Frontier Development in ICP: Subnational Purchasing Power Parities***

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International Workshop on International Comparison Program
18-20 September 2019, Nanning, China

*The views expressed in this presentation are those of the presenter and do not necessarily reflect in any way the views and policies of the organizations. The presenter is on sabbatical from the ADB and currently affiliated with UN ESCAP as an independent consultant and/or resource person.

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Objectives:

Have better appreciation on:

- PPP estimation and calculations
- Application of ICP methods and approaches for national settings

Key Questions

1. How are PPPs calculated?
2. How are the PPP methods applied for subnational PPP calculations?

Presentation Outline

1. Review of basic concepts
2. Calculating PPP
3. Frontier of ICP development: Subnational PPPs
4. Poverty, wellbeing and PPP of the ICP (presentation at the ISIWSC2019)

1. Review of basic concepts

What are PPPs?

USD100 → XR=6.46 → RMB646

measure the total amount of goods and services in a single unit of an economy's currency can buy in another economy

USD100 → PPP=3.51 → RMB351

PLI = (PPP/XR)*100 = 54.33

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Why is ICP and PPPs important?

United Nations Development Program
- Human Development Index
- Inequality-adjusted Human Development Index
- Gender Development Index

United Nations Educational, Scientific and Cultural Organization
- The relative value of funding provided annually for education

United Nations International Children's Emergency Fund
- The number of children living in poverty

International Monetary Fund (IMF)
- Output and growth of composite groups of economies
- Quota subscription of member countries

The European Commission
- Allocation of Structural and Cohesion Funds to implement the growth policy of the European Union

The Organisation for Economic Cooperation and Development (OECD)
- Aggregation of real GDP and its components for the OECD
- Research and policy analysis

WORLD BANK GROUP
- Size of the economy
- Poverty rates and international poverty line
- Shared prosperity
- Health systems
- Energy dependency, efficiency and carbon dioxide emissions
- Price levels

SUSTAINABLE DEVELOPMENT GOALS

Policymakers, academia and think-tanks: in analyzing a wide variety of topics including bilateral, regional and global comparisons
Private sector: increasingly using PPPs for evaluating cross-country investment costs

Source: World Bank Group, 2018

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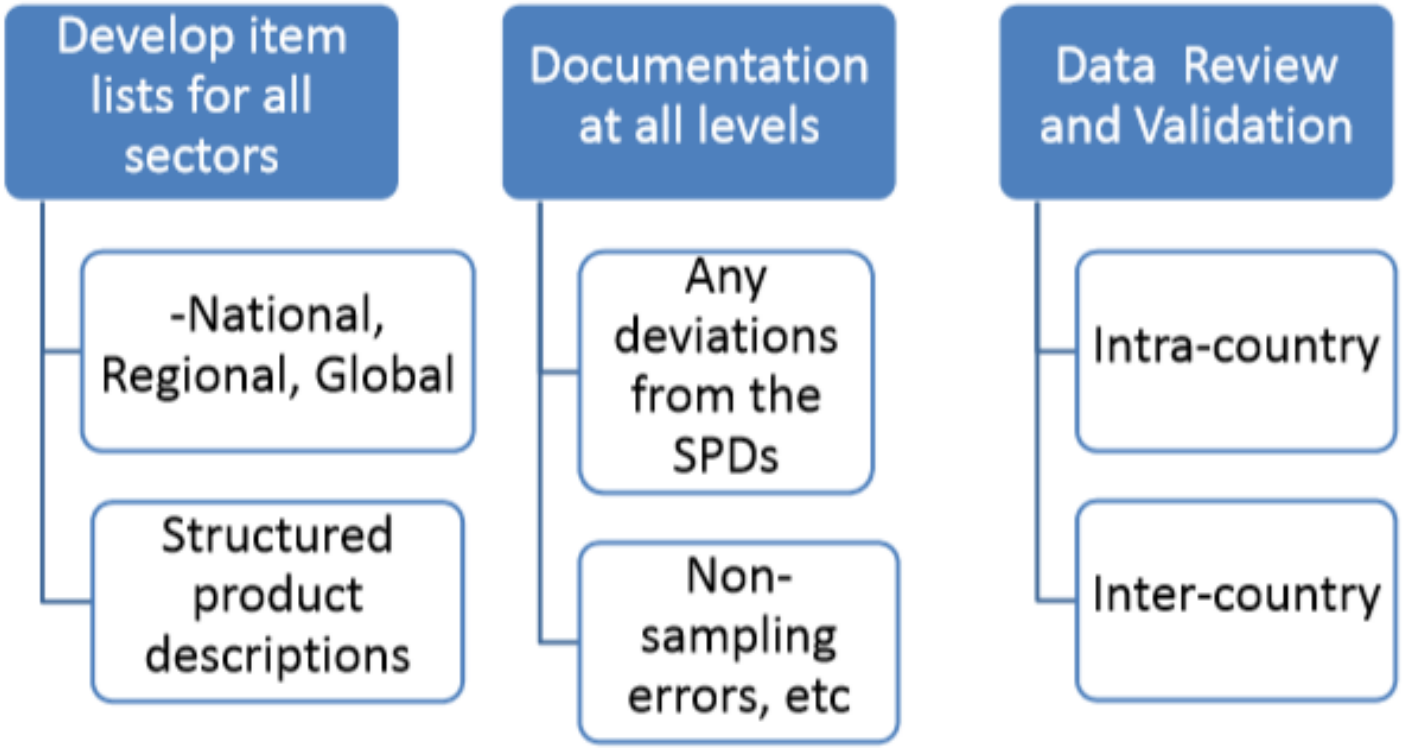
How can comparability be achieved?



What are the ICP Data Requirements

- a set of national annual prices for a selection of products chosen from a common basket of well-defined goods & services
- a breakdown of final expenditure on GDP by product group (basic heading) according to a common classification
- mid-year resident population
- all data should refer to the year of comparison – e.g. 2011, 2015, 2016, 2017

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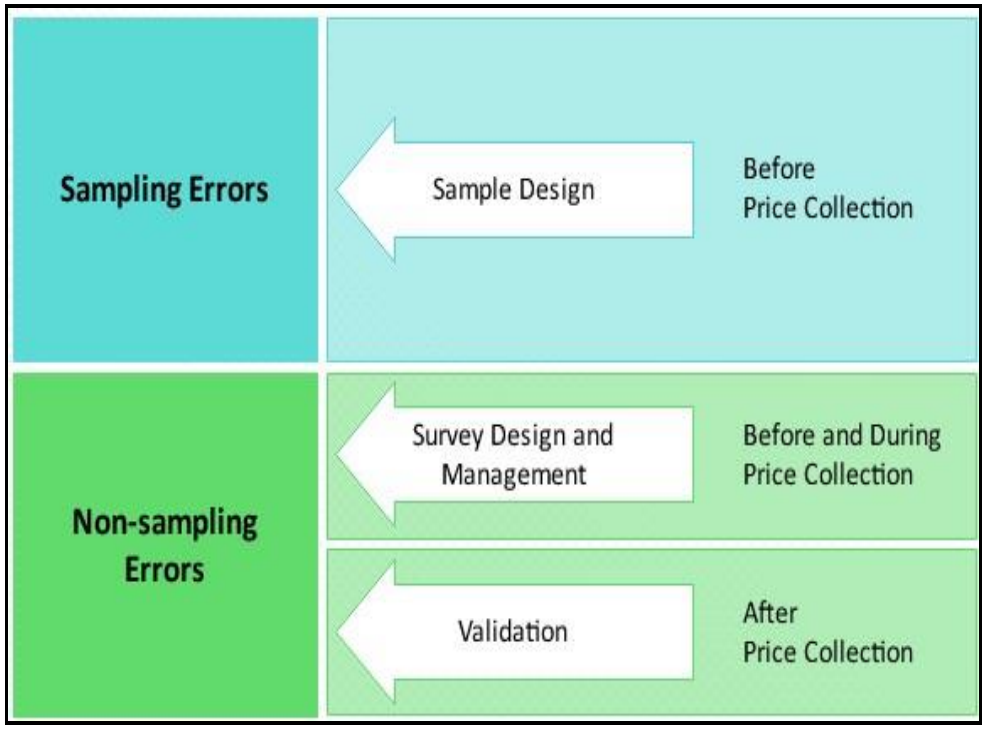
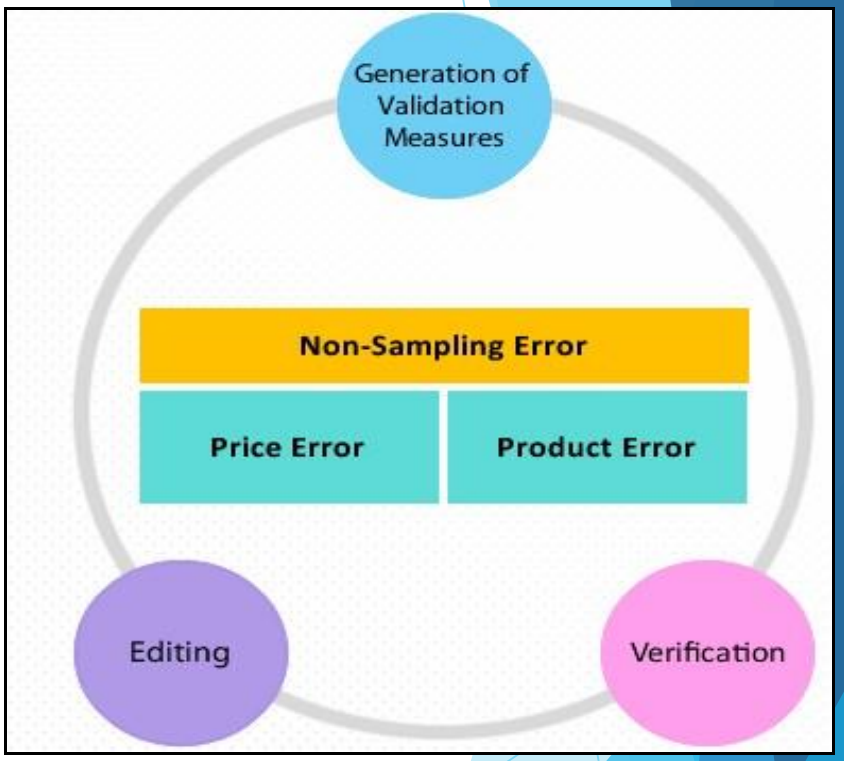
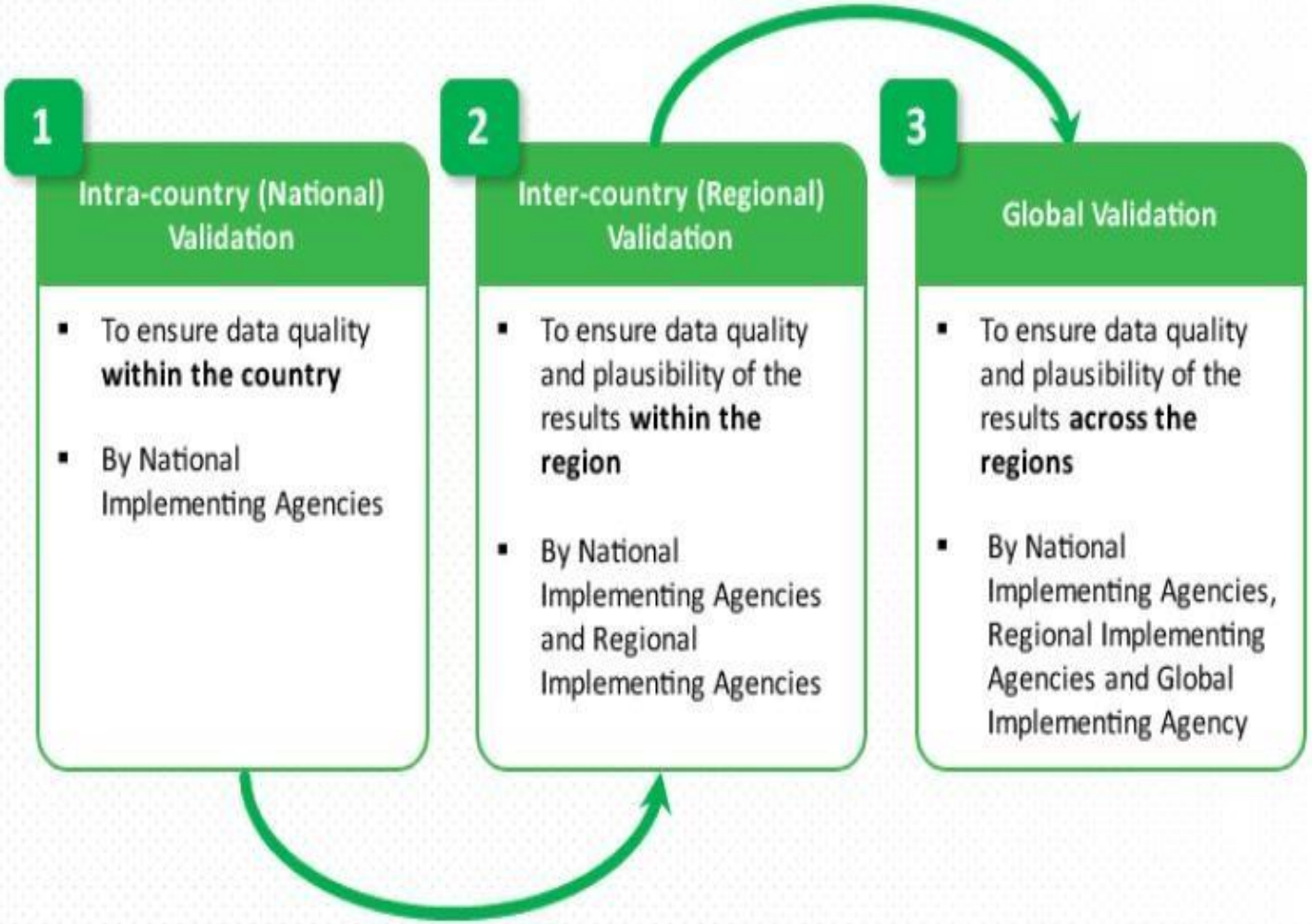
The need for data validation





Stages of data validation



ICP Data Validation: Basics

Basic considerations in ICP:

- Products priced are exact matches *(strictly followed the structured product descriptions for each item)*
- Prices are reflective of **annual national averages**

Across Economies:

- Price relativities (PPPs) changed significantly between 2005 and 2011.

Background: CPI and ICP Comparison

Key Question:

- Did we compare "like with like"?
  - Across Space (Spatial Analysis)
    - Within country (across region/province)
    - Across economy in Asia and the Pacific
  - Across Time (Temporal Analysis)
    - Using prices from benchmark ICPs: 2005 and 2011
    - Comparing ICP price movements with CPI price movements for the same years

Intra-Country Validation: Parity Within

Validation Generated from the ICP APSS

- Table 1 – Summary of Data Submission

  - shows count of items, quotations

- Table 2 – Summary Statistics

  - shows price statistics by item (average, no. of quotations, CV, min and max prices, MMR)

- Table 2.1 – Summary Statistics Urban/Rural

  - same as Table 2 statistics but with Urban and Rural dimension

Intra-Country Validation: Parity Within

Validation Generated from the ICP APSS

- Annex 1 – List of Products which does not meet the required parameters (Quotations, CV and MMR)
- Annex 2 – Observed Data of Products with CV and MMR Error
- Report 1 – Number of Available and Important Products by Basic Heading
- Report 2 – Number of Outlets by Location and by Outlet Type

Intra-Country Validation: Parity Within

Validation Generated from the ICP APSS

- Report 3 – Number of Quotations by Product, Location and Location Type
- Report 4 – Number of outlets with at least one price Quotation by Product, Location and Location Type
- Report 5– Number of Quotations by Product and Outlet Type
- Summary Statistics by Product
- Summary Statistics by Location and by Product

Intra-Country Validation: Parity Within

Validation Generated from the ICP APSS

- Report 3 – Number of Quotations by Product, Location and Location Type
- Report 4 – Number of outlets with at least one price Quotation by Product, Location and Location Type
- Report 5– Number of Quotations by Product and Outlet Type
- Summary Statistics by Product
- Summary Statistics by Location and by Product

Intra-country validation: Recognizing the Issues

Table 2. Priority Concerns:

First and Second Quarter

Particulars
Total Number of Items for Review
TopMost Priority
A. Priced in Only One Area
1. Mapped as Available and Important
2. Mapped as Available but Less Important
3. Mapped as Unavailable but prices were included
B. With Possible Non-Sampling Errors
Second Priority
A. With Relatively High Variations (Remaining Items aside from B)
1. 30%<CV<40% and 0.25 <Minmax Ratio < 0.33
2. Minmax Ratio < 0.33
3. CV>30%
B. Quarterly Price Data For review
1. Price Ratios > 1.15
2. Price Ratios < 0.85
3. Priced in only one quarter
C. Priced But not mapped
D. Not Priced in the 2011 ICP
1. Mapped
a. Mapped as Available and Important
b. Mapped as Available but Less Important
2. Priced in the 2005 ICP

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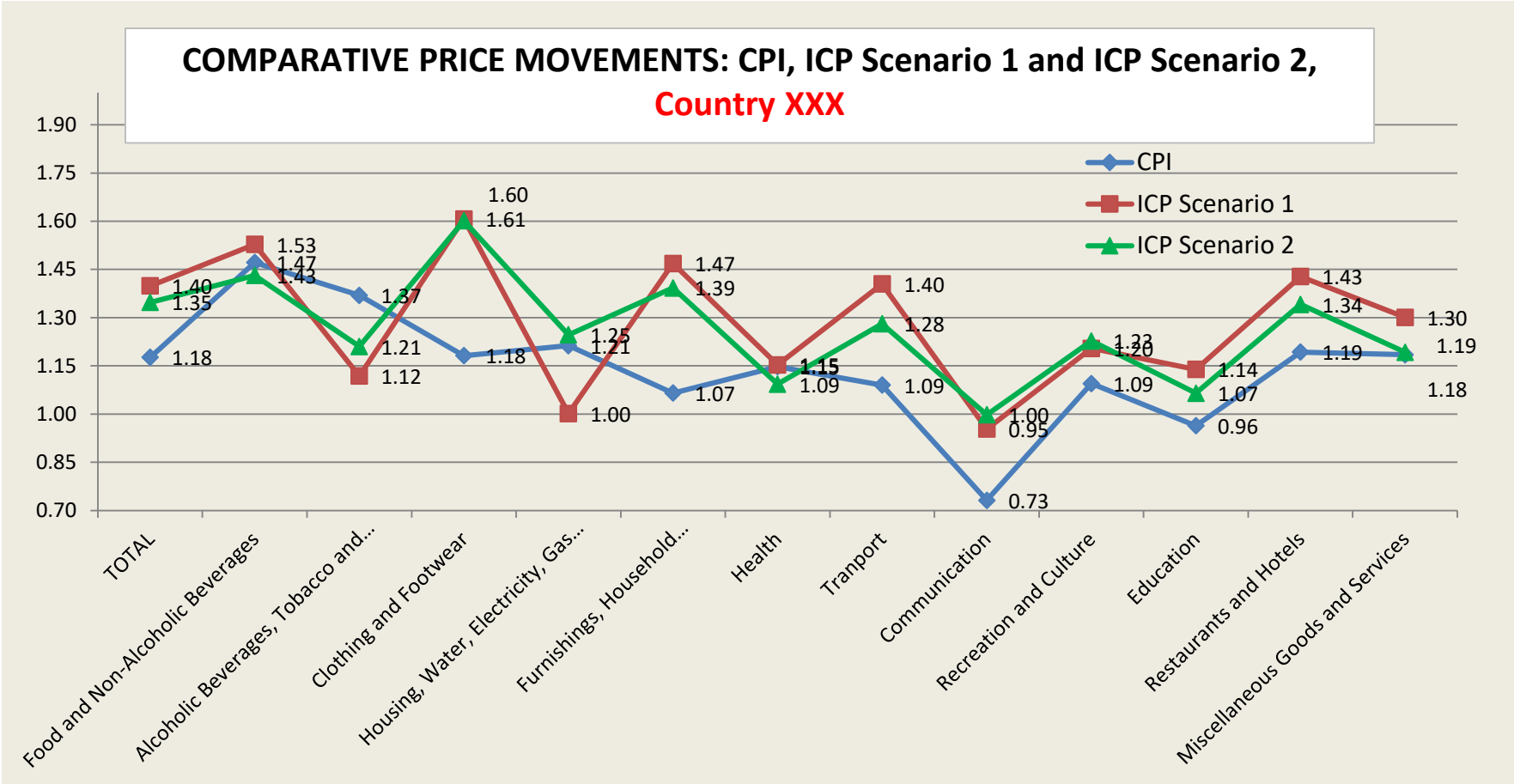
Intra -country validation

- Comparison of ICP and CPI



Intra-country validation: Presentation Format

- Comparison of ICP and CPI, BH Level Analysis

BH Code	BH Name	CPI			Implied Inflation (2011/2005)		CPI/ICP Differences (CPI Less ICP inflation)	
		2005 Index	2011 Index	Inflation/ Deflation	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1101111	Rice							
1101112	Meat							
1101113	Fish							
	…							
	…							
	…							
	…							
	…							
	…							
	…							
	…							
	…							
1112711	Other Services, NEC							

Intra-country validation: National Accounts

- Updated data sources
- SNA compliance: 1968,1993 and 2008
- Implementation of new methods
- Structural changes
- Country-specific: Treatment of expenditures of residents abroad

COMPLIANCE WITH SNA

NIA	2005 ICP	2005 REV	2011
BAN	1993	1993	1993
BHU	1968, 1993	1968, 1993	1968, 1993
BRU	1993	1993	1993
CAM			
PRC			
FIJ	1993	1993	2008
HKG	2003	2008	2008
IND	1968, 1993	1968, 1993	1968, 1993, 2008
INO	Mixed 1968/1993	Mixed 1968/1993	Mixed 1968/1993
LAO	1993	1993	1993
MAC		**METHODS**	
MAL			
MLD	1993	1993	1993
MON	1993	1993	1993
MYA			On the way to 1993 SNA
NEP			
PAK	1993	1993	1993
PHI	1993	1993	1993
SIN	1993	1993	1993
SRI			
TAP	1993	1993	1993
THA	1968	2008	2008
VIE			

METHODS

- New and Improved Methods
- Annual Chain Linking
- Rebasing

STRUCTURAL CHANGES

- CONSUMPTION PATTERN
  - Reclassification
  - Technology development
  - Inflation
  - Higher disposable income
  - Change in Lifestyle
  - Others

STRUCTURAL CHANGES

- GOVERNMENT SPENDING PATTERN CHANGED

Example:

a. Increase in medical provision due to rising healthcare costs and an ageing population

SPECIFIC

- TREATMENT OF EXPENDITURE OF RESIDENTS AND NON RESIDENTS

2005ICP - Prepaid tours under residents expenditure abroad

2011 ICP – Recorded in their respective BH of HFCE (package holidays)

BALANCE OF EXPENDITURE ABROAD

BALANCE OF EXPENDITURES OF RESIDENTS ABROAD AND EXPENDITURES OF NON RESIDENTS ON THE ECONOMIC TERRIT.			
NIAs	**2005ICP**	**2005REV**	**2011**
BRU	✔	✔	✔
CAM	✔	✔	✔
FIJ	✔	✔	✔
HKG	✔		
IND	✔	✔	✔
LAO	✔	✔	✔
MAC	✔	✔	✔
MAL	✔		
NEP	✔	✔	✔
SIN	✔	✔	
SRI	✔	✔	✔
TAP	✔		
THA	✔		
VIE	✔	✔	✔

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CONCEPTUAL COMPLIANCE TO 1993 SNA

1. Is government defense expenditure on fixed assets that can be used for civilian purposes included in GCF?

2. Is consumption of fixed capital included on all government fixed assets (roads, dams and breakwaters and other forms of construction except structures)?

3. Is all mineral exploration (successful and unsuccessful) capitalized?

4. Is expenditure on computer software included in Gross Capital Formation (GCF) and is expenditure on software development included in output?

5. Is expenditure on entertainment, literary or artistic originals included in GCF and expenditure on their development included in output?

6. Is the net acquisition of valuables included in GCF?

7. Are Financial Intermediation Services Indirectly Measured (FISIM) divided between intermediate and final consumption

CONCEPTUAL COMPLIANCE TO 2008 SNA

1. The entire defense expenditure incurred by government included in the GCF?

2. Consumption of fixed capital measured on all government fixed assets (airfields, roads, hospitals, docks, dams and breakwaters and other forms of construction except structures) including military weapon systems?

3. The expenditure on Research and Development included in the output and GCF?

4. All (successful and unsuccessful) mineral exploration expenditure capitalized?

5. Purchases of computer software expected to be used for more than a year included in GCF?

6. Expenditure on software development on own account expected to be used for more than a year and for sale included in GCF and output?

7. The expenditure on all databases expected to be used for more than a year, whether purchased on the market or developed in-house, included in the GCF and output?

CONCEPTUAL COMPLIANCE TO 2008 SNA

8. Expenditure on entertainment, literary or artistic originals included in the GCF and on their development included in the output?
9. Expenditure on valuables included in the GCF?
10. The natural growth of cultivated forests included in output in GCF?
11. The output of financial intermediation services indirectly measured (FISIM) calculated on loans and deposits only using interest rates on deposits and loans and a reference rate of interest?
12. The output of FISIM allocated to users?
13. The production of all goods that are produced by households whether for sale or not —included in the output?
14. The activity of the own-account money lenders included in the output?
15. The value of output of goods and services produced by households and corporations for own final use, when estimated on cost basis, include a return to capital?

CONCEPTUAL COMPLIANCE TO 2008 SNA

16. The output of non-life insurance services in the event of catastrophic losses estimated using adjusted claims and adjusted premium supplements?

17. The output of the Central Bank estimated separately for financial intermediation services, monetary policy services and supervisory services overseeing financial corporations?

18. The unit undertaking purely ancillary activity, located in a geographically separate location from establishments it serves, treated as a separate establishment?

19.The output of the activity of non-autonomous pension funds and unfunded pension schemes separately recognised? Volume estimates

20. Volumes estimated using a chaining procedure on an annual basis? Social contributions/insurance

21. Unfunded social contributions (for sickness, unemployment, retirement etc.) by enterprises imputed as compensation of employees and included as contributions to social insurance?

CONCEPTUAL COMPLIANCE TO 2008 SNA

22. Non-life insurance estimates include premium supplements rather than being based just on premiums less claims?

23. Life insurance estimates include premium supplements rather than being based just on premiums less claims?

24. Reinvested earnings estimates included in the rest of the world account?

25. Foreign workers' remittances excluded from GNI?

26.a Output and value added measured at basic prices? a

26.b Output and value added measured at producers' prices? a

26.c Value added measured at factor cost? a (not part of the 2008 SNA)

27. The goods for processing recorded on a net basis? Final consumption

28. Government final consumption expenditure broken down into individual and collective consumption?

29. The 2008 SNA has not been implemented in officially reported national accounts, when does the country plan to implement and release data based on the 2008 SNA? (Specify the year.)

Inter-country validation

- Inter-Country Summary Statistics

Particulars	XXX
No. of Products Priced	
% to Total Products	
PPP	
PLI	
SD	
Global	
BH	
Exchange Rate (LCU/HKG Dollar)	
Aggregate Level Selected: Basic Heading	
Priced	
% to total selected level exc. Repairs	

Particulars	XXX
Not Priced	
Priotiry Products for Review	
% to Products Priced	
With CPD Residuals	
Aggregate Level Selected: Basic Heading	
>2.00 or < -2.00	
>0.75 or < -0.75	
>0.25 or < -0.25	
Global Level	
>2.00 or < -2.00	
>0.75 or < -0.75	
>0.25 or < -0.25	

Inter-country validation: CPD residuals (Basic Heading Level)

		Cntr1	Cntr2	Cntr3	Cntr4	Cntr5	Cntr6	Cntr7	Cntr8	Cntr9	Cntr10	STD	CNT
	PPP	1.000	2.480	1.176	294.69	1,206	0.411	2,131	1.675	11.013	935.65		
	STD	0.20	0.18	0.15	0.17	0.19	0.30	0.21	0.14	0.13	0.19	0.19	
	N. of items priced	7	11	10	10	11	8	8	10	6	8		16
	PLI	1.00	0.88	1.27	1.47	1.50	1.20	0.97	1.50	1.26	1.29		
	Exchange Rate	1.000	2.823	0.927	200.77	806.20	0.342	2,191	1.115	8.715	726.00		
	ER (LCU/US$)	2.923	8.253	2.711	586.92	2356.78	1.0000	6405.2	3.259	25.4781	2122.34		
1101111_0101	Premium ric	(0.00)	0.08	-	(0.00)	(0.00)	-	0.00	(0.08)	(0.00)	-	0.04	9
1101111_0102	Premium ric	-	(0.08)		-	-	-	-	0.08	-	-	0.07	3
1101112_0101	Wheat flour prepackaged	0.40	0.01	(0.00)	(0.07)	0.26	(0.66)	0.37	(0.27)	0.16	(0.19)	0.31	10
1101112_0102	Wheat flour loose	(0.01)	-	0.01	-	-	-	(0.05)	-	0.05	-	0.04	4
1101112_0103	Wholemeal flour (Atta)	-	0.42	0.12	(0.35)	(0.33)	0.15	-	(0.05)	-	0.04	0.25	7
1101112_0104	Semolina (Suji)	-	-	-	-	0.05	-	-	-	-	(0.05)	0.05	2
1101112_0201	Corn flour loose	(0.32)	-	0.05	0.19	-	-	0.07	-	-	-	0.19	4
1101112_0202	Corn flour prepackaged	-	(0.24)	-	(0.10)	(0.12)	0.47	(0.43)	0.01	-	0.40	0.30	7
1101112_0203	Rice flour	-	0.10	(0.37)	-	-	-	-	0.27	-	-	0.27	3
1101112_0301	Cake mix	(0.07)	-	0.35	0.10	-	-	0.04	-	(0.21)	-	0.13	5
1101112_0302	Oats	-	(0.17)	0.05	0.07	0.20	(0.08)	-	0.04	-	(0.10)	0.12	7
1101112_0303	Cornflakes	-	(0.13)	-	0.17	(0.06)	0.13	-	-	-	(0.11)	0.12	5
1101113_0101	White bread sliced	0.05	0.15	(0.19)	0.20	(0.33)	(0.14)	0.08	0.07	(0.13)	0.24	0.18	10
1101113_0102	White bread loose	-	-	-	-	0.14	(0.14)	-	-	-	-	0.14	2
1101113_0103	Roll or bun loose	(0.05)	(0.05)	(0.02)	(0.20)	0.21	-	(0.08)	0.06	0.13	-	0.12	8
1101113_0104	Roll or bun prepacked	-	(0.09)	0.20	-	(0.02)	0.28	-	(0.13)	-	(0.24)	0.18	6

BASIC HEADING

SCOPE OF CPD REGRESSION FOR PPP - GDP level

SCOPE OF ITEM-SPECIFIC COMPUTATIONS (STD and CNT /N. of countries pricing the item/ by item)

SCOPE OF CPD REGRESSION FOR CPD RESIDUALS IN ITEM SECTION

SCOPE OF COUNTRY-SPECIFIC CHARACTERISTICS (STD and N. of items priced)

Inter-country validation: CPD residuals (Global/All Items)

		Cntr1	Cntr2	Cntr3	Cntr4	Cntr5	Cntr6	Cntr7	Cntr8	STD	CNT
	PPP	1.000	2.040	1.026	239.754	886.041	0.342	1,701.13	1.189		
	STD	0.28	0.38	0.31	0.35	0.32	0.31	0.33	0.32	0.34	
	N. of items priced	401	369	396	418	369	350	400	369		571
	PLI	1.00	0.72	1.11	1.19	1.10	1.00	0.78	1.07		
	Exchange Rate	1.000	2.823	0.927	200.77	806.20	0.342	2,191.1	1.115		
	ER (LCU/US$)	2.923	8.253	2.711	586.92	2356.78	1.0000	6405.150	3.259		
1101111_0101	Premium rice #1	(0.06)	0.00	0.24	(0.09)	0.21	-	(0.53)	(0.24)	0.25	9
1101111_0102	Premium rice #2	-	(0.08)	-	-	-	0.08	-	(0.00)	0.07	3
1101112_0101	Wheat flour prepackaged	0.66	(0.16)	0.07	(0.11)	(0.03)	(0.63)	0.32	(0.42)	0.35	10
1101112_0102	Wheat flour loose	0.14	-	(0.02)	-	-	-	(0.20)	-	0.13	4
1101112_0103	Wholemeal flour (Atta)	-	0.30	0.24	(0.33)	(0.57)	0.23	-	(0.15)	0.32	7
1101112_0104	Semolina (Suji)	-	-	-	-	(0.19)	-	-	-	0.19	2
1101112_0201	Corn flour loose	(0.12)	-	0.06	0.09	-	-	(0.04)	-	0.08	4
1101112_0202	Corn flour prepackaged	-	(0.35)	-	(0.07)	(0.34)	0.57	(0.41)	(0.07)	0.41	7
1101113_0101	White bread sliced	0.24	0.40	(0.30)	0.19	(0.37)	(0.31)	0.31	(0.19)	0.27	10
1101113_0103	White bread loose	-	-	-	-	0.20	(0.20)	-	-	0.20	2
1101113_0104	Roll or bun loose	0.09	0.16	(0.16)	(0.24)	0.13	-	0.11	(0.24)	0.17	8
1101114_0101	Cup cakes	-	0.24	0.17	-	0.01	0.18	-	(0.31)	0.22	6
1101114_0102	Sponge Cake boxed	0.16	(0.08)	0.19	(0.05)	(0.04)	-	(0.06)	(0.22)	0.13	9
1101114_0103	Plain Butter Cookies (bag)	(0.13)	-	0.10	(0.09)	-	-	0.23	-	0.14	5
1101114_0201	Biscuits prepacked	-	0.45	-	(0.11)	-	-	-	(0.20)	0.26	4
1101114_0202	Soda crackers	0.43	-	-	(0.16)	-	-	(0.22)	-	0.26	4
1101121_0101	Mince/ground beef	-	0.25	(0.08)	(0.09)	(0.17)	(0.19)	-	0.00	0.18	7
1101121_0102	Round steak	(0.02)	0.51	0.06	(0.54)	(0.03)	0.13	0.53	(0.08)	0.32	10
1101121_0103	Sirloin steak	0.08	-	0.14	(0.37)	-	-	0.22	-	0.20	6
1101122_0101	Pork loin chops	0.37	(0.14)	0.31	(0.59)	0.01	(0.25)	0.47	(0.26)	0.32	10
1101123_0101	Lamb leg	0.07	0.04	0.13	(0.16)	-	(0.23)	0.40	0.15	0.22	9
1101124_0101	Fresh whole chicken	(0.25)	0.40	(0.21)	-	-	-	-	0.06	0.26	4
1101124_0102	Live chicken	0.05	-	0.20	(0.02)	(0.33)	-	0.01	-	0.15	7
1101124_0201	Native house chicken	-	0.17	-	-	-	(0.19)	-	0.03	0.15	3
1101125_0101	Beef liver	(0.07)	(0.15)	0.24	(0.04)	(0.23)	(0.05)	0.24	(0.20)	0.18	10
1101125_0201	Pork liver	0.48	(0.00)	(0.03)	-	(0.52)	-	0.72	(0.28)	0.42	8
1101125_0301	Mutton/goat liver	(0.16)	-	0.27	(0.42)	-	-	0.51	-	0.34	5
1101125_0302	Pork kidney	(0.17)	(0.40)	0.34	0.64	0.01	(0.43)	0.31	(0.49)	0.36	10
1101125_0303	Bacon	0.31	(0.56)	0.10	0.78	(0.02)	(0.43)	0.20	0.15	0.39	10
1101131_0101	Mud crab	(0.19)	-	0.19	0.24	-	-	(0.25)	-	0.22	4
1101131_0102	Sea Crab	0.10	-	0.09	(0.15)	(0.17)	-	-	0.21	0.17	7
1101131_0103	Sea Lobster	-	-	-	0.02	(0.04)	0.06	-	(0.28)	0.17	5
1101131_0104	Prawn/shrimp small	0.27	-	0.23	(0.46)	(0.75)	-	-	-	0.53	5
1101131_0105	Prawn/shrimp medium	-	(0.35)	-	(0.09)	(0.22)	-	-	0.53	0.31	5
1101131_0106	Squid	0.20	(0.15)	(0.09)	-	-	-	0.05	-	0.13	4

Product Code

Product Name

individual Basic Headings

CPD RESIDUAL

Country Name

Number of Items Priced in the Region

Overall STD of Residuals in the Region: uses whole tableau of CPD residuals

STD of Residuals for the Country

STD of Residuals for the Product

Number of Products Priced in that Country

Price Level Index (PPP/ER ratio)

PPP based on CPD index ran on all products and countries in the region

Number of Countries Pricing that Product

Exchange Rate vs. base country

Exchange Rate vs. US$

GENERAL PART: COMPUTED USING ALL AVAILABLE ITEMS (571 in this example) AND ALL COUNTRIES (8) *computed at the selected level (PPP is computed at the GDP level)*

ITEM-SPECIFIC PART: COMPUTATIONS FOR INDIVIDUAL ITEMS (PRODUCTS), out of 571 lines in this example, first 41 lines are shown, grouped by basic headings

computed at the selected level (GDP total in this case)

ADB

2. PPP estimation and tools

ICP PPP Estimation: Aggregation Process

Three Stages in Aggregation Process

Computing national annual averages of price observations

Aggregating prices to basic heading level parities

Aggregating basic heading parities to GDP and other sub-aggregates

PPP Calculation: Data Requirements

1. Annual National Average Prices
2. Basic heading PPPs, with country 1 acting as the reference country and its currency as the numeraire
3. Complete set of basic heading expenditures in national currencies

PPP Calculation: Three Stages

1

Annual National Average Prices (NIAs)

2

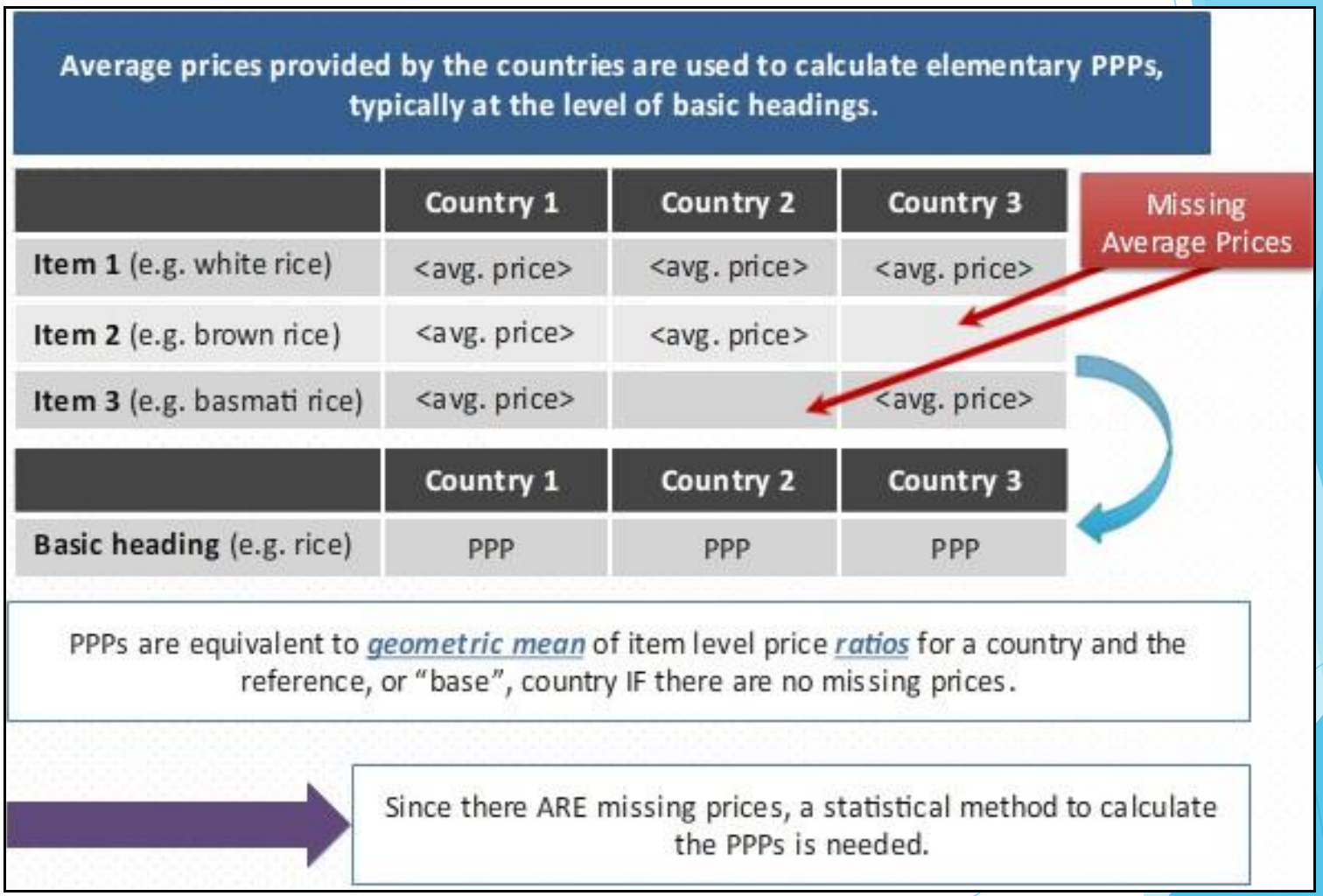
Regional PPPs (RIA)

Linking regional PPP to calculate global PPPs

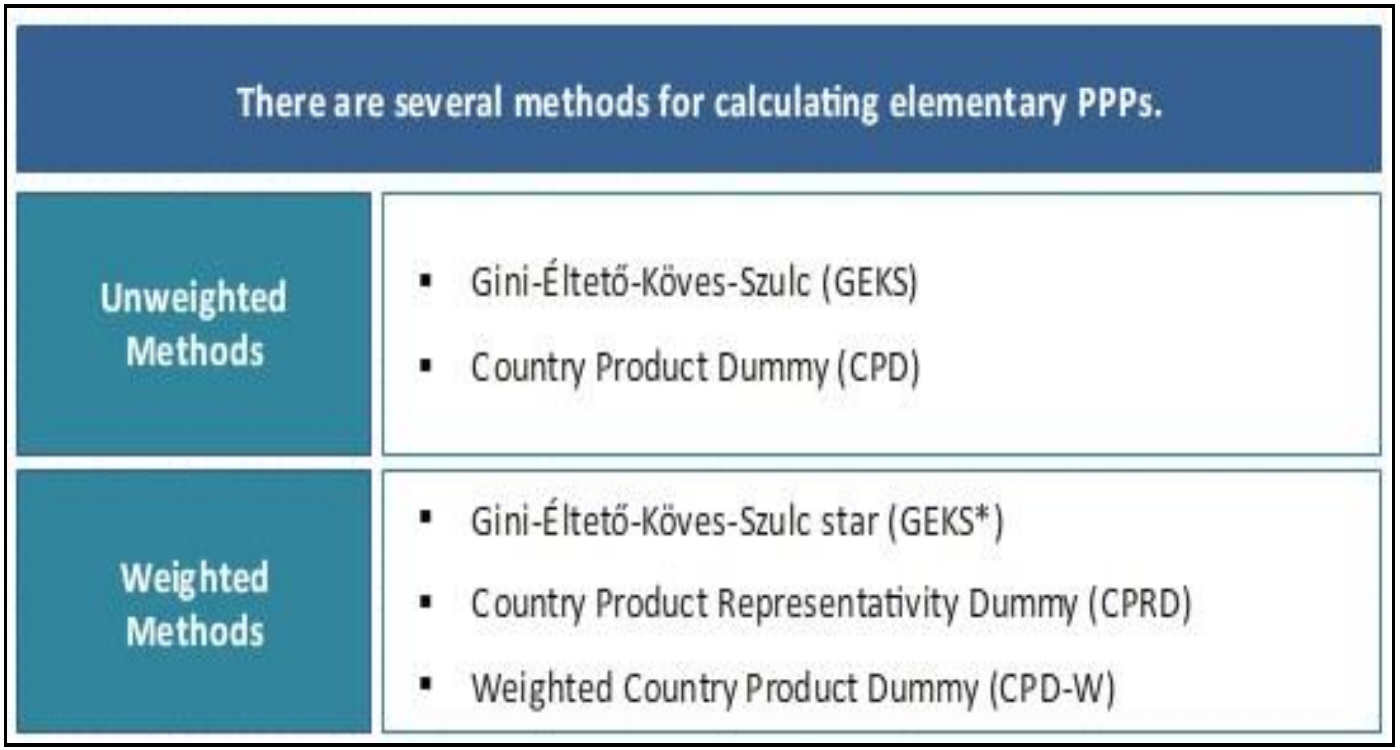
National average prices

Countries participating in the ICP compile detailed breakdown of final expenditures on GDP that cover the whole range of goods and services included in the GDP.	
Expenditures are:	▪ Annual ▪ Expressed in local currency units ▪ Compiled by following the ICP classification ▪ Validated at national, regional and global levels

Elementary PPP



Elementary PPP Calculation



Elementary PPP Calculation: CPD

CPD is a statistical method that is used to derive PPPs by regressing the logarithm of observed prices against a set of *dummy variables* that are defined with respect to the **products priced** and the **participating countries.**

The regression equation for the CPD can be written as:

$$\text{Ln } p^{h}_{ij} = \Sigma \alpha_j C_j + \Sigma \beta_i P_i + \varepsilon$$

Where

$i = 1,\ldots,M$ products; $j = 2,\ldots,N$ countries ; $h = 1,\ldots,K$ basic headings

$\text{Ln } p^{h}_{ij}$ is the natural logarithm of price for product i in country j

C_j is country dummy which takes the value of 1 when the price is for country j, otherwise zero; C_1 is dropped because country 1 is the base country

P_i is product dummy which takes the value of 1 for product i, otherwise zero

ε is an error term

PPP Calculation:
Properties of Price and Volume Indices

Base country invariant

- all participating countries are symmetrical so the results are no different to the chosen base country

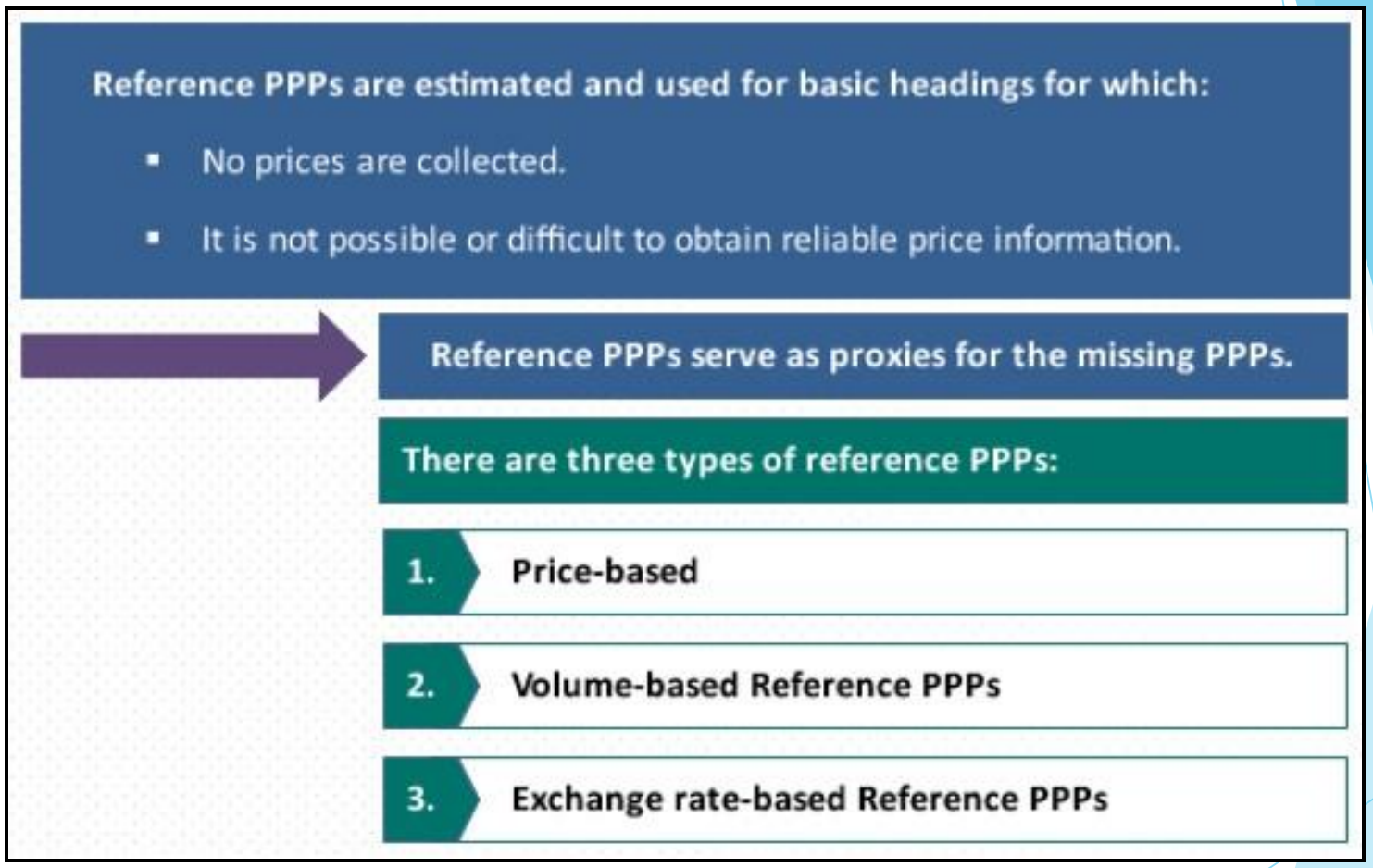
Commensurability

- All produce results that are invariant to changes in the units of measurement for prices and quantities

Transitivity

- Requires that every indirect parity I PPP_{jk} should equal the corresponding direct parity PPP_{jk}

Reference PPPs



PPP aggregation

Elementary PPPs are aggregated by using national account expenditures as weights to obtain PPPs for each aggregation level up to GDP.

	Country 1	Country 2	Country 3	Country 1	Country 2	Country 3
BH 1 (e.g. *rice*)	PPP	PPP	PPP	weight	weight	weight
BH 2 (e.g. *cereals*)	PPP	PPP	PPP	weight	weight	weight
BH 3 (e.g. *bread*)	PPP	PPP	PPP	weight	weight	weight

A Matrix of PPPs and Weights

	Country 1	Country 2	Country 3
Aggregate (e.g. *bread and cereals*)	PPP	PPP	PPP

The aggregation of PPPs is undertaken separately for each level of expenditure up to the level of GDP.

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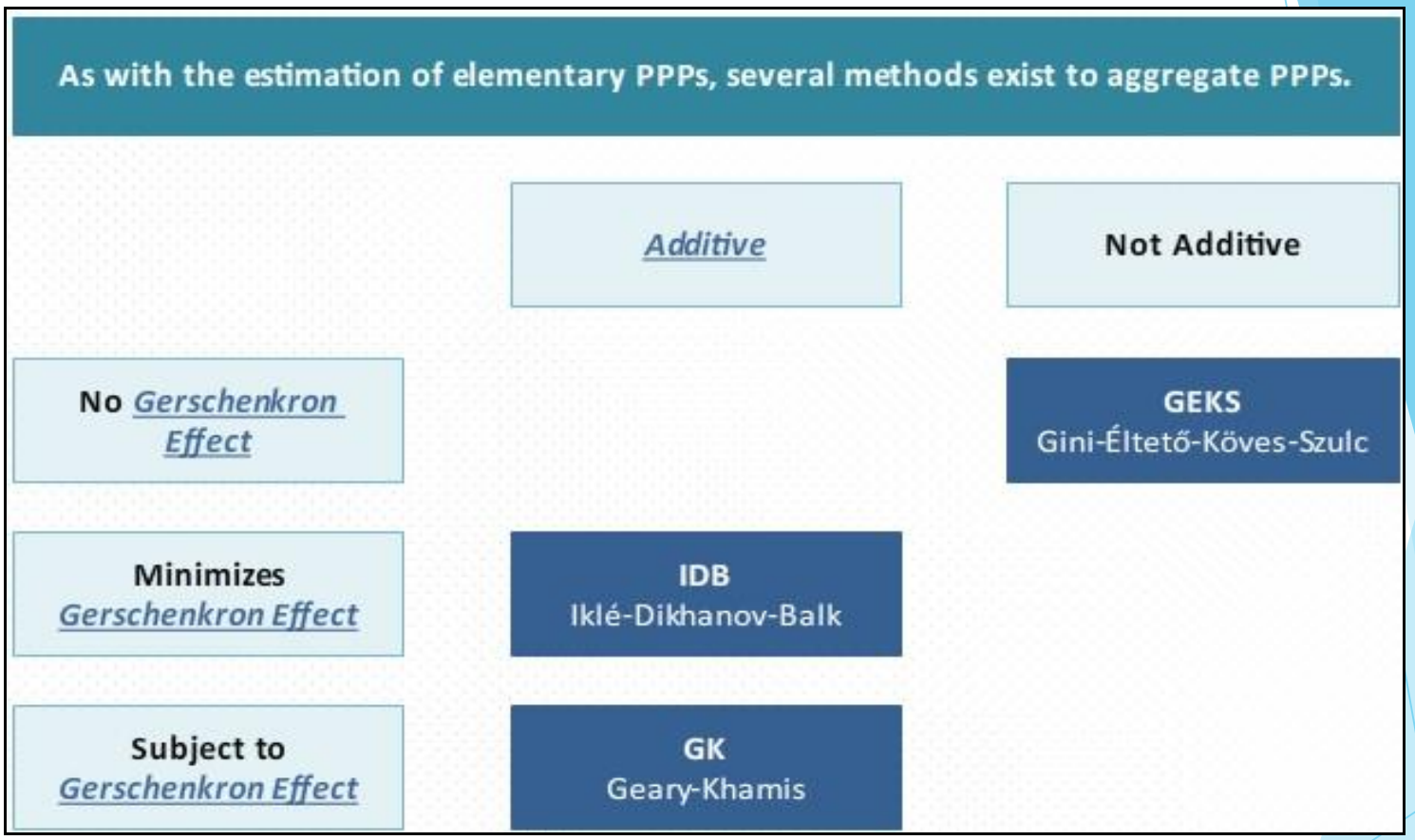
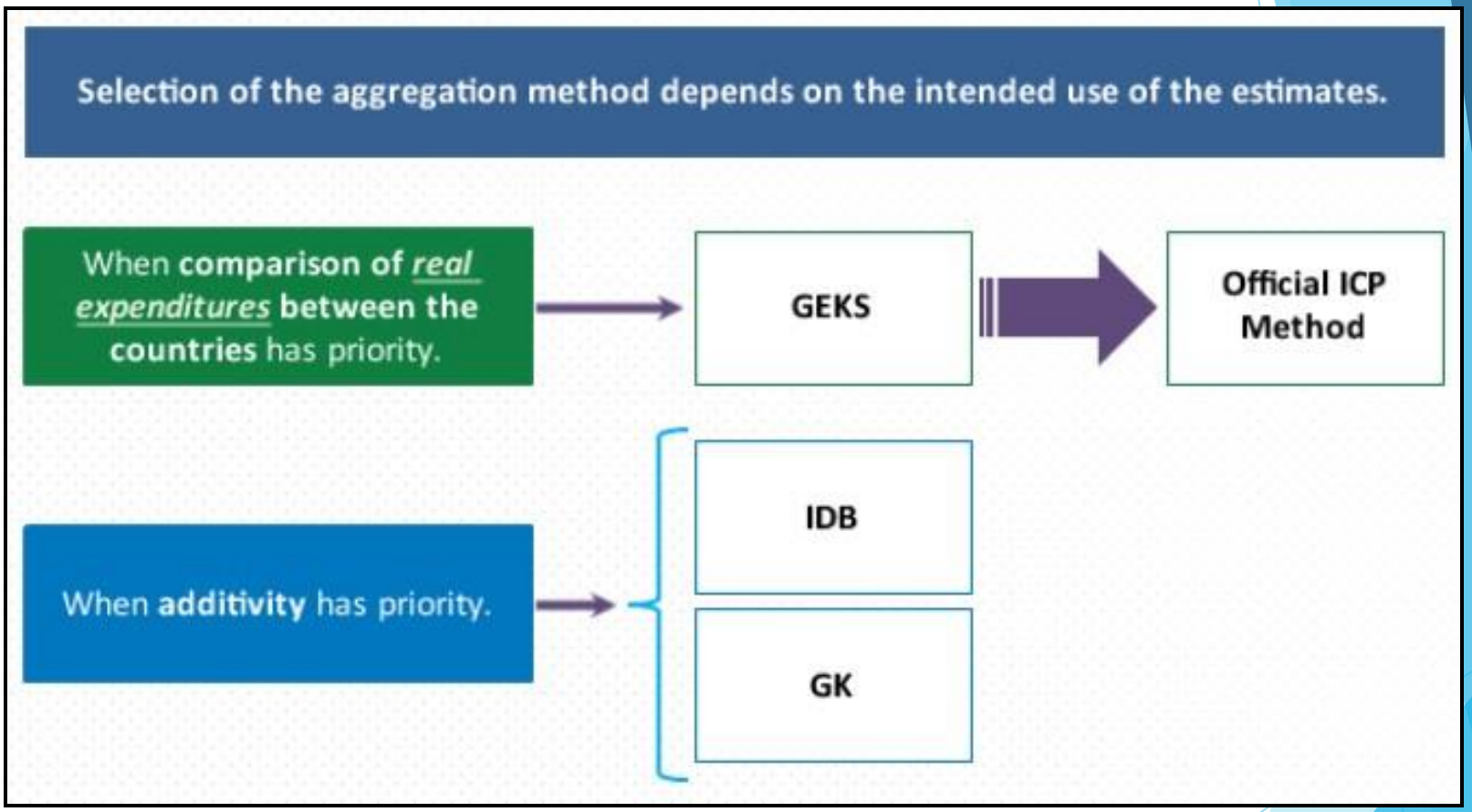
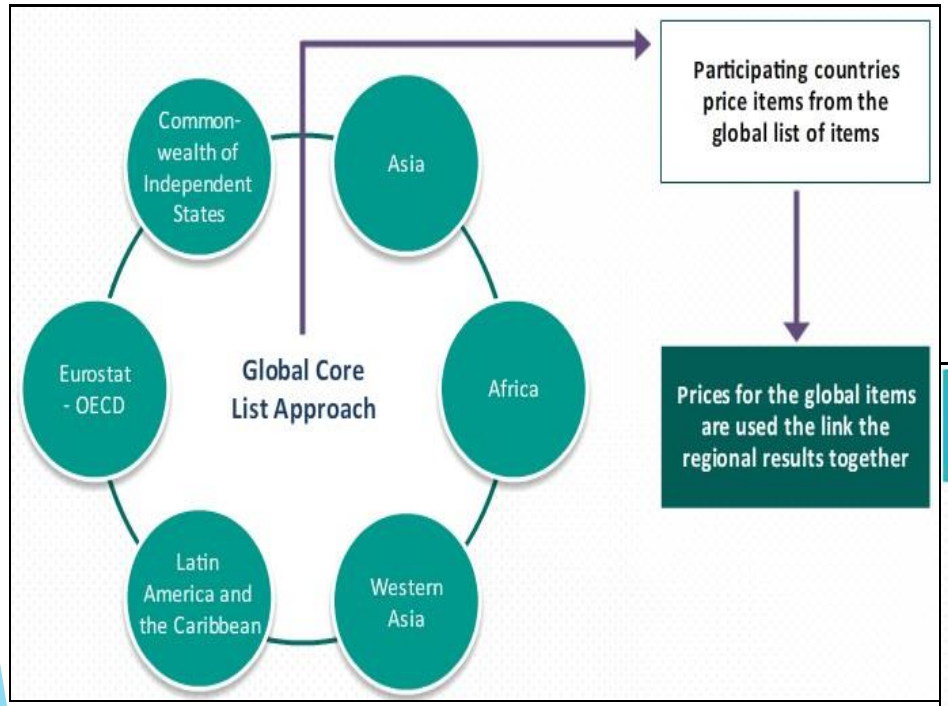
PPP aggregation: Methods



Choosing the method



Linking regional PPPs



To calculate the global PPPs (US$=1) the following inputs are required for each participating countries and regions:

- Global core list item prices in local currency
- Regional PPPs at the basic heading and aggregate levels following the ICP classification
- National accounts expenditures at the basic heading level in local currency
- Annual average market exchange rates to the U.S. dollar

The linking is carried out in two stages:

- At the basic heading level
- At the aggregate level

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ICP Tools for all

- World Bank:
  - ICP Toolpack
  - Also developed excel macros for index number calculations including complex estimates of CPD and GEKS
- ADB: has the Asia Pacific Software Suite to:
  - Manage country and regional data for PPP computation
  - Automate the system of survey administration, data collection, data validation, data processing and reporting
  - Country modules were for each component requiring data collection and validation (Household, Compensation of employees, construction, equipment, rental, etc.)

3. Frontier of ICP Development: Subnational Purchasing Power Parities

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Motivations

- ICP produces quality benchmark PPP for cross-country comparisons of economic activity and relative price levels
- Increasing Demand for more frequent (annual) PPP
- Institutionalization of the ICP at the national, regional and global level (UNSC)

Yet….

- ICP has always been resource-intensive
- Utilities of the ICP outputs at the national level and research have been inadequate

Key Questions

- Why estimate subnational PPP
- What are the options for estimating subnational PPPs?
- Is it possible to integrate ICP with regular price collection work of economies?
- What else?

Presentation Outline

1. Subnational PPP: Some considerations
2. Subnational PPP: Approaches and Methods
3. Some Applications and Findings
4. Conclusions and Way Forward

3.2 Subnational PPPs: Some Considerations

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2. Why do we need to do Subnational PPPs?

For establishing comparability across time and space within area (state or region)

- The Idea of calculating subnational PPP is to:
  - Apply ICP concepts and methods
  - Directly compare regions/states/province within country across time

2. Why we need subnational PPPs

For a more sustainable ICP program

- Key element for achieving sustainability of the ICP and its gradual integration in the regular price collection particularly the CPI. Hence, ADB has been:
  - Advocating the construction and use of PPPs at national level
    - Estimation of Subnational price levels
    - Application and use of subnational PPP to improve socio-economic indicators (e.g. HDI, SCOLI)

2. Why do we need to do subnational PPP?

For Greater ICP-CPI Harmonization

Among major issues raised were:

- Advocacy: Lack of use of PPP at national level for decision making
- Representativity: current ICP basket is not representative of the national commodity basket particularly, non-traded goods
- Integration of ICP and CPI commodity items

The “Dream”: Reduce resource cost and burden to economies

2. Harmonizing ICP-CPI

Information collected and processed during construction of CPI can be used in the calculation of PPP

CPI
Index constructed at national level (annual or quarterly)

CPI
Price change for capital cities and regions (annual or quarterly

Provides measurement of price movements over time

Information collected and processed during construction of CPI can be used in the calculation of PPP

PPP
Spatial Price comparison across regions within country

Provides measurement of price level differences in different regions

2. Some Considerations

Using CPI information for sub-national PPP compilation means,

- No additional data collection will be required from country
- A “core list” of CPI varieties will be identified to establish comparability of price levels across states
- Otherwise, another set of comparable set of data maybe collected to reflect target population (e.g. spending of the poor, etc.)