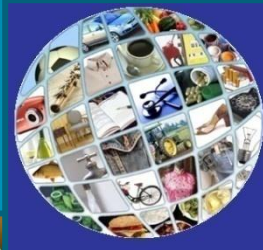




[01.00]

# Overview of Linking and Aggregation Methods



7<sup>TH</sup> Technical Advisory Group Meeting  
September 17-18, 2012  
Washington, DC

# Review of TAG Actions and some consequences

- ☐ BH PPPs
- ☐ Linking
- ☐ Aggregation
- ☐ Validating the Aggregation
- ☐ Explaining 2005/2011 levels

# Basic Heading PPPs

- ☐ Consumption (except dwellings)—TAG V
  - ☐ CPD weighted using Importance classification
  - ☐ Recommended 3:1 but also suggested sensitivity testing (2:1, 5:1, and 10:1)
- ☐ Equipment—TAG V
  - ☐ Use Importance classification?
  - ☐ Include margins (taxes, transport, trade margins)
  - ☐ Use Price Factor method if cannot price equipment
  - ☐ Collapse some BHs if trouble obtaining weights
- ☐ Construction
- ☐ Government
- ☐ Dwelling Rents

# Basic Heading PPPs

☐ Construction—TAG V

☐ Input Prices

	Residential Buildings		Non-Residential Buildings		Civil Engineering	
Materials (38)	PPP*	Wt	PPP	Wt	PPP	Wt
Equipment (5)	PPP	Wt	PPP	Wt	PPP	Wt
Labor (7)	PPP	Wt	PPP	Wt	PPP	Wt
BH PPP		100		100		100
BH expenditure weight for aggregation						

\*CPD no weights

- ☐ Productivity Adjustment not needed because of labor input
- ☐ Info on markups, profits, VAT—try to obtain
- ☐ Discussed informal construction—wait until next round

# Basic Heading PPPs

- ☐ Dwelling Rents—TAG III
- ☐ Within Region
  - ☐ Actual Rent Questionnaire—where have data
  - ☐ Quantity/Quality— required for all countries
  - ☐ TAG silent on how use where had both results (2005 Geo mean if had both results)
- ☐ Linking Regions
  - ☐ TAG silent (2005 Calculated linking factors using quantity/quality data 97 countries)  
Use rents and quantities if have data?

# Basic Heading PPPs

- ❑ Government---Compensation—TAG V
  - ❑ Global PPPs estimated directly using
  - ❑ Global CPD of compensation
  - ❑ Productivity adjustment applied—all countries—all regions—Global Office provide adjustments
- ❑ Regions use global aggregation to BH directly—or-
- ❑ Do regional aggregation with regional methodology & use global aggregation results to link with rest of the world



# Linking Regions at BH

- ❑ Compute linking factors (between region PPPs)
  - ❑ Each core price converted to regional price using Country/region PPP
  - ❑ Importance weight from regional comparison used
  - ❑ CPD weighted using weights to be determined
- ❑ Global BH PPP = within region BH PPP X between region linking factor

# Aggregation

## ☐ Input

- ☐ BH linked PPPs 155 headings X 180+ countries
- ☐ BH expenditures in national currency (155 x 180+)

## ☐ CAR

- ☐ Unrestricted Fisher-GEKS aggregation
- ☐ Sum regional volumes—redistribute to regional aggregation to retain fixity
- ☐ Validating the aggregation



# Global Aggregation--Validation

- ☐ Fisher matrix 180+ times 180+ countries
  - ☐ P/L spreads
- ☐ GEKS—multi lateral PPPs based on two direct and n-2 indirect PPPs
- ☐ Next 3 slides show sources of variability—set stage for Heston and Deaton presentations
- ☐ Conclude with point about comparing with 2005

# Validating the Aggregation—Fisher PPPs

**Table 10.2 Paasche-Laspeyres Spreads for Countries with Largest Number of Bilateral PLSs Greater than 2.0**

	No. of PLSs > 2.0	No. time s max.	LUX	NOR	CHE	KGZ	MDA	TJK	BHR	KWT	QAT	GMB	USA
LUX	84	11	1.00	1.10	1.00	8.53	5.44	16.23	1.64	1.42	1.74	9.80	1.12
NOR	67		-	1.00	1.04	5.80	3.94	10.48	1.55	1.55	2.07	6.29	1.23
CHE	54		-	-	1.00	5.30	3.94	9.09	1.46	1.46	1.98	5.81	1.11
KGZ	89		-	-	-	1.00	1.08	1.18	5.71	6.39	9.36	1.87	5.54
MDA	77		-	-	-	-	1.00	1.69	4.88	5.27	8.24	1.86	3.65
TJK	135	104	-	-	-	-	-	1.00	8.51	10.50	12.30	2.75	10.53
BHR	58		-	-	-	-	-	-	1.00	1.04	1.30	5.03	1.49
KWT	66		-	-	-	-	-	-	-	1.00	1.04	5.97	1.42
QAT	112	31	-	-	-	-	-	-	-	-	1.00	7.21	1.98
GMB	79		-	-	-	-	-	-	-	-	-	1.00	7.21
USA	41												1.00

# GEKS - Direct and Indirect PPPs

	HKG	MAC	SGP	TWN	BRN	BGD	BTN	IND	USA
HKG	<b>5.87</b>	5.79	6.13	5.41	5.32	5.25	4.77	5.34	<b>5.87</b>
MAC	5.70	<b>5.61</b>	6.06	5.04	5.26	4.72	4.59	4.69	<b>5.61</b>
SGP	1.18	1.14	<b>1.23</b>	1.06	1.05	1.00	0.87	0.98	<b>1.23</b>
TWN	19.11	19.63	20.46	<b>17.62</b>	18.51	18.82	16.81	18.43	<b>17.62</b>
BRN	1.02	0.98	1.08	0.88	<b>0.92</b>	0.80	0.76	0.82	<b>0.92</b>
BGD	22.97	24.42	25.33	19.21	23.77	<b>20.52</b>	19.53	22.29	<b>20.52</b>
BTN	16.41	16.30	18.95	13.98	16.21	14.02	<b>13.34</b>	14.69	<b>13.34</b>
IND	15.41	16.79	17.67	13.40	15.70	12.90	12.72	<b>14.01</b>	<b>14.01</b>
USA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	<b>1.00</b>

# GEKS - Variability of Indirect PPPs

**Table 10.5. Measures of variability of the direct and indirect PPPs (US = 1.00 for countries with the largest maximum/minimum ratios.**

<b>Country</b>	<b>Max/Min indirect PPPs</b>	<b>Relative Standard Deviation* of direct and indirect PPPs</b>	<b>Direct PPP/GEKS</b>	<b>GEKS PLI Weighted PLS/ GEKS</b>
<b>TZA</b>	<b>3.59</b>	<b>.18</b>	<b>1.19</b>	<b>1.01</b>
<b>QAT</b>	<b>2.78</b>	<b>.15</b>	<b>1.18</b>	<b>1.05</b>
<b>TJK</b>	<b>2.76</b>	<b>.15</b>	<b>.83</b>	<b>1.09</b>
<b>LAO</b>	<b>2.63</b>	<b>.14</b>	<b>.93</b>	<b>1.00</b>
<b>VNM</b>	<b>2.56</b>	<b>.14</b>	<b>.99</b>	<b>1.04</b>
<b>KHM</b>	<b>2.56</b>	<b>.13</b>	<b>.94</b>	<b>1.00</b>
<b>GNQ</b>	<b>2.50</b>	<b>.15</b>	<b>1.16</b>	<b>.99</b>
<b>KGZ</b>	<b>2.41</b>	<b>.14</b>	<b>.88</b>	<b>100</b>

# Two stage Vs. One stage 2005 data

	GDP per capita indexes (world = 100)			GDP world shares			
	GEKS				GEKS		
	Two-stage (1)	One-stage (2)	Ratio (3)	Two- stage (4)	One-stage (5)	Ratio (6)	
Asia-Pacific	40	43.8	1.10	21.9	22.4	1.02	
South America	93.8	91.9	0.98	5.6	5.1	0.91	
Eurostat-OECD	295.3	299.3	1.01	66.3	62.6	0.94	
CIS	102.5	116.6	1.14	4.1	4.4	1.07	
Africa	24.8	26.8	1.08	3.3	3.1	0.94	
Western Asia	86	89.6	1.04	2.5	2.4	0.96	
World	8,971	9,210		54,976	56,033		
China	45.6	50.4	1.105	9.7	10.04	1.04	
India	23.7	25.9	1.093	4.26	4.35	1.02	
Brazil	95.8	93.4	0.975	2.88	2.63	0.91	
Russian Federation	132.2	147.6	1.116	3.09	3.22	1.04	
Tajikistan	15.8	23.2	1.468	0.02	0.02	1.00	
South Africa	94.5	93.1	0.985	0.72	0.67	0.93	
Egypt, Arab Rep.	56.3	56.9	1.011	0.64	0.61	0.95	
United States	464.5	452.5	0.974	22.51	20.52	0.91	



# Making sense of new vs. old

- ❑ If everything remained unchanged—CAR increases Asia per capita indexes by 10 percent
- ❑ Also need to think about impact of:
  - ❑ All countries core vs. some countries ring
  - ❑ Use of importance and choice of weights
  - ❑ Direct estimates for dwellings in Asia/Africa
  - ❑ 2011 extrapolation vs. benchmark



# Last but not least

- ❑ What do about countries with significantly different price levels from 2005?
  - ❑ Statistical process to identify
  - ❑ Statistical method to estimate



# Thank You