README for "Present Bias Amplifies the Household Balance-Sheet Channels of Macroeconomic Policy"

Overview

This replication package provides the Matlab and Stata code needed to reproduce the results in the article.

Data Availability and Provenance Statements

- Survey of Consumer Finances (SCF)
    - The SCF data is downloaded directly in the code. Data can also be manually downloaded from https://www.federalreserve.gov/econres/scfindex.htm
- Federal Reserve Economic Data (FRED)
    - Data can be obtained from https://fred.stlouisfed.org/. Copies are provided as part of this archive for replication purposes. The specific series used are:
        - Monthly FRED.xls: GS10, MORTGAGE30US, MORTGAGE5US, TERMCBCCALLNS
        - Weekly FRED.xls: DFII10

Dataset List

Data file	**Source**	**Provided**
SCF/data/p16i6	SCF	No (code downloads directly)
FRED/data/Monthly FRED.xls	FRED	Yes
FRED/data/Weekly FRED.xls	FRED	Yes

Computational Requirements

The Matlab and Stata code used to generate the results in the article are uploaded to the repository.

Software Requirements

- Matlab (code was run with Matlab release 2024a)
- Stata (code was run with StataSE 18)

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 roughly 3 hours to solve
    - Some iterations can utilize pre-calculated data to run more quickly (see e.g. the variable HJB_preSolved)

MODEL: Description of Matlab Programs

(in the 'Matlab Model/' folder)

- Run main_householdbalancesheet.m to solve the model
    - The program is set up so that it runs the monetary policy experiment for the Exponential Benchmark
        - To run other calibration / simulation cases, the variables calibrationCase and sim_case need to be changed (further details provided below)
- Once all calibration/simulation cases have been run and saved in the output directory (saving is automatic), run tables_figures.m to produce the tables/figures in the paper
    - The 'main' code saves Matlab workspaces (.mat) to the output directory
    - The 'tables_figures' code saves tables/figures to the figs directory
- The subfunctions directory contains additional Matlab scripts that are used when solving the model and/or simulating a specific shock. See in particular:
    - model_calib.m provides various model calibration cases (see variable calibrationCase in 'main' file)
    - initialize_sim_case.m provides various model simulation cases (see variable sim_case in 'main' file)

EMPIRICS: Description of Stata and Matlab Programs

(in the 'Empirical Analysis/' folder)

- In the folder SCF/, run the file scf2016_main.do to download and analyze the 2016 SCF
    - The 'main' program calls scf2016_dataclean.do, which helps process the data
    - The 'main' code produces the file SCF_results_16.xlsx, which stores the output used to calibrate our model
- In the folder FRED/, run the file FRED_analysis.m to process the interest rate data used to calibrate our model
    - The output used to calibrate our model is reported directly in Matlab

MODEL: Instructions to Replicators

- To begin, note that descriptions and codes of simplified stopping-time problems are available at https://benjaminmoll.com/codes/
    - See in particular http://benjaminmoll.com/liquid_illiquid_numerical/ as well as the corresponding code currently located at https://benjaminmoll.com/wp-content/uploads/2020/06/liquid_illiquid_LCP.m
- The file main_householdbalancesheet.m needs to be run separately 38 times under the following specifications. Note that sim_case = 0.0 and sim_case = 0.2 are the benchmark monetary and fiscal shock experiments. The other sim_case setups are for various extensions. The following order is recommended:[1,2]

[1] This exact order is not needed, but some runs are dependent on others. Changing the order may cause errors.

[2] For researchers with the available RAM, some cases can be run simultaneously to speed up computing time.

    - calibrationCase = 1 (Exponential Benchmark)
        - sim_case = 0.0 (Benchmark Monetary Policy shock)
        - sim_case = 0.2 (Benchmark Fiscal Policy shock)
        - sim_case = 0.1
        - sim_case = 0.51
        - sim_case = 0.52
        - sim_case = 0.7
        - sim_case = -1.25
        - sim_case = -1.251
        - sim_case = -1.252
        - sim_case = 1.25
        - sim_case = 1.251
        - sim_case = 1.252
        - sim_case = 2
        - sim_case = 2.1
        - sim_case = 2.2
    - calibrationCase = 2 (Present-Bias Benchmark)
        - Run the 15 sim_case iterations again exactly as specified just above
    - calibrationCase = 3 (Intermediate Case: Exponential + Procrastination)
        - sim_case = 0.0
        - sim_case = 0.2
    - calibrationCase = 4 (Intermediate Case: Exponential + Rational Inertia)
        - sim_case = 0.0
        - sim_case = 0.2
    - calibrationCase = 5 (Intermediate Case: Present Bias + No Procrastination)
        - sim_case = 0.0
        - sim_case = 0.2
    - calibrationCase = 6 (Intermediate Case: Present Bias + Rational Inertia)
        - sim_case = 0.0
        - sim_case = 0.2
- Once all of the above 38 iterations of main_householdbalancesheet.m have been run, then running the code tables_figures.m will produce the figures/tables in the paper and appendices

EMPIRICS: Instructions to Replicators

- Running SCF/scf2016_main.do produces an excel file titled SCF_results_16.xlsx that stores the output from the 2016 SCF used to calibrate our model
    - Note that the SCF provides SAS code to produce variables for their Bulletin articles, and our Stata code draws heavily from this SAS code
    - See https://www.federalreserve.gov/econres/files/bulletin.macro.txt
- Running FRED/FRED_analysis.m produces (directly in Matlab) the interest rate wedges and dynamics that we use to calibrate our model

List of Tables and Programs

For our Matlab model, tables and figures are produced by running the file tables_figures.m. Note that tables_figures.m assumes that all calibration / simulation cases have already been run and saved (details above).

References[3]

Board of Governors of the Federal Reserve Board, Survey of Consumer Finances; https://www.federalreserve.gov/econres/scfindex.htm.

Board of Governors of the Federal Reserve Board, SCF Bulletin Macro; https://www.federalreserve.gov/econres/files/bulletin.macro.txt.

Board of Governors of the Federal Reserve System (US), Commercial Bank Interest Rate on Credit Card Plans, All Accounts [TERMCBCCALLNS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/TERMCBCCALLNS.

Board of Governors of the Federal Reserve System (US), Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis [GS10], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/GS10.

Board of Governors of the Federal Reserve System (US), Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis, Inflation-Indexed [DFII10], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/DFII10.

Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States [MORTGAGE30US], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MORTGAGE30US.

Freddie Mac, 5/1-Year Adjustable Rate Mortgage Average in the United States (DISCONTINUED) [MORTGAGE5US], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MORTGAGE5US.

[3] Note that the current README draws heavily from the README template used previously in Laibson et al.'s paper titled "Estimating Discount Functions with Consumption Choices over the Lifecycle", both of which draw from the "README for social science replication packages" template provided by Social Science Data Editors.