2nd Banca d'Italia Workshop on Microsimulation modelling
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"Tax and benefit microsimulation in an inflationary environment: applications and methodological issues"

Opening address

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It is my pleasure to open this workshop on microsimulation studies on the redistributive effects of inflation. Many thanks to all speakers, discussants and participants.

This workshop gathers experts of microsimulation modelling from many different European universities and institutions, even more numerous than in our first workshop held in 2018. This testifies how pervasive microsimulation techniques have become in policy analysis and the extent to which they can provide valuable research, even thanks to a growingly richer availability of data, from both sample surveys and administrative archives.

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I do have some familiarity with tax-benefit microsimulation models. One of the first international economics conferences I ever attended was the IARIW Special Conference "Microsimulation and Public Policy" held at the University of Canberra in December 1993.[2] That conference was organised by professor Ann Harding, who prematurely passed away last January at 64. Ann played a very important role in pushing ahead research on microsimulations. If I am not mistaken, Ann was a co-founder and the first president of the International Microsimulation Association. In Australia, she founded and directed for sixteen years the National Centre for Social and Economic Modelling, NATSEM, at the University of Canberra. According to a report in the Canberra Times, she said about NATSEM:

> The reason for making the centre an independent institution is that it will be available as a national resource to anyone who wants to use it for strategic planning and to help improve the level of social and economic policy-making. It's going to help construct a much more informed debate about social policy.[3]

Ann was a friend. We will miss her.

It was then that I began to familiarise myself with microsimulations. In mid-1990s, I volunteered for what turned out to be an impossible mission. As a member of the governmental Poverty Commission, I proposed and then coordinated an exercise estimating the distributive effects of the 1995 Italian Budget Law conducted by running in parallel the three microsimulation models at the time existing in Italy.[4] Despite harmonising as much as possible simulation inputs and assumptions, and despite the generous efforts by all researchers involved, the outcome was a disaster: the simulations yielded conflicting results for the overall impact on inequality and poverty of the Budget Law.[5] It was not easy to explain this outcome to all other Commission's members, mostly non-economists, and certainly the experience did not benefit the credibility of our profession. The joint exercise

was carried out again few months later to assess the additional corrective measures approved by Parliament in March 1995, with similar difficulties.[6] Quite understandably, this exercise was never repeated. Nonetheless, it has provided a salutary warning that a single set of microsimulation results ought to be taken with a pinch of salt.

This disappointment did not stop us from developing microsimulation models at the Research Department of the Bank of Italy.[7] At the turn of the previous century, we started to work on DYNAMITE, a fully integrated behavioural dynamic model of the Italian household sector, with endogenous population dynamics and behavioural responses in consumption and labour supply. We developed a prototype, but the project was far too ambitious: its advancement and maintenance required many human resources and eventually we abandoned it.[8] That experience was not lost, however. It paved the way to several microsimulation analyses of taxes and transfers,[9] eventually culminating in the release of BIMic, the Bank of Italy's tax-benefit static microsimulation model that is regularly used to assess the redistributive effects of policy changes as well as their impact on monetary incentives to labour supply (although no behavioural response is incorporated into the model yet).[10] In parallel, we apply microsimulation tools for financial stability analysis, more specifically, to assess households' financial vulnerability.[11]

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In the face of the inflation upsurge, it was more than natural last year to use BIMic to assess its distributional consequences together with those of the counterbalancing Government policy measures.[12] We soon realised that we were not alone in this endeavour and that many institutions and researchers were carrying out similar exercises. Hence this conference.

The current inflationary shock poses a methodological challenge for microsimulation models, as they typically analyse changes in the legislation given the macroeconomic environment. Instead, this inflationary episode requires to assess the distributive effects of the macroeconomic shock itself. It will be interesting to see how this challenge has been dealt with in the papers discussed at this workshop.

Although referring to different countries, many papers that are going to be presented today share a similar conclusion: the most effective anti-inflationary tax-benefit policy measures are those well targeted to households most in needs. This is an important conclusion from the policy perspective. Indeed, the Bank of Italy's Governor recently called for Government's measures against inflation to be "temporary and targeted", and added:

> these interventions must be promptly removed when they are no longer indispensable, both because returning to the price stability target would be more difficult in the event of excessive public transfers and in order to not hinder the necessary transition to renewable energy sources.[13]

In designing interventions mitigating the effects of energy price rises, policymakers must consider that full sterilisation would be too costly for public finances, and that prolonged and universal public aids weaken the signalling effect of high energy prices, hence slowing down green transition.

Overall, drawing on national experiences as well as cross-country comparisons, today findings and discussions may help us to better understand the design of targeted and tailored discretionary measures. I am pleased to report that the Editor of the *International Journal of Microsimulation* proposed the organisers to collect selected papers from this workshop in a

special issue of the *Journal*. Going forward, I hope that this gathering can promote a stricter cooperation among microsimulation researchers belonging to different institutions and universities. As for us, Banca d'Italia will keep investing in microsimulation as an empirical method to fully understand the heterogeneous effects of policy changes.

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To conclude, let me make two points.

First, in Italy, but in many other advanced countries as well, we are facing big demographic changes. We definitely need dynamic microsimulation models, which account for population ageing, family transitions, intergenerational transfers, and so forth. My hope is to resurrect the old DYNAMITE project to have a better "microeconomic" understanding of how our society will evolve in the coming decades.

Second, tax-benefit microsimulation models are powerful tools. But we need to pause and be prudent when interpreting their results, as my experience with the Poverty Commission showed. At the same time, these models should not be seen as something for specialists only. Before Ann Harding, Tony Atkinson conceived microsimulation models as tools that could be applied by policy-makers, journalists and the general public alike. Here, we must be aware that they imply a serious black-box risk. Transparency is of upmost importance.

> It is essential – Tony wrote in a paper written with Mervyn King and Holly Sutherland forty years ago – that the methods used in the analysis should be fully explicit, and the availability of micro-computer programs of the kind produced by [us] is intended to encourage better informed debate about these important issues.[14]

In a sense, this is a call for FAIR (Findable, Accessible, Interoperable and Reusable) data.[15] Forty years earlier.

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[1] I thank Nicola Curci, Emanuele Dicarlo and Marco Savegnago for helping me in preparing this text, and Luisa Minghetti for valuable comments.

[2] At the conference, I presented a paper jointly written with G. Bruno and L. Guiso, "MOSED, A Macro-Econometric Simulation Model of Distributive Effects". MOSED was a prototype model to simulate the distributive effects of macroeconomic policies obtained by replacing the aggregate consumption equation in the Bank of Italy's quarterly econometric model of the Italian economy with a microeconomic module where expenditure decisions were modelled at the household level, using data from the Bank of Italy's Survey of Households' Income and Wealth. The consumption expenditure derived from aggregating individual estimates was fed into the macro-econometric model; the loop was closed by specifying a set of "entitlement rules" which allocated aggregate incomes and wealth to each individual household.

[3] Cited by A. Payne, "Ann Harding Obituary" (https://aliciapayne.com.au/news/speeches/ann-harding/).

[4] The exercise involved three research groups: the Centro Interdipartimentale di Studi Internazionali sull'Economia e lo Sviluppo (CEIS, University of Tor Vergata, Rome), the Istituto di Studi per la Programmazione Economica (ISPE, Rome), and Prometeia (Bologna).

[5] The exercise revealed important differences in the construction of the three models as well as in the definition of microsimulation outputs, including the choice of inequality and poverty indices. Despite the efforts, the ex-ante reconciliation was only partial. The final results for the impact of the Budget Law remained rather different: for instance, CEIS estimated a poverty headcount fall by 0.03 percentage points, ISPE an increase by 0.03 points, and Prometeia a far more substantial rise by 0.7 points. The summary joint report did not attempt to

reconcile these contrasting estimates and focused more on the coherent, mostly qualitative, results, especially those concerning individual measures included in the Budget Law. On the basis of this evidence, the Poverty Commission concluded that, within the limits of the exercise, the impact on poverty was overall modest, but stressed that this result had to be seen against an underlying tendency of poverty to grow (Commissione d'Indagine sulla Povertà e sull'Emarginazione, "Valutazioni in merito all'impatto della Legge Finanziaria per il 1995 sulla povertà e sulla distribuzione del reddito", 5 December 1994). The Poverty Commission sent its summary assessment, together with the three Institutes' joint and individual reports, to Government Ministers and to the Presidents of the Chamber of Deputies and the Senate of the Republic.

[6] See Centro Interdipartimentale di Studi Internazionali sull'Economia e lo Sviluppo, Istituto di Studi per la Programmazione Economica and Prometeia, "L'impatto sulla povertà della politica economica e sociale: la manovra correttiva 1995", March 1995.

[7] Almost from the outset, the Bank of Italy was also associated with the EUROMOD project, the European Union tax-benefit microsimulation model directed for over twenty years by Holly Sutherland, as I served as a member of its Advisory Group from 1998 to 2000 and again of its Steering Committee from 2010 to 2013.

[8] A. Ando, A. Brandolini, G. Bruno, L. Cannari, P. Cipollone, G. D'Alessio, I. Faiella, L. Forni, M.R. Marino, S. Nicoletti Altimari, "The Bank of Italy's DYNAMITE: Recent Developments", paper presented at the Banca d'Italia-CIDE Conference "Ricerche Quantitative per la Politica Economica", Perugia, 15-18 December 1999. The project originated from the model built by Albert Ando and Sergio Nicoletti Altimari, with the collaboration of Luigi Cannari. See L. Cannari, S. Nicoletti Altimari, "A Dynamic Micro Simulation Model of the Italian Households' Sector", *Annali di statistica*, vol. 16, 1998, pp. 103-134; S. Nicoletti Altimari, "A Micro Simulation Model of Demographic Development and Households' Economic Behavior", University of Pennsylvania, Ph.D. Dissertation, 1999; A. Ando, S. Nicoletti Altimari, "A micro simulation model of demographic development and households' economic behavior in Italy", Banca d'Italia, Temi di discussion, no. 533, December 2004.

[9] For instance, M.R. Marino, C. Rapallini, "La composizione familiare e l'imposta sul reddito delle persone fisiche: un'analisi degli effetti redistributivi e alcune considerazioni sul benessere sociale", Banca d'Italia, Temi di discussione, no. 477, June 2003; M.R. Marino, G. Messina, A. Staderini, "Gli effetti redistributivi della riforma dell'imposta sul reddito degli anni 2003-2005", in G. Rovati (ed.), *Povertà e lavoro. Giovani generazioni a rischio*, pp. 159-192, Roma, Carocci, 2007.

[10] N. Curci, M. Savegnago, M. Cioffi, "BIMic: the Bank of Italy microsimulation model for the Italian tax and benefit system", Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), no. 394, September 2017; N. Curci, P. Rizza, M. Romanelli, M. Savegnago, "Irpef, (in)equità e (in)efficienza: un'analisi strutturale basata sul modello di microsimulazione BIMic", *Economia Italiana*, no. 1, 2020, pp. 165-192; N. Curci, M. Savegnago, "L'assegno unico e universale per i figli: aspetti di equità ed efficienza", Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), no. 636, July 2021; E. Dicarlo, P. Recchia, A. Tomasi, "Le modifiche al sistema fiscale e di welfare italiano attuate nel 2022: profili di equità ed efficienza", Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), no. 748, March 2023.

[11] V. Michelangeli, M. Pietrunti, "A microsimulation model to evaluate Italian households' financial vulnerability", Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), no. 225, September 2014; C. Aurora Attinà, F. Franceschi, V. Michelangeli, "Modelling households' financial vulnerability with consumer credit and mortgage renegotiations", *International Journal of Microsimulation*, vol. 13(1), 2020, pp. 67-91.

[12] N. Curci, M. Savegnago, G. Zevi, R. Zizza, "The redistributive effects of inflation: a microsimulation analysis for Italy", Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), no. 738, December 2020.

[13] I. Visco, "The Governor's Concluding Remarks", Banca d'Italia, *Annual Report 2022*, Roma, 2023, p. 10.

[14] A.B. Atkinson, M.A. King, H. Sutherland, "The Analysis of Personal Taxation and Social Security", *National Institute Economic Review*, vol. 106, 1983, pp. 63-74; citation at p. 74.

[15] M. Wilkinson, M. Dumontier, I. Aalbersberg, et al., "The FAIR Guiding Principles for scientific data management and stewardship", *Scientific Data*, vol. 3, 2016, art. 160018.