TWINNING CONTRACT

Support to the State and Entity Statistical Institutions, phase V

Bosnia-Herzegovina

FINAL
MISSION REPORT

on

Structural Business Statistics

Component no 1.2.3 activity

Mission carried out by
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25th June – 29th June 2012

		STATISTICS DENMARK

IPA 2008

Abbreviations

BHAS BiH Agency for Statistics
BiH   Bosnia-Herzegovina
BRC   District of Brcko
FIS   Federation Institution for Statistics
KAU   Kind of Activity Unit
RSIS   Republic Institution for Statistics
SBS   Structural Business Statistics
FS   Financial Statements
E&I   Editing and Imputation

1. Executive Summary

The mission was carried out under the component 1. business statistics and sub-component 1.2 Structural business statistics of EU Twinning Project BA 08-IB-FI-03. Expected activities were the presentation and discussion of editing and imputation practices in the field of SBS and analysis of data editing methods in SBS/BiH.

Consultation consisted of five days of presentations and discussions in small expert groups. During the mission many areas of editing and imputation were presented and discussed. Selective editing, logical edits, outlier detection, donor imputation methods and E&I practises in Finnish and Lithuanian SBS were gone through. Also Lithuanian SBS electronic questionnaires were presented.

Data collection in SBS/BiH is currently based on stratified sample. It was perceived during the mission that BIH entities have access to FS data. FS data should be thoroughly analyzed and its role in SBS should be re-evaluated. At least, the possibility to use FS data as auxiliary information in editing and imputation should be examined. On a longer run, the main part of SBS production could be based on FS data instead of sample variables. This would mean increase in cost-efficiency, reduction in the response burden of enterprices and increase in the quality of the data, as main variables could be derived from real data.

Editing and imputation in SBS/BiH is currently, on a large part, based on interactive treatment. In longer run this can become quite labour intensive, especially if the scope of BR/BiH is enlarged or the coverage of SBS is widened to include all necessary activities. To improve cost-efficiency of statistical production of SBS, more automatic methods should be adopted, in the wider timeframe. First, a common E&I strategy for SBS for BiH entities should be formed. In the strategy, E&I process, methods and tools used should be described. Methods should include selective editing and complementary automatic editing and imputation methods to handle the non-influental cases. Strategy should be common for all BiH statistical system entities (RSIS, FIS, BHAS, Brcko district). As for the current situation, agreement should be reached between entities on harmonizing current practices used in E&I.

In the short run, all microedit rules should be included in one phase and before manual treatment of the data to prevent unnecessary loops in the editing process and hence, unnecessary contact to respondents. Microedit rules should take account all the relevant data available, that is; FS and historical data from previous data collections. Automatic imputation could be applied directly after edit rules to prevent unnecessary manual treatment.

2. Assessment and results

Editing and imputation practises

General editing and imputation practises in Finnish, Lithuanian and BiH structural business statistics were presented and discussed. On the first day, the BiH practises in E&I were discussed in more detail.

Editing in BiH is done in the different organizations of BiH statistical system, BHAS, FIS and RSIS and partially in their regional offices. For initial automatic editing (error checking) a common set of edit rules have been formed. Also for calculation of SBS variables common formulas are used.

In RSIS data is collected on regional level. Specialists from RSIS continue with data entry and data processing. First data is automatically checked against editing rules, failed edits are transferred to separate error datatable and from there the data is corrected manually. During microdata editing auxiliary information are used; from FS of the reference year and previous year SBS data. After manual correction, formulas are used to calculate the derived variables of the SBS regulation. Last, data is checked for outliers (Hidiroglou-Berthelot method) for the most important indicators. These outliers are then checked and corrected manually.

In FIS data is collected in the regional level. Also data entry and the subsequent data correction in accordance with edit rules is done on regional level. During microdata editing auxiliary information are used; from FS of the reference year and previous year SBS data. Data is then checked again in the FIS and after manual checking calculation of SBS variables is done. In FIS, data for stratas under 50% response rates was imputed by actual data from financial statements automatically and then the imputed data were again checked. Outlier detection was done with different method from RSIS and outliers were corrected automatically by hotdeck imputation on SBS variable level and manually at item level. Imputation for item non-response is done using colddeck method. Question was presented at which level corrections based on outlier detection should be done; SBS variable level or initial item level. Correction should be made on item level.

Data from Brcko district were manually edited in district but then delivered to BHAS and then followed the same procedure as in the case of FIS described above.

RSIS has implemented also edit rules concerning historical data and administrative data to the initial editing. Also the question of using derived variables in edit rules was brought up. It is the view of the consultants that all micro data editing rules should be preferably be done in one place with all the relevant auxiliary data that is available. And the following interactive editing for an observation, if possible, should be done only one time.

For all the data the consistency rules of EUROSTAT SBS manual are partially used. It was discussed how to handle the groups outside the boundaries of year-to-year variation check rules. The consultants pointed out that the values outside should be checked for errors, but if the corresponding data is evaluated correct it can and should be left untouched.

Administrative data of financial statements

The use of administrative data on the production was discussed. Currently the access to financial statements data is available to entities (RSIS, FIS, Brcko district) and is received in electronic format. The use of administrative data could be the basis of SBS data in BiH in the future, but at least it should be used in initial E&I phase automatically in edit rules and possibly in automatic imputation. The level of use of FS in SBS production as either basis of SBS or as auxiliary variable should be decided. But first a review of FS data as source information should be done. This was agreed to be homework for the second next mission for BiH.

Editing strategy

All the institutions of BiH statistical system agreed that a common strategy for editing should be applied for all institutions. After the decision concerning the use of administrative data a common E&I strategy should be formed, including the common E&I process, methods used and common tools produced.

During the mission the methods used in Finland and Lithuania in automatic E&I presented included error detection and correction based on edit rules, outlier detection in error localization and subsequent imputation, re-scaling method of imputation and donor imputation methods of hot deck and cold deck data. In the production of SBS selective editing should be used in combination of automatic E&I practises and both should therefore be included in the E&I strategy for implementation in the longer term.

In short term, agreement should be made on unifying methods in place and counterparts have agreed to do so. The agreement should be reached prior to next mission.

Usage of administrative data as auxiliary variables in initial automatic E&I was discussed. Automatic imputation, that is done before manual editing and immediately after automatic edit rule checks, should be implemented to correct systematic errors that can be localized correctly. The advantages of this procedure are clear; manual treatment of errors that can be corrected by exact automatic rules is neither cost-effective or of high quality, because different specialists in different circumstances could treat the same exact case differently. It was discussed whether the FS data is suitable for the purposes mentioned above.

During the mission EDIMBUS recommended practises manual was presented and the basic ideas of the manual gone through. Recommendations of the manual should be studied in BiH.

During the discussions of the next mission the representatives of BiH expressed their whish that the consultants of the SBS component should not change from mission to mission constantly.

3. Conclusions and recommendations

The recommendations from this mission are

Long term recommendations

1. *Review the use of financial statements data in SBS production. After the review, decision should be made whether to use it as an auxiliary information or as the basis of production of a part of SBS. Consultants recommend to use administrative data as the basis of the SBS production, at least in a longer perspective, but preferably as soon as it is possible.*
2. *Define a common E&I strategy including a common E&I process, with common methods used.*
3. *Selective editing and automatic E&I procedures complementing it should be adopted as part of the strategy.*

Short term recommendations

4. *All micro level edit rules should be applied at one place and interactive editing of the unit done at one time, if possible, to prevent unnecessary loops in the editing process.*
5. *Automatic initial E&I should be developed and applied.*

6. *Agreement should be reached on current practices used in E&I*

Annex 1. Terms of Reference

Structural Business Statistics
25th of June to 29th of June 2012
Terms of Reference - Activity 1.2.3
EU Twinning Project BA 08-IB-FI-03
Institute for Statistics of Federation of BiH, Zelenih beretki 26, Sarajevo

Component 1   Business statistics
      1.1. Statistical Business Register
      1.2. Structural Business Statistics
      1.3.   Construction Statistics
      1.4.   Retail Trade Statistics
      1.5. Tourism Statistics

Component 2   Houshold Budget Survey

Component 3   Institutional Capacity
      3.1. Long term strategy
      3.2. Metadata and classification system development
      3.3. Promotion of dissemination

Benchmarks
A) Sample designed (of 2011 reference year) improved by 3rd project quarter
B) Questionnaire sent out for SBS survey (2011 reference year) by 4th project quarter
C) Annual SBS results analysed by 8th project quarter
D) Annual SBS survey methods documented 8th project quarter

1.2.3. Activity
Follow up on 2011 SBS survey

The expected activities are:
- Going through the selective editing idea and solutions; discussion on use in SBS/BiH
- Going through the automatic editing routines, such as logical edits and outlier detection including theory and practical solutions; discussion about possible applying in SBS/BiH
- Going through the imputation methods such as cold deck and hot deck imputation including theory and practical solutions and discussion about applying method in SBS 2010/BiH
- Presenations of good practices in the field of data editing in SBS
- Analysis of data editing methods used on SBS data in BiH for 2010 as reference year - advantages and disadvantages; suggestion for data editing of SBS for 2011 as reference year
- Going through the electronic forms - best practice
- Preparation of list of activities that should be done before the next mission
- Preparation of list of topics for the next mission

Expected output
- ✓ Extend the training activities regarding data editing theory and practice
- ✓ Mission report – summarized and detailed version completed

✓ General and detailed activity plan and draft ToR for the next mission prepared and agreed by all partners (BHAS-DB, FIS, RSIS participants, experts and RTA)

<u>Explanation of the Expected output</u>
It is essential that the experts give selective and automatic editing idea, solutions and suggestions about possible improvements of data editing in SBS for 2011 as reference year.

List of participants

<u>Agency for statistics of BiH</u>
Nataša Lučić	Assistant Director in the Sector of Business Statistics
Tima Karačić	Senior Adviser for Structural Business Statistics,
Mia Šimović	Junior Official for Structural Business Statistics,
Bojana Cicović	Junior Official for Structural Business Statistics,
Jasna Hadžić	Head of the Department for sampling,
Alen Mrgud	Senior Official for IT,

<u>Institute for Statistics of Federation of BiH (FIS)</u>

Alma Čolpa	Senior Official for Structural Business Statistics,
Aida Ljuca	Senior Official for Structural Business Statistics,
Amina Muhić	Head of the Department for Sampling,
Asmira Hotović	Senior Official for IT.

<u>Institute for Statistics of Republika Srpska (RSIS)</u>

Slađana Nikić	Senior Official for Structural Business Statistics,
Darko Marinković	Senior Official for Sampling design and analysis,
Nevenka Bozalo	Senior Official for IT.

<u>Experts</u>
Pekka Tamminen	Dtatistics Finland
Antanina Valiulienė	Statistics Lithuania

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Đemka Šahinpašić	RTA Assistant, 00 (387) 63/721-104
Haris Imamović	Interpreter

Annex 2. Agenda of the mission

Time	Event	Purpose / detail
25 June, 12:00	Review of homework	• Pekka Tamminen, Antanina Valiulienė, BC participants)
	Editing	• Going through the selective editing idea and solutions; discussion on use in SBS/BiH • Going through the automatic editing routines, such as logical edits and outlier detection including theory and practical solutions; discussion about possible applying in SBS/BiH (Pekka Tamminen, Antanina Valiulienė, BC participants)
	Imputation methods	• Going through the imputation methods such as cold deck and hot deck imputation including theory and practical solutions and discussion about applying method in SBS 2010/BiH • Presenations of good practices in the field of data editing in SBS • Analysis of data editing methods used on SBS data in BiH for 2010 as reference year - advantages and disadvantages; suggestion for data editing of SBS for 2011 as reference year (Pekka Tamminen, Antanina Valiulienė, BC participants)
	Electronic forms and preparation for the next mission	• Going through the electronic forms - best practice • Activities to be done before the next mission • Topics for the next mission (Pekka Tamminen, Antanina Valiulienė, BC participants)
29 June, 12:00	Debriefing	• Evaluation and approval of the Summary Mission Report (Pekka Tamminen, Antanina Valiulienė, BC participants)

Annex 3. Persons met

Agency for statistics of BiH
Tima Karačić   Senior Adviser for Structural Business Statistics,
Mia Šimović   Junior Official for Structural Business Statistics,
Bojana Cicović   Junior Official for Structural Business Statistics,
Jasna Hadžić   Head of the Department for sampling,

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Alma Čolpa   Senior Official for Structural Business Statistics,
Aida Ljuca   Senior Official for Structural Business Statistics,
Amina Muhić   Head of the Department for Sampling,

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