

The following programs produce the results shown in the figures for “**Household Debt Overhang and Transmission of Monetary Policy**” by Sami Alpanda and Sarah Zubairy

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(These files work in Matlab R2015a)

### **FIGURES 1-13 and 16**

The main files to construct impulse response functions are as follows:

MATLAB program: main\_az.m

DATA file: [data.xlsx](#)

**Inputs:** The following inputs need to be supplied for the specification being considered.

```
timesample=1; % 1 means 1955-2007; 2 means 1969-2007; 3 means 1955-2015
thresholdd=1; % Check line 102 onwards % 1 means default threshold; 4 means
mortgage debt as state variable; 5 means 2 percent above trend; 9 uses
bandpass filter
shockchoice=1; % 1 means SVAR shock; 2 means using FFR; 3 means Romer-Romer
shock
datafile=1; %1 means main set of variables; 2 means subcomponents of
consumption and investment
opt=0; % 0 means Newey-West with bandwidth=i; 1 means optimal bandwidth
(takes much longer to run)

ppp=0;% 0 means default; 1 means putting price puzzle control of commodity
prices in VAR
debtcontrol=0;% 0 means default; 1 means putting debt as lagged control
variable in the Jorda equation
signif=0;% 0 default (no signif results); 1 means showing significance
results
```

### **Outputs:**

This file produces the impulse response functions to a monetary policy shock, for various sample sizes, identification scheme, and data sets.

Now we list the files and inputs required to produce the figures as numbered in the paper.

**Figure 1:** figure1.m

**Figures 2 and 4:** main\_az.m with timesample=1; thresholdd=1; **shockchoice=1**; datafile=1; opt=1; ppp=0; debtcontrol=0; signif=0;

**Figure 3:** main\_az.m with timesample=1; thresholdd=1; shockchoice=1; **datafile=2**; opt=1; ppp=0; debtcontrol=0; signif=0;

**Figures 5 and 7:** main\_az.m with **timesample=2**; thresholdd=1; **shockchoice=3**; datafile=1; opt=1; ppp=0; debtcontrol=0; signif=0;

**Figure 6:** main\_az.m with timesample=2; thresholdd=1; shockchoice=3; **datafile=2**; opt=1; ppp=0; debtcontrol=0; signif=0;

**Figure 8:** figure8.m

**Figure 9:** figure9.m

Note: The .mat file inputs for Figure 9 are produced as follows.

bandpass\_timing.mat: Run main\_az.m with timesample=1; **thresholdd=9**; shockchoice=1; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

onehp\_timing.mat: Run main\_az.m with timesample=1; **thresholdd=10**; shockchoice=1; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

bandpass\_romer.mat: Run main\_az.m with timesample=2; **thresholdd=9**; shockchoice=3; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

onehp\_romer.mat: Run main\_az.m with timesample=2; **thresholdd=10**; shockchoice=3; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

**Figure 10:** The three panels of Figure 10 can be produced as follows.

Panel I: Run main\_az.m with timesample=1; **thresholdd=4**; shockchoice=1; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

Panel II: Run main\_az.m with timesample=1; **thresholdd=5**; shockchoice=1; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

Panel III: Run main\_az.m with timesample=1; **thresholdd=1**; shockchoice=1; datafile=1; opt=0; ppp=0; **debtcontrol=1**; signif=0;

**Figure 11:** figure11.m

Note: The .mat file inputs for Figure 11 are produced as follows.

results\_ep1.mat: Run main\_az\_episode.m with timesample=1; thresholdd=1; shockchoice=1; datafile=1; opt=1; **episode=1**;

results\_ep2.mat: Run main\_az\_episode.m with timesample=1; thresholdd=1; shockchoice=1; datafile=1; opt=1; **episode=2**;

and so on.

**Figure 12:** main\_az.m with **timesample=3**; thresholdd=1; shockchoice=1; datafile=1; opt=0; ppp=0; debtcontrol=0; signif=0;

**Figure 13:** figure13.m

Note: The .mat file inputs for Figure 13 are produced as follows.

recession\_highdebt.mat: Run main\_az\_recession.m with timesample=3; thresholdd=1; shockchoice=1; datafile=1; opt=0; **recess=1**;

baseline.mat: Run main\_az\_recession.m with timesample=3; thresholdd=1; shockchoice=1; datafile=1; opt=0; **recess=0**;

**Figure 16:** Run main\_az\_hel\_refi.m with **timesample=5**; thresholdd=2; shockchoice=1; **datafile=3**;

## **FIGURES 14-15**

The main files to construct impulse response functions are as follows:

MATLAB programs: run\_IRFs\_new\_v3.m, run\_IRF\_comparison\_new\_v3, run\_IRF\_distribution\_new\_v3

**Relevant settings in run\_IRFs\_new\_v3.m and run\_IRF\_distribution\_new\_v3:**

```
adj_rate = 1; %1: adj-rate loans; 0: fixed-rate loans
fixed_rate_no_refi = 0; %1: fixed-rate no refi, 0: fixed-rate with refi
int_only = 1; %0: baseline with HE channel; 1: interest rate channel only
high_debt = 1; %0: baseline with initial debt at st-st; 1: high initial debt
```

**Figure 14a:** Run run\_IRFs\_new\_v3.m twice; once with settings adj\_rate = 0; fixed\_rate\_no\_refi = 1; int\_only=0; high\_debt=0 and another one with same settings except high\_debt=1. The results are saved in IRF\_R\_baseline.mat and IRF\_R\_highdebt.mat, respectively. Now run run\_IRF\_comparison\_new\_v3 (under setting of repres\_agent=1) to obtain Figure 14a.

**Figure 14b:** Run run\_IRFs\_new\_v3.m twice; once with settings adj\_rate = 0; fixed\_rate\_no\_refi = 0; int\_only=0; high\_debt=0 and another one with same settings except high\_debt=1. The results are saved in IRF\_R\_baseline.mat and IRF\_R\_highdebt.mat, respectively. Now run run\_IRF\_comparison\_new\_v3 (under setting of repres\_agent=1) to obtain Figure 14b.

**Figure 14c:** Run run\_IRFs\_new\_v3.m twice; once with settings adj\_rate = 1; fixed\_rate\_no\_refi = 0; int\_only=0; high\_debt=0 and another one with same settings except high\_debt=1. The results are saved in IRF\_R\_baseline.mat and IRF\_R\_highdebt.mat, respectively. Now run run\_IRF\_comparison\_new\_v3 (under setting of repres\_agent=1) to obtain Figure 14c.

**Figure 15:** Run run\_IRF\_distribution\_new\_v3.m twice; once with settings adj\_rate = 0; fixed\_rate\_no\_refi = 0; int\_only=0; high\_debt=0 and another one with same settings except high\_debt=1. The results are saved in IRF\_R\_baseline.mat and IRF\_R\_highdebt.mat, respectively. Now run run\_IRF\_comparison\_new\_v3 (under setting of repres\_agent=0) to obtain Figure 15.