



LINKING CONSTRUCTION AND CIVIL ENGINEERING IN ICP 2017

ICP Global Office, October 2019

**4th Meeting of the International Comparison Program (ICP)
Technical Advisory Group (TAG)**

**October 28–29, 2019
World Bank, 1818 H St. NW, Washington, DC**

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(ICP Global Office)

INTRODUCTION

The International Comparison Program (ICP) 2011 and 2017 approach for estimating construction and civil engineering purchasing power parities (PPPs) at the regional level is based on an input cost method, under which countries collect prices for items under three input groups — materials, labor and equipment hire — and provide estimates on weights of these three input groups for residential buildings, non-residential buildings and civil engineering related projects.

The steps to estimate the construction and civil engineering PPPs at the regional level entail the following:

- **STEP 1:** Input prices collected for materials, labor and equipment hire are allocated under the three construction and civil engineering basic headings — residential buildings, non-residential buildings and civil engineering works — based on the relevancy of a particular item for the given basic heading.
- **STEP 2:** PPPs for the three input groups, or sub-headings, — materials, labor and equipment hire — are calculated using the unweighted country product dummy (CPD) method, resulting in nine sets of sub-heading PPPs.
- **STEP 3:** The nine sets of sub-heading PPPs are aggregated based on construction resource mix weights¹ using the Gini-Éltető-Köves-Szulc (GEKS) method, resulting in three sets of basic heading PPPs.
- **STEP 4:** PPPs for the three basic headings are aggregated based national accounts expenditure weights using the GEKS method, resulting in a single set of PPPs for the construction and civil engineering category.

Eurostat-OECD follows a different approach for estimating the construction and civil engineering PPPs, namely, the “bills of quantity” approach². For linking purposes, Eurostat-OECD collects data as per the ICP approach for a selection of countries.

Due to the differences in the regional approaches for estimating the construction and civil engineering PPPs, the linking of said PPPs at the global level necessitates a special linking approach, as detailed below³.

LINKING CONSTRUCTION AND CIVIL ENGINEERING IN ICP 2011

For ICP 2011, Eurostat-OECD provided datasets as per the ICP approach for the following ten countries:

- Australia (AUS), Canada (CAN), Denmark (DEN), Finland (FIN), Hungary (HUN), Netherlands (NLD), Portugal (PRT), Russia (RUS), United Kingdom (GBR) and United States (USA).

The steps to link the regional construction and civil engineering PPPs entailed the following:

- **STEP 1:** Relevant machinery and equipment survey item prices were used as a reference for the equipment hire sub-heading at the global level, due to concerns with construction survey data quality and comparability.
- **STEP 2:** Regional item prices in local currency were used to calculate sub-heading PPPs using the CPD method for all regions and countries participating in the global linking; this yielded three sets of sub-heading PPP under the three basic headings.

¹ In practice, resource mix shares are used to divide basic heading level national account expenditure weights according to shares for each basic heading.

² Refer to [Eurostat-OECD Methodological Manual on Purchasing Power Parities](#) for details.

³ Refer to Annex 1 for the standard linking approach.

- **STEP 3:** The nine sets of sub-heading PPPs were subsequently aggregated using the GEKS method; this yielded three basic heading PPPs.
- **STEP 4:** Linking factors for the three construction basic headings were calculated as geometric means of the aggregated PPPs for the countries in a region.
- **STEP 5:** The regional basic heading PPPs were linked utilizing the linking factors from the Step 4.

After the below steps, the linked construction basic heading PPPs entered into the global aggregation as any other “standard” basic heading.

LINKING CONSTRUCTION AND CIVIL ENGINEERING IN ICP 2017

The ICP 2011 linking approach is suggested for the ICP 2017, with two exceptions:

- Eurostat-OECD countries with data as per the ICP approach are the following eleven countries: Belgium (BEL), Bulgaria (BGR), Germany (DEU), Finland (FIN), Netherlands (NLD), Norway (NOR), Portugal (PRT), Slovenia (SVN), Russia (RUS), United Kingdom (GBR) and United States (USA).
- Due to improvements in item definitions and respectively on data quality, data for the three input groups — materials, labor and equipment hire — are suggested for linking, including the equipment hire input group.

ASSESSMENT ON IMPACT OF THE SUGGESTED LINKING APPROACH

The above suggested linking approach for the ICP 2017 does not differ from the ICP 2011 approach. However, the utilized input data differs in terms of selection of the Eurostat-OECD countries for linking and usage of all input data from the construction survey.

Annex 1: Standard linking approach

Five regions were involved in the global linking: Africa (AFR), Asia and the Pacific (ASI); Eurostat-OECD (EUO), Latin America (LAT) and Western Asia (WAS).

The “standard” linking approach at the basic heading (BH) level entailed the following steps:

- **STEP A1:** ICP regions and Eurostat-OECD calculate regional basic heading (BH) PPPs using the weighted⁴ and unweighted⁵ country product dummy (CPD) or weighted and unweighted Gini-Éltető-Köves-Szulc (GEKS) methods⁶, and utilizing referencing.
- **STEP A2:** Global Core List item prices in national currency are converted into a common regional numéraire using the country's regional BH PPPs from [step A1](#).
- **STEP A3:** Interregional Linking Factors (LFs) for each BH are estimated using the weighted or unweighted methods based on converted GCL prices from [step 2](#).
- **STEP A4:** Countries' regional BH PPP from [step A1](#) are multiplied by the interregional LFs resulting from step A3 to arrive at linked BH global PPPs in world numéraire, with fixity⁷.

Furthermore, the “standard” linking approach above the BH level entailed the following steps:

- **STEP B1:** ICP regions and Eurostat-OECD aggregate regional BH PPPs using the GEKS method.
- **STEP B2:** Countries' volume shares in regional comparisons are obtained for each level of aggregation from [step B1](#).
- **STEP B3:** BH PPPs in world numéraire from [step A4](#) are aggregated using the GEKS method⁸.
- **STEP B4:** Regional volume totals in global comparison are obtained by summing the volumes for individual countries in each region from [step 3](#)⁹.
- **STEP B5:** Regional volume totals for each region from [step B4](#) are divided using the countries' shares in regional comparison from [step B2](#)¹⁰.
- **STEP B6:** PPPs in world numéraire for each country are derived indirectly by dividing countries' nominal expenditures by the volumes derived from [step B5](#) for each level of aggregation up to GDP.

⁴ Household consumption headings, excluding Asia and the Pacific region.

⁵ Other than household consumption headings, and Asia and the Pacific region for all headings.

⁶ Eurostat-OECD.

⁷ Global BH PPPs for the dual-participation countries are geometric means of “regional” AFR and WAS PPPs.

⁸ Dual-participation countries included only once to AFR region.

⁹ Volumes of dual-participation countries are included in both regions AFR and WAS

¹⁰ Volumes for the dual-participation countries are geometric averages of “regional” AFR and WAS Volumes