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Poverty-Specific PPPs**

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# *Basic Heading PPPs – A Review of alternative methods*



# Data for Aggregation at the BH Level

- ◆ No expenditure share weights are available for items below this level.
- ◆ BH is the lowest level at which expenditure share weights are available.
- ◆ Price tableau may be:
  - Complete
  - Incomplete
- ◆ Incomplete tableau (missing prices for some items in some countries) is more frequent.
- ◆ In the ICP 2005 round, for poverty work each item in the ICP product list was classified as representative or not representative



# Basic Data

	Country $j$			
Product $i$	1	2	...	c
1	$p_{11}$	$p_{12}$	...	$p_{1c}$
2	$p_{21}$	$p_{22}$	...	$p_{2c}$
·	·	·		·
·	·	·		·
n	$p_{n1}$	$p_{n2}$	...	$p_{nc}$

- **Transitivity**

$$PPP_{\text{Thailand,India}} = PPP_{\text{Thailand,Malaysia}} PPP_{\text{Malaysia,India}}$$

- **BH Parities must satisfy transitivity and base country invariance**



# Aggregation Methods at the BH Level

- ◆ Elteto-Koves-Szulc (EKS) method
  - Four different alternatives
  - For use in different situations
- ◆ Country-Product-Dummy Method (CPD)
  - Unweighted
  - Weighted
  - CPRD method – use a dummy variable 1 if a given item is representative.



# EKS Method

Incomplete Price Tableau – not all items are priced in all countries

- Information on representativeness is known.
- We make an index based on all items representative in country  $j$  which are also priced in  $k$  and vice versa. Then take geometric mean of the two indexes.

$$I_{jk} = \left\{ \prod_{i \in N_{kj}} \left[ \frac{p_i^k}{p_i^j} \right]^{n_{kj}} \prod_{i \in N_{jk}} \left[ \frac{p_i^k}{p_i^j} \right]^{n_{jk}} \right\}^{\frac{1}{2}}$$

Where  $n_{kj}$  = no. of representative items in  $k$  that are also priced in  $j$   
and  $n_{jk}$  = no. of representative items in  $j$  that are also priced in  $k$



# EKS Method – Variant

- A variant of the EKS method in this case is to give double weight when a priced item is representative in both countries  $j$  and  $k$ .

Note: We note here that the indices described here are not-transitive. But they can be made transitive by using:

$$I_{jk}^{\text{EKS}} = \prod_{\ell=1}^M [I_{j\ell} I_{\ell k}]^{1/M}$$



# Country-Product-Dummy (CPD) Method

- ◆ **The Basic Model: The CPD model regresses log price on dummy variables representing countries and commodities.**

$$\ln p_i^j = \eta_1 D_1 + \eta_2 D_2 + \dots + \eta_n D_n + \pi_1 D_1^* + \pi_2 D_2^* + \dots + \pi_M D_M^* + u_i^j$$

where  $D^*$ 's and  $D$ 's are country and product dummy variables

☞ When all items are priced in all countries, the CPD and EKS methods produced identical results for BH parities.

☞ CPD is the method recommended by TAG for aggregation below the basic heading level.



# Country-Product-Dummy (CPD) Method

- ✦ In our case we have information on whether or not a particular item is “representative for the poor”.
- ✦ *Weighted CPD*: One approach considered here to give additional weight if a particular item is representative. In this project, we give weight 2 for items that are representative and a weight of 1 if it is not representative..
- ✦ *CPRD Method*: If some items are representative, then we can handle it by including a “representativeness dummy” in CPD model.

$$\ln p_i^j = \eta_1 D_1 + \eta_2 D_2 + \dots + \eta_n D_n + \pi_1 D_1^* + \pi_2 D_2^* + \dots + \pi_M D_M^* + \gamma_i R_i + u_i^j$$

Where  $R_i = 0$  if item is representative and  $= 1$  if it is not representative

# Basic Heading PPPs - Results

- ◆ We present several sets of BH PPPs to examine the sensitivity of the results.
- ◆ In the ICP, BHPPP's have been derived using the CPD method without any consideration for representativity.
- ◆ For purposes of sensitivity analysis, we considered information on representativity.
- ◆ The CPRD method did not work very well as there are some non-overlapping sets of representativeness – so this approach was not used.
- ◆ The weighted CPD where a product is given a weight of 2 if it is representative of consumption of the poor and 1 otherwise.

