README file for the R code in "Health Risk and the Value of Life"

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The folder containing this README file includes two separate implementations of code used to run the model used in the Quantitative Analysis section of the paper. The first implements the baseline specification (model-baseline) and the second allows for bequests (model-bequests).

The mathematical algorithms they employ are documented in Appendix C of the paper.

The R scripts are called from Stata using the **rscript** command. Below, we provide documentation on the R routines used by these scripts, as well as some supplemental routines that may be of interest.

Routines

calcLE(init_age,init_state, intrate = 0, RETPROBS = FALSE)

Calculates life expectancy. If interest rate is provided discounted life expectancy. If RETPROBS = TRUE, returns a vector with survival probabilities.

calcQualAdjLE(init_age,init_state, intrate = 0)

Calculates quality-adjusted life expectancy (QALY).

calcQualAdjPowLE(init_age,init_state, intrate = 0, qualpow = 1)

Calculates the expected value of quality of life to a power when alive.

calcVFun(init_age,init_state,wealth)

Calculates the value function (V).

calcVPrime(init_age,init_state,wealth)

Calculates V', the first derivative of the value function with respect to wealth.

calcVSL(init_age,init_state,wealth,onlyVSL = TRUE)

Calculates the value of statistical life (VSL).

calcVSI(init_age,fromstate,tostate,wealth)

Calculates the value of statistical illness (VSI).

calcPATH(init_age,state_path,wealth_zero)

Returns a path consisting of consumption, VSL, and wealth based on an initial age and wealth, and a given health state path.

simPATHS(numpaths,init_age,init_state)

Calculates sample paths for the health state based on initial age and state.

simVSL(numpaths,init_age,init_state,wealth_zero,TOSIM = 2)

Simulates VSL paths. If TOSIM = 1, then it simulates consumption paths rather than VSL paths.

Additional Information

VSL_data_init.R loads the data in the global environment. Quality of life and mortality rates are saved in 2-dimensional arrays, where the first component is the current state and the second component is age/time. Transition rates and interest rates are saved in 3-dimensional arrays, where the first component is the current (from) state, the second component is age/time, and the third component is the future (to) state.

VSL_solution_init.R implements the closed-form solution, particularly the K and c matrices defined in Appendix C of the paper.