TWINNING CONTRACT

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

MISSION REPORT

Activity 2.3.3:
Analysis of pre-pilot surveys results of the CPPI for Civil engineering

Component 2: Business Statistics
Sub-component 2.3: Construction Producer Prices Index

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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
FIS	Institute for Statistics of Federation of Bosnia and Herzegovina
MS	EU Member State
RSIS	Institute for Statistics of Republika Srpska
RTA	Resident Twinning Adviser
ToR	Terms of Reference

Executive Summary

This was the third mission conducted under sub-component 2.3 Construction producer price index for civil engineering. The main aims of this mission was to agree on the weights, sample, questionnaire, and timetable to be used for the pilot survey on civil engineering in BiH covering the areas of roads, highways, tunnels and bridges. A new it-application to be used for the computation of indices for CPPI (and SPPI) including calculation of indices and weights was also of great importance at this mission.

The mission included presentations and discussion of the experience from the statistical institutions of BiH from a pre-pilot survey where a smaller number of enterprises were invited to give comments on the questionnaire.

The sample for the pilot survey was agreed upon together with the final versions of the questionnaires for the survey. The reported prices from this pilot survey should be analyzed at the fourth mission under this component and a timetable for the pilot survey was therefore made and agreed upon.

An IT application is under development under activity 2.C.2 and this application shall be used for calculating the producer price indices for civil engineering. For that reason discussions on the use of this IT application were initiated including discussions on calculation issues related to indices and weights.

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 the sub-component 2.3 within Component 2 of the project.

The purposes of the mission were:

- Follow up from the previous mission
- Final questionnaire and results from the pre-pilot survey
- Sample for the pilot survey (presentation and discussion)
- Final weighting structure (presentation and discussion)
- Decide on timetable for pilot survey
- Discussion on how to implement CPPI for civil engineering in the new it-application
- Discussion on calculation of CPPI for civil engineering

The consultant 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 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

Follow-up from study visit to Denmark

In September 2018 a study visit to Statistics Denmark were conducted with participants from Agency for Statistics of Bosnia-Herzegovina and Institute for Statistics of Republika Srpska. Different general topics like *process model*, *data collection* and *publication of statistics* were presented together with the more CPPI specific issues like calculation of index for CPPI and IT application for the CPPI.

The lessons learned from this study visit were discussed during the mission. The statistical institutions of BiH all agreed on the importance of increased used of administrative data in the work with CPPI since use of for example VAT data from the tax authorities could prove to be a useful supplement to the survey data included in the statistical business register. Also it was agreed that more focus should be given to web based solutions in relation to surveys. This would increase the efficiency and reduce burdens experienced by both the reporting units and the statistical institutions of BiH.

Pre-pilot survey
Both FIS and RSIS has since the last mission tested the questionnaire for CPPI among some larger enterprises. This pre-pilot survey was conducted in to ways – actual meetings with potential future reporting enterprisesand by sending draft questionnaires for reporting and comments to other potential reporting enterprises.

This has been a good experience for several reason. The statistical institutions of BiH has with this pre-pilot survey gained valuable information from the reporting enterprises on the questionnaire in terms of understanding and possibilities. Some enterprises have already submitted price information on CPPI for civil engineering.

Some reporting enterprises has been very reluctant in relation to participate in the pre-pilot survey and more specific in reporting prices on their civil engineering projects due to confidentiality issues. This poses a rather serious problem for the statistical institutions of BiH and for the success of this component. The law on statistics in BiH stipulates that enterprises are obliged to transmit data to the statistical institutions of BiH when asked.

Solutions to these challenges where discussed at the mission.

Support could come from business associations for the area of construction and civil engineering. In Denmark this kind of support were used in the process of compiling new statistics for the area of renovation and maintenance and in relation to the statistics on producer price index for residential buildings. Statistics Denmark included business associations in the start-up phase in order to facilitate a good understanding on both sides for relevant issues.

Another possibility could be having relevant ministries or public enterprise (e.g. J.P. Autoceste and J.P. Autoputevi) informing the reporting enterprises of the importance of the data collection. In BiH public corporations like these could play an important role. They are responsible for contracting on state highways in BiH.

Questionnaires
The BiH experts presented a final version of the questionnaires. There are four questionnaires, one for each of the four selected structures: Roads, Highways, Bridges and Tunnels. All four questionnaires will be sent out to all of the selected companies in the pilot survey in order for them to choose which ones to fill in depending on what kind of construction work they are engaged in. The MS experts therefore suggested including a cover letter in the pilot survey, which explains this to the companies, so they know that they should not necessarily fill in all four questionnaires.

Weights

The issue regarding weights were discussed. From the Bill of Quantities weights exists at a very detailed level. Each of the four selected structures are divided into groups, sub-groups and work items[1], e.g. for Main Roads 100 m. see figure 1.

Figure 1: Hierarchy

	Item number	DESCRIPTION OF WORKS
Group	**1.**	**ENABLING WORKS**
Sub-group	1.1.	**Geodetic works**
Item	1.1.1.	Renewal and protection of set out alignment axis of other public roads on mountainous ground
Item	1.1.2.	Placing and protection of cross-section of road on mountainous ground-every 20m
Item	1.1.3.	Renewal and protection of set out alignment of other public works – final setting out
Sub-gruop	1.2.	**Clearing for construction site**
Item	1.2.1.	Removal of shrubbery and a tree of trunk of diameter up to 10 cm, and branches from densely vegetated surface – with machines
Group	**2**	**EARTH WORKS**
Sub-group	2.1.	**Excavations**
Item	2.1.1.	Surface excavation of fertile soil (topsoil) – machine work including loading and transport
Item	2.1.2.	Spread excavation of coherent soil including loading and transport
Item	2.1.3.	Spread excavation of soft rock including loading and transport

From the Bill of Quantities, weights exists on all three levels where the item level is the most detailed level. These weights from the Bill of Quantities belongs to the level of elementary aggregates or elementary indices in the calculation hierarchy.

The Calculation hierarchy is divided into two main parts; The lover level which is the calculation of the elementary indices from individual prices. This calculation is done in several steps using the Jevons (geometric mean) index formula[2]. The higher level where elementary indices are aggregated into higher level indices (sub- and total indices) using the Laspeyres-type index formula.

The elementary aggregate weights, i.e. the weights from the Bill of Quantities are used for these higher level aggregations. The main question is therefore at what level in the Bill of Quantities these elementary aggregates and their weights should be defined.

In the calculation of CPPI for residential buildings the level of work items is used as elementary aggregates. Therefore the most detailed level of weights from the Bill of Quantities are used in this calculation. This is a good argument for using elementary aggregate weights at the most detailed level in the calculation of CPPI for civil engineering as well. As long as there is no change in the work items until a new Bill of Quantity is conducted, this method is good.

However if it is anticipated that new items will enter the sample of work items and existing work items will leave the sample of work items on a regular basis, it is necessary to have more flexibility at this level. In this case, it would be better to use the sub-groups from figure 1 as elementary aggregates and then use the weights from this level of detail as the elementary aggregate weights. The work items within a sub-group could then either be weighted equally or by individual weights specified by the BiH experts based on the detailed knowledge from the Bill of Quantities and calculated using the Jevons Index

[1] In the SPPI/CPPI IT application, work items are called products, and are defined by a product id. In the IT application these can be further divided by using the sub-product id.
[2] Suggested in the mission report from Activity 2.C.1 regarding the IT application.

formula. This method would give more flexibility for work items to enter and leave the sample of work items.

Another issue is that not all of the work items from the Bill of Quantities will be used in the sample. Only the ones with the highest values are chosen for the sample. This gives rise to the second question, that is whether the entire sum of value from the Bill of Quantities should be reallocated to those items that are chosen for the sample. The MS experts and the BiH experts agree that the entire sum of values should be reallocated, as the chosen items represents the entire group of construction work.

Sample selection
The population from where a sample should be drawn for the pilot survey was defined as all units in the two NACE groups 42.11 and 42.13 covering construction of roads/highways and construction of tunnels/bridges. This population consists of 146 enterprises in the statistical business register (as of June 2018).

It was argued that the relevant population might be greater since enterprises in other NACE groups under *construction* also have activities related to the construction of roads/highways and tunnels/bridges. Therefore, there was a discussion on other possible sources from where these enterprises might be identified. Two possible sources might be of help in this work:

1. GRAD 21 – a quarterly survey on production within the area of construction includes information on the value of different fields of construction works. From this it might be possible to identify enterprises not classified inside NACE groups 42.11 and 42.13 with significant construction work related to roads/highways and tunnels/bridges.
2. J.P. Autoceste and J.P. Autoputevi (a public enterprise) has information on all enterprises involved in the construction of certain highways and this information could give further information to be used for the delimitation of the target population.

It was agreed that the statistical institutions of BiH would investigate the usefulness of these possible sources for information.

At the second mission, it was agreed to use two thresholds for the sample selection:
1. Only include units with 10 or more persons employed
2. Only include units with a financial turnover of 500 000 KM or more

Since the target population is small it was agreed to conduct the pilot survey with a sample equal to the target population. This would also make it possible to test the NACE classification of all the units registered within the NACE codes 42.11 and 42.13 in the statistical business register. That is, all 146 units in the statistical business register plus units identified from the GRAD 21 data or information from J.P. Autoceste and J.P. Autoputevi.

Timetable for pilot survey
A timetable for the pilot survey was agreed. The pilot survey should be finalised before 1 March 2019 or before the fourth mission to be conducted under this component. Data from the pilot survey should be well integrated in the new IT application before the fourth mission begins since one of the topics for this mission is actual look on the results of the pilot survey.

The agreed timetable for the pilot survey is given in the table below.

Task	**Deadline**
Finalise sample selection	14 December 2018
Questionnaires, cover notes etc. are prepared	20 December 2018
Send out questionnaires to selected sample	7 January 2019
Contact to nonresponding units ended	15 February 2019

Data editing ended	25 February 2019
Data in new it-application	1 March 2019

CPPI for civil engineering in the new IT application
New IT application for calculation of producer price indices for civil engineering is under development. This IT application will also support calculations of CPPI for residential buildings and SPPI (joint IT application).

During this mission different topics related to the future use of this IT application was discussed. The discussion was based on the mission report from the mission 29 October - 2 November 2018 under activity 2.C.2. and the developed IT application. The mission report included a *specification of the it system*. Several issues was highlighted.

First of all, the use of terms and the names of variables should be consistent throughout the specification in order to avoid misunderstandings. For example, "item" and "product" are used for the same variable. This should be corrected.

The term "sub-product" is introduced but not explained and in the window displayed on page 16 the name "Sub" is used for a variable. It is assumed that this "Sub" is the same as "Sub-product" but again, to avoid misunderstandings it must be clear what it covers.

At this time, it is not possible to enter notes in the application that will be saved as comments across periods. However a "Note"-button is already introduced in the application but with a different purpose. The purpose of this button is to register prices/products which are still under investigation. During the mission it was agreed that this "Note" button should be reserved for notes/comments to be saved in the data base (even from period to period). Furthermore a click-cell could be introduced for the registration of prices/product under investigation.

When working with price indices it is sometimes necessary to change prices of the previous period. On page 16 in the report it is stated that this should not be possible for the user, which is wrong. In case of quality changes it should be possible to change the price of the previous period.

Sometimes, a reporting unit fails to report prices in one period. This temporary nonresponse should be included in the calculation using an unchanged price. If a reporting unit fails to report in several periods it should be considered a permanent nonresponse and the reporting unit should be terminated. In this case the prices of the reporting units should not be included in current and future calculations. It is unclear whether the system keeps these units and prices in the calculations (as they should be for the temporary nonresponse) or not (as they should be for the permanent nonresponse). Therefore, this topic needs more attention in the specifications of the IT application.

3. Conclusions and recommendations

It was **concluded** that the pre-pilot survey had been a good and informative exercise for the statistical institutions of BiH.

Relevant business associations could help facilitate the reporting of data from the enterprises through information initiatives. Therefore, it is **recommended** that the statistical institutions of BiH take contact to those business associations to investigate possible solutions.

J.P. Autoceste and J.P. Autoputevi are public enterprises responsible for contracts in relation to construction of state highways. J.P. Autoceste and J.P. Autoputevi could approach the reporting companies asking them to fulfil their obligations towards the statistical institutions of BiH. This would require that high-level management of the statistical institutions of BiH take contact to the Ministry of

Transport and Communication in order to facilitate this initiative. It is **recommended** that the statistical institutions of BiH work for this solution.

It was **concluded** to use the questionnaires as they were presented by the BiH experts during this mission, and that the questionnaires should be accompanied by a cover letter explaining purpose and giving guidance (the MS experts will send suggestions for this cover letter).

It was **concluded** that when the sample of work items is considered stable, weights can be used at this detailed level in the calculations without the lack of flexibility being a problem.

In defining the sample for the pilot survey it is **recommended** that the statistical institutions of BiH should investigate the possibility for obtaining additional information on potential reporting units from the GRAD 21 survey and the public enterprises J.P. Autoceste and J.P. Autoputevi.

For the pilot survey it was **concluded** that a sample corresponding to the full population of NACE groups 42.11 and 42.13 in the statistical business register plus possible other relevant enterprises in other NACE groups should be used.

Conclusions were made on a timetable for the pilot survey (see table under 2.). The ultimate goal is to have reported data integrated in the new IT application before the fourth mission.

It is **strongly recommended** that the statistical institutions of BiH – as soon as possible – compile test data for the CPPI on civil engineering to be used for the test of the IT application. The test data should have the correct format to be successfully imported in the IT application. Since there are some unclearness on this issue the MS expert on the IT application should be contacted as soon as possible for guidance.

The specifications of the IT application (the mission report) gave rise to several questions. It is **recommended** that the statistical institutions of BiH submit these questions as soon as possible to the MS expert on the IT application – at least before the next mission under that activity (2.C.2 in December 2018).

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

Action	**Deadline**	**Responsible person**
Create CPPI test data and import it to the IT application	Before 4th mission	BiH counterpart
Send questions and comments to MS expert under activity 2.C.2	Before 10 December 2018	BiH counterpart
Investigate possible co-operation with business associations	Before 4th mission	BiH counterpart
Approach Ministry of Transport and Communication for co-operation with J.P. Autoceste and J.P. Autoputevi	Before 4th mission	BiH counterpart
Finalise sample selection	Before 4th mission	BiH counterpart
Questionnaires, cover notes etc. are prepared	Before 4th mission	BiH counterpart
Send out questionnaires to selected sample	Before 4th mission	BiH counterpart
Contact to non-responding units ended	Before 4th mission	BiH counterpart
Data editing ended	Before 4th mission	BiH counterpart
Data in new IT application	Before 4th mission	BiH counterpart

4. Topics for the next mission

The next mission will focus on analysing the results of the pilot survey. This includes discussions about data validation, response rate, nonresponses, calculations and implementation of CPPI in the new IT application.

Annex 1. Terms of Reference

Terms of Reference

EU Twinning Project BA 15 IPA ST 01 17

Component 2: Business Statistics
Sub-component 2.3: Construction Producer Price Index
12-15 November 2018

Hosting institution: BHAS – Agency for Statistics of BiH

Activity 2.3.3: Analysis of pre-pilot surveys results of the CPPI for Civil engineering

1. Mandatory result and benchmarks for the component

Mandatory result:

- Construction producer price index for division F42 – Civil engineering works produced by 8th project quarter

Benchmarks:

- Plan for development of producer price index produced by 1st project quarter
- Draft questionnaire and supporting documents for pilot survey prepared by 1st project quarter
- Pilot survey conducted by 2nd project quarter
- Results of pilot survey analyzed by 2nd project quarter
- Criteria for an IT application defined by 2nd project quarter
- Plan for regular production developed by 4th project quarter
- Index compiled by 5th project quarter
- Index made available to users by 6th project quarter
- Methodological document on producer prices in construction developed by 8th project quarter
- Quality report for producer prices in construction developed by 8th project quarter

2. Purpose of the activity

- Follow up from the previous mission:
  - Prepare the final version of the questionnaires for the pilot survey
  - Update the sample for the pilot survey using SBR 2017 for all three entities
  - Pre-pilot survey; each entity visits, if possible, 10 companies for testing the questionnaires
  - Finalise the weighting structure using the bill of quantities

- Presentation of final questionnaire and results/thoughts from the pre-pilot survey
- (BiH counterpart)
- Discussion about final questionnaire and pre-pilot survey (BiH counterpart +MS experts)
- Presentation of updated sample for the pilot survey (BiH counterpart)
- Discussion about updated sample for the pilot survey (BiH counterpart +MS experts)
- Presentation of final weighting structure (BiH counterpart)
- Discussion about final weighting structure (BiH counterpart +MS experts)
- Detailed timetable for pilot survey in January 2019 (BiH counterpart +MS experts)
- Discuss how to implement CPPI in the new IT application (BiH counterpart +MS experts)
- Start discussion on how to calculate the producer price index for civil engineering. Incl. how to do chain linking (BiH counterpart +MS experts)

3. Expected output of the activity

- Final version of the questionnaires for the pilot survey defined
- Sample for the pilot survey using SBR 2017 for all three entities updated
- Pre-pilot survey conducted, presented and analysed (field visit - testing the questionnaires)
- Weighting structure using the bill of quantities finalized
- Input provided to the ToR of next activity

Annex 2. Persons met

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