

TWINNING CONTRACT

**Support to the State and Entity Statistical
Institutions, phase V**

Bosnia-Herzegovina



MISSION REPORT


on

Extended household budget survey (EHBS)

Component no 2, Activity 2.4

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List of Abbreviations

BiH	Bosnia and Herzegovina
BHAS	Agency for Statistics of Bosnia and Herzegovina
CONCORD	Controllo e Correzione Dati
DEI	Data Editing and Imputation
EHBS	Extended Household Budget Survey
ESS	European Statistical System
FIS	Institute for Statistics of Federation of Bosnia and Herzegovina
HBS	Household Budget Survey
RSIS	Institute for Statistics of Republika Srpska
Istat	Italian National Institute for Statistics
ToR	Terms of Reference

1. General comments

This mission report was prepared within the Twinning Project „Support to the State and Entity Statistical Institutions, phase V”. It was the second mission to be devoted to EHBS within Component 2 of the project.

The concrete objectives of the mission were:

- Clarify all steps in the Data Editing and Imputation stages
- Design further procedures of the DE&I for continuous variables
- Ranges of acceptance for HBS variables introduced into DEI procedures
- DE&I procedures for variables from ad hoc modules on social inclusion designed
- Design DE&I procedures for new HBS variables
- Mission report – summarized and detailed version completed
- General and detailed activity plans and draft ToR for the next mission prepared and agreed by all partners (BHAS-BD/ FIS/RSIS participants, experts and RTA) Presentation of alternative procedures for data cleaning, editing and imputation
- Preparation of the list of activities to be done before the next mission
- Preparation of the list of topics for the next mission

The consultants would like to express his/her thanks to all officials and individuals met for the kind support and valuable information which he/she received during the stay in Bosnia-Herzegovina, and which highly facilitated the work of the consultant.

This views and observations stated in this report are those of the consultants and do not necessarily correspond to the views of EU, BHAS / FIS / RSIS or Istat.

2. Assessment and results

Introduction

The main objective of this mission was to assist and train the BHAS, FIS, RSIS staff to solve the existing problems concerning HBS 2011 data editing and imputation related to the CONCORD software that have been used in the previous HBS surveys (2004 and 2007).

Current situation in data editing and imputation

Data editing and imputation in two previous HBS surveys was performed using the tailor-made software for data editing and imputation (it consists of CONCORD and additional programs developed in C++) developed in ISTAT. This software was used for data editing and imputation of both categorical and continuous variables. Software uses logical relations among variables (edit rules) for detecting errors in variables and for detecting missing variables as well.

For categorical variables CONCORD program was used implementing both the Fellegi-Holt algorithm for localizing random errors in data and nearest neighbour hot-deck technique for imputation. The application of this step was divided into different hierarchical procedures. Continuous variables checks mainly were based on the idea that variable values (or ratio variable values) must be located in certain pre-defined intervals. The boundaries for these intervals were built by local experts by observing data. Once these intervals have been defined, values that were not in the acceptance region were considered erroneous and thus replaced by imputed values. Nearest neighbor method was used for imputation in two previous surveys.

Rules for data editing, i.e. logical relations among variables and edit rules as well as boundaries for pre-defined intervals for variables were built by BHAS, FIS and RSIS staff. Such rules and boundaries for pre-defined intervals for EHBS 2011 have been prepared.

What concerns data editing and imputation in HBS 2004 and HBS 2007, it was performed with the help of the tailor-made software for data editing and imputation mentioned above and developed within a technical assistance projects. Staff in BiH statistical institutions has not enough knowledge in using this software.

HBS team in statistical institutes in BiH opinion is that above mentioned software is the only way to get data cleaned and edited for the EHBS 2011. Time schedule is too tight to implement alternative ways and alternative software for data editing.

During this mission, coherence and relationships between the DEI procedures have been established, and the organization of the programs and input and output files has been shown. The DEI methods developed under the CONCORD program in 2007 has been revised. In particular all the rules were verified and adapted to the HBS 2011, and some other logical rules were added. It has been assessed the work about the DEI phases done by the Bosnian team. It has been finalized almost all the DEI procedure. In particular the main focus of the work was about the analysis of outliers, through the construction of acceptance ranges and the

finalization of the final part of the DEI procedures concerning the treatment of continuous variables concerning consumption levels and income/investment levels.

The activities that the Bosnian team should do before the next mission are the following

1. Further improve the acceptance ranges according to the discussion had during this mission.
2. Adapt the program codes concerning the check of income and investments.
3. Apply the DEI procedure to the whole set of data in order to have the first statistics and indicators about the impact of the DEI procedure in order to have information for the final tuning of the DEI.
4. Concerning the two new modules on health and social inclusion, do some statistics about missing items, and think about some rules involving the main variables. These are critical modules because they gather subjective information, and it is difficult to check the validity of such a kind of information.

3. Conclusions and recommendations

The meeting has been very fruitful especially because of the work done by the Bosnian team on the DEI before the meeting.

Almost all the DEI procedure adopted for the HBS 2007 has been discussed and adapted to the HBS 2011. There are still some tasks to finalize the DEI and they refer in particular to the income and investment sections. The Bosnian team has to implement and develop program codes for these sections according to the decisions we agreed during the mission. More precisely, they have to implement deterministic rules to deal with inconsistencies between indicators addressing the presence of an income and the existence of an amount for income. Moreover they have to analyse outliers and find the ones that are caused by errors, this is carried out (as in other parts of the DEI) by means of acceptance ranges.

They will develop a program code for doing those checks. The code is very similar to the one that was used to check the consumption levels. Finally, before the next meeting, it is important to make run a first time the whole DEI procedure to have results and indicators to be discussed during the next mission in order to have the final version of the DEI procedure to apply to the data in order to have final validated data.

The recommendations are:

1. Finalize consistency rules for income and investments,
2. Finalize acceptance ranges (outlier analysis) for income and investment variables.
3. Implement a program code for doing the checks and the imputations
4. Do a first application of the DEI procedure to have first results to be used for the final tuning of the procedure.

4. Topics for the next meeting

The next mission in this component will be mission 4 from the plan. This mission will take place one month after this mission. The main activities during this mission will be

1. Assess the analysis of outliers made by the Bosnian team concerning income and investments variables
2. Go through the whole DEI procedure by applying it to the 2011 HBS survey data.

3. Analysis of the results and indicators in order to assess the validity of the DEI procedure
4. Final tuning of the DEI procedure.
5. Apply the final version of the DEI procedure to the HBS 2011 data .