

# International Comparison Program

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## Estimation of PPPs for the Pacific

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## **ESTIMATION OF PPPs FOR THE PACIFIC**

### **1. Introduction**

An important element of the Global ICP is linking the different regions to enable comparisons across regions. For all regions except the Pacific, linking will be based on common products from the Global Core List (GCL) as described in section 2 below. By contrast, linking for the Pacific will need to be based on common countries rather than common products; it is proposed that Fiji be used to link the Pacific to Asia and New Zealand and Australia be used to link the Pacific to the OECD.

This note provides further detail on a proposed methodology for linking the Pacific to other regions participating in the Global ICP.

### **2. The current approach to linking PPPs across regions**

The global linking methodology is best described within the broader context of estimating global PPPs and global expenditure shares.

PPPs are the ratio of prices in the currency of one country to prices in the currency of a second country. They can be computed at the level of a specific product, and aggregated to any desired level. PPPs can be interpreted as conversion factors required for an apples versus apples comparison of expenditure in two different countries. Where there are different currencies involved, PPPs have a natural interpretation as alternative exchange rates. However, even where two countries have the same currency, PPPs are measures of relative prices in the two countries and in general will be different from one.

The objective is to estimate overall PPPs for each country (relative to a base country and/or between each pair of countries), and to use these PPPs to estimate each country's share of global expenditure. Estimation proceeds in two stages – linking PPPs at BH level across regions and linking PPPs above BH level across regions (see for example Hill and Scholz, 7th TAG paper [02.01]).

#### **2a. Linking PPPs at BH level across regions**

Step 1a: Estimation of Regional BH PPPs based on Regional and Global items priced within each region. The preferred methodology is to estimate PPPs via a CPD-W regression if importance indicators have been compiled for the region (alternatively, unweighted CPD).

Step 2a: Conversion of Global items prices to the regional numeraire using BH PPPs from step 1a.

Step 3a: Estimation of linking factors between regions at BH level using Global item prices expressed in the regional numeraire from step 2a. This uses a version of the CPD-W methodology in which regions are treated as countries and each region has multiple prices for each product (ie one for every country).

Step 4a: Estimation of Global BH PPPs by multiplying regional PPPs from step 1a by linking factors from step 3a.

## **2b. Linking PPPs above BH level across regions**

Step 1b: Estimation of aggregate PPPs within a region using unrestricted GEKS aggregation. Laspeyres and Paasche price indexes are calculated for each pair of countries and used to calculate the Fisher price index. These are based on BH PPPs from step 1a and BH expenditure weights in national currency for each country. The GEKS method involves calculating a set of indirect indexes between a given pair of countries using each of the remaining countries (in turn) as an intermediate, and taking the average of these (together with the direct index).

Step 2b: Aggregated expenditures are deflated by aggregated PPPs from step 1b to derive volumes, and in particular country volume shares within each region. This "fixes" expenditure shares for countries within the regions. The main purpose of steps 1b and 2b is to establish fixity within regions.

The following steps 3b and 4b essentially replicate steps 1b and 2b at a global level.

Step 3b: Aggregated PPPs for each country are estimated by applying unrestricted GEKS aggregation on Global BH PPPs from step 4a and BH expenditure weights in national currency. This is done for each level of aggregation.

Step 4b: Aggregated expenditures are deflated by aggregated PPPs from step 3b to derive volumes for each country, and regional volumes are obtained by summing up total volumes for each country within the region.

Step 5b: The CAR method is then used to distribute regional volumes from step 4b to countries within the region according to the country shares in the regional results from step 2b. This maintains fixity within regions.

Step 6b: Aggregated global PPPs for countries are calculated indirectly by dividing country expenditures in national currency by volumes. This is done for each level of aggregation.

## **3. What is different about the Pacific?**

The dataset for the Pacific is characterised by a limited number of products within each BH, and a significant number of missing prices; that is, not every country prices every item in the BH and some countries price no items in the BH. The table in the Attachment shows the number of items in the Pacific Product List (PPL) within each BH and the number priced by each country in the Pacific.

The Pacific has not priced Global Core List products, and so cannot participate in steps 3a and 3b above to generate linking factors between the Pacific and other regions. As an alternative, it is proposed that the Pacific use overlapping countries (link countries) to estimate linking factors. In particular, Fiji is

participating in both the Asian and Pacific region comparisons and New Zealand and Australia are participating in both the OECD and Pacific region comparisons

With this in mind the following estimation and linking methodology is proposed for linking the Pacific and Asian regions:

Step 1: Estimate Pacific region BH PPPs using the same methodology outlined in step 1a above with Fiji as the base country. The CPD-W regression will provide BH PPPs relative to the base country for each country that prices at least one item in the BH; that is, the CPD-W regression will generate a BH PPP between two countries that have not priced a common item providing that each country has priced at least one item in the BH.

It has been noted that since most BHs only have a small number of products/prices, it may be preferable to calculate PPPs at a higher level of aggregation in order to generate more reliable PPPs. Table 1 can be used as a guide as to what levels of aggregation above BH may be appropriate for the Pacific.

Step 2: Estimate aggregate PPPs for the Pacific region using unrestricted GEKS, similar to step 1b above. This can be done at various levels of aggregation.

Step 3: Link Pacific PPPs to Asia by multiplying Pacific PPPs by Fiji's PPPs in the Asian comparison. Again, this can be done at various levels of aggregation

New Zealand is also participating in the Pacific region comparison and therefore could also serve as a link country. The number of products priced by New Zealand is also shown in the table in the Attachment. This means that the same methodology can be applied for New Zealand to link the Pacific to the OECD. If New Zealand is used as a second link country, there will be a need to "transitivise" so that the direct linking factor between the OECD and the Pacific equals the indirect linking factor between the OECD and the Pacific via Asia. This requires a GEKS type approach - given the initial estimates of the linking factors what are the "closest" estimates that satisfy transitivity.

Australia is also participating in the Pacific region comparison and therefore could serve as a second link country between the OECD and the Pacific. This would generate a second linking factor between factor between the OECD and the Pacific. The linking factors will be different if the PPP between Australia and NZ estimated in the Pacific comparison is different than the PPP between Australia and NZ estimated in the OECD comparison. In this case it may be logical just to take an average of the linking factors generated by New Zealand and Australia.

The dataset for the Pacific is also characterised by the fact that not all countries price all BHs. This would not be an issue if the unpriced BHs have zero expenditure weights. However, for some countries in the Pacific there are BHs with positive expenditure weights that have not been priced - either because the PPL does not contain any items from the BH, or because the country does not price any PPL items from the BH. Inclusion of these BHs in the aggregations will require proxy PPPs - PPPs for BHs judged similar and for which robust estimates of PPPs are available. (Note that this would be similar to estimating PPPs at a higher level of aggregation to start with as suggested above).

## **Attachment**

The following table shows the BHs priced in the Pacific, the number of products in the Pacific Product List (PPL) for each BH, and the number of products priced by each country.

There are two worksheets: the first shows only the BHs represented in the PPL and the second shows all BHs within Household Consumption



BH PRODUCTS.xlsx