



# MONGOLIA

## TECHNICAL ASSISTANCE REPORT—REPORT ON THE PRICES STATISTICS MISSION

October 2017

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# **INTERNATIONAL MONETARY FUND**

Statistics Department



## **MONGOLIA**

### **REPORT ON THE PRICES STATISTICS MISSION**

April 17–28, 2017

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**August 2017**

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**ABBREVIATIONS**

COICOP-HBS	Classification of Individual Consumption According to Purpose for Household Budget Surveys
CPI	Consumer Price Index
HIES	Household Income and Expenditure Survey
IPPI	Industrial Producer Price Index
ISIC	International Standard Industrial Classification of All Economic Activities
NSOM	National Statistical Office of Mongolia
XMUVI	Export Import Unit Value Indexes

## EXECUTIVE SUMMARY

In response to a request from the National Statistics Office of Mongolia (NSOM), a technical assistance mission visited Ulaanbaatar, Mongolia during April 17–28, 2017, to provide assistance with updating and improving the Consumer Price Index (CPI) and the Industrial Producer Price Index (IPPI). The mission also provided advice on the Restaurant Index and Export Import Unit Value Indexes (XMUVI), and reviewed the index compilation system used by the NSOM.

The mission found the CPI's expenditure weights were likely to overstate the significance of automobiles and motorcycles as they include secondhand purchases from other households. The next Household Income and Expenditure Survey (HIES) must identify these purchases so that the weights reflect net household expenditure by excluding transactions between households. The mission also recommends an adjustment to the expenditure shares in the updated CPI based on alternative data sources and improvements to the compilation procedure used to estimate the monthly price change for automobiles and motorcycles.

The selection of enterprises and products in the rebased IPPI should ensure appropriate coverage of exports. The mission recommended this process should include a review of 2015 customs data to ensure relevant enterprises and their products are selected in proportion to their significance to overall production. The NSOM should collect separate prices for domestic transactions and exports to support disaggregation of the IPPI between domestic transactions and exports.

The mission built on recommendations from a previous national accounts mission to enhance estimates of price change for exported copper concentrate in the XMUVI. The mission developed alternative methodologies to exclude the impact of quality change from the XMUVI for this significant product.

The mission commended the NSOM for implementing an internationally standard methodology within the system used to compile the updated CPI as recommended by previous missions. The mission did not have sufficient time to review the system's imputation procedures and encouraged the NSOM to complete this activity. The mission discussed, and the NSOM agreed, to implement the internationally standard methodology when the rebased IPPI is published in 2018.

### Priority Recommendations

- Adjust the expenditure share for automobiles and motorcycles in the updated CPI based on alternative data sources for sales of automobiles and motorcycles by households.
- Ensure the future HIES compiles data for sales of automobiles and motorcycles by households.

- Institute a compilation procedure for the automobile and motorcycle components of the CPI that holds the age, rather than the model year, constant.
- Ensure the IPPI's selection of enterprises and products reflect the significance of exports to production.
- Compile analytical XMUVI series for copper concentrate using alternative methods, and assess their suitability.
- Review the imputation procedures in the index compilation system employed by the updated CPI to ensure they are in line with international guidelines.
- Compile the rebased IPPI with the system used to compile the updated CPI.

## I. INTRODUCTION

1. In response to a request from the National Statistics Office of Mongolia (NSOM), a technical assistance mission visited Ulaanbaatar, Mongolia during April 17–28, 2017, to provide assistance with updating and improving the Consumer Price Index (CPI) and the Industrial Producer Price Index (IPPI). The mission also provided advice on the Restaurant Index and Export Import Unit Value Indexes (XMUVI), and reviewed the index compilation system used by the NSOM.
2. This is the fourth technical assistance mission to assist the NSOM in developing a suite of price indexes that reflect international guidelines and best practices. This report should be read in conjunction with the previous reports on missions in April 2012, September 2013, and October 2014. The mission also built on recommendations from the previous national account mission conducted in September 2016.

## II. CONSUMER PRICE INDEX

3. The current CPI was last revised in January 2012 based on the Household Income and Expenditure Survey (HIES) conducted in 2010. The weight reference period is calendar year 2010 and the index reference period is December 2010. The list of sampled items and their weights are derived from the 2010 HIES. This index has one year of overlap (2011) with its predecessor (based on the 2005 HIES). The NSOM is currently in the final stages of updating the CPI's weight reference period to calendar year 2015 to incorporate results from the 2015 HIES.<sup>1</sup>

### **Linking the current and updated CPI**

4. The updated CPI must be recompiled for earlier periods to enable linking with the current CPI. The mission supports the NSOM's decision to set the index reference period for all indexes to calendar year 2015. This will require the updated CPI series to be compiled back to January 2015 (using expenditure weights derived from the 2015 HIES). The NSOM plans to complete this task in early 2018 and subsequently publish the results in the Statistical Year Book.
5. As the current and updated indexes will overlap by 27 months (January 2015 to March 2017), the overlap period is ambiguous and must be specified. The historical practice has been to use a single month (December), and this remains a possibility. The mission recommends setting the overlap period to calendar year 2015 to ensure consistency between the linked time series and the updated CPI for all periods after and including 2015.

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<sup>1</sup> The updated CPI (commencing in April 2017) was published in May 2017 with an index reference period of April 2017.

***Recommendations:***

- Commence the updated CPI in January 2015 to enable linking with the current CPI.
- Use calendar year 2015 as the overlap period when compiling linked CPI time series.

**Expenditure shares for automobiles and motorcycles**

6. The expenditure share for automobiles and motorcycles should be derived using net purchases. This requires the HIES to collect information regarding data on both purchases and sales of automobiles and motorcycles by households.

7. The expenditure share of automobiles and motorcycles in the current CPI is overstated as all purchases of cars from other households are included in household expenditure. The current index's expenditure shares are derived using purchases of automobiles and motorcycles reported in the 2010 HIES. This issue has been discussed in previous mission reports and results from the absence of data items for sales of automobiles and motorcycles by households in the 2010 HIES.

8. The expenditure share of automobiles and motorcycles in the updated CPI is also overstated and should be addressed prior to publication. The 2015 HIES survey form had been finalized when this issue was identified in previous missions and no data item for sales by households was available in the 2015 HIES. The mission noted the overstatement may not be substantial as the expenditure shares for automobiles and motorcycles in the updated CPI are similar to expenditure shares in comparable countries. Nonetheless, the mission recommends an adjustment to the expenditure shares of the updated CPI based on alternative data sources (such as national accounts) to address this issue.

9. The absence of data on sales of automobiles and motorcycles by households is a critical deficiency in the HIES survey form which must be addressed. The mission reiterated previous mission recommendations to collect data on sales of automobiles and motorcycles by households in the same section of the HIES survey form which currently collects purchases.

***Recommendations:***

- Adjust the expenditure share for automobiles and motorcycles in the updated CPI based on alternative data sources for sales of automobiles and motorcycles by households.
- Ensure the future HIES compiles data for sales of automobiles and motorcycles by households. This will enable the CPI to compile expenditure shares based on net purchases.

### **Compilation of the price index for purchases of vehicles**

10. Currently, the price indexes for the purchase of automobiles and motorcycles are based on single brands and model years of vehicles for these types of vehicles. For automobiles, a single model year of a Toyota Prius is priced over time. Neither the model year nor the brand of the vehicle, used for pricing, is changed over time. A similar methodology is employed for pricing motorcycles.

11. The mission recommended a revised methodology for pricing automobile and motorcycle purchases in the new CPI. The revised methodology will expand the coverage of automobiles and motorcycles to include four different brands/types of vehicles and four different model years for each brand/type of vehicle. In addition, it was recommended that ongoing sample rotation be employed to hold the age of the vehicles, rather than the model years of the vehicles, constant over time. This could be accomplished by replacing the oldest model year for one brand/type of vehicle each quarter with a corresponding brand/type that is four years newer. Over a twelve-month period, the oldest model year for each brand/type of vehicle would be updated.

#### ***Recommendations:***

- Increase the coverage of the automobile and motorcycle components of the CPI to include different brands/types and different model years of vehicles. There should be four brands/types of vehicles and four different model years for each brand/type of vehicle.
- Institute a compilation procedure for the automobile and motorcycle components of the CPI that holds the age, rather than the model year, constant. This could be accomplished by replacing the oldest model year for one brand/type of vehicle each quarter with a corresponding brand/type that is four years newer.

### **III. INDUSTRIAL PRODUCER PRICE INDEX**

12. The current monthly IPPI has been compiled since January 2010 for products primary to the mining, manufacturing, electricity and water industries. Indexes are compiled for 89 products in 52 four-digit *ISIC 3.1* categories using monthly price data for 511 specifications collected from 151 enterprises. Its weight reference period is calendar year 2010 and the NSOM plans to publish a rebased IPPI (to 2015) in January 2018.

13. The selection of enterprises and products in the rebased IPPI should ensure appropriate coverage of exports. The selection of enterprises and products is (correctly) being carried out at the four-digit level of *ISIC v.4*. The mission recommended this process should include a review of 2015 customs data to ensure relevant enterprises and their products are selected in proportion to their significance to overall production. The mission also emphasized that separate prices should be collected for domestic transactions and exports where the product's characteristics (e.g., quality, terms of sale etc.) are dependent upon the

purchaser. This will support disaggregation of the IPPI between domestic transactions and exports, and compilation of an export price index based upon constant quality products with fixed specifications rather than unit value data obtained from Customs.

14. The rebased IPPI must be recompiled to for earlier periods to enable linking with the current IPPI. In order to support the NSOM's decision to set the index reference period for all indexes to calendar year 2015, the rebased IPPI should be compiled back to January 2015 (using weights derived from the 2015 production data). The mission recommends setting the overlap period to calendar year 2015 to ensure consistency between the current IPPI and the rebased IPPI for all periods after and including 2015.

***Recommendations:***

- Ensure the IPPI's selection of enterprises and products reflect the significance of exports to production. This will include collecting separate prices for domestic transactions and exports to support disaggregation of the IPPI between domestic transactions and exports, and compilation of an export price index based upon constant quality products with fixed specifications rather than unit value data obtained from Customs.
- Commence the rebased IPPI in January 2015.
- Use calendar year 2015 as the overlap period when compiling linked IPPI time series.

#### **IV. THE RESTAURANT INDEX**

15. The Restaurant Index is under development. Based on 2012–2014 revenue data, a sample of 125 enterprises were selected which reported a large volume of sales in all three years. An attempt to collect product detail of for sales was undertaken during 2015; however, this information is incomplete and not considered adequate. A revised collection was undertaken in 2016 and is expected to provide the desired product detail.

16. Data from 2016 should be used to construct the Restaurant Index's weights and sample selection. It should be supplemented with (incomplete) information from 2015 as required. The mission recommended to use the most recent period available and commence the Restaurant Index from January 2015.

***Recommendations:***

- Construct the Restaurant Index's weights and sample selection using data from 2016 sales data for the selected 125 enterprises. Supplement with data from 2015 where data for 2016 is unavailable.
- Commence the Restaurant Index from January 2015.

## V. EXPORT IMPORT UNIT VALUE INDEXES

17. The NSOM currently compiles and disseminates Export Import Unit Value Indexes (XMUVI) of various types. The sample of products and enterprises for the XMUVI were determined from Customs data for a period of 51 months (2010, 2011, 2012, 2013, and the first quarter of 2014). Those products with transactions in 25 or more of the 53 months were selected. For exports, 77 products in 15 groups comprising 97 percent of the value of exports were selected. For imports, 248 products in 19 groups comprising 77 percent of the value of imports were selected.

18. Unit values are problematic when products are not homogeneous as changes reflect both difference in the imported/exported product and price change. Previous missions have noted this issue and recommended the use of unit values is restricted to goods that are homogeneous in order to reduce volatility.

19. A pilot survey conducted in September 2014 collected specification based prices directly from exporters and importers. The survey covered export prices for two enterprises (covering one (raw plastic materials) of 77 exported products) and import prices for 40 enterprises (covering 64 of 248 products). While this approach reduced the incidence of unit values, the bulk of the data used to compile the XMUVI comprise unit value data obtained from Customs.

20. The NSOM attempted to reduce volatility by compiling XMUVIs as Fisher indexes with 12 month moving averages. The mission observed the resulting indexes remain volatile and appear to have minimal impact upon volatility of unit values. The mission also notes Fisher indexes with 12 month moving averages are: (a) atypical of other countries; (b) complicated; and (c) unlikely to meet requirements of national accountants.

21. The mission reiterates recommendations of previous missions to use specification based price data obtained directly from exporters and importers. The mission notes its recommendation to include export prices in the IPPI and suggests these provide a means to pursue compilation of an export price index based upon constant quality products with fixed specifications rather than unit value data obtained from Customs.

22. Following recommendations of the previous national accounts mission, estimates of price change for exported copper concentrate were discussed. The discussion confirmed the proportion of trace minerals such as gold, silver, and molybdenum do not remain constant over time and further efforts are required to exclude the impact of quality change from the XMUVI due to this product's significance. Several possible methodologies were discussed, including construction of a hedonic price index.

***Recommendations:***

- Replace unit value data obtained from customs with export prices collected by the IPPI.
- Compile analytical XMUVI series for copper concentrate using alternative methods, and assess their suitability.

**VI. COMPILATION SYSTEMS AND RECOMMENDATIONS FOR ALL PRICE INDEXES**

23. The index compilation systems currently employed by the NSOM are suboptimal and comprise the most substantial impediment to the orderly compilation price indexes which meet international guidelines and reflect best practice. The current systems are largely Excel-based and employ the current-to-base period formulation of the Laspeyres index formula and do not allow for the automatic imputation of missing prices. These issues are discussed in previous mission reports which recommended adopting the two-stage modified Laspeyres formulation for compiling all the price index series.

24. The Excel-based index compilation system developed for the updated CPI was reviewed and confirmed to use the two-stage modified Laspeyres formulation. The mission did not have time to review of the system's imputation procedures to ensure all imputations are self-correcting. Self-correcting imputations are essential to ensure the imputed values are brought back to the next directly observed price and described in international guidelines.

25. All other indexes use an index compilation system which is not based on the two-stage modified Laspeyres formulation. The mission discussed the possibility of compiling the rebased IPPI with the two-stage modified Laspeyres formulation system used by the updated CPI. It was agreed this change would be undertaken when implementing the rebased IPPI in 2018.

***Recommendations:***

- Review the imputation procedures in the index compilation system employed by the updated CPI to ensure they are in line with international guidelines.
- Compile the rebased IPPI with the two-stage modified Laspeyres formulation system used to compile the updated CPI.