2019 Age, Income, Kids, Marry EV and EC All Checks

This is the example vignette for function: **snw_evuvw19_jmky_allchecks** from the **PrjOptiSNW Package.**
2019 integrated over VU and VW

Test SNW_EVUVW19_JMKY_ALLCHECKS Parameters

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 retrievel costs

```
clear all;
% Start mp contorls
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_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
% mp_params = snw_mp_param('default_dense');
mp_params = snw_mp_param('default_docdense')
```

```
mp_params =
  Map with properties:

       Count: 59
     KeyType: char
   ValueType: any
```

```
mp_params('beta') = 0.95;
% Unemployment
xi=0.5; % Proportional reduction in income due to unemployment (xi=0 refers to 0 labor income;
b=0; % Unemployment insurance replacement rate (b=0 refers to no UI benefits; b=1 refers to 100
TR=100/58056; % Value of a wezlfare check (can receive multiple checks). TO DO: Update with alt
mp_params('xi') = xi;
mp_params('b') = b;
mp_params('TR') = TR;
% 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_covidyr_manna_heaven');
```

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 betwen 238000,
fl_max_phaseout = 238000;
fl_multiple = 58056;
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

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_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_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=329.8181
Completed SNW_VFI_MAIN_BISEC_VEC 1 Period Unemp Shock;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time
sum of Phi_adj:83
sum of Phi_true:45.7931
sum of Phiss:83
summ of diff of Phiss and Phi_adj:-3.5195e-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=1503.0554
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=300.5785
SNW_EVUVW19_JMKY_MASS Start
Completed SNW_EVUVW19_JMKY_MASS;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=5.2427
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                    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	1.5354e-05	14.
Phi_true_jmky	2	2	4	42640	82	520	45.787	0.0010738	0.0032452	3.0

```
SNW_EVUVW19_JMKY_ALLCHECKS Start
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;welf_checks=0;TR=0.0017225;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_te
Completed SNW_A4CHK_UNEMP_BISEC_VEC;welf_checks=0;TR=0.0017225;xi=0.5;b=0;SNW_MP_PARAM=default_docdense;SNW_MP_CONTR
Completed SNW_EVUVW20_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=8.2461
Completed SNW_EVUVW19_JAEEMK_FOC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=15.0977
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=9.949
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 0 of 2, time=189.3415
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;welf_checks=1;TR=0.0017225;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_te
Completed SNW_A4CHK_UNEMP_BISEC_VEC;welf_checks=1;TR=0.0017225;xi=0.5;b=0;SNW_MP_PARAM=default_docdense;SNW_MP_CONTR
Completed SNW_EVUVW20_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=7.9148
Completed SNW_EVUVW19_JAEEMK_FOC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=15.1666
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=10.2059
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 1 of 2, time=191.3794
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Completed SNW_A4CHK_WRK_BISEC_VEC;welf_checks=2;TR=0.0017225;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_te
Completed SNW_A4CHK_UNEMP_BISEC_VEC;welf_checks=2;TR=0.0017225;xi=0.5;b=0;SNW_MP_PARAM=default_docdense;SNW_MP_CONTR
Completed SNW_EVUVW20_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=8.0759
Completed SNW_EVUVW19_JAEEMK_FOC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=14.9399
Completed SNW_EVUVW19_JMKY;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=9.8663
SNW_EVUVW19_JMKY_ALLCHECKS: Finished Check 2 of 2, time=192.7634
Completed SNW_EVUVW19_JMKY_ALLCHECKS;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=3130.0692
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	ndim	numel	rowN	colN	sum	mean
Output	1	1	2	1.0157e+06	1.1285e+05	9	6.7265e+06	6.6228
ec19_jmky_allchecks	2	2	5	1.2792e+05	3	42640	2.6502e+05	2.0718
ec19_jmky_allchecks_posmass	3	3	2	1.1285e+05	1.1285e+05	1	2.6502e+05	2.3484
ev19_jmky_allchecks	4	4	5	1.2792e+05	3	42640	-7.5242e+05	-5.8819
ev19_jmky_allchecks_posmass	5	5	2	1.1285e+05	1.1285e+05	1	-7.5242e+05	-6.6674

xxx TABLE:Output xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c6	c7	c8	c9
r1	18	0	0	0	2.9349e-05	-0.57722	-163.81	0.059745
r2	18	0	0	1	2.9349e-05	-0.57722	-163.08	0.061159
r3	18	0	0	2	2.9349e-05	-0.57722	-162.36	0.062463
r4	19	0	0	0	2.5821e-05	0.42278	-156.79	0.059746
r5	19	0	0	1	2.5821e-05	0.42278	-156.05	0.061412
r112847	86	1	4	1	3.6663e-49	4.2268	3.8365	13.954
r112848	86	1	4	2	3.6663e-49	4.2268	3.8365	13.954
r112849	87	1	4	0	1.9546e-57	4.2413	3.6531	14.64
r112850	87	1	4	1	1.9546e-57	4.2413	3.6532	14.64
r112851	87	1	4	2	1.9546e-57	4.2413	3.6532	14.641

xxx TABLE:ec19_jmky_allchecks xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c42637	c42638	c42639	c42640
r1	0.059745	0.059746	0.062939	0.064769	0	0	0	0
r2	0.061159	0.061412	0.064609	0.066437	0	0	0	0
r3	0.062463	0.063053	0.066255	0.068082	0	0	0	0

xxx TABLE:ec19_jmky_allchecks_posmass xxxxxxxxxxxxxxxxx

	c1

r1	0.059745
r2	0.061159
r3	0.062463
r4	0.059746
r5	0.061412
r112847	13.954
r112848	13.954
r112849	14.64
r112850	14.64
r112851	14.641

xxx TABLE:ev19_jmky_allchecks xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c42637	c42638	c42639	c42640
r1	-163.81	-156.79	-149.55	-146.59	0	0	0	0
r2	-163.08	-156.05	-148.88	-145.96	0	0	0	0
r3	-162.36	-155.34	-148.24	-145.36	0	0	0	0

xxx TABLE:ev19_jmky_allchecks_posmass xxxxxxxxxxxxxxxxx

	c1
r1	-163.81
r2	-163.08
r3	-162.36
r4	-156.79
r5	-156.05
r112847	3.8365
r112848	3.8365
r112849	3.6531
r112850	3.6532
r112851	3.6532