=	12.32
Index 2	PPP -*	"DRA/FF"	=	24.72
Index 3	PPP *-	"DRA/FF"	=	Not exist
	PPP	"DRA/FF"	=	<b>12.32</b>

### Weights (%) assign- ed for item sets

42.86	**
28.57	-*
28.57	*-
100	

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## E95-1 “Greece-Austria” for BH 110441 „Cheese“

		Greece (DRA)		Austria (ATS)		PPP "DRA/ATS"
		Aster.	Price	Aster.	Price	
110441a1	Camembert type		1958	*	103.8	18.86
110441e	Gouda - Holland	*	1251		134.2	9.32
110441f	Gouda type		1155	*	105.3	10.97
110441g	Edam - Holland	*	1235		141.6	8.72
110441j	Danablu	*	1235		193.0	6.40
110441l	Emmenthal type		2188	*	106.6	20.53
110441p	Feta	*	1953		129.2	15.12
110441q	Feta II	*	1602	*	143.9	11.14
110441s	Mozzarella		2456	*	132.3	18.56
110441v	Processed cheese	*	2181	*	133.4	16.35
110441w	Processed cheese	*	2152		121.1	17.76
110441x	Cottage cheese		1888	*	56.8	33.22

Geometric mean = 14.19

	No. of items
N11 (**)	2
N10 (-*)	5
N01 (*-)	5
<b>Total</b>	<b>12</b>

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## E95-1 “Greece-Austria” for BH 110441 „Cheese“

### Traditional method

PPP - P "DRA/ATS"	=	11.43
PPP - L "DRA/ATS"	=	17.37
<b>PPP - F "DRA/ATS"</b>	=	<b>14.09</b>
<b>L/P ratio</b>	=	<b>1.520</b>

### Weights (%) for item sets

28.57	**
35.71	-*
35.71	*-
100	

### Modified method

Index 1	PPP **	"DRA/ATS"	=	13.49
Index 2	PPP -*	"DRA/ATS"	=	19.21
Index 3	PPP *-	"DRA/ATS"	=	10.69
	<b>PPP</b>	<b>"DRA/ATS"</b>	=	<b>14.09</b>

### Weights (%) assigned for item sets

28.57	**
35.71	-*
35.71	*-
100	

The ratio for the examination by modified method:  
 $(PPP^{*-} \times PPP^{*-})^{0.5} / PPP^{**} = 1.062$

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## Other possible weighting systems

Weighting EKS-S system is partly arbitrary as it is inevitable for each system of quantitative weights attributed to the qualitative indicators<sup>1)</sup> (like “representative” / “non-representative”). Some other possible versions of weights are the following:

- S.Varjonen (OECD) proposed to increase the weight of parity for the set of items representative in both countries (\*\*) as the most reliable part (he named this modification as the EKS-S\* method but it can be named as the EKS-S-V modification) in the following way:

$$w_{11} = \frac{n_{11}}{n_{11} + \text{MIN}(n_{10}, n_{01})} ; \quad w_{10} = w_{01} = 0.5 \times \frac{\text{MIN}(n_{10}, n_{01})}{n_{11} + \text{MIN}(n_{10}, n_{01})} .$$

[the EKS-S uses also this approach when either  $n_{10} = 0$  or  $n_{01} = 0$  – only the PPP for the set (\*\*) is used in these extreme cases].

- an other possibility to increase the weight for PPP(\*\*) is to give a higher weight, for example, = 3 or 4 (but not 2 as presently) to the items representative in both countries

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1) An indirect analogue, from football. Present system: victory – 3 points, tie – 1 point, defeat – 0; former system: victory – 2 points, tie – 1 point, defeat – 0.

## However - **What is really important?**

If general premises (foil 11) are correct then it is important that the parities for the sets (\*-) and (-\*) should have equal weights to allow a compensatory effect. An obvious priority for a higher weight for the set (\*\*) is not absolutely necessary and even not always desirable.

If the variation of partial PPPs in the set (\*\*) is high or these PPPs are overlapped with the PPPs for the sets (\*-) / (\*-) then it means our premises are not fully in accordance with the reality (asymmetrical situation). Some operations with the weights based on the basis on no. of prices can't help in this case.



# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## E88-1 “Greece-France”: BH 110441 „Cheese“: Variation of individual PPPs is very high

		Greece (DRA)		France (FF)		PPP
		Aster.	Price	Aster.	Price	"DRA/FF"
11441A	Camembert		2093	*	38.9	53.80
11441B	Brie		1356	*	42.0	32.29
11441E	Gouda - Holland		706	*	43.0	16.42
11441F	Gouda type	*	665	*	41.3	16.10
11441G	Edam - Holland	*	671	*	38.4	17.47
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11441Q	Feta	*	462	*	69.5	6.65
11441S	Mozzarella		1245	*	57.2	21.77
11441V	Processed cheese		987	*	39.8	24.80

Geometric mean = 20.45

	No. of items
N11 (**)	3
N10 (-*)	8
N01 (*-)	0
<b>Total</b>	<b>11</b>

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## Probably, the following tools can be more efficient:

### 1) The analysis of the variation of partial PPPs with an estimation of their reliability (see Annex 1)

The weights should be inversely proportional to the distance function:

$$w_{jk} = 1 / d_{jk} = \text{Sqr} (n-1) / [(\text{Sigma} / \text{Av.PPP})]$$

If only one Item was matched, the weight is assigned a value of zero.

The weights  $w_{jk}$  reflects no. of common Items as well as the variation of individual PPPs: a situation with a higher no. of matched Items and with a lower variation of individual PPPs produces more reliable

### 2) The check of reliability of obtained results by help of some formal procedures (similar with L/P ratio)

The examination can be carried out in the following ways:

a) Geometric mean from two biased PPP – PPP(\*-) and PPP(-\*) - must be not too far from the PPP obtained on the basis of items representative of both countries - PPP(\*\*).

b) If PPP(\*\*) are not available then the ratio PPP(-\*)/PPP(\*-) must not exceed a certain (conventional) fixed threshold (for example: 1.5).

## Modification EKS-S vs. traditional EKS

- EKS-S is not a revolutionary idea but an evolutionary development (modification) of the EKS method
- EKS-S and EKS methods are based on the same premises and on the same input data
- Differences between the EKS-S / EKS concern the calculation of bilateral PPPs only
- EKS-S yields unbiased PPPs (in any case, from a point of view of the theoretical premises)  $\Leftrightarrow$  EKS does not guarantee the compensate effect of non-equi-representativity of priced sets
- Implementation of the EKS-S modification is very easy and it has been built up in the Eurostat PPP software



## Modification EKS-S vs. traditional EKS

The theoretical aspects were considered in former foil

**This foil demonstrates possible numerical differences**

**Differences between the PPPs at the Survey-Total level  
by the traditional EKS and modified EKS-S methods  
(as % from the results by the traditional EKS method)**

	Furniture, etc.	Transport / Oth. Prod.	HH Durables	Clothing & footwear	FOBETO	SERVICES	Construc- tion
	E99-1	E99-2	E00-1	E00-2	E01-1	E01-2	2001
MAX	2.92	3.10	1.51	2.33	2.05	2.12	2.03
MIN	-1.98	-1.78	-1.08	-2.61	-1.64	-1.48	-2.09
MAX-MIN	4.90	4.88	2.59	4.95	3.68	3.59	4.12

# Consultation on the European Comparison Programme (Geneva, 31 March – 2 April 2003)

## Differences between the PPPs by the traditional EKS and modified EKS-S methods at the BH level **E00-2 (Annual National, 30 countries)**

Code of BH	Name of basic heading	Max	Min	Max-Min	Av.Abs.Diff.*)	No.of It.
03.1.1.0	Clothing materials	13.16	-5.97	19.13	1.77	7
03.1.2.1	Men's clothing	5.41	-7.16	12.57	1.92	102
03.1.2.2	Women's clothing	1.63	-1.84	3.47	0.80	104
03.1.2.3	Children's clothing	2.53	-5.43	7.96	0.86	40
03.1.2.4	Infant's clothing	4.74	-4.45	9.19	1.17	13
03.1.3.0	Other articles of clothing and clothing accessories	14.10	-14.87	28.97	2.73	14
03.1.4.0	Cleaning, repair and hire of clothing	10.59	-4.21	14.80	1.43	5
03.2.1.1	Men's footwear	9.40	-6.31	15.71	2.77	18
03.2.1.2	Women's footwear	6.87	-3.13	10.00	1.60	25
03.2.1.3	Children's and infant's footwear	5.96	-6.05	12.01	1.63	12
03.2.2.0	Repair and hire of footwear	7.07	-1.83	8.90	1.08	4
05.2.2.0	Household textiles	2.01	-1.69	3.69	0.83	31
<b>Survey - Total</b>		<b>2.33</b>	<b>-2.61</b>	<b>4.95</b>	<b>XXX</b>	<b>375</b>

\*) This indicator was calculated as  $|\text{PPP}_{\text{mod}} - \text{PPP}_{\text{trad}}| / \text{Min}(\text{PPP}_{\text{mod}}, \text{PPP}_{\text{trad}})$  to equalize the deviations in different directions

## EKS-S vs. EKS: Reservations (1)

- The Eurostat PPP WP (June and November 2002) agreed the proposed modification (EKS-S) is an methodological improvement, which ensures the application of an unbiased method. **However the methods with some theoretical advantages have not automatically the advantages in all cases in the practice**
- **The efficiency of the proposed modifications depend directly on the quality of input data:**
  - The attribution of the asterisks by the countries
  - No. of prices and asterisked Items involved in the calculation of the binary PPPs (e.g., this is the case for “Construction”). If there are only few priced Items (or only few asterisked Items) within a BH then the results are more sensitive and volatile to the choice of the method



## EKS-S vs. EKS: Reservations (2)

- If it is known in advance that input data is low quality or not sufficient then the use of the complicated (even theoretically more correct) methods is practically useless. There is not a lot of sense to use a sophisticated method in this case
- The simplest methods should be used in the cases of low quality of input *data (generally it allows to include more data in the calculations and the probability of the reduction of the accidental deviations is higher)*
- However the theoretical improvements should not be rejected due to the imperfectness of input data. **Both processes should go parallel: the quality of input data as well as the applied methods should be improved**



## EKS-S vs. EKS: Recommendations (1)

- A **general recommendation** is the following:
  - the traditional EKS method is preferable for the use in the situations with few no. of items in BHs or where the allocation of asterisks is problematic  
(although, these features are rather in favour of simple total geometric mean without taking into account the asterisks at all)
  - the modified EKS-S method should be advised in other cases
- It is inevitable that we should have only one official set of the results and therefore a method should be selected for the calculation of the official results.

**However ==>**



## EKS-S vs. EKS: Recommendations (2)

- The analysis showed that **significant differences between the EKS-S / EKS results occurred exclusively in the cases with the specific structure of reported country data** (strange allocation of asterisks, irrational price relations - like Brandless items are more expensive than similar Specified Brand items or simply some non-detected rough mistakes)
- Therefore it is **desirable to use both methods** (the traditional EKS as well as EKS-S) **for each Survey paralelly as an additional validation tool** for the check of reliability of data
- The calculation by both methods can't automatically improve input data itself but this brings additional analytical possibilities **to detect problematic points especially concerning the allocation of asterisks during the validation of input data**

## ICP 2004 proposal:

to use more complicated weighting system  
like: **2 = very representative**, **1 = moderate representative**, **0 = non-representative**

- **WHY this proposal? =>**
  - present system of asterisks seems to be insufficient
  - minimal ICP GDP Classification comprises expanded BHs with possible high internal variation of partial PPPs
- **How this proposal can be realized practically by the CPD and the EKS methods?**

**CPD method with notional weights presented  
as a particular kind of the G-K method  
(in logarithmic terms) allows to introduce each system  
of notional weights without big technical problems:**

$$p_i = \left( \prod_{j=1}^N (P_{ij} / f_j)^{q_{ij}} \right)^{1/\sum_{ij} q_{ij}}; \quad i = 1, 2, \dots, M$$

$$f_j = \left( \prod_{i=1}^M (P_{ij} / p_i)^{q_{ij}} \right)^{1/\sum_{ij} q_{ij}}; \quad j = 1, 2, \dots, N$$

## EKS method with notional weights (\*\*; \*; -)

**256 !!! (2<sup>8</sup>)** different possible situations exist  
for each pair of the countries if we want to work  
with compensatory sets (see Col. in equal colour)

	Set 1 (**)(**)	Set 2 (*)(*)	Set 3 (**)(*)	Set 4 (*)(**)	Set 5 (**)(-)	Set 6 (-)(**)	Set 7 (*)(-)	Set 8 (-)(*)
Situation 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Situation 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Nb
Situation 3	Yes	Yes	Yes	Yes	Yes	Yes	Nb	Yes
Situation 4	Yes	Yes	Yes	Yes	Yes	Yes	Nb	Nb
.....	.....	.....	.....	.....	.....	.....	.....	.....
Situation 254	Nb	Nb	Nb	Nb	Nb	Nb	Yes	<b>Nb</b>
Situation 255	Nb	Nb	Nb	Nb	Nb	Nb	Nb	Yes
Situation 256	Nb	Nb	Nb	Nb	Nb	Nb	Nb	Nb

# Analysis showed that

- - Use of more complicated imaginary weights for items (like 2, 1, 0) within the traditional EKS method leads to considerable practical problems
- - These problems rise exponentially by more diversified weights (3, 2, 1, 0)
- **WHAT COULD BE DONE ?**



## **EKS version with notional weights (\*\*; \*; -)**

**A parity of Laspeyres-type** - the arithmetic mean with the weights of the denominator country h:

$$L(j/h) = \sum_{i=1}^k \left( \frac{P_{ij}}{P_{ih}} \right) * w_{ih} / \sum_{i=1}^k w_{ih}$$

**A parity of Paasche-type** - the harmonic mean with the weights of the numerator country j

$$P(j/h) = \sum_{i=1}^k w_{ij} / \sum_{l=1}^m w_{ij} / \left( \frac{P_{ij}}{P_{ih}} \right)$$

$w_{ih}, w_{ij}$  – weights (2, 1, 0 or some like) for item **i** in the countries **h** and **j** (these are the same values which are regarded as quantities  $q_{ih}$ ,  $q_{ij}$  in the CPD method)

$k$  – no. of items for which exist bilateral PPP(j/h).

**The standard Fisher-PPP** can be obtained from these two indices.

**The Tornqvist type** can be also calculated on the basis of the same imaginary weights of countries ( $w_{ij}$ ,  $w_{ih}$ ) as it is done by the calculation of the L-, P- indices:

$$T(j/h) = \left[ \prod_{i=1}^k \left( \frac{P_{ij}}{P_{ih}} \right)^{(w_{ij} + w_{ih})/2} \right]^{1/\left[\sum_{i=1}^{k+m} (w_{ij} + w_{ih})/2\right]}$$

## Conclusions for ICP 2004 proposal

- New ICP proposals change considerably the original concept of equi-representativity (a theoretical possibility to have one priced representative item per country) and the approach applied for the bilateral PPPs (the compensatory effect, etc.) within the EKS method
- However the elaborated indices described above are closer to the standard aggregated PPPs where the expenditure are applied. If selected weighting system is reasonable then the same features of aggregated indices should bring the reliable indices with these sophisticated weights
- On other side, these notional weights can't, of course, play the same role as the actual expenditure and even more careful preparation of item list and the analysis of structure of price sets collected by the countries will be necessary

