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CCAMTAC- Regional Research/Analytical Economic Policy Seminar

"Microsimulation for Policymakers: POLSIM Model and its Applications"

Wednesday, June 22, 2022

Introduction and Moderator:

Norbert Funke, Director, CCAMTAC

Presenters:

Mateusz Najsztub, *Head of Fiscal Analysis Unit, Ministry of Finance, Poland*

Mr. Artur Krawczyk, *Senior Specialist, Ministry of Finance, Poland,*

Mr. Sebastian Roy, *Senior Analyst, Ministry of Finance, Poland*

Discussant

Mr. Shafik Hebous, *Deputy Division Chief, Tax Policy Division, IMF*

In his opening remarks, Norbert Funke highlighted that this was the first CCAMTAC research seminar given by one of CCAMTAC's development partners, and he thanked Marta Skrzyńska, the Polish steering committee member, for the initiative. Presentations not only by country authorities, but also development partners and IMF staff will further support peer learning.

As background to the analysis, Mateusz Najsztub started off by explaining that Poland has engaged in a number of smaller and larger tax reforms during the past few years. In addition to an analysis of the macroeconomic impact of reforms, key questions for policymakers are: How much will it cost? How many taxpayers will benefit/lose? Who will pay the price? These questions cannot be answered with macroeconomic models alone. However, microsimulations, based on the data of millions of taxpayers, while maintaining confidentiality, can shed light on these questions. To perform microsimulations each country has two potential data sources: official administrative data and households budgets surveys.

In his part of the presentation, Sebastian Roy focused on the Polish model and artificial reform scenario analysis. While several models exist, including from the European Union, Poland has developed its own model. The model is programmed in R and built with the object-oriented programming (OOP) paradigm. He showed how powerful the model is by analyzing a hypothetical simulation of two tax changes in Poland: (i) a change in tax-deductible expenses and (ii) the abolition of the possibility for married entrepreneurs to pay taxes jointly. Simulations allowed to analyze personal income tax changes by income decile group, income tax declaration, per occupation type, and as combinations of those.

To further promote peer learning, the authors also talked about the steps countries should to take to build their own model. Five key steps are: (1) review data availability and identify the best data sources; (2) choose the type of model (ready solutions versus custom solution); (3) develop the model; (4) test and validate; and (5) prepare the analysis, perform scenario analyses, and prepare a report.

In his comments Shafik Hebous underlined the importance of these type models and pointed to the advantages of in-house models, like the one from Poland. In-house models allow for a more customized analysis of scenarios. It would be important to validate the models. One of the challenges would be that standard models rely on a comparative static analysis and may not take into account behavioral changes of taxpayers, for example when tax reforms lead to a change in labor supply. However, this shortcoming can be overcome with satellite analysis of related elasticities and integration of the results in the models, without necessarily developing a fully integrated model. He concluded by noting that the IMF also provides capacity development in this area, including to assess the impact of tax expenditure.

Questions focused on the confidentiality of the data, the number of staff needed to develop and run these models, and scenario analysis.

For more information the authors suggested a few resources, including:

- EUROMOD: https://euromod-web.jrc.ec.europa.eu/;
- CEQ: https://commitmentoequity.org/;
- International Journal of Microsimulation (IJM); https://www.microsimulation.pub/;
- Journal of Artificial Societies and Social Simulation (JASSS): https://www.jasss.org .