**Microsimulation package INEQ-RS-COVID-19 - Version 1**

INEQ-RS-COVID-19 microsimulation package is the result of work on the project “ *Social Stability in Serbia Challenged? Pandemics, Economic losses, Inequality and Policy Responses - INEQ RS COVID-19*”, no. 7552225, financed by the Science Fund of the Republic of Serbia, within the Special Research Program COVID-19. The members of the project team INEQ RS COVID-19 are solely responsible for all errors that may occur in the operation of the package. We owe great gratitude for the formation of this package to the employees of the Republic Statistical Office (SORS) who provided us with data from the Survey on Income and Living Conditions (SILC) and are always ready to respond to our requests and inquiries regarding the research they conduct.

To use this tool, you need the STATA software package, knowledge of the work in this software, and harmonized micro data from the Survey on Income and Living Conditions (SILC), which can be obtained upon request from the Republic Statistical Office (SORS).

*This is the first version of the package in which the basic elements of the microsimulation system are defined: basic data, tax simulation (currently only for employees for salary) and simulation of compensation (currently only for monetary social assistance), as well as files analyzing changes in disposable income, inequality and poverty for two hypothetical system reforms. The current version of the package was made on the basis of data for SILC 2019. If the names of the variables are not changed, the package will work with both previous and future versions of the data from this research.*

*Further work on improving the package and its application in assessing the effects of the covid-19 pandemic on poverty is forthcoming.*

**Aim and description of the INEQ-RS-COVID-19 package**

The INEQ-RS-COVID-19 microsimulation package is a system of syntaxes (so-called *files*), programmed in the STATA software package that allows analysis. The aim of this package is to analyze the effects of reforming existing policies or introducing new policies in the field of taxation and social benefits. In the analysis of reforms of existing or introduction of new measures, the model is flexible and enables testing of different scenarios of new measures by changing the parameters of the model.

By its nature, the INEQ-RS-COVID-19 package performs ex-ante analysis, which means that the analysis is based on policy changes before the change occurred, based on the simulations of the reforms and comparison to the status quo. The microsimulation tool developed was inspired by microsimulation systems such as EUROMOD - the European microsimulation model[[1]](https://translate.googleusercontent.com/translate_f" \l "_ftn1)[[1]](#footnote-1) and CEQ package [[2]](#footnote-2) - implemented by the organization Commitment to Equity, which works closely with the World Bank. Microsimulation systems have been present for decades in analyzing the effects of economic and social policy reforms on inequality and poverty and other indicators of household well-being.[[3]](#footnote-3)

INEQ-RS-COVID-19 package starts from the income that a person or household receives, according to SILC survey data and analyzes how different types of income affect the disposable income of the household. In addition to using existing data from the SILC survey, INEQ-RS-COVID-19 is also based on simulations of taxes and social transfers. The tax simulation is based on the income that a person earns from work or capital and the taxes (including contributions) that each person has to pay depending on their status in the labor market and other income that they have. The simulation of social transfers is based on the analysis of the characteristics (including income) of persons and households, on the basis of which it is assessed if they are eligible to receive a certain social transfer and its amount.

The analysis within the INEQ-RS-COVID-19 package is based on several steps and we will describe each of them below.

**Step 0 - Extract relevant data from the SILC survey**

The first to file in tag 00 extracts the relevant data from the SILC survey and renames the variables so that the different databases from this survey can be used together. Additionally, within this file, data transformations are performed to arrive to derived variables, such as the number of children and family identifiers.

**Step 1 - Verification of data in relation to administrative reports**

In step 01a , the basic indicators of poverty and inequality are checked against the official SORS reports, which are calculated on the basis of SILC data and derived variables. In step 02a, the calculation of the basic aggregate variables (according to the instructions from the Eurostat website) - total income and disposable household income - is reconstructed to determine whether the sum of the individual variables corresponds to the aggregate variable.

**Step 2 - Defining different revenue groups within the INEQ-RS-COVID-19 package**

Step 2 defines the names of variables within the INEQ-RS-COVID-19 package and aggregate values ​​by income groups (income from labor / capital, pensions, social benefits, net transfers between companies) and provides a basic data package for the analysis of inequality and poverty, before any reform of the tax system or social transfer system occurs.

**Step 3 - Simulate taxes**

In step 3a, the gross income is first defined on the basis of the net income in the database, by taking into account the tax rules currently in force in the Republic of Serbia. Defining gross income is necessary because the basis for taxation in Serbia is gross salary, which in addition to net salary includes taxes and contributions paid by the employee (contributions that are paid by the employer are not included).

In step 3b, taxes for each employee are calculated on the basis of gross salary, by first calculating the monthly amounts of gross salaries and then applying the taxation rules to them.

*Currently, only taxes and contributions on wage-employed are defined. The current version also contains a tax reform in which the non-taxable part of wages is increased from the current 15,300 RSD, to the amount of the minimum wage (30,000 RSD).*

**Step 4 - Simulate social transfers**

In step 4, the package firstly determines the eligibility of the household or individual based on the socio-economic and demographic characteristics of household members. Then for those who are eligible for the transfer, the transfer is "allocated" to households.

*Currently, only the simulation of monetary social assistance is defined (4a). The current version also contains a reform of cash social assistance which eliminates the condition for the maximum number of household members who can receive social assistance (currently social assistance is received for a maximum of 6 household members).*

**Step 5 – Analysis of the effect of reforms**

Taking into account the results obtained in steps 3 and 4, files 5 analyze the changes in disposable income that have occurred as a result of the reforms. After calculating the new disposable income for each household member, the effects of reforms on poverty and inequality are analyzed.

*Currently, two files are defined*

*1)*   *File 5 3b\_r1 - tax reform in which the non-taxable part of wages is increased from the current level of 15,300 RSD to the amount of the minimum wage (30,000 RSD) - the analysis is done assuming that the tax reduction is fully transferred to the increase in net wages.*

*2)*   *File 5 4a\_r1 - a file analyzing the reform of cash social assistance in which the condition for the maximum number of household members who can receive social assistance is eliminated.*

1. for more details see Sutherland, H., and Figari, F. (2013). EUROMOD: the European Union tax-benefit microsimulation model. International Journal of Microsimulation, 6 (1), 4-26. [↑](#footnote-ref-1)
2. Lustig, N. (Ed.). (2018). Commitment to equity handbook: Estimating the impact of fiscal policy on inequality and poverty. Brookings Institution Press. p. 117. [↑](#footnote-ref-2)
3. More details on the usefulness of the microsimulation approach can be found in Bourguignon, F., and Spadaro, A. (2006). Microsimulation as a tool for evaluating redistribution policies. The Journal of Economic Inequality, 4 (1), 77-106 [↑](#footnote-ref-3)