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Currency Composition of Foreign Exchange Reserves (COFER) Data: Updates on the Implementation of Imputation Procedure of “Unallocated” Portion

Prepared by the Statistics Department

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Currency Composition of Foreign Exchange Reserves (COFER) Data: Updates on the Implementation of Imputation Procedure of “Unallocated” Portion¹

IMF staff have been testing imputations of the currency composition of the “unallocated” portion of the Currency Composition of Foreign Exchange Reserves (COFER) dataset to improve the analytical usefulness of the COFER global aggregates, following BOPCOM’s previous guidance on the benefits, methodology, and risks of this initiative. IMF staff are planning to release a working paper describing the imputation methods and results in November 2025. The next release of COFER data, currently scheduled for December 19, 2025, will provide 2025Q3 data. This release will be the first with the unallocated portion replaced by imputed data and 100 percent of foreign exchange reserves allocated. The historical time series will also be revised to include these imputations.

INTRODUCTION

1. The Currency Composition of Foreign Exchange Reserves (COFER) dataset provides the currency composition of official foreign exchange reserves. COFER data for individual countries are strictly confidential. Only global totals are published, with no regional breakdowns. At present there are 149 reporters, consisting of member countries of the IMF, non-member countries/economies, and other foreign exchange reserve holding entities. The allocated portion of the dataset comes from reporters, while the unallocated portion is mainly collected from total reserves—without currency breakdowns—reported by countries and entities compiled in the International Liquidity (IL) dataset that is part of the International Financial Statistics (IFS) framework. The dataset includes annual data from 1995–1998 and quarterly data from 1999 onward.
2. In 2025Q2, the latest quarter released, the “unallocated” portion of the COFER dataset was \$919.3 billion (i.e., 7.1 percent of the \$12.9 trillion in foreign exchange reserves held globally in that quarter), an amount which has been roughly unchanged since 2018. The unallocated portion is down considerably from the pre-2018 period, when reported data from countries accumulating large foreign exchange reserve holdings was either not provided, or still being phased into the COFER dataset to protect individual country data from residual disclosure.

BACKGROUND

3. There has been increased analytical attention on the COFER dataset, particularly in the context of geoeconomic fragmentation. At the same time, existing and potential fluctuations in the unallocated portion of the dataset may make it challenging for COFER data users to draw accurate conclusions from the aggregated data. For example, the movement of countries from reporters to non-reporters and vice versa, and related statistical methods used to smooth these entries/exports and prevent residual disclosure of individual country data, may obscure underlying patterns in currency composition.

¹ Prepared by Mr. Glen Kwende, Ms. Erin Nephew, and Ms. Hannah Wei, Balance of Payments Division, STA.

4. Now that the unallocated portion of the COFER dataset is down to only seven percent of foreign exchange reserves held globally, IMF staff have been testing imputations of the currency composition of the remaining country holdings to improve the analytical usefulness of the global aggregates presented in the COFER dataset.

5. Users of the COFER dataset typically either assume that the currency composition of allocated reserves reflects the total, or they impute the unallocated shares in their analysis. IMF staff are uniquely positioned to impute the unallocated portion of the COFER dataset, leveraging their access to country-level data while simultaneously reinforcing the confidentiality of reporters and reported data.

ESTIMATING THE UNALLOCATED PORTION OF THE COFER DATASET

6. IMF staff have developed methods of estimating this “unallocated” portion, using the discernable patterns in the other 93 percent of the dataset and other publicly available information, so that the published COFER dataset would provide complete coverage. Although the COFER dataset is based mostly on the data reported by countries, IMF staff were already using estimation methods to allocate the foreign exchange reserves of countries who have occasional missing or late submissions taking advantage of the relatively stable currency composition of monetary authorities’ portfolios.

7. The imputation methods applied to estimate the unallocated portion of the COFER dataset include carry-forward imputation,² stratified mean imputation,³ and/or a mixed method that is a combination of the two.

8. The largest part of the unallocated total is attributable to countries that haven’t ever reported to COFER at all, or that have previously reported to COFER, but stopped at some stage. For these countries, the entire amount of their reserves as reported in IL is currently included in COFER as “unallocated”.

9. For countries that have never reported to COFER, IMF staff have applied a stratified mean imputation method to impute the currency composition of their foreign exchange reserves. Countries that have never reported to COFER were grouped using publicly available data on trade and financial linkages, geopolitical relationships, and judgment. IMF staff then used the average currency shares from a grouping of similar countries in the COFER dataset to impute the country’s currency shares.

10. For countries who have previously reported COFER data to the IMF and then stopped, or for countries with large holdings of foreign exchange reserves, a previously-reported unusual skew to their currency shares, or both, IMF staff have used a mixed method. This combines carry-forward and donor-based imputation in order to arrive at the most analytically useful estimate, with adjustments based on publicly available information.

² The value at time t-1 replaces the missing value at time t. For non-reporting countries who were previous COFER reporters, the imputation of the currency composition of their reserves is based on their last reported shares for the first four periods after they stop reporting.

³ A missing value is imputed with a value observed from the mean of a stratified subgroup. For the COFER dataset, the average currency shares of the group to which the non-reporting country is assigned are utilized.

11. About three percent of the unallocated total (i.e., 0.21 percent of the COFER total) is attributable to countries that report the currency composition of their reserves as part of COFER, but whose total foreign exchange reserves do not fully coincide with those reported by the countries in their IL reports. For countries that report a different amount to COFER than is compiled in IL, the difference is currently included in COFER as “unallocated”. IMF staff are now proposing to eliminate the inclusion of such differences in COFER as unallocated. Instead, IMF staff are testing the use of total foreign exchange reserves derived using the most recent report, whether that report is from COFER, IL, or another official source (central bank website, etc.). The allocation of total foreign exchange reserves by currency in COFER, if not fully reported, will then be estimated by IMF staff using one of the other methods. This means that 100 percent of total foreign exchange reserves in the COFER database will be allocated.

STRENGTHENING CONFIDENTIALITY AND PREVENTING RESIDUAL DISCLOSURE

12. Strengthening the confidentiality of the COFER dataset is of the utmost importance. Imputing the unallocated portion of the dataset helps mitigate residual disclosure risks, particularly when countries enter or exit the reporting sample. Although there is no confidentiality concern about what could be revealed from these new imputations of the unallocated portion of the dataset, it is nonetheless important to keep in mind how outside observers may interpret the data. While publishing both the imputed and unimputed historical series bears little risk of residual disclosure, publishing both for the current period could reveal information for new respondents and non-respondents in the reporting population. Therefore, for current data, the IMF will only publish the percentage of total reserves that are imputed in each quarter, thus eliminating any residual disclosure risk.

13. The IMF used to publish a breakdown of the COFER dataset for advanced economies and emerging and developing economies up until 2015. However, starting in 2015Q2, this breakdown was no longer available. COFER is a strictly confidential dataset and the IMF is fully committed to safeguarding the confidentiality of individual data submitted by participating economies. To remain confidential and to avoid possible residual disclosure of individual country data, with the release of a list of COFER participants, the IMF decided to terminate publication of this breakdown. In the context of this work on estimating the unallocated portion of the COFER dataset, IMF staff have decided to continue not publishing this breakdown to preserve the confidentiality of individual country data.

NEXT STEPS

14. IMF staff are planning to release a working paper describing the imputation methods and results in November 2025. The next release of COFER data, currently scheduled for December 19, 2025, will provide 2025Q3 data. This release will be the first with the unallocated portion eliminated and 100 percent of foreign exchange reserves allocated, using the imputation procedures described above. The historical time series will also be revised to include these imputations.