Intra-economy and Inter-economy Validation

Technical Meeting on Construction Survey of the ICP 2021 Cycle

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Aaron Wright FRICS MCIOB
Construction Consultant

Economic Commission for Latin America and the Caribbean

Agenda

- Introduction
- Intra-economy validation
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    - Equivalent materials
    - Units of measurement and dimensions
    - Relevance Indicators
    - Resource Mixes
    - Consistency checks of similar/related items
- Overview of Inter-economy validation

Introduction (1)

Price data submitted by economies undergo three major validation stages

- Intra-economy validation
  - At the national level, NIAs validate the data collected before submitting to RIA
- Inter-economy validation
  - RIA conduct regional validation workshops to validate submitted data at the regional level
- Global validation
  - ICP GO validates data from ICP participating economies worldwide

NIA = National Inter-Agency, RIA = Regional Inter-Agency, GO = Global Office

Introduction (2)

NIA

Prices and Other Information (Intra-economy)

RIA

Regional PPPs and related indicators with USD as base (Inter-economy)

GO

Global PPPs and related indicators with USA as base (Global)

Intra-economy Validation

Intra-economy Validation (1)

- During the intra-economy validation process, the NIAs, together with national construction experts, verify the completeness and accuracy of the information collected during the survey
- The NIAs confirm with the national construction experts that the prices reported
  - Should be those paid by construction contractors to their suppliers
  - Reflect the buying power of contractors undertaking significant amounts of work
  - Include all nonrecoverable taxes
  - Should be for typical construction projects within an economy
  - Represent national average prices

Intra-economy Validation (2)

More specifically...

- Materials – usually the prices paid after discounts to manufacturers or intermediaries (agents or merchants), including all nonrecoverable taxes

- Equipment rental – it should be the rental charges paid to hire companies or rates paid for internal hire excluding operating fuel, equipment insurance and life insurance

- Labor – the cost to the contractor of employing the workers

  - Informal payment arrangements for labor are common in construction. Some payment is in the form of wages, subject to taxes and on which employers' costs are incurred, while other payments are in cash— and respondents should bear this in mind when determining what is an "average" wage.

Equivalent Materials (1)

Materials included in the construction survey are selected on the basis of their common use across economies. However, the listed materials may not always be available or used in all economies. In these cases, equivalent materials are selected and priced.

- NIAs should verify with the national construction experts that the alternative material is indeed equivalent to the original material
- substitution is clearly indicated in the price survey questionnaire, and that sufficient information is provided on the material.

Unit of Measurement and Dimensions (1)

For each item, prices are to be reported in the preferred unit and quantity. **It is crucial to verify that the reported prices respond to the requested unit.**

- Prices can be reported in alternative units—that is, based on either the metric or imperial system. However, the NIAs must verify
  - that the alternative unit is clearly indicated, and all relevant information is given and
  - that the alternative unit can be converted into the preferred unit.
- Errors and problems in units are the most common reason for prices that are not comparable across economies. **Thus, utmost attention should be paid to this point during the intra-economy validation.**

Conversion factors for items with alternative unit quantities

Item Code	Item Name	Preferred Unit	Alternative Unit	Conversion Factor to convert Preferred unit to Alternative Unit	Notes on conversion and conversion factors
Materials					
1501200-1-01	Aggregate for concrete	Cubic meter (m3)	Cubic foot (ft3)	x 35.3147	Straightforward imperial to metric conversion
			Cubic yard (yd3)	x 1.307873	Straightforward imperial to metric conversion
			Tonne (t)	x 1.92	Assume that aggregate weighs 1.92 t/m3 (but may vary by local material and should be checked).
1501200-1-02	Sand for concrete and mortar	Cubic meter (m3)	Cubic foot (ft3)	x 35.3147	Straightforward imperial to metric conversion
			Cubic yard (yd3)	x 1.307873	Straightforward imperial to metric conversion
			Tonne (t)	x 1.6	Assume that sand weighs 1.6 t/m3 (but may vary by local material and should be checked).
1501200-1-03	Softwood for carpentry	Linear meter (m)	Foot (ft)	x 3.2808	Straightforward imperial to metric conversion
			Yard (yd)	x 1.0936	
1501200-1-05	Exterior plywood	Square meter (m2)	Square foot (ft2)	x 10.7639	Straightforward imperial to metric conversion
			Square yard (yd2)	x 1.196	
			sheet (8 ft x 4 ft)	x 0.3364	Size of sheet is 8 ft x 4 ft is 32 ft2 or 2.97 m2; The conversion factor is derived as: 0.3364 = 10.7639 ft2 / (8 ft x 4 ft)
			sheet [L (m) x W (m)]	x 1 / (L x W)	Assume that the size of sheet is L x W, substitute values for L and W in the formula to get a revised quantity.

Relevance Indicators

- National experts indicate whether a material is commonly used in the construction projects in an economy. They do so by indicating the relevance of items separately for each basic heading

- In classifying material items as relevant or not relevant, the NIAs should check for completeness, that is **each available item has relevance indicated in each BH**.

Resource Mixes

Percentages for resource mixes should be provided for each BH

- **NIAs need to ensure that**
  - the information is complete for each element and;
  - the BH percentages add up to the totals

Basic Heading (BH)	Construction Input			Total
	Materials	**Equipment Rental**	**Labor**	
Residential Buildings	50	15	35	100
Non-Residential Buildings	40	30	30	100
Civil engineering Works	40	35	25	100

Consistency of prices for similar or related items (1)

- NIAs also need to check the collected prices for consistency
- There are certain items whose prices are expected to be more costly than other items
- In some cases these may not be always true, NIAs will have to confirm these cases and provide remarks, if needed

Consistency of prices for similar or related items (2)

Examples of consistency checks – Materials

- Price for **"Exterior Plywood"** is expected to be higher than **"Interior Plywood"**
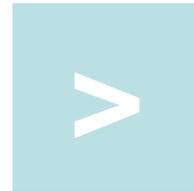
Consistency of prices for similar or related items (3)

Examples of consistency checks – Equipment Rental

- Price per hour for **"Tracked Tractor with Operator"** is expected to be higher than **"Tracked Tractor without Operator"**
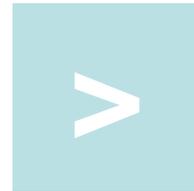
Consistency of prices for similar or related items (4)

Examples of consistency checks – Labour

- Price per hour for **"Skilled"** worker is expected to be higher than **"Unskilled"** worker
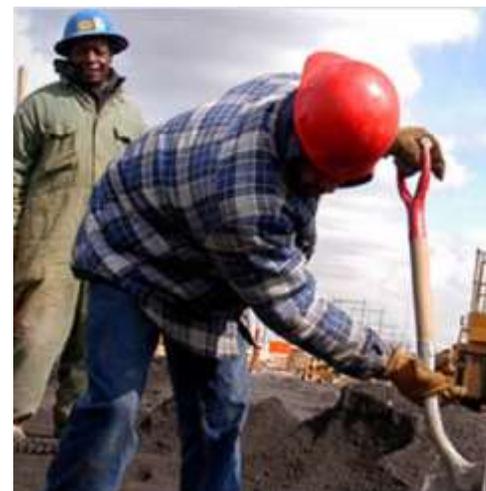
Inter-economy Validation

Inter-economy Validation (1)

- During the inter-economy validation, the NIAs and RIAs check the completeness and correctness of the data submission and conduct validation of the price data and metadata across economies
- After initial review of the submitted data, the next step is to validate the data using Dikhanov validation table

Dikhanov tables

- an approach developed by Yuri Dikhanov of the World Bank and first introduced and implemented in the 2005 ICP.
- are based on the country-product-dummy (CPD) method used to estimate PPPs at the basic heading level.

Inter-economy Validation (2)

Dikhanov tables

- Make use of residuals from CPD regression at the
  - basic heading level; and
  - higher level aggregates (whole household consumption, government compensation, construction, and machinery and equipment, etc.)
- Identify outliers among the PPP ratios and provide measures of price variations for products and economies.
- CPD residuals are generated for each item for which prices are submitted by the economies
- Each CPD residual value has a corresponding interpretation in terms of actual collected price as a percentage of the model-predicted price.

Inter-economy Validation (3)

CPD Residual Values	Interpretation	Color Code
Between –0.25 and 0.25	Actual price is 78% to 128% of predicted price.	None
Between –0.75 and –0.25; or 0.25 and 0.75	Actual price is 47% to 78%, or 128% to 212% of predicted price.	Yellow
Between –2.0 and –0.75; or 0.75 and 2.0	Actual price is 14% to 47%, or 212% to 739% of predicted price.	Red
Less than –2.0 or greater than 2.0	Actual price is less than 14%, or more than 739% of predicted price.	Black

CPD = Country-Product-Dummy.
Source: World Bank. 2015. *Operational Guidelines and Procedures for Measuring the Real Size of the World Economy: 2011 International Comparison Program*. Washington, DC: World Bank.
http://pubdocs.worldbank.org/en/777881487094209758/OG-eBook.pdf.

Inter-economy Validation (4)

- RIA will request NIAs to check the submitted average prices of products flagged in **<mark style="background-color:yellow">yellow</mark>**, **<mark style="background-color:red; color:white">red</mark>** and **<mark style="background-color:black; color:white">black</mark>**.
- NIAs should confirm or revise the average prices after further review and verification of the items
- NIAs should resubmit the verified average prices to RIA