

DYPENSI – Dynamic Pension Microsimulation Model for Slovenia: Overview, Model Architecture and Recent Developments towards a Multi-Purpose Policy Tool

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Economic sustainability and adequacy of social security systems is under severe pressure. Numerous studies prepared for Slovenia during the last decade clearly show that the on-going pension reform will not be enough to compensate the negative effects of demographic changes after 2025. Without further reforms the sustainability of the public finance and pension system would therefore steadily deteriorate, reaching one of the highest public finance deficits among the EU member countries. The Slovenian pension microsimulation model DYPENSI addresses these issues, allowing to assess both the future pension expenditures and the adequacy of pensions under various reform proposals.

The aim of this paper is to present the DYPENSI model, paying special attention on its technical architecture and design. As a continuous-time model allowing for realistic sub-annual spell durations of processes like unemployment, maternity and parental leave, and corresponding policies and benefits it follows a non-classical approach in the context of most other European models. Together with its high modularity and elaborate (optional) alignment routines we found this approach very powerful in various important dimensions: First, the design enables us both to reproduce and to challenge external scenarios as used e.g. in the Ageing Report. Second, it supports the further development of the model to a multi-purpose tool covering various additional policy domains including social assistance, health, and health care. DYPENSI is implemented in Modgen, a freely available programming language developed and maintained at Statistics Canada. This choice has proven to be very efficient in handling a large interacting population based on administrative data, maintaining family links, and implementing the various Slovenian policies which frequently include population wide relative measures like average wages in its benefit formulas.

DYPENSI has recently received new funding for substantial updates and extensions. In this context, this paper also aims at stimulating discussion on modelling choices, their trade-offs, and the consequences for the further development of DYPENSI to a multipurpose policy tool – being of potential interest also for other microsimulation projects.