Survey Framework for ICP Price Collection

April 16, 2010

Overview of Survey Framework

- **Product dimensions**
  - **Product specifications**
  - **Selection of products**
  - **Number of products to price by basic heading**

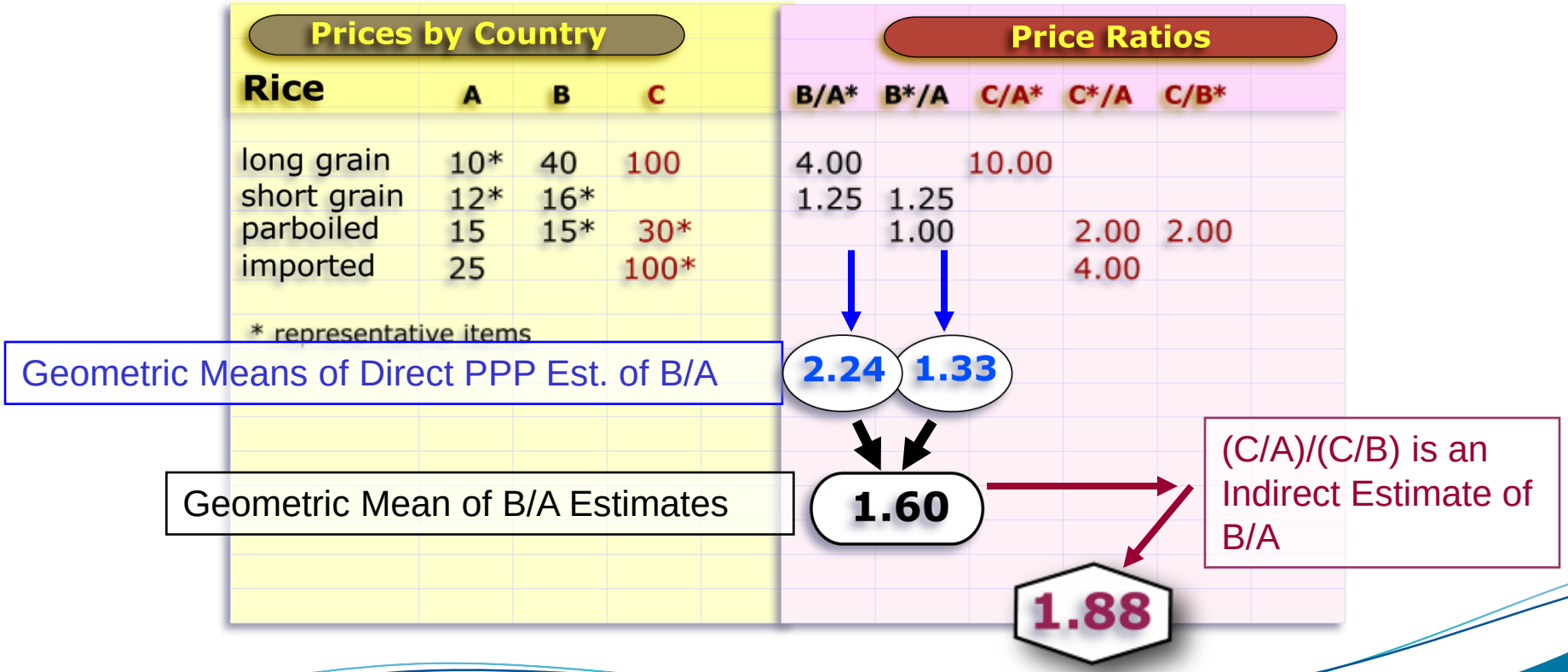
- **Price survey dimensions**
  - **Selection of locations—capital city, other urban, rural**
  - **Selection of outlets by type**
  - **Number of outlets—price observations required**

Conceptual Framework

- **Target Population---national GDP** $\sum\sum PQ$
  - **Divided into 155 Basic Headings**
- **Target product prices**
- **ICP Population**
  - **Products as defined and available other countries—however, inferences made to target population**
  - **“like with like”**
- **ICP product prices**
  - **Outlet prices collected instead of transaction prices**

$$\overline{p_i} = \frac{\sum_j (p_{ij} q_{ij})}{\sum_j q_{ij}} = \sum_j w_{ij} p_{ij}$$

Conceptual Framework—Product PPPs



Conceptual Framework, continued

- **Variability in Product PPPs**
  - **Differs by BH—determines number of products**
- **Not every product is available in other countries**
  - **Overlap determined by level of detail to define products—rice vs long grain-white, parboiled**
- **Products are not of equal importance to every country—select important products, also need to price less important**
- **Countries are treated equally regardless of size when computing PPPs**

Representative products

- In ICP 2005 price collectors were asked to identify “representative” products among all the products for **household private consumption expenditure**.

- For other major headings in the ICP Expenditure Classification, all goods and services were assumed to be “representative”.

Why does it matter?

- The calculation of PPPs is more accurate if the PPPs between any two countries are only calculated using prices for items that are “representative” in one or both of the two countries-
  - Or giving representative products more weight
- Prices for products that are not representative in either country are not used to calculate bilateral PPPs.
  - Or given less weight

Why product selection is important

Product	Country J	Country K	J*/K	J/K*	
1	Rep	Non rep	ppp		
2	R	N	ppp		A. Each product PPP for country K carries twice weight of each product PPP for country J B. PPPs for products 8,9, and 10 carry more weight that the other product PPPs. C. Products 13 and 14 not used in binary comparison— will enter as indirect comparisons in EKS*
3	R	N	ppp		
4	R	N	ppp		
5	R	N	ppp		
6	R	N	ppp		
7	R	N	ppp		
8	R	R	ppp	ppp	
9	R	R	ppp	ppp	
10	R	R	ppp	ppp	
11	N	R		ppp	
12	N	R		ppp	
13	N	N			
14	N	N			CPRD will include PPPs for products 13 and 14.
			PPP J*/K	PPP J/K*	
			Geo Mean J*/K and J/K*		

Countries—difficulty defining "representativity" in 2005

- A "representative" product was one whose price was typical of the "price level" in each Basic Heading.
- For ICP 2005, countries in some regions found it difficult to decide which products within a given Basic Heading were "representative".
- As a result "representativity" was not taken into account in calculating PPPs except for OECD-Eurostat and CIS countries.

Important Products

- For ICP 2009 it is proposed that the term “representative” will be replaced by “important”.

- Within each Basic Heading for Household consumption expenditure, countries will be asked to say whether each product is **IMPORTANT** or **LESS IMPORTANT**

What is an Important Product?

- We have agreed that countries cannot be asked to provide expenditure weights below the BH level.
- Therefore countries almost certainly do not know the expenditure weight for any product.
- But **if they did have the expenditure weight** would it be **LARGE** or **SMALL**?

Not an Exact Science

- Deciding whether a product is “important” or “less important” cannot be done precisely
- The country statistician is being asked to use expert judgment whether an expenditure weight would be relatively LARGE or SMALL within a Basic Heading
- But the statistician is asked to make that determination for **all** products for which prices are collected.

LARGE and SMALL within a BH

- Note that “Large” and “Small” relate to the Basic Heading.
- A product that has a “Large” expenditure share within a given BH may still be “Small” in total household consumption expenditure.
- **Example:** Expenditure on the BH “Wine” might be quite small in many countries but his does not mean that all the specified wines should be treated as LESS IMPORTANT. There will be one or more types of wine where expenditure is “Large” relative to other types. These will be marked as “IMPORTANT”.

Heterogeneous Basic Headings

- Some BHs contain several different types of goods. In deciding what items are IMPORTANT or LESS IMPORTANT it is necessary to consider each type separately.
- **Example:** the BH "Garments" includes clothing for men, women and children. It is best to consider expenditure shares separately for each type.
- "Woman's T-shirt, v-neck, short sleeve, 100% cotton" could be marked as IMPORTANT if its share is large for women's clothing although it is small within "Garments"

How to Decide if a Product is Important? (1)

- Rule 1. **Is it in the CPI?**

- If a product is the same as, or similar to, a good or service included in the CPI. IT IS IMPORTANT.

How to Decide if a Product is Important? (2)

- Rule 2. **In-House Knowledge.** The price collector/national accountant may know if a product is IMPORTANT (i.e. Large expenditure share in the BH) from her/his own knowledge.

- **Example:** In this country, cheddar cheese is sold in almost all grocery stores. IT IS IMPORTANT. Brie cheese is only sold in a few “specialty” shops. IT IS LESS IMPORTANT.

How to Decide if a Product is Important? (3)

- Rule 3. **Ask an expert.** The expert will usually be the shopkeeper.
- **Example:** There are two products for breakfast cereals – “Kellogg's All-Bran, family size” and “Country Store Muesli, 500 gram”. Ask the **shop-keeper** if either is a “big seller”.
- The answer might be “both are” (both IMPORTANT), “neither” (both LESS IMPORTANT) or only one is (one is IMPORTANT, the other is LESS IMPORTANT).

How Countries Should Proceed

- **For each Basic Heading, consider the full list of products.**
- **For some products the country may have no price because the product is not available. Ignore these products.**
- **For the products which are available, go through the list and mark each one as "Important" or "Less Important" using one of the three rules above.**
- **For a given Basic Heading, a country may decide that**
  - **all products are IMPORTANT – very rare**
  - **no product is IMPORTANT – very rare**
  - **some products are IMPORTANT and others are LESS IMPORTANT – the usual case.**
- **Note that PRICES should be collected for both IMPORTANT and LESS IMPORTANT products**

Review product specifications and Importance during data validation

- Products in each country should be “balanced” with relative prices above and below average
- Products with large expenditures have lower relative prices than specialty items.
- Important products have prices below/near average
- Use Quaranta/Dikhanov table diagnostics when reviewing product specifications
  - Variation of product PPPs within countries
  - Large product variation—bad specs
- See example

Product	National prices converted into the currency of A using the basic heading PPPs			International price (Geomean)	Relative prices (National PPP price divided by the international average price)			Rel STD	
	A	B	C		A	B	C		
1	10	17.82	18.1	**14.78**	0.67	1.21	1.22	**0.31**	**1**
2	18	18.68	8.48	**14.18**	1.27	1.32	0.6	**0.4**	**1**
3	15	16.98	14.48	**15.45**	0.97	1.1	0.94	**0.08**	**1**
4	12	8.49	10.86	**10.34**	1.16	0.82	1.05	**0.17**	**1**
5	12	10.19	20.36	**13.55**	0.89	0.75	1.5	**0.4**	**1**
6	8	6.37	6.33	**6.86**	1.16	0.93	0.92	**0.14**	**1**
				Relative STD	**0.22**	**0.25**	**0.3**		
PPP (A = 1)	**1**	**2.36**	**88.42**	**Geomean**	**1**	**1**	**1**		**1**

→ Important products should generally have a relative price level near or below 1 with the more specialty items (less important products) being relatively more expensive.
→ Importance cannot be finalized until data collection is complete, thus countries need to price both categories.

Reliability of PPPs

- **Product definitions**
- **Number of products to be priced**
- **Amount of overlap vs data gaps**
- **Outlet sample—number of price observations**

- **Use Quaranta/Dikhanov diagnostics**

Sample Sizes by target precision 10 percent level of significance

Target precision %	Estimated relative standard deviation : s/m				
	.05	0.1	0.2	0.3	0.4
	Number of products or number of price observations				
5	3	10	45	100	176
10	1	3	10	25	100
15		1	5	10	20

Number of products to price

Product	Relative STD of relative price ranges over countries	Target number of products	Number in 2005 Ring
Electricity	.03-.05	3	5
Rice	.10-.20	10 +	6
motorcars	.15-.25	10-45	30
Fresh/frozen seafood	.20-.25	10-45 +	10
Garments	3.0-3.5	25-100	68
Pharmaceuticals	2.5-3.5	25-100	43

Country and product relative STDs—2005 Ring

Item Code	Item Name	Number of products priced	Geo mean of country STDs	Geo mean of product STDs
99.11.01.11.1	Rice	6	0.211	0.265
99.11.01.11.2	Other cereals, flour and other products	7	0.156	0.187
99.11.01.11.3	Bread	4	0.126	0.211
99.11.01.11.4	Other bakery products	8	0.223	0.240
99.11.01.11.5	Pasta products	6	0.171	0.219
99.11.01.12.1	Beef and veal	14	0.150	0.162
99.11.01.12.2	Pork	11	0.143	0.137
99.11.01.12.3	Lamb, mutton and goat	8	0.082	0.117
99.11.01.12.4	Poultry	9	0.162	0.163
99.11.01.12.5	Other meats and meat preparations	19	0.244	0.223
99.11.01.13.1	Fresh, chilled or frozen fish and seafood	10	0.226	0.271
99.11.01.13.2	Preserved or processed fish and seafood	7	0.177	0.196
99.11.01.14.1	Fresh milk	5	0.067	0.097
99.11.01.14.2	Preserved milk and other milk products	6	0.180	0.213

Guidelines for number of products

- **Consider the basic heading share of expenditures**
  - **Above average want more precise PPPs –more products**
  - **Below average—PPPs with less precision**
- **Consider size of overlap—or gaps—need more products to ensure minimum is priced**
- **Remember—number of products dependent on variability in Product PPPs—a joint decision of regions and countries**

Outlet Sample for Price Collection

- **Background**
  - **Remember target price—national annual average underlying national accounts**
- **Input/questions from data users about 2005 ICP**
  - **Was there an urban bias in some countries?**
  - **Did large country prices reflect national average?**
  - **Did countries follow same price collection methods?**
- **Requirement for 2011**
  - **Survey framework that identifies urban/ rural, or capability to calibrate urban to national**
  - **Code Outlet type for each price observation.**

Sources of within country price variability

- **Urban – Rural**
  - **Capital City vs. other urban**
  - **Suburban--Rural**
- **Outlet types**
- **Seasonality**
- **Inflation**

Urban--Rural

- **Following slides show approaches used in 2005**
- **Also information from household surveys showing percent of expenditures by rural households**
  - **Use to determine survey sample,**
  - **And/or as weights to combine urban—rural prices**

“UN –definition of rural depends on degree of concentration—country defines”

India	22 states	31 urban centers collect on everthing 201 rural villages collect only on food, clothing and footwear, education
Indonesia	28 provinces to represent urban-rural; West-East Indonesia; Java-outer islands; and large-medium cities.	
Iran, Islamic Rep.	30 provinces	urban in 30 provinces (30 capitals + 50 other cities) and rural in 28 provinces (62 villages)
Lao PDR	capital + 7 provinces	urban in capital and 4 provinces and rural in 3 provinces
Malaysia	14 states	urban (36 capita and urban centers) and rural (15 rural centers)

Brazil	6 major cities	urban
Chile	capital and 12 cities	urban
Colombia	Capital + 3 major cities	urban
Ecuador	2 major cities	urban
Paraguay	Gran Asuncion	urban
Peru	Capital + 4 cities	urban
Uruguay	Capital + 4 cities	urban
Venezuela, RB	Grand Caracas	urban
Austria	capital city	urban
Belgium	capital city	urban
Germany	capital city	urban
Luxembourg	capital city	urban
Netherlands	capital city with main urban areas	urban

Angola	9 provinces	province capital plus two to three rural areas accessible from the provincial capital
Benin	all 12 departments	urban (urban centers) and rural (village closest to urban centers)
Botswana	every Census district has at least one collection center (32, 52%population & 69% consumption)	all town/city (100%), some urban villages (63%) and rural villages (4%)
Burkina Faso	10 regions	region center and adjacent rural area with largest population within a radius of about 20 km
Burundi	7 zones	urban (urban centers)
Cameroon	all 10 regions	urban (10 urban centers) and rural (10 rural areas)
Cape Verde	3 islands	urban and rural in all three islands
Central African Republic	7 administrative regions/10 prefectures	urban (urban centers) and rural (rural locality closest to urban centers)
Chad	8 regions	urban and additional rural markets
Comoros	all 3 islands	urban and rural (331 towns/villages)
Congo, Dem. Rep.	11 provinces	urban (10 centers) and rural (10 centers)

% Rural--- Senegal, S. Africa, India, Indonesia, Brazil

Rice	51.28	43.71	67.31	57.24	24.76
Other cereals, flour and other	63.44	54.06	63.18	69.92	34.06
Bread	25.54	32.37	36.36	30.88	9.61
Other bakery products	68.66	15.58	51.80	40.30	16.61
Pasta products	23.30	18.61	34.65	37.91	20.29
Beef and veal	13.25	29.50	60.05	24.00	19.94
Pork	8.48	18.81	65.26	55.76	32.08
Lamb, mutton and goat	31.39	17.01	53.20	46.05	29.41
Poultry	14.40	34.59	57.49	32.04	21.36
Other meats and meat prepara	46.37	19.34	68.68	16.35	20.99

Guidelines for selection of outlets

- Start with CPI frame
- Select outlets by type in general proportion to volume of sales (self weighting sample)
- Represent urban and rural domains in general proportion to volume of sales (self weighting)
- Use price variability to determine number of outlets
- Frequency—quarterly or capability to calibrate to annual
- Use coding structure for price observations---
  - Capital city, other urban, rural, by outlet type

Sample Sizes by target precision 10 percent level of significance

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Outlet type and location matrix

Outlet Types		
	Types	**Examples**
1	Large shops	Supermarkets, hypermarkets, department stores, etc.
2	Medium & small shops	Minimarkets, kiosks, neighborhood shops,grocery stores, convenience stores. etc.
3	Markets	Open markets, covered markets, wet markets, etc.
4	Street outlets	Mobile shops, street vendors, etc.
5	Bulk and discount shops	Wholesale stores, discount shops,etc.
6	Specialized shops	Supply shops, hardware shops, furniture shops, etc.
7	Private service providers	Taxi cabs, hotels, restaurants, private schools, private hospitals, etc.
8	Public or semi-public service providers	Water suppliers, electric power companies, public schools, public hospitals, etc.
9	Other kinds of trade	Online (Internet) shopping sites, catalogue orders, etc.

Summary

- **Products will be coded—Important or less Important**
- **Variability in Basic Heading Product PPPs used to determine number of products to price**
  - **Use BH shares to determine level of precision**
- **Both important and less important products will be priced**
  - **If less important available in outlet sample for important products**
- **Important/less important designation to be part of data validation**

Summary

- **Survey framework include urban/rural domains and outlet types**
- **Each price observation identified by location and type**
- **Use Quaranta/Dikhanov analysis to identify products with weak specifications and to verify importance classification**