

How Can Preferences of Policy-Makers Be Operationalised in Optimum Control Problems?

Dmitri Blueschke

Alpen-Adria-Universität Klagenfurt, Department of Economics, Austria
dmitri.blueschke@aau.at

Klaus Weyerstrass

Alpen-Adria-Universität Klagenfurt, Department of Economics, Austria, and
Institute for Advanced Studies, Macroeconomics and Public Finance Group, Austria
klaus.weyerstrass@aau.at

Reinhard Neck

Alpen-Adria-Universität Klagenfurt, Department of Economics, Austria
reinhard.neck@uni-klu.ac.at

Miroslav Verbič

University of Ljubljana, Faculty of Economics, Slovenia, and
Institute for Economic Research, Ljubljana, Slovenia
miroslav.verbic@ef.uni-lj.si

Abstract. In this study we use the SLOPOL10 model, a macroeconometric model of the small open economy of Slovenia. In order to obtain optimal trajectories of the fiscal policy instruments, we run several optimal control exercises using the OPTCON2 algorithm. Solving an optimum control problem implies finding certain paths of control variables which minimize an objective function involving deviations of the values of the politically relevant variables from some pre-specified target paths. The policy maker in this optimal control experiment is the government of Slovenia, which calculates the optimal trajectories of policy instruments for the years 2018 to 2030.

In a survey of the Slovenian politicians we asked them to name and then to rank economic indicators which are considered to be important in the process of policy making. All of the participants were asked to provide an estimate of importance of the category for the estimate of the condition of the Slovenian economy. According to the results of the survey, we selected eight major state variables which enter the objective function, namely the growth rate of GDP, the unemployment rate, the inflation rate, the budget balance ratio to GDP, the debt level ratio to GDP, the current account balance ratio to GDP, real private consumption, and real private investment. We also added some variables from the supply side to enter the objective function to allow for a stable optimal solution, called ‘minor’ target variables. To attach corresponding weights to the major variables based on the observed preferences, we define four different scenarios. Using the specified targets and weights, we are able to carry out several optimal control exercises and to calculate optimal fiscal policies according to the assumptions made.

We conclude from the optimization runs that scenarios with higher weights of revealed preferences lead to a better performance of the most important state variables but at the costs of a more active use of the control variables leading to higher objective function values. In all scenarios we observe qualitatively similar paths of the optimal results. The results can be interpreted that the main trade-off in the model come from a conflict between the costs of policy making and the costs of missing the “ideal” paths of the target variables. Our approach is a first step towards a better representation of policy makers’ preferences by interacting with the policy makers and incorporate the results from these interactions into the optimal control approach to the determination of optimal economic policies.

Keywords: macroeconomics; fiscal policy; Slovenia; crisis; public debt



JEL Code: E17; E37; H63