

# 2007 Age, Income, Kids, Marry EV and EC All Checks (Bush Checks)

This is the example vignette for function: [snw\\_evuvw19\\_jmky\\_allchecks](#) from the [PrjOptiSNW Package](#). 2019 integrated over VU and VW

The function [snw\\_evuvw19\\_jmky\\_allchecks](#) was initiall designed to handle the COVID problem, the revised version of the program handles both the 2007/8/9 Bush stimulus check problem, and the 2019/20/21 Trump and Biden stimulus check problems.

The key features of the Bush stimulus checks are: i) determined based on 2007 information; ii) checks received in 2008, when the great recession has not arrived yet, but all expect it to in 2009; iii) the Great Recession hits in 2009, putting some people, based on education and age, into unemployment state with a shared unemployment duration and lost income and also UI benefits (calibrated to match overall UI share of wages); iv) the economy returns to steady-state in 2010.

## Test SNW\_EVUVW19\_JMKY\_ALLCHECKS Parameters for Bush Checks

Save a result that is low in memory cost so that it can be loaded quickly for various allocation tests. Turn off Various Printing Controls. Call function with wide income bins to reduce memory storage and retrieval costs

```
clear all;
% Start mp controls
mp_controls = snw_mp_control('default_test');
% Solve for Unemployment Values
mp_controls('bl_timer') = true;
mp_controls('bl_print_vfi') = false;
mp_controls('bl_print_vfi_verbose') = false;
mp_controls('bl_print_ds') = false;
mp_controls('bl_print_ds_verbose') = true;
mp_controls('bl_print_precompute') = false;
mp_controls('bl_print_precompute_verbose') = false;
mp_controls('bl_print_a4chk') = false;
mp_controls('bl_print_a4chk_verbose') = false;
mp_controls('bl_print_v08p08_jaeemk') = false;
mp_controls('bl_print_v08p08_jaeemk_verbose') = false;
mp_controls('bl_print_v08_jaeemk') = false;
mp_controls('bl_print_v08_jaeemk_verbose') = false;
mp_controls('bl_print_evuvw20_jaeemk') = false;
mp_controls('bl_print_evuvw20_jaeemk_verbose') = false;
mp_controls('bl_print_evuvw19_jaeemk') = false;
mp_controls('bl_print_evuvw19_jaeemk_verbose') = false;
mp_controls('bl_print_evuvw19_jmky') = false;
mp_controls('bl_print_evuvw19_jmky_verbose') = false;
```

Dense default, and unemployment parameters:

```
% default dense load
% 1. generate MP_PARAMS specific to 2008 stimulus
% Use non-default values for Bush Stimulus
mp_more_inputs = containers.Map('KeyType','char','ValueType','any');
```

```

mp_more_inputs('fl_ss_non_college') = 0.225;
mp_more_inputs('fl_ss_college') = 0.271;
fl_p50_hh_income_07 = 54831;
mp_more_inputs('fl_scaleconvertor') = fl_p50_hh_income_07;
% st_param_group = 'default_small';
% st_param_group = 'default_dense';
st_param_group = 'default_docdense';
mp_params = snw_mp_param(st_param_group, false, 'tauchen', false, 8, 8, mp_more_inputs);
% mp_params = snw_mp_param('default_docdense')
mp_params('beta') = 0.95;
fl_scaleconvertor = 62502;
mp_more_inputs('fl_scaleconvertor') = fl_scaleconvertor;
% Unemployment
mp_params('xi') = 0.532;
mp_params('b') = 0.37992;
mp_params('a2_covidyr') = mp_params('a2_greatrecession_2009');
mp_params('TR') = 100/fl_p50_hh_income_07;
% Check Count: 89 checks to allow for both the first and the second round
n_welfchecksgrid = 3;
mp_params('n_welfchecksgrid') = n_welfchecksgrid;
mp_params('a2_covidyr') = mp_params('a2_greatrecession_2009');

```

Income bins:

```

% Income Grid
% 4 refers to 4*58056=232224 dollars in 2012USD
% max 7 refers to 7*58056=406392 dollars in 2012USD
% all phase out = (4400/5)*100 + 150000 = 238000
% if 500 dollar interval, need 476 inc groups before 238000
% if have 85 percent of points between 238000,
fl_max_phaseout = 238000;
fl_multiple = fl_scaleconvertor;
it_bin_dollar_before_phaseout = 5000;
it_bin_dollar_after_phaseout = 25000;
fl_thres = fl_max_phaseout/fl_multiple;
inc_grid1 = linspace(0,fl_thres,(fl_max_phaseout)/it_bin_dollar_before_phaseout);
inc_grid2 = linspace(fl_thres, 7, (7*fl_multiple-fl_max_phaseout)/it_bin_dollar_after_phaseout);
inc_grid=sort(unique([inc_grid1 inc_grid2]'));
mp_params('n_incgrid') = length(inc_grid);
mp_params('inc_grid') = inc_grid;

```

## SNW\_EVUVW19\_JMKY\_ALLCHECKS Low Storage Invoke for Bush Checks

The simulation here (dense) requires less than 10 GB of memory with 8 workers (8 threads needed), simulating over 88 checks takes with 8 workers

```

st_biden_or_trump = 'bushchck';
st_solu_type = 'bisec_vec';
bl_parfor = false;
it_workers = 1;
bl_export = false;
bl_load_mat = false;
snm_suffix = ['_test_ybin' num2str(it_bin_dollar_before_phaseout)];

```

```
[ev19_jmky_allchecks, ec19_jmky_allchecks, output] = ...
    snw_evuvw19_jmky_allchecks(mp_params, mp_controls, ...
    st_biden_or_trump, st_solu_type, ...
    bl_parfor, it_workers, ...
    bl_export, bl_load_mat, snm_suffix);
```

```
Completed SNW_VFI_MAIN_BISEC_VEC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=330.7856
Completed SNW_VFI_MAIN_BISEC_VEC 1 Period Unemp Shock;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time
Completed SNW_VFI_MAIN_BISEC_VEC 1 Period Unemp Shock;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time
Completed SNW_V08P08_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=524.1155
sum of Phi_adj:83
sum of Phi_true:45.7931
sum of Phiss:83
summ of diff of Phiss and Phi_adj:-3.4775e-12
summ of diff of Phiss and Phi_true:37.2069
Completed SNW_DS_MAIN_VEC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=1254.4898
Trump Check, do not need to resolve distribution
Wage quintile cutoffs=0.4645    0.71528    1.0335    1.5632
Completed SNW_HH_PRECOMPUTE;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time cost=265.7184
SNW_EVUVW19_JMKY_MASS Start
Completed SNW_EVUVW19_JMKY_MASS;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=5.264
```

```
-----
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

	i	idx	ndim	numel	rowN	colN	sum	mean	std	coef
Phi_true	1	1	6	4.37e+07	83	5.265e+05	45.793	1.0479e-06	1.5289e-05	14
Phi_true_jmky	2	2	4	43460	82	530	45.787	0.0010535	0.0031057	2.9

```
SNW_EVUVW19_JMKY_ALLCHECKS Start
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;SNW_MP_PARAM=bushchck;welf_checks=0;TR=0.0018238;SNW_MP_PARAM=default_docdense;SNW
Completed SNW_V08_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=2.81e-05
Completed SNW_EVUVW19_JAEEMK_FOC;st_biden_or_trump=bushchck;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=10.3545
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 0 of 2, time=106.2974
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;SNW_MP_PARAM=bushchck;welf_checks=1;TR=0.0018238;SNW_MP_PARAM=default_docdense;SNW
Completed SNW_V08_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=2.94e-05
Completed SNW_EVUVW19_JAEEMK_FOC;st_biden_or_trump=bushchck;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=10.0897
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 1 of 2, time=106.6849
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;SNW_MP_PARAM=bushchck;welf_checks=2;TR=0.0018238;SNW_MP_PARAM=default_docdense;SNW
Completed SNW_V08_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=2.1e-05
Completed SNW_EVUVW19_JAEEMK_FOC;st_biden_or_trump=bushchck;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=10.1555
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 2 of 2, time=106.7998
Completed SNW_EVUVW19_JMKY_ALLCHECKS;ST_BIDEN_OR_TRUMP=bushchck;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default
```

```
-----
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

	i	idx	ndim	numel	rowN	colN	sum	mean
Output	1	1	2	1.0483e+06	1.1648e+05	9	7.7619e+06	7.4042
ec19_jmky_allchecks	2	2	5	1.3038e+05	3	43460	2.737e+05	2.0992
ec19_jmky_allchecks_posmass	3	3	2	1.1648e+05	1.1648e+05	1	2.737e+05	2.3498
ev19_jmky_allchecks	4	4	5	1.3038e+05	3	43460	-2.3148e+06	-17.754
ev19_jmky_allchecks_posmass	5	5	2	1.1648e+05	1.1648e+05	1	17932	0.15395

xxx TABLE:Output xxxxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c6	c7	c8	c9
	—	—	—	—	—	—	—	—
r1	18	0	0	0	2.1599e-05	-0.57722	0.0053606	0.066639
r2	18	0	0	1	2.1599e-05	-0.57722	0.0053744	0.067396
r3	18	0	0	2	2.1599e-05	-0.57722	0.0053882	0.068355
r4	19	0	0	0	1.9002e-05	0.42278	0.0055828	0.068128
r5	19	0	0	1	1.9002e-05	0.42278	0.0055969	0.069089
r116474	86	1	4	1	3.937e-49	4.2268	0.97866	13.912
r116475	86	1	4	2	3.937e-49	4.2268	0.97868	13.912
r116476	87	1	4	0	1.0014e-58	4.2413	1.0716	14.596
r116477	87	1	4	1	1.0014e-58	4.2413	1.0716	14.597
r116478	87	1	4	2	1.0014e-58	4.2413	1.0716	14.597

xxx TABLE:ec19\_jmky\_allchecks xxxxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c43457	c43458	c43459	c43460
	—	—	—	—	—	—	—	—
r1	0.066639	0.068128	0.071766	0.071091	0	0	0	0
r2	0.067396	0.069089	0.072695	0.072031	0	0	0	0
r3	0.068355	0.069782	0.073378	0.07271	0	0	0	0

xxx TABLE:ec19\_jmky\_allchecks\_posmass xxxxxxxxxxxxxxxxxxxx

	c1
	—
r1	0.066639
r2	0.067396
r3	0.068355
r4	0.068128
r5	0.069089
r116474	13.912
r116475	13.912
r116476	14.596
r116477	14.597
r116478	14.597

xxx TABLE:ev19\_jmky\_allchecks xxxxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c43457	c43458	c43459	c43460
	—	—	—	—	—	—	—	—
r1	-186.55	-179.12	-171.74	-172.54	0	0	0	0
r2	-186.07	-178.67	-171.33	-172.13	0	0	0	0
r3	-185.59	-178.22	-170.92	-171.72	0	0	0	0

xxx TABLE:ev19\_jmky\_allchecks\_posmass xxxxxxxxxxxxxxxxxxxx

	c1
	—
r1	0.0053606
r2	0.0053744
r3	0.0053882
r4	0.0055828
r5	0.0055969
r116474	0.97866
r116475	0.97868
r116476	1.0716
r116477	1.0716
r116478	1.0716