Replication Code: "Interest Rate Cuts vs. Stimulus Payments: An Equivalence Result"

Christian K. Wolf

July 24, 2024

This document describes the replication files for the paper "Interest Rate Cuts vs. Stimulus Payments: An Equivalence Result". The code produces all numbers and figures referred to in the paper. The files are organized into four main folders—one for the quantitative HANK model used in most of the analysis, one for the analytically tractable models that underlie the sufficient statistics formula, one for the two-type spender-saver model with empirically relevant MPEs, and one containing several auxiliary functions. All codes have been run and tested on Matlab R2021b on iMac (27-inch, 2020). The total runtime should not exceed around 20 minutes. To ensure that all codes run, the variable "local"—located near the top of the various m-files—needs to be changed to reflect the local machine.

In addition to code that I have produced, the replication material draws on the following files that have been wholly or partially produced by other authors:

- The solution of the HANK model uses: first, several files from the replication codes of the article Ahn et al. (2017); second, the CompEcon toolbox of Miranda and Fackler, available here: `www4.ncsu.edu/~pfackler/compecon`; and third, the `ergodicdist.m` function, written by Marco Maffezzoli.

- For plotting purposes I use the file `jbfill.m`, available on Mathworks file exchange. The license is reproduced in the folder `_auxiliary_functions`.

- The empirical targets for (cumulative) intertemporal marginal propensities to consume in the extended three-type model (Online Appendix C.3) are taken from the replication files for Fagereng et al. (2021). Specifically, the file `fhn_results`, stored in `.mat` and

`.csv` format in `analytical/_inputs/_impcs`, is obtained from the publicly available replication codes of that paper, running the replication file `Fig2.m` and then storing the four series `cumC1`, `lowCI`, `uppCI`, and `x` corresponding to the cumulative consumption panel of their Figure 2.[1]

The rest of this readme describes the contents of the three main results folders in detail.

1 HANK

This folder contains the files necessary to produce most of the paper's numerical results—i.e., all figures except for Figure C.1, Figure C.2 (see "Analytical" below) and the right panel of Figure C.5 (see "Twotype_lab" below).

- The sub-folder `baseline` contains results for the baseline HANK model with the union bargaining protocol discussed in Online Appendix B.3.
  - The sub-folder `_aux` contains various auxiliary functions.
  - The sub-folder `_inputs` contains files that compute the aggregate consumption function for the baseline HANK model with standard union bargaining. The file `get_hank_ss.m` solves for the steady state, and the file `get_hank_jac.m` then constructs the sequence-space Jacobians of the aggregate consumption function. At the beginning of each file it is necessary to specify the liquid wealth calibration (baseline, low, or high). All results are stored in the sub-folder `_results`, and they are required inputs for the subsequent computations.
  - The file `suffstats_pred.m` in the sub-folder `pe` evaluates the accuracy of the sufficient statistics approximation. At the beginning it is necessary to specify the liquid wealth calibration: for the baseline calibration the file generates Figures 1 and 2; for the low liquid wealth calibration it generates the left panel of Figure C.3 and top panel of Figure C.4; and for the high liquid wealth calibration it generates the right panel of Figure C.3 and bottom panel of Figure C.4.
  - The sub-folder `ge` contains files that compute general equilibrium transition paths. The file `get_target_mp.m` (which needs to be run first) computes impulse responses to a monetary policy shock and then stores the result; `get_equiv_tau.m`

[1] The replication materials are available at https://doi.org/10.3886/E121561V1.

(which needs to be run second) loads that result, solves for the equivalent transfer stimulus, and reports the results as Figure 3.

  - The sub-folder `ineq` contains files that compute general equilibrium impulse responses of the cross-sectional consumption dispersion to monetary as well as fiscal policy shocks. The file `get_target_mp.m` computes impulse responses to a monetary policy shock and stores the result; `get_equiv_tau.m` loads that result, solves for the equivalent transfer stimulus, and reports impulse responses of consumption dispersion as Figure C.6.

- The sub-folder `labor_variant` contains results for the alternative HANK model with the union bargaining protocol discussed in Online Appendix C.4.

  - The sub-folder `_aux` contains various auxiliary functions.
  - The sub-folder `_inputs` contains files that compute the aggregate consumption function for the HANK model with the alternative union bargaining protocol. The file `get_hank_ss.m` solves for the steady state, and the file `get_hank_jac.m` then constructs the sequence-space Jacobians of the aggregate consumption function. All results are stored in the sub-folder `_results`, and they are required inputs for the subsequent computations.
  - The sub-folder `ge` contains files that compute general equilibrium transition paths. The file `get_target_mp.m` (which needs to be run first) computes impulse responses to a monetary shock and stores the result; `get_equiv_tau.m` (which needs to be run second) loads that result, solves for the approximate equivalent transfer, and reports the results as the left panel of Figure C.5.

2 Analytical

This folder contains the files necessary to produce Figures C.1 and C.2—results from the analytically tractable models that underlie the sufficient statistics formula.

- The sub-folder `_aux` contains various auxiliary functions.
- The file `get_c_3type.m` solves for the aggregate consumption of a three-type model that is rich enough to closely match empirical evidence on intertemporal MPCs, and then compares the implied aggregate consumption function with the predictions of the simpler sufficient statistics formula. Results are reported as Figure C.1.

- The file `suffstats_range.m` shows the transfer paths required to engineer various contemplated excess demand paths, under different assumptions on the consumption function sufficient statistics. Results are reported as Figure C.2.

3 Twotype_lab

This folder contains the files necessary to produce the right panel Figure C.5—results from a two-type model that is consistent with empirical evidence on marginal propensities to earn.

- The sub-folder `_aux` contains various auxiliary functions.
- The sub-folder `_inputs` contains the file `get_twotype_inputs.m`, which computes the aggregate consumption and labor supply functions.
- The sub-folder `ge` contains files that compute general equilibrium transition paths. The file `get_target_mp.m` (which needs to be run first) computes impulse responses to a monetary shock and stores the result; `get_equiv_tau.m` (which needs to be run second) loads that result, solves for the approximate equivalent transfer, and reports the results as the right panel of Figure C.5.

References

Ahn, S., Kaplan, G., Moll, B., Winberry, T., & Wolf, C. K. (2017). When Inequality Matters for Macro and Macro Matters for Inequality. *NBER Macroeconomics Annual*, *32*.

Fagereng, A., Holm, M. B., & Natvik, G. J. (2021). Mpc heterogeneity and household balance sheets. *American Economic Journal: Macroeconomics*, *13*(4), 1–54.