

# Alternative Simple Dynamic Model

## 1 Simple Model

Take a representative sample of households for the initial year. These will be distributed over the various possible inputs into the MicroSim model.

Find the optimal savings, labor/leisure and other decisions for each agent using behavioral equations from the macro model. Use a future expected time path for prices from a relatively simple forecasting model; perhaps an ILA DSGE model. Use the MicroSim to get taxes paid by each household given their status, this will require searching over possible choices by the household to find the optimal response. This may be a non-convex problem.

Use the assumed demographic laws of motion to find the status of each surviving agent from the sample. Add new 20-year-olds with some random initial draws. Make assumptions about the distribution of characteristics for new immigrants and draw these randomly as well.

With this new distribution for the second year of the simulation, repeat the above.

Iterate over all periods.

Note this allows for switching of individual types from one period to the next. The macro model in this case will involve a household's problem with explicit uncertainty in this case. We will need to solve using a Bellman equation setup.

We need a value function and/or policy function for each age. We need to map the current state into next period's state for the household. Some state variable can be viewed as exogenous and we will assign law of motion. Others will be endogenous and require finding policy functions using a grid method. We will need as many characteristics in the first category as is reasonably possible to avoid the curse of dimensionality.