PARTIALLY-MULTILATERAL COMPARISON (PMC) APPROACH IN LINKING CIS ICP TO EU/OECD COMPARISON

CIS-Stat

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

October 28–29, 2019
World Bank, 1818 H St. NW, Washington, DC
Partially-Multilateral Comparison (PMC) approach in linking CIS ICP to EU/OECD comparison

Note prepared by CIS-Stat
October 7, 2019

CIS ICP

Most important features to be mentioned in context of linking the CIS to the EU/OECD are:

- The CIS-STAT carries out the regional multilateral comparisons using the Russian ruble as the numéraire currency;
- Russia participates in both CIS ICP and OECD comparison and strictly needs to fix its results (PPPs towards USD, etc.) gotten from the OECD comparison;
- CIS countries are highly interested in getting PPPs of their national currencies towards a broad set of other currencies (first of all, towards US dollar or/and euro), this ensures a much wider area for comparative analysis;
- CIS countries are interested in getting PPPs towards USD and other currencies based on a multilateral comparison approach;
- According to the EU/OECD rules, there is no option to include CIS countries (except Russia) into the EU/OECD comparison at the items’ level.

PPP estimates for CIS currencies towards the US dollar were obtained for all three CIS comparisons (accomplished up to now) – 2005, 2011, and 2014. Different methodological solutions were used for this.

Within the 2005 and 2011 cycles, the simplest approach was applied to link CIS ICP to EU/OECD comparison using a direct recalculation via a bridge country (“Simple Linear Calculation” approach). From the methodological point of view this was not a multilateral comparison of CIS countries with EU/OECD countries, but obtaining an indirect estimate.

Within the 2014 comparison a much more sound methodological approach was used. It was called a “Partially-Multilateral Comparison” of CIS and EU/OECD countries (PMC approach): “multilateral” – because the multilateral methodology is applied for the PPP aggregation, “partially” – because the bridge country data were used still at the first stage of computations (BH-PPPs).

Brief description of both approaches (2005/2011 and 2014) from the CIS experience is presented below.
Simple Linear Calculation (SLC) using bridge country data

Linking CIS and EU/OECD comparisons using direct recalculation on the basis of Russia’s results in the EU/OECD comparison is a simple procedure. The PPP estimates for each country’s currency towards the Russian ruble obtained within the CIS comparison are recalculated towards the US dollar using the respective PPPs of the Russian ruble to the US dollar obtained within EU/OECD comparison. The role of Russia as a bridge country is very clear here.

(1) \[ PPP(\text{NC}_{\text{CIS-j}} / \text{USD}) = PPP(\text{NC}_{\text{CIS-j}} / \text{RUB}) \times PPP(\text{RUB} / \text{USD}) \]

where:

- \( PPP(\text{NC}_{\text{CIS-j}} / \text{USD}) \) – purchasing power parity of the national currency of the country \( j \) from the CIS region towards US dollar
- \( PPP(\text{NC}_{\text{CIS-j}} / \text{RUB}) \) – purchasing power parity of the national currency of the country \( j \) from the CIS region towards the Russian ruble obtained within the CIS comparison
- \( PPP(\text{RUB} / \text{USD}) \) – purchasing power parity of the Russian ruble towards US dollar, obtained within the EU/OECD comparison

A direct linear recalculation provides fixity in both aspects needed:

- regional CIS comparison results themselves, they are just rescaled proportionally which maintains all relations between these countries’ results; and
- Russian results in EU/OECD comparison, which are not being modified at all.

The main advantage of linking two regional comparisons using direct linear recalculation is the simplicity of the procedure while maintaining fixity for Russian results within EU/OECD comparison. These reasons played the key role during the first two CIS ICP cycles (2005 and 2011), when there were many other problems to solve and restricted resources did not encourage additional work on linking on the basis of adequate methodology of the multilateral approach.

The main drawback of direct Simple Linear Calculation is the violation of the concept of multilateral comparison, which is inevitable for such approach. Use of a bridge country imposes all the peculiarities of the statistics (and economies) of the bridge country to other countries’ results. As a result one may not exclude that the PPP estimates for these countries could be biased.

The only way to avoid these disadvantages is to conduct multilateral comparisons, i.e. to carry out an integrated calculation on the basis of data collected in accordance with a single item list by national statistical offices of all the countries participating in the comparison. In order to obtain adequate – from the methodological point of view – multilateral PPP estimates of the CIS countries’ currencies towards EU/OECD currencies (towards the US dollar, the euro, etc.) it is necessary to integrate data on prices and GDP structures of the CIS and EU/OECD countries within a single calculation. Item lists (product baskets) used in the
CIS and EU/OECD comparisons are quite similar. But, due to organizational matters a full scale participation of CIS countries (with the exception of Russia\(^1\)) in the multilateral EU/OECD comparison has not been possible up to now. One of the key restrictions is the OECD and EU regulations that prohibit the disclosure of item price data to any non-member EU/OECD country.

In this regard, as there was no possibility to include the CIS countries into the EU/OECD 2014 comparison on a comprehensive multilateral basis, CIS-STAT used the partially-multilateral comparison approach to link the 2014 CIS ICP results to the EU/OECD ones. This allowed to substantially eliminate the shortcomings of indirect linking via a bridge country (Simple Linear Calculation) and to obtain more adequate multilateral PPPs of the CIS currencies towards the US dollar and other currencies.

**Partially-Multilateral Comparison (PMC) procedure**

Following the negotiations with the OECD and further agreement with Eurostat it was decided to link CIS and EU/OECD data at the BH level. This made it possible to avoid the issue of disclosing the EU/OECD item price data to CIS countries. This compromise solution appeared to be well-balanced and acceptable for all parties.

**PMC is a three-stage procedure.** At the **first stage** estimates of PPPs of the CIS currencies towards US dollar are obtained at the basic headings level:

\[
PPP_{BH-k}^{NC_{CIS-j}/USD} = PPP_{BH-k}^{NC_{CIS-j}/RUB} * PPP_{BH-k}^{RUB/USD}
\]

where:

- \(PPP_{BH-k}^{NC_{CIS-j}/USD}\) – purchasing power parity of the national currency of the country \(j\) from the CIS region towards US dollar for the basic heading \(k\)
- \(PPP_{BH-k}^{NC_{CIS-j}/RUB}\) – purchasing power parity of the national currency of the country \(j\) from the CIS region towards Russian ruble for the basic heading \(k\)
- \(PPP_{BH-k}^{RUB/USD}\) – purchasing power parity of the Russian ruble towards US dollar for the basic heading \(k\)

The first PMC step presented in (2) is a simple linear recalculation carried out at the BH level. However, next steps are performed in full compliance with the concept of multilateral comparisons.

At the **second stage**, on the basis of the combined BH data from CIS and EU/OECD countries, the GEKS method is used to compute intermediate aggregated PPPs of each CIS and EU/OECD country.

---

\(^1\) In 1996 Russia got the opportunity to participate in the OECD comparison on an experimental basis; this was officially transformed into regular participation later.
Actually, the results computed at this stage are already PPP estimates towards the US dollar and other currencies obtained on the basis of the multilateral comparison of CIS and EU/OECD countries. However these estimates cannot be considered as final ones because it is necessary to maintain a strict fixity for the results of countries participating in the EU/OECD comparison (including Russia as participant of the OECD comparison).

This is done at the **third stage**. For this purpose, one part of estimates obtained at the second stage (for countries participating in EU/OECD comparison including Russia) are brought back to the values which had been obtained within the initial EU/OECD comparison (i.e. are strictly fixed), and another part of values (for CIS countries) are modified proportionally.

Briefly speaking, one can say that PPPs from the EU/OECD comparison and also from the expanded EU/OECD/CIS comparison are scaled to the level of EU/OECD=1, and PPPs for EU/OECD countries obtained within the expanded EU/OECD/CIS comparison are replaced back with the PPPs from the initial OECD/SU comparison, followed by corresponding modification of PPPs for CIS countries.

Technically, this procedure\(^2\) may be described as it is shown below in the formulae (3) – (6):

\[
(3) \quad \text{PPP}^{\sim}_{\text{EU/OECD}} = \text{GEOMEAN} \{\text{PPP}^{\sim}_{\text{EU/OECD}-i}\}
\]

where:

\(\text{PPP}^{\sim}_{\text{EU/OECD}}\) – the geometric mean of the interim PPP estimates for all EU/OECD countries \((i)\) obtained within the PMC initially

\[
(4) \quad \text{PPP}_{\text{fixedEU/OECD}} = \text{GEOMEAN} \{\text{PPP}_{\text{EU/OECD}-i}\}
\]

where:

\(\text{PPP}_{\text{fixedEU/OECD}}\) – the geometric mean of the respective PPP estimates for all EU/OECD countries \((i)\) obtained within official EU/OECD comparison

\[
(5) \quad \text{FixCoef} = \frac{\text{PPP}_{\text{fixedEU/OECD}}}{\text{PPP}^{\sim}_{\text{EU/OECD}}}
\]

where:

\(\text{FixCoef}\) – fixity coefficient to keep the results obtained within the official EU/OECD comparison staying intact within the set of PMC final results

\[
(6) \quad \text{PPP}(\text{NC}_{\text{CIS-j}} / \$_{\text{EU/OECD}}) = \text{FixCoef} * \text{PPP}^{\sim}(\text{NC}_{\text{CIS-j}} / \$_{\text{EU/OECD}})
\]

where:

\(\text{PPP}(\text{NC}_{\text{CIS-j}} / \$_{\text{EU/OECD}})\) – purchasing power parity estimate for the CIS country \(j\), finally obtained within partially-multilateral comparison of the joint group of CIS

---

\(^2\) This is the standard procedure used by the Eurostat and the OECD for maintaining fixity – see “EUROSTAT-OECD Methodological manual on purchasing power parities (PPPs), 2012”, para. 12.2.6 and 12.3.5.
and EU/OECD countries, after applying fixity principle to the official EU/OECD comparison results

\[ \text{PPP}^\text{~}(N_{\text{CIS-j}} / \$_{\text{EU/OECD}}) \]  – purchasing power parity estimate for the CIS country \( j \), initially obtained within partially-multilateral comparison of the joint group of CIS and EU/OECD countries, before applying fixity principle to the official EU/OECD comparison results.

The PPPs towards the $\text{EU/OECD}$ are rescaled to the USD\(^3\) in a simple way.

As a result, the PPP estimates for the countries participating in the EU/OECD comparison (including Russia) remain unchanged.

Therefore all crucial requirements formulated at the beginning of the present note are met:

- CIS countries get PPPs of their national currencies towards USD, that ensures a much wider area for comparative analysis;
- these estimates are based on a (partially) multilateral approach, that ensures their much stronger methodological soundness;
- Russia’s PPPs towards USD as well as all other EU/OECD countries’ PPPs, gotten from the OECD comparison, stay strictly fixed;
- EU/OECD rules regarding the non-disclosure of items’ price data are fully met.

Numerical differences: internal regional (“pure”) CIS results vs. CIS results within the combined EU/OECD–CIS comparison

The nature of multilateral PPP calculations inevitably predetermines the likelihood of obtaining different numerical results depending on which range of countries are involved in the comparison. Respectively internal regional (“pure”) CIS results and CIS results within the combined EU/OECD–CIS comparison have differences – see the table in the Annex.

The differences are not uniform for different countries, but they have identical features for the whole set of countries in both 2011 and 2014 comparisons:

1) In fact, the richer CIS countries (like Kazakhstan, Belarus, Azerbaijan), having more economic similarity with Russia, kept their GDP p.c. level regarding the Russia’s level almost intact while moving from internal regional CIS comparison to the PMC-based combined EU/OECD–CIS comparison in both 2011 and 2014 comparisons.

Conversely, the poorer CIS countries got perceptibly some higher real GDP per capita while moving from internal regional CIS to EU/OECD–CIS in both 2011 and 2014 comparisons. This can be explained by the inclusion of a bigger number of more similar economies from the EU/OECD into the combined comparison.

---

\(^3\) The PPPs with the neutral base “OECD Dollar = 1” and with the base “USD = 1” (USD as numéraire currency) are different presentations of the same results. There is a strong users’ demand for getting the PPPs estimates towards the US dollar, not a conditional currency like e.g. “OECD dollar” (USD at the OECD average price level) or “Purchasing power standard, PPS” (euro at EU average price level). Therefore, CIS-Stat publishes results towards the US dollar as the numéraire currency.
2) Simultaneously, PMC-based CIS results demonstrated that the ranking by real GDP per capita achieved in the “pure” internal regional CIS comparison didn’t change in the aggregated final results for combined EU/OECD–CIS comparison. So, the fixity principle in a broad sense is maintained for all countries in combined multilateral comparison (both in 2011 and 2014): for the EU/OECD countries it is strictly ensured by the PMC procedure and for the CIS countries the ranking is kept.

Basing on this experience, one can say that applying the PMC procedure for linking CIS to the EU/OECD does not entail any radical changes for the CIS countries, but using a wider range of countries makes it possible to obtain more robust, reliable and transparent results.

**Uniqueness of official results**

The uniqueness of official results is an important condition for their correct use in the PPP-based analysis. Comparison results are used in various macro-economic calculations, including very important ones where statistical ambiguities are unacceptable.

In order to exclude any ambiguity in comparison results, the PPP estimates for CIS countries, gotten within the “pure” internal regional CIS comparison, are considered interim, and the CIS-Stat does not publish them. **The only official set of CIS ICP results is that one obtained via the partially-multilateral comparison EU/OECD–CIS.** (That’s why the table presented in the Annex is confidential.)

The mentioned argument is a political one. It is extremely important and it is absolutely sufficient for the decision taken. But there is also a strong methodological argument requiring focusing only on the final PMC results with ignoring the interim ones. Enlarging the number of countries with introducing more similar (by “per capita level”, price structures, etc.) countries makes the multilateral comparison results being more robust and reliable.

One might say that while looking for CIS currencies’ PPPs towards Russian ruble the internal regional CIS comparison would be appropriate, but while looking for PPPs towards US dollar the PMC procedure ensures a substantially better quality of results.

* * *

Within the 2014 CIS ICP, this was for the first time that the CIS PPPs’ estimates towards USD were obtained with using the partially-multilateral approach. Currently, the revision of 2011 and 2014 CIS ICP results as well as the computation of 2017 CIS ICP results include the PMC-based linking of the CIS to the EU/OECD results.

The Partially-Multilateral Comparison procedure was elaborated with the important participation of Sergey Sergeev as international expert supported by the World Bank.
The CIS-Stat highly appreciates also the very constructive cooperation with the OECD and the Eurostat which allowed making this important step forward.