TWINNING CONTRACT

BA 15 IPA SR 01 17

Support to the reform of the statistics system in Bosnia and Herzegovina

MISSION REPORT

Activity 2.2.6:
Testing of new framework for production of SBS data for 2017 as reference year

Component 2: Business Statistics
Sub-component 2.2: Structural Business Statistics

Mission carried out by
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List of Abbreviations

BHAS	Agency for Statistics of Bosnia and Herzegovina
BiH	Bosnia and Herzegovina
CBBH	Central Bank of Bosnia and Herzegovina
EC	European Commission
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FIA	Financial agency of FBiH
FIS	Institute for Statistics of Federation of Bosnia and Herzegovina
MS	EU Member State
APIF	Intermediary Agency for IT and financial services of Republika Srpska
RSIS	Institute for Statistics of Republika Srpska
RTA	Resident Twinning Adviser
ToR	Terms of Reference
SBR	Statistical Business Register
SBS	Structural Business Statistics
AD	Administrative data

1. General comments

This mission report was prepared within the EU Twinning Project "Support to the reform of the statistics system in Bosnia and Herzegovina". It was the third mission to be devoted to Subcomponent "2.2: Structural Business Statistics" within Component "2: Business Statistics" of the project.

The purposes of the mission were:
- Follow up from the second mission
  - Progress on draft agreement for the general supply of information or SBS AD – continued
  - To continue the analysis of variables from the AD pilot and study methodological causes of differences for complete set of variables for 2016
  - Depending on available resources, create and test a certain number of editing rules
- Presentation of the requirements for updating the application for producing SBS data for 2017 as reference year
- Testing calculation of variables from the updated application
- Analysis and discussion on improvement of the new production method of SBS
- Discussion about data editing and data imputation

The consultant would like to express their thanks to all officials and individuals met for the kind support and valuable information which they 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 consultant and do not necessarily correspond to the views of EU, BHAS, FIS, RSIS, CBBH, Statistics Denmark, INSEE, Statistics Finland and Croatian Bureau of Statistics.

2. Assessment and results

As a continuation of the previous mission, it was necessary to determine the progress made on the draft of AD agreement with FIA as the owner of the mentioned administrative data, for the integration in the SBS production system. Unfortunately, as FIS representatives could not participate in the mission, we do not have any feedback on possible progress on the agreement in question.

The analysis on variables derived from the AD Pilot processing for the 2016 reference year was continued during this mission, in order to consolidate the differences and inconsistencies related to population of companies covered with SBS 2016 survey. Comparisons were made between Income statement and annex and Income statement and Balance Sheet, and between variables derived from SBS survey and variables calculated from administrative sources.

An analysis and comparison of the results obtained by SBS survey with the results obtained from AD at the activity section level and companies' size class, was presented. Generally, the difference in total is minimal, but at the level of individual activities for particular variables, higher deviations of results have been noted. In particular, the analysis was performed on variables on inventories, e.g. total purchases and gross margin on goods for resale, and their influence on value added.

Additionally, the mathematical and logical controls of AD and the errors have been presented. Most errors are related to the comparison of data from the Income statement and data from the accounting Annex. Income statement, balance sheet and accounting annex for Republika Srpska are obtained from APIF, while for FBiH only the statistical annex is available from FIA.

A set of variables derived from Income statement were compared with the variables derived from the same items in the accounting annex, for the companies that were the subject of analysis. Variables

derived from Income statement were also compared with those derived from the same items in the Balance Sheet. The main focus was on turnover, inventories and personnel costs. Some inconsistencies have been identified, indicating that the Income statement and Balance sheet data are more reliable and better than the same items in the Annex.

Furthermore, some inconsistencies can be eliminated by editing some of the bad quality items on administrative source for which the error is very clear and unambiguous automatic editing rules can be defined. Set of editing rules which specify or constrain the admissible values should be implemented by computer program which should both detect and correct the data. In general, Income statement should be treated as a priority AD source in regards to additional statistical / accounting annex.

Differences between AD and annex with minimal amounts are suggested to be ignored because they do not affect the result and are most likely caused by rounding. Wherever possible, it is necessary to improve AD quality by incorporating controls on the AD forms themselves and by defining uniform and consistent user instructions in the next period. Generally, at any future data analysis and attempting to eliminate inconsistency at unit level, it is necessary to take into account the principle of matching revenues with expenses. Nevertheless, despite some inconsistencies, administrative data can be recommended in SBS production, with focusing on further auditing of major business entities, and enhancing and extending the data editing rules list related to individual administrative items. Furthermore, as a result of the analysis, the first set of data editing rules for the AD quality improvement were created at the mission. Since the definition of editing rules is demanding and complex work, and assumes a lot of analysis, modelling, simulations and calibrations, for the future development of editing rules, priority should be given to chosen priority items and then step by step expand the list of rules. The general edition model with accent on the order of performance of editations was presented and discussed.

Regarding improvement of the new production method of SBS, some proposals for updating of the new SBS production application and integration of administrative data were presented. Data flow was analysed in details, as well as key cooperation with SBR. The necessary set of data that SBR has to provide in accordance with the SBR Regulation EC 177/2008 has been highlighted and the basic guidelines and recommendations have been given. Also, experience with treatment of the part of the population without main administrative data source was presented from Croatia. BiH already has certain experience with unit non response estimate and assess SBS variables of entrepreneurs. The assessment is based on regression method using available data from SBR for entrepreneurs'.

But, in this way estimation is performed only on aggregate level. Therefore, it is recommended to move from estimation on aggregated level to estimation on unit level, based on ratio estimator – the share of a variable in turnover of the same stratum population (for which variables are calculated from available sources). Since, there is still no turnover information in SBR for some units, the 3-step evaluation model is recommended:

> ➢ Step 1 – estimation of turnover where it's missing:
> - Calculation of coefficient A = average „turnover" per employee in NACE and size class
>   - use for estimation of turnover at unit level
> - Estimation: unit turnover = unit number of employees * coefficient A
>
> ➢ Step 2 – estimation of other financial variables:
> - Calculation of coefficient B_{1-n} = share of every variable in turnover in NACE and size class
>   -use for estimation of financial variables on unit level
> - Estimation: unit variable = unit turnover * coefficient B_{1-n}
>
> ➢ Step 3 – estimation of variables of personnel costs
> - Calculation of coefficient C_{1-n} = average personnel costs per employee in NACE and size class
>   -use for estimation of variables Personnel costs, Wages and salaries and Social security cost
> - Estimation: unit personnel costs = unit number of employees * coefficient C_{1-n}

The following procedure is recommended to apply:

Considering that X^s represents „total turnover" for specific stratum, and representing each variable in stratum as Y^s, a ratio is obtained by: $\sum_{i=n}^{n} (Y_s / X_s)$.

Turnover existing in SBR-a is represented by X^e.
Each missing variable is represented by Y^e and the estimation on unit level is done by applying the following formula:

Where:

$$Y^e = X^e \times \sum_{i=n}^{n} \frac{Y^s}{X^s}$$

e = individual company variable
S = stratum variable
i = 1, ..., n = represents all companies with observed variables and that belong to the same stratum for which we want to estimate the variables.

Stratum is defined taking into account the activity classification (NACE Rev 2., 4-digit level).
In the case of non-existing minimum 3 units in some stratum, an interactive process is taking place based on higher NACE level.

Also, given that the English word "entrepreneurs" has a much wider meaning, it is proposed to change the term to "craftsmen", which are the natural persons' population engaged in economic activities.

3. Conclusions and recommendations

Although this mission was done in a satisfactory manner and represents significant progress in the integration of AD into the BiH SBS production system, the very fact that FIS representatives did not attend mission or provide feedback on the implementation of the previous recommendations shows that successful implementation of the project still faces difficulties. Therefore, as pointed out earlier, key efforts, with the EU's continued support, should be focused on:

- maximum coordination and cooperation between statistical system constituents (BHAS, FIS and RSIS), with a view to common definition and establishment of uniform methods, rules and interrelated statistical processes.

- Establishment, improvement and formalization of cooperation with AD holders, with a view to first make the regular delivery and then creating the possibility of direct intervention in defining the content and content of AD data.

- Improving the SBR content and quality of data as a key statistical resource responsible for defining the SBS population framework and providing key variables (NACE code, turnover, number of persons employed, number of employees).

- Support of the management in order to provide the necessary human and IT resources necessary for successful completion of project activities and for further sustainability of future established production and implemented solutions.

Other recommendations:

- Move from estimation on aggregated level to estimation on unit level used ratio estimator (estimation method is based on the ratio of each variable in turnover for the population with the same stratum)
- Continuation of analyses and testing of AD quality, development and modelling of new data editing procedures, by priorities
- Further development of work on editing algorithms, with defining of priority AD items
- Income statement should be treated as a priority AD source in relation to the additional statistical / accounting annexes

Actions needed for moving forward as well as for preparing the next mission

Action	Deadline	Responsible person
Forming of a list of editations rules for items in AD	before the next mission	BHAS FIS RSIS
Upgrade of SBS IT application	before the next mission	BHAS RSIS FIS
Further development of cooperation within the system (BHAS-FED-RS and SBS-SBR-NR)	before the next mission	BHAS FIS RSIS
Further development of cooperation with AD holders	before the next mission	BHAS RSIS FIS
Further development of treatment of the part of the population without main AD source	before the next mission	BHAS FIS RSIS
Plan of redesigning of SBS questionnaires	before the next mission	BHAS RSIS FIS

Annex 1. Terms of Reference

Terms of Reference
EU Twinning Project BA 15 IPA ST 01 17

Component 2: Business Statistics
Sub-component 2.2: Structural Business Statistics
22-25 May 2018
Hosting Institution: RSIS, Veljka Mlađenovića 12d, Banja Luka

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Activity 2.2.6: Testing of new framework for production of SBS data for 2017 as reference year

1. **Mandatory result and benchmarks for the component**

Mandatory result:

- Use of administrative data for producing structural business statistics established by 8th project quarter

Benchmarks:

- Inventory of existing administrative data source for the compilation of structural business statistics variables prepared by 1st project quarter
- Agreement with provider/s of administrative data sources made by 8th project quarter
- First structural business statistics variables based on administrative data produced by 8th project quarter
- Burden of reporting units calculated by 8th project quarter
- Updated methodological document on structural business statistics developed by 8th project quarter
- Quality report for Structural business statistics developed by 8th project quarter

2. **Purpose of the activity**

- Follow up from the second mission
  - o Progress on draft agreement for the general supply of information or SBS AD – continued
  - o To continue the analysis of variables from the AD pilot and study methodological causes of differences for complete set of variables for 2016
  - o Depending on available resources, create and test a certain number of editing rules
- Presentation of the requirements for updating the application for producing SBS data for 2017 as reference year
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3. **Expected output of the activity**

- Improved application for production of SBS data
- Improved and agreed method for calculation of variables
- Input provided to the ToR of next activity

Annex 2. Persons met

Agency for Statistics of BiH (BHAS)
- Tima Karačić, Head of Business Statistics Unit

- Bojana Cicovic, Specialist in Business Statistics Department

Institute for Statistics of Republika Srpska (RSIS)
- Danica Babić, Senior Officer for SBS

- Slađana Nikić, Senior Officer for SBS

MS Experts
- Željko Jelovečki, Croatian Bureau of Statistics

- Stjepan Boroš, Croatian Bureau of Statistics

Twinning Project Administration
- Katja Møller Hjelvang, RTA

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