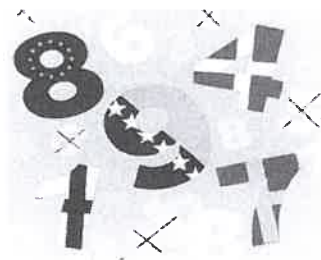


TWINNING CONTRACT

BA 17 IPA ST 01 20



Further Support to the Reform of Statistics System in Bosnia and Herzegovina



MISSION REPORT

Activity 5E: R training of staff from the Central Bank of BiH

**Component 5: Methodology for the compilation of the Monthly Balance of Payments
Statistics developed and aligned with EU standards**

Mission carried out by
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08 - 11 May 2023

Version: Final

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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

1. General comments

This mission report was prepared within the EU Twinning Project "Further Support to the Reform of the Statistics System in Bosnia and Herzegovina". It was the fourth mission to be devoted to the Component 5, Methodology for the compilation of the Monthly Balance of Payments, of the Project.

The purposes of the mission were:

- R computer software - basic training

The consultants would like to express their thanks to all officials and individuals from Bosnia and Herzegovina met for the kind support and valuable information, and which highly facilitated the work of the consultants.

This views and observations stated in this report are those of the consultant and do not necessarily correspond to the views of EU, CBBH, Statistics Denmark and Statistics Finland.

2. Assessment and results

The mission was scheduled as a four-day beginner course in statistical programming in R. The topics covered was as follows:

- R and RStudio
- Basic R
- Packages
- Reading and exporting data
- Data transformation using tidyverse
- Summary statistics
- Strings and dates
- Introduction to visualisation using ggplot2
- Introduction to reports using Rmarkdown

Furthermore, an example was presented on how to calculate the parts of the Balance of Payments for Maintenance and Repair based on a data supplied by CBBH.

The participants were well prepared, engaged and good at discussing the exercises internally, also their varied backgrounds benefited the course greatly.

The course covered a lot of content and it will require practice to get comfortable with programming in R and reap the benefit of using it instead of existing tools in the production of the BoP.

The topics of visualisation and reporting were introductory and could be expanded on in future missions.

3. Conclusions and recommendations

The participants in the course acquired the skills listed in the section above, but it is recommended that resources be set aside to practice using R and getting more familiarity with the environment.

Since the participants come from different sections of CBBH, we would recommend to set up a channel of communication where they can exchange experiences and problems with using R in production, this could be a Microsoft Teams channel, a mailing list or a physical forum.

4. What to do before the next mission for the BC Counterpart

See the recommendations in section 3

Annex 1. Terms of Reference for the current mission

Terms of Reference

EU Twinning Project BA 17 IPA ST 01 20

Component 5 - Monthly Balance of Payments Statistics

Monday 8th May 10 hrs– Thursday 11th May 15:30 hrs

(For specific time schedule, see the [Course webpage](#))

On-site meeting

Venue: Central Bank of Bosnia and Herzegovina, Mehmeda Spahe Street, Sarajevo

Activity 5E: R training of staff from the Central Bank of BiH

1. Mandatory results

Methodology for the compilation of the Monthly Balance of Payments Statistics developed and aligned with EU standards

There are two main objectives or sub results:

- 5.1 Preliminary monthly BOP report against rest of the world for determined time period produced.
- 5.2 Plan for introduction of GEO distribution in compilation and reporting of monthly BOP – prepared

Indicator / Relevant Milestones / Internal deadlines:

- Established internal registry of data sources for compilation of monthly BOP by end of (to be decided on the first mission)
- Prepared reporting table in accordance with selected format and delivered to Eurostat by end of (to be decided on the first mission)

2. Purpose of the activity

R computer software - basic training

For specific topics expected to be covered, please see below and the [Course webpage](#)

3. Expected output of the activity

Basic R level knowledge gained to be utilised in the daily work

Topics expected to be covered on the training (with expected time slots)

Day 1

Morning:

- The role of R (the engine) and RStudio (the control center)
- R-projects, workspace and history
- Using R help function (including built-in help function, online help, and “cheat sheets”)

Afternoon:

- Types of elements (numerical, character, logical, factor)
- Types of objects (vectors, matrices, data frames, and lists)
- Special values (NA, NaN, Inf)
- Logical operators

DAY 2

Morning:

- Packages (to extend functionality of base R)
- Reading from and writing to data in R-format (RData and RDS) and delimited files (csv and related); to a lesser extent we have covered working with databases and file formats native to other programs (Excel, SAS, SPSS, Stata etc.)

Afternoon + DAY 3

- *Functional flow and the pipe-operator*
- **Main focus:** Data wrangling using the tidyverse (dplyr and tidyr)
- Basic summary statistics

DAY 4

Morning:

- Working with the institution’s own data
- Discussion on potential additional course

Afternoon:

If time allows it: a brief demonstration of more advanced R features:

- R-reports (either compiled from plain .R files or knitted from R Markdown)
- Visualisation using graphical functions from base R (plot) and introduction to the grammar of graphics with ggplot2
- Maps on a NUTS2-level.

Annex 2. Topics for the next mission

Annex 3. Persons met

CBBH:

1. Vedran Milisav, Head of BoP Statistics Section
2. Naida Hadžimuratović, Expert for BoP Statistics
3. Suzana Kozinović – Ličanin, Expert for BoP Statistics
4. Dino Bojčanović, Senior Specialist for BoP Statistics
5. Aida Kalčo, Senior Specialist for BoP Statistics
6. Miran Ivanković, Specialist for BoP Statistics
7. Ivana Gotovac, Specialist for BoP Statistics
8. Radomir Mutabdžija, Specialist for BoP Statistics
9. Ajla Gežo, Financial Stability Specialist
10. Aida Nizamić, Financial Stability Specialist
11. Indira Avdagić, DBA
12. Edin Helda, IT Specialist
13. Belma Čolaković, Officer at the Office of the Chief Economist
14. Elma Hasanović, Officer at the Office of the Chief Economist
15. Emina Milišić, Officer at the Office of the Chief Economist

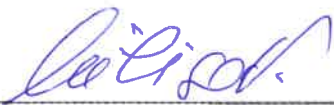
RTA Team:

Niels Madsen
Larisa Muslimovic

Signatures

For the approval of the contents of this summarized report, representative from CBBH as well as the MS experts and the RTA sign here:

Date:



Component leader, CBBH



RTA



MS Expert



MS Expert