The following programs produce the results shown in the tables and figures for "**Government Spending Multipliers in Good Times and in Bad: Evidence from U.S. Historical Data**" by Valerie Ramey and Sarah Zubairy

February 2018

(These files work in Stata 14 and Matlab R2015a)

The main files to estimate multipliers are as follows,

STATA program: jordagk.do

DATA file: rzdat.xlsx (Note: if you have an earlier version of Stata that does not read Excel files, comment out the "import excel" command and uncomment the "insheet using rzdatnew.csv" command.)

Inputs: The following inputs need to supplied for the specification being considered. (see lines 29-41 in the code)

```
sample = 1;  /*1 = full sample, 2 = post-WWII */
omit nomit;  /*either nomit (don't omit subsample) or wwii (omit WWII) */
state slack;  /* slack or zlb or recession or ag*/
shock newsy; /* shock identification: either newsy or bp */
p = 4; /*number of lags of control variables*/
trends = 0; /*0 = no trends, 1 = trends */
tax = 0; /*0 = exclude taxes, 1 = include taxes */
```

Outputs:

This file produces the impulse response functions for government spending and GDP in response to the specified shock.

It also saves results in the following csv files:

outsheet h Fkplin Fkpexp Fkprec using **junk.csv** if h<=20, comma replace ;
This saves the first stage F-statistic (Kleibergen-Paap rk Wald F statistic) for the case of linear, expansion (low unemp or normal) and recession (high unemp or ZLB).

outsheet h Fdifflin Fdiffexp Fdiffrec using **junkfdiff.csv** if h<=20, comma replace ;
This saves the difference of the first stage F-statistic and the valid 5 percent threshold based on Olea and Pflueger (2013) for the case of linear, expansion (low unemp or normal) and recession (high unemp or ZLB).

outsheet h multlin1 seylin multexp1 seyexp multrec1 seyrec ptestdiff using **junkmultse.csv** if h<=20, comma replace ;
This saves the multipliers and corresponding standard errors for horizon of 20 quarters for the case of linear, expansion (low unemp or normal) and recession (high unemp or ZLB). The last column shows the HAC robust p-value for the difference of multipliers across states.

Table 1

Specification	Military news shock	BP shock	Combined
Program	Jordagk.do	Jordagk.do	Jordagk_twoinstruments.do
Sample	1	1	1
Omit	nomit	nomit	nomit
State	slack	slack	slack
Shock	newsy	bp	
P	4	4	4
Trends	0	0	0
tax	0	0	0

In order to get Anderson-Rubin p-values, run jordagk_ar.do (takes longer to run).

outsheet h multlin1 multexp1 multrec1 arp using **junkarp.csv** if h<=20, comma replace;

The last column shows the weak instrument robust AR p-values for the difference of multipliers across states.

Table 2: For the following we keep sample=1; omit nomit; p=4; trends=0; tax=0, and change shock to be newsy or bp based on respective row and modify state as follows:

- HP filtered time-varying threshold (with $\lambda = 106$): state slackhp
- 8% unemployment rate threshold: state slack8
- NBER recession dates: state recession
- Moving avg. of output growth weighting function: state ag

Table 3: For the following start with sample=1; omit nomit; state slack; p=4; trends=0; tax=0, and change shock to be newsy or bp based on respective row and modify the following choices only:

- Additional control for taxes: taxes =1
- Excluding WWII: omit wwii
- Subsample: 1947-2015: sample=2

Table 4:

Specification	Military news shock	BP shock	Combined
Program	Jordagk.do	Jordagk.do	Jordagk_twoinstruments.do
Sample	1	1	1
Omit	nomit	nomit	nomit
State	zlb	zlb	zlb
Shock	newsy	bp	
P	4	4	4
Trends	0	0	0
tax	0	0	0

Table 5: For the following start with sample=1; omit nomit; state zlb; p=4; trends=0; tax=0, and change shock to be newsy or bp based on respective row and modify the following choices only:

- Defining ZLB as T-bill rate≤ 0.5: state zlb5
- Additional controls for taxes and inflation: tax =1 and uncomment inflation terms in newsylinxlist, bplinxlist, newsynlxlist, bpnlxlist

Table 6:

Specification	Military news shock	BP shock	Combined
Program	Jordagk.do	Jordagk.do	Jordagk_twoinstruments.do
Sample	1	1	1
Omit	wwii	wwii	wwii
State	slack	slack	slack
Shock	newsy	bp	
P	4	4	4
Trends	0	0	0
tax	0	0	0

Table 7:

Tvar.do estimates the VARs separately for each state. The multipliers from these IRF estimates are computed in TVAR_output.xlsx. The Matlab file tvar_figures.m produces the IRF figures from the TVARs, shown in the Appendix.

Figures

Note: Figures are produced in Matlab.

figures_1_3_8.m produces Figures 1, 3 and 8.

figure_2 produces Figure 2

figure_4 produces Figure 4

figure_irfs_multiplier.m produces Figures 5 and 6, when we choose statechoice=1; % where 1 means default unemp threshold; 2 means default ZLB threshold
(Note: Choosing shockchoice= 2; % where 1 means news shock; 2 means BP shock give analogous figures for BP shock)

figure_irfs_multiplier.m produces Figures 11 and 12, when we choose statechoice=2; % where 1 means default unemp threshold; 2 means default ZLB threshold

figure_7 produces Figure 7

figure_9 produces Figure 9

figure_10 produces Figure 10

Additional files

There are some additional files that produce some of the tables and figures shown in the supplementary appendix.

The files in AGreplication folder help reproduce Table 7 and Figure 12.

main_reconciling_ag_final.m reproduces the results for “Jorda Method Applied to AG specification” and Figure 12.

agirf_actualz.tsp reproduces the results for "Actual State Dynamics, No Feedback"

ag_altmult.xlsx shows how we got the results for “AG Partial Feedback”

agirf_actualz_feedback.tsp reproduces the results for "Actual State Dynamics, Partial Feedback"