README for "Present Bias Unconstrained: Consumption, Welfare, and the Present-Bias Dilemma"

Overview

This replication package provides the Matlab code needed to reproduce the results in Supplementary Material Appendices E and F of the article.

Data Availability and Provenance Statements

- No external datasets were used. However, the code provided here draws heavily from the codes provided on Benjamin Moll's website: https://benjaminmoll.com/codes/
    - It also uses the LCP code from Yuval Tassa available here: http://www.mathworks.com/matlabcentral/fileexchange/20952

Computational Requirements

Software Requirements

- Matlab (code was run with Matlab release 2023b)

Memory and Runtime Requirements

- This code was run on an 8-core Intel-based PC with 320GB of RAM
- Each iteration of the model takes less than 2 minutes to solve

Appendix E: Description of Matlab Programs

- Run main_2Huggett.m to solve the model
    - The program is set up so that it runs the exponential ($\beta = 1$) calibration
        - To run the other calibration cases, the variable presentBias needs to be changed (further details provided below)
- Once all three calibration cases have been run and saved in the output directory (saving is automatic), run plotOutput_2Huggett.m to produce the tables/figures in Appendix E
    - The 'main' code saves Matlab workspaces (.mat) to the output directory
    - The 'plotOutput' code saves figures to the figs directory
- The subfunctions directory contains additional Matlab scripts that are used when solving the model

Appendix F: Description of Matlab Programs

- Run wrapper.m to solve the model
    - The program is set up so that it runs both the rCC = 30% and rCC = 15% cases, and then plots the relevant output
    - The 'wrapper' code saves figures to the figs directory
- The 'wrapper' file calls model_calib.m and solve_HJB.m, which are used when solving the model

Appendix E: Instructions to Replicators

- The file main_2Huggett.m needs to be run 3 separate times, changing the variable presentBias each time. The following order is recommended:
    - presentBias = 0 (Exponential Case)
    - presentBias = 1 (Sophisticated Present-Bias Case)
    - presentBias = 2 (Naive Present-Bias Case)
- Once those 3 iterations of main_2Huggett.m have been run and the output saved, then the code plotOutput_2Huggett.m will produce the tables/figures used in Appendix E
    - The data for Table 1 is saved with the model output: see variable wealthDistStats

Appendix F: Instructions to Replicators

- Running the file wrapper.m will produce the figures used in Appendix F

List of Tables and Programs

The tables/figures in Appendices E and F can be reproduced based on the instructions above

References[1]

- Achdou, Yves, Jiequn Han, Jean-Michel Lasry, Pierre-Louis Lions, and Benjamin Moll, "Income and Wealth Distribution in Macroeconomics: A Continuous-Time Approach," The Review of Economic Studies, 2022, 89 (1), 45–86.
    - See in particular the associated collection of codes on Benjamin Moll's website:
        - Moll, Benjamin, "Heterogeneous Agent Models in Continuous Time," n.d., https://benjaminmoll.com/codes/
- Yuval, "LCP / MCP Solver (Newton-Based)," Matlab Central File Exchange, 2008, http://www.mathworks.com/matlabcentral/fileexchange/20952

[1] Note that the current README draws heavily from the README template used previously in Maxted et al.'s paper titled "Present Bias Amplifies the Household Balance-Sheet Channels of Macroeconomic Policy", both of which draw from the "README for social science replication packages" template provided by Social Science Data Editors.