Readme file for the materials in 20170040_additional_materials.zip

This directory contains all the files needed to replicate the results in "Liquidity Traps and Monetary Policy: Managing a Credit Crunch". The programs listed below were run in MATLAB R2017a, 64-bit (maci64) using a MacBook Pro with macOS Mojave.

figures_final_201902.m: this Matlab program constructs all the figures in the main text and online appendix using as inputs data files provided in this directory. To run this program the following plain text data files (.txt) and MATLAB data files (.mat) must be in the same directory:

r_data_1_2006.txt
r_data_2_2006.txt
R_data.txt
debt_GDP_2006.txt

lognormal_B_bailout_cal_trans_smooth_201902.mat
lognormal_B_bailout_00_smooth_201902.mat
lognormal_B_bailout_0075_smooth_201902.mat
lognormal_B_lumpsum_bmk_smooth_201902.mat
lognormal_B_bailout_cal_trans_smooth_nu_0_201902.mat
lognormal_B0_nu0_201609.mat
lognormal_B_fixed_M_nominal_smooth_201902.mat
welfare2_bmk.mat
welfare2_00.mat
welfare2_0075.mat
lognormal_B_bailout_cal_trans_sensitivity_th_059.mat
lognormal_B_bailout_cal_trans_sensitivity_th_079.mat
lognormal_B_bailout_cal_trans_smooth_lafixed_201609.mat
lognormal_B_bailout_cal_trans_smooth_201902
lognormal_B_bailout_cal_trans_smooth_201609_alt_Bt.mat

The MATLAB data files listed above were created by the following MATLAB programs running the different simulations:

lognormal_B_bailout_cal_trans_smooth.m: this is the main Matlab program calculating the simulation of the benchmark model. This program, as well as the programs listed below, uses various custom made Matlab functions provided in this directory. This program is also used to calculate alternative simulations provided in the online appendix. To calculate the alternative simulations one needs to uncomment the appropriate parts of the script (see comments in the script). To run (the different versions of) this program the following MATLAB data files (.mat) and MATLAB files defining various functions (.m) need to be in the same directory:

lognormal_B0_201609.mat
lognormal_B0_nu0_201609.mat
lognormal_B0_201609_th059.mat

lognormal_B0_201609_th079.mat

out_workers_simple3.m
eq_sum_Tax_2_c.m
eq_sum_Tax_c.m
eqR.m
eq_Tax_c.m
eqzhat_ZLB_B.m
eqZ_ZLB_B.m
eqzhat_unc_B.m
eqZ.m

The corresponding simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B_bailout_cal_trans_smooth_lafixed_201609.mat
lognormal_B_bailout_cal_trans_smooth_201902.mat
lognormal_B_bailout_cal_trans_smooth_nu_0_201902.mat
lognormal_B_bailout_cal_trans_sensitivity_th_059.mat
lognormal_B_bailout_cal_trans_sensitivity_th_079.mat
la_hist_cal_201902.mat

lognormal_B_bailout.m: this Matlab program calculates the simulations with alternative inflation targets. To run (the different versions of) this program the following MATLAB data files (.mat) and MATLAB files defining various functions (.m) need to be in the same directory:

lognormal_B0_201609.mat
la_hist_cal_201902.mat

out_workers_simple3.m
eq_sum_Tax_2_c.m
eq_sum_Tax_c.m
eqR.m
eq_Tax_c.m
eqzhat_ZLB_B.m
eqZ_ZLB_B.m
eqzhat_unc_B.m
eqZ.m

The corresponding simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B_bailout_00_smooth_201902.mat
lognormal_B_bailout_0075_smooth_201902.mat

lognormal_B_lumpsum: this Matlab program calculates the simulation with lump sum taxes. To run (the different versions of) this program the following MATLAB data files (.mat) and MATLAB files defining various functions (.m) need to be in the same directory:

lognormal_B0_201609.mat
la_hist_cal_201902.mat

out_workers_simple3.m
eqR.m
eqzhat_ZLB_B.m
eqZ_ZLB_B.m
eqzhat_unc_B.m
eqZ.m
eq_sum_Tax_2.m
eq_sum_Tax.m
eq_Tax.m

The simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B_lumpsum_bmk_smooth_201902.mat

lognormal_nominal_flexible.m: this Matlab program calculates the simulations with a fixed quantity of money, both with indexed and with nominal bonds. To run this program the following MATLAB data files (.mat) and MATLAB files defining various functions (.m) need to be in the same directory:

lognormal_B0_nu0_201609.mat
la_hist_cal_201902.mat

out_workers_simple3.m
eq_sum_Tax_2.m
eq_sum_Tax.m
eqR.m
eq_Tax.m
eqzhat_unc_B.m
eqZ.m
eqR3.m

The simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B_fixed_M_nominal_smooth_201902.mat

welfare_lognormal_fixed_inflation.m: this Matlab program calculates the welfare cost presented in the online appendix. To run (the different versions of) this program the following MATLAB data files (.mat) and MATLAB files defining various functions (.m) need to be in the same directory:

lognormal_B0_201609.mat
lognormal_B_bailout_cal_trans_smooth_201902.mat
lognormal_B_bailout_00_smooth_201902.mat
lognormal_B_bailout_0075_smooth_201902.mat
la_hist_cal_201902.mat

out_workers_simple3.m
eq_sum_Tax_b.m
eq_sum_Tax_2_b.m

The simulations calculated with this program are save in the following MATLAB data files (.mat)

welfare2_bmk.mat
welfare2_00.mat
welfare2_0075.mat

lognormal_calibration.m: this Matlab program is used to calibrate the discount factor and B0 to target an annual real rate of 2% and a debt to GDP ratio of 0.62 in the initial steady state. The calibration was done "manually" by adjusting the two parameter. To run (the different versions of) this program the following MATLAB files defining various functions (.m) need to be in the same directory:

eqZ.m
eqR.m
eq_Tax_0.m
eq_sum_Tax_0.m
eq_sum_Tax_02.m
eqzhat_unc_B.m

The final values of the simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B0_201609.mat
lognormal_B0_201609_th059.mat
lognormal_B0_201609_th079.mat

These contain the initial steady state values used as starting values for the simulations given the transitional dynamics after the credit shocks.

lognormal_calibration_nu0.m: this Matlab program is used to calibrate the discount factor and B0 for the case in the cashless limit.

eqZ.m
eqR.m
eq_Tax_0.m
eq_sum_Tax_0.m
eq_sum_Tax_02.m
eqzhat_unc_B.m

The final values of the simulations calculated with this program are save in the following MATLAB data files (.mat)

lognormal_B0_nu0_201609.mat