2020 V and C without Unemployment

This is the example vignette for function: **snw_a4chk_wrk_bisec_vec** from the **PrjOptiSNW Package.** This function solves for the V(states, check) for individuals working. Dense solution. Bisection, most time for the test here taken to genereate the income matrixes. But these can be generated out of the check loops.

Test SNW_A4CHK_WRK_BISEC_VEC Defaults Dense

Call the function with default parameters. Solve first for non-covid value and policy. Then depending on 2020 taxes, solve for 2020 policy and value.

```
mp_params = snw_mp_param('default_docdense');
% mp_params = snw_mp_param('default_dense');
mp_params('beta') = 0.95;
mp_controls = snw_mp_control('default_test');
mp_controls('bl_print_vfi') = false;
mp_controls('bl_timer') = true;
[V_ss,~,cons_ss,~] = snw_vfi_main_bisec_vec(mp_params, mp_controls);
```

```
Completed SNW_VFI_MAIN_BISEC_VEC;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=497.9011
---------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	ndim	numel	rowN	colN	sum	mean	std	coefvari
V_VFI	1	1	6	4.37e+07	83	5.265e+05	-1.2728e+08	-2.9126	20.655	-7.0915
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.3962e+09	31.95	36.423	1.14
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.3374e+08	5.3487	8.4439	1.5787

```
xxx TABLE:V_VFI xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-274.81	-274.42	-271.94	-266.29	-257.26	14.439	14.533	14.626	14.718	14.80
r2	-265.29	-264.9	-262.43	-256.84	-248.12	14.494	14.585	14.674	14.763	14.8
r3	-255.77	-255.38	-252.93	-247.53	-239.24	14.55	14.636	14.723	14.808	14.89
r4	-246.16	-245.8	-243.52	-238.46	-230.68	14.606	14.689	14.772	14.853	14.93
r5	-237.48	-237.14	-235.01	-230.26	-222.92	14.654	14.734	14.813	14.891	14.9
r79	-9.6662	-9.655	-9.5783	-9.3823	-9.0457	2.4698	2.4801	2.4898	2.4989	2.507
r80	-8.7031	-8.6919	-8.6152	-8.4192	-8.0826	2.253	2.261	2.2685	2.2755	2.282
r81	-7.5138	-7.5026	-7.4258	-7.2298	-6.8933	1.9749	1.9803	1.9855	1.9904	1.99
r82	-5.9155	-5.9043	-5.8275	-5.6315	-5.295	1.582	1.5851	1.588	1.5907	1.593
r83	-3.5892	-3.578	-3.5012	-3.3052	-2.9687	0.97904	0.98004	0.98097	0.98185	0.9826

```
xxx TABLE:ap_VFI xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c526500
r1	0	0	0.00051498	0.0066578	0.021589	112.13	117.66	123.39	129.3	135.72
r2	0	0	0.00051498	0.0057684	0.020245	112.16	117.7	123.42	129.34	135.75
r3	0	0	0.00020768	0.0041456	0.018539	112.19	117.72	123.45	129.36	135.77
r4	0	0	0.00010346	0.0041199	0.018307	112.85	118.38	124.11	130.02	136.44
r5	0	0	5.2907e-06	0.0041199	0.018091	113.53	119.06	124.78	130.7	137.11
r79	0	0	0	0	0	81.091	85.373	89.342	93.265	97.358
r80	0	0	0	0	0	76.137	79.759	83.442	86.995	90.589
r81	0	0	0	0	0	67.958	70.652	73.689	77.006	81.091
r82	0	0	0	0	0	50.126	53.467	56.319	57.902	60.587

r83	0	0	0	0	0	0	0	0	0	0

xxx TABLE:cons_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c**
r1	0.036717	0.037251	0.040477	0.044486	0.049324	12.272	12.557	12.851	13.152	1
r2	0.036717	0.037251	0.040477	0.045375	0.050668	12.508	12.794	13.089	13.391	1
r3	0.036717	0.037251	0.040784	0.046998	0.052374	12.762	13.05	13.345	13.646	1
r4	0.038144	0.038678	0.042314	0.048449	0.054031	13.008	13.297	13.593	13.891	1
r5	0.039534	0.040068	0.043802	0.049839	0.055635	13.245	13.534	13.83	14.125	1
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.858	37.4	39.448	41.74	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.785	42.986	45.321	47.983	5
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.942	52.071	55.052	57.95	6
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.755	69.238	72.404	77.036	8
r83	0.2179	0.21844	0.22216	0.23228	0.25197	116.87	122.69	128.71	134.92	1

```
welf_checks = 2; % 2 checks is $200 dollar of welfare checks
xi=1; % xi=0 full income loss from covid shock, xi=1, no covid income losses
b=1; % when xi=1, b does not matter, no income losses
TR = 100/58056;
mp_params('TR') = TR;
mp_params('xi') = xi;
mp_params('b') = b;
% if = mp_params('a2_covidyr_manna_heaven'), V_emp_2020 same as V_ss if b=1
% or xi=1.
% if = mp_params('a2_covidyr_tax_fully_pay'), V_emp_2020 differ due to 2020
% tax differences
mp_params('a2_covidyr') = mp_params('a2_covidyr_manna_heaven');
% mp_params('a2_covidyr') = mp_params('a2_covidyr_tax_fully_pay');
[V_emp_2020,~,cons_emp_2020,~] = snw_vfi_main_bisec_vec(mp_params, mp_controls, V_ss);
```

Completed SNW_VFI_MAIN_BISEC_VEC 1 Period Unemp Shock;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time
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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

	i	**idx**	**ndim**	**numel**	**rowN**	**colN**	**sum**	**mean**	**std**	**coefvari**
V_VFI	1	1	6	4.37e+07	83	5.265e+05	-1.2728e+08	-2.9126	20.655	-7.0915
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.3962e+09	31.95	36.423	1.14
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.3374e+08	5.3487	8.4439	1.5787

xxx TABLE:V_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-274.81	-274.42	-271.94	-266.29	-257.26	14.439	14.533	14.626	14.718	14.80
r2	-265.29	-264.9	-262.43	-256.84	-248.12	14.494	14.585	14.674	14.763	14.8
r3	-255.77	-255.38	-252.93	-247.53	-239.24	14.55	14.636	14.723	14.808	14.89
r4	-246.16	-245.8	-243.52	-238.46	-230.68	14.606	14.689	14.772	14.853	14.93
r5	-237.48	-237.14	-235.01	-230.26	-222.92	14.654	14.734	14.813	14.891	14.9
r79	-9.6662	-9.655	-9.5783	-9.3823	-9.0457	2.4698	2.4801	2.4898	2.4989	2.507
r80	-8.7031	-8.6919	-8.6152	-8.4192	-8.0826	2.253	2.261	2.2685	2.2755	2.282
r81	-7.5138	-7.5026	-7.4258	-7.2298	-6.8933	1.9749	1.9803	1.9855	1.9904	1.99
r82	-5.9155	-5.9043	-5.8275	-5.6315	-5.295	1.582	1.5851	1.588	1.5907	1.593
r83	-3.5892	-3.578	-3.5012	-3.3052	-2.9687	0.97904	0.98004	0.98097	0.98185	0.9826

xxx TABLE:ap_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c526500**

r1	0	0	0.00051498	0.0066578	0.021589	112.13	117.66	123.39	129.3	135.72
r2	0	0	0.00051498	0.0057684	0.020245	112.16	117.7	123.42	129.34	135.75
r3	0	0	0.00020768	0.0041456	0.018539	112.19	117.72	123.45	129.36	135.77
r4	0	0	0.00010346	0.0041199	0.018307	112.85	118.38	124.11	130.02	136.44
r5	0	0	5.2907e-06	0.0041199	0.018091	113.53	119.06	124.78	130.7	137.11
r79	0	0	0	0	0	81.091	85.373	89.342	93.265	97.358
r80	0	0	0	0	0	76.137	79.759	83.442	86.995	90.589
r81	0	0	0	0	0	67.958	70.652	73.689	77.006	81.091
r82	0	0	0	0	0	50.126	53.467	56.319	57.902	60.587
r83	0	0	0	0	0	0	0	0	0	0

```
xxx TABLE:cons_VFI xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.036717	0.037251	0.040477	0.044486	0.049324	12.272	12.557	12.851	13.152	1
r2	0.036717	0.037251	0.040477	0.045375	0.050668	12.508	12.794	13.089	13.391	1
r3	0.036717	0.037251	0.040784	0.046998	0.052374	12.762	13.05	13.345	13.646	1
r4	0.038144	0.038678	0.042314	0.048449	0.054031	13.008	13.297	13.593	13.891	1
r5	0.039534	0.040068	0.043802	0.049839	0.055635	13.245	13.534	13.83	14.125	1
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.858	37.4	39.448	41.74	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.785	42.986	45.321	47.983	5
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.942	52.071	55.052	57.95	6
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.755	69.238	72.404	77.036	8
r83	0.2179	0.21844	0.22216	0.23228	0.25197	116.87	122.69	128.71	134.92	1

```
[V_W_2020, C_W_2020] = snw_a4chk_wrk_bisec_vec(welf_checks, V_emp_2020, cons_emp_2020, mp_param
```

```
Completed SNW_A4CHK_WRK_BISEC_VEC;welf_checks=2;TR=0.0017225;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_te
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	ndim	numel	rowN	colN	sum	mean	std
C_W	1	1	6	4.37e+07	83	5.265e+05	2.3376e+08	5.3493	8.444
C_W_minus_C_ss	2	2	6	4.37e+07	83	5.265e+05	25255	0.00057793	0.00077744
V_W	3	3	6	4.37e+07	83	5.265e+05	-1.2673e+08	-2.9001	20.606
V_W_minus_V_ss	4	4	6	4.37e+07	83	5.265e+05	5.4734e+05	0.012525	0.068763
mn_MPC	5	5	6	4.37e+07	83	5.265e+05	7.331e+06	0.16776	0.22568

```
mn_V_W_gain_check = V_W_2020 - V_emp_2020;
mn_MPC_W_gain_share_check = (C_W_2020 - cons_emp_2020)./(welf_checks*mp_params('TR'));
```

Dense Param Results Define Frames

Define the matrix dimensions names and dimension vector values. Policy and Value Functions share the same ND dimensional structure.

```
% Grids:
age_grid = 18:100;
agrid = mp_params('agrid')';
eta_H_grid = mp_params('eta_H_grid')';
eta_S_grid = mp_params('eta_S_grid')';
ar_st_eta_HS_grid = string(cellstr([num2str(eta_H_grid', 'hz=%3.2f;'), num2str(eta_S_grid', 'wz
edu_grid = [0,1];
marry_grid = [0,1];
kids_grid = (1:1:mp_params('n_kidsgrid'))';
```

```
% NaN(n_jgrid,n_agrid,n_etagrid,n_educgrid,n_marriedgrid,n_kidsgrid);
cl_mp_datasetdesc = {};
cl_mp_datasetdesc{1} = containers.Map({'name', 'labval'}, {'age', age_grid});
cl_mp_datasetdesc{2} = containers.Map({'name', 'labval'}, {'savings', agrid});
cl_mp_datasetdesc{3} = containers.Map({'name', 'labval'}, {'eta', 1:length(eta_H_grid)});
cl_mp_datasetdesc{4} = containers.Map({'name', 'labval'}, {'edu', edu_grid});
cl_mp_datasetdesc{5} = containers.Map({'name', 'labval'}, {'marry', marry_grid});
cl_mp_datasetdesc{6} = containers.Map({'name', 'labval'}, {'kids', kids_grid});
```

Analyze Difference in V and C with Check

The difference between V and V with Check, marginal utility gain given the check.

```
% Generate some Data
mp_support_graph = containers.Map('KeyType', 'char', 'ValueType', 'any');
mp_support_graph('cl_st_xtitle') = {'Savings States, a'};
mp_support_graph('st_legend_loc') = 'eastoutside';
mp_support_graph('bl_graph_logy') = true; % do not log
mp_support_graph('it_legend_select') = 21; % how many shock legends to show
mp_support_graph('cl_colors') = 'jet';
```

MEAN(MN_V_GAIN_CHECK(A,Z))

Tabulate value and policies along savings and shocks:

```
% Set
ar_permute = [1,4,5,6,3,2];
% Value Function
st_title = ['MEAN(MN_V_W_GAIN_CHECK(A,Z)), welf_checks=' num2str(welf_checks) ', TR=' num2str(m
tb_az_v = ff_summ_nd_array(st_title, mn_V_W_gain_check, true, ["mean"], 4, 1, cl_mp_datasetdesc
```

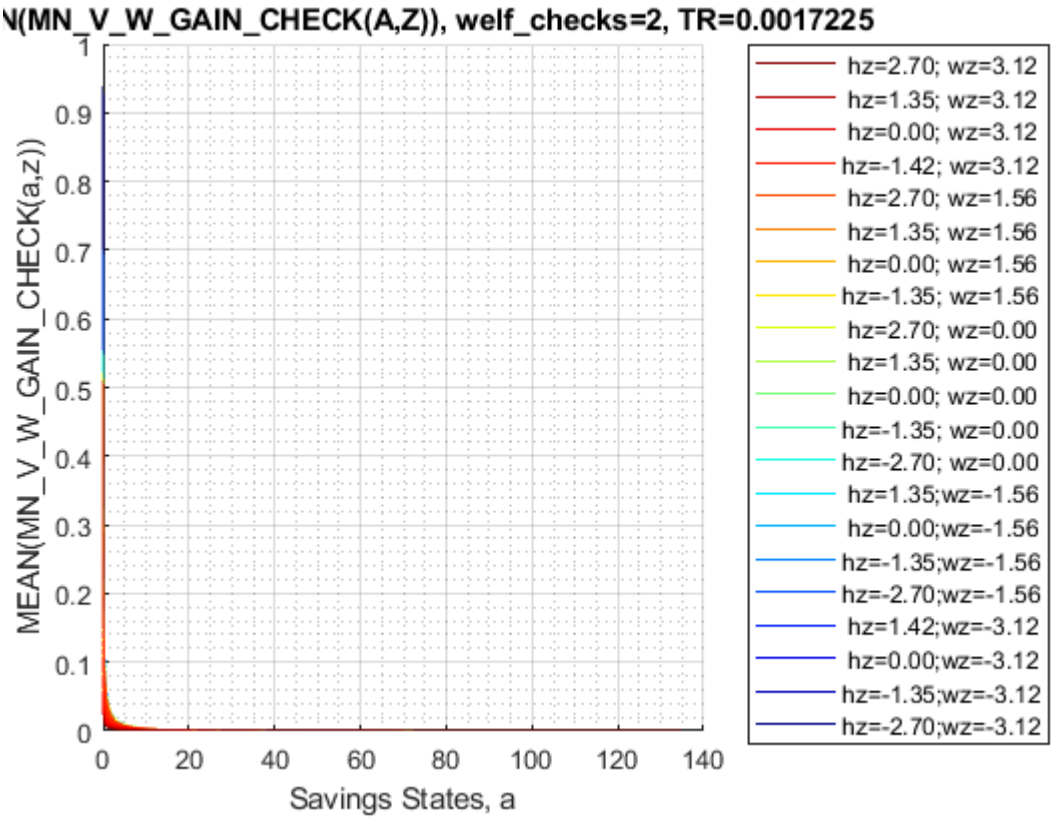
```
xxx  MEAN(MN_V_W_GAIN_CHECK(A,Z)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     savings      mean_eta_1    mean_eta_2    mean_eta_3    mean_eta_4    mean_eta_5    mean_eta_6    mean_
    _____    _________    __________    __________    __________    __________    __________    __________    _____

      1             0        0.9392       0.83995       0.75143       0.67247       0.60211       0.53949       0.
      2     0.00051498       0.92853       0.83105       0.74401       0.66627       0.59692       0.53514       0.
      3      0.0041199       0.77235       0.70233       0.63637        0.5753       0.51956       0.46916        0
      4       0.013905       0.58905       0.54392       0.49958       0.45714       0.41741       0.38076       0.
      5       0.032959       0.42485        0.3981       0.37046       0.34301       0.31661       0.29176       0.
      6       0.064373       0.30454       0.28847       0.27108       0.25326       0.23574       0.21897       0.
```

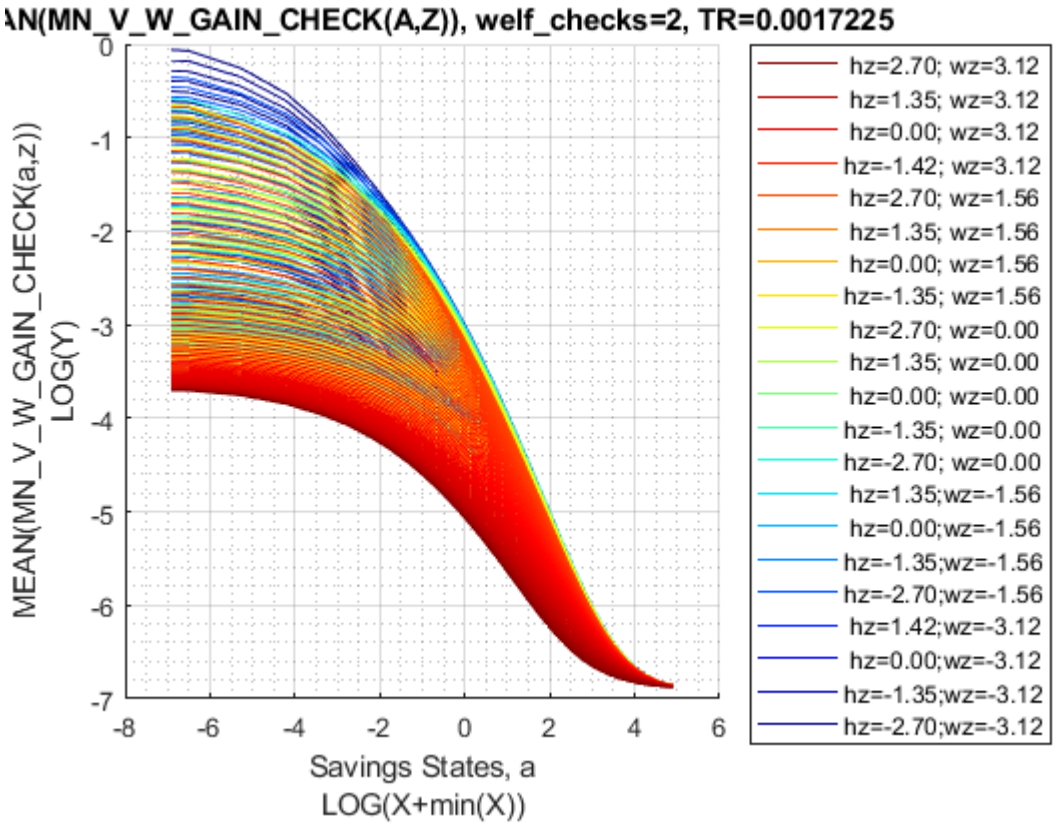
```
% Consumption
st_title = ['MEAN(MN_MPC_W_GAIN_CHECK(A,Z)), welf_checks=' num2str(welf_checks) ', TR=' num2str
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_W_gain_share_check, true, ["mean"], 4, 1, cl_mp_dat
```

```
xxx  MEAN(MN_MPC_W_GAIN_CHECK(A,Z)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     savings      mean_eta_1    mean_eta_2    mean_eta_3    mean_eta_4    mean_eta_5    mean_eta_6    mean_
    _____    _________    __________    __________    __________    __________    __________    __________    _____

      1             0        0.99819       0.99542       0.99298       0.99165       0.99158        0.9919       0.99
      2     0.00051498        0.99786       0.99458       0.99169       0.99012       0.99004       0.99041       0.99
      3      0.0041199        0.88447       0.87855       0.87718       0.87666       0.87656       0.87691       0.87
      4       0.013905         0.8027       0.80028       0.79717        0.7959       0.79596       0.79674       0.79
      5       0.032959        0.72023       0.71543       0.71313       0.71256       0.71322       0.71476       0.71
      6       0.064373        0.64495       0.64422       0.64465       0.64572       0.64725       0.64909       0.65
```

Graph Mean Values:

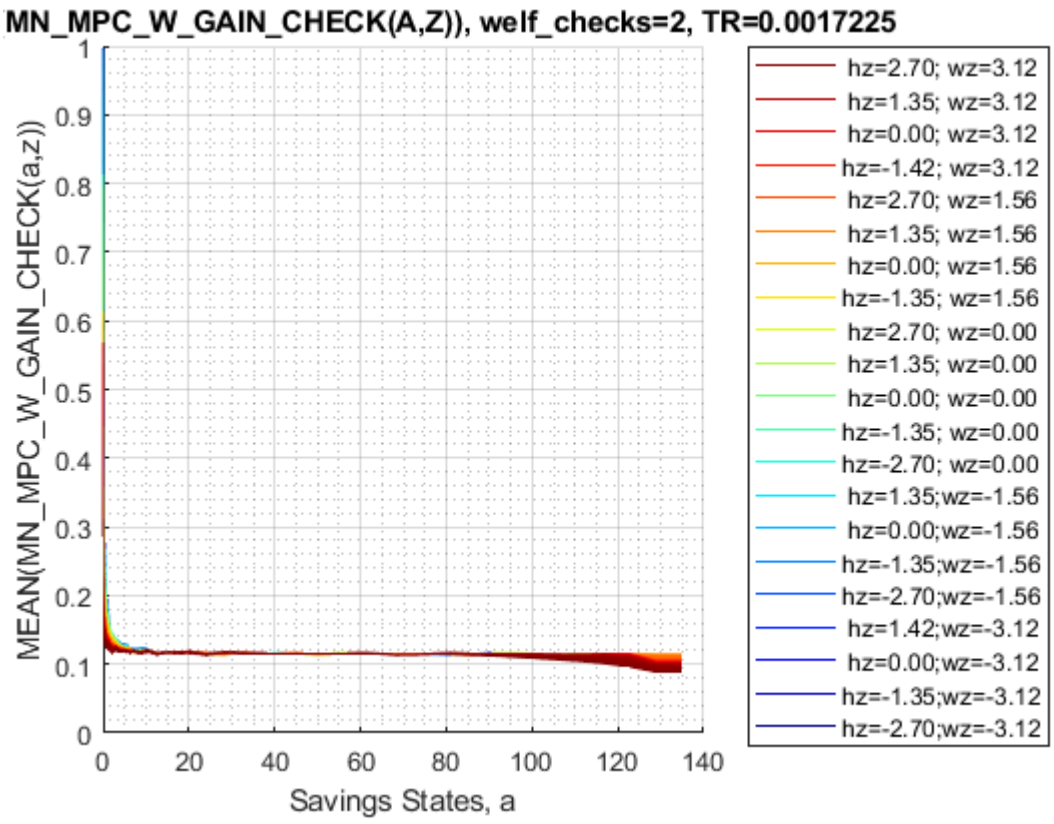
```
st_title = ['MEAN(MN\_V\_W\_GAIN\_CHECK(A,Z)), welf\_checks=' num2str(welf_checks) ', TR=' num2
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_W\_GAIN\_CHECK(a,z))'};
ff_graph_grid((tb_az_v{1:end, 3:end})', ar_st_eta_HS_grid, agrid, mp_support_graph);
```

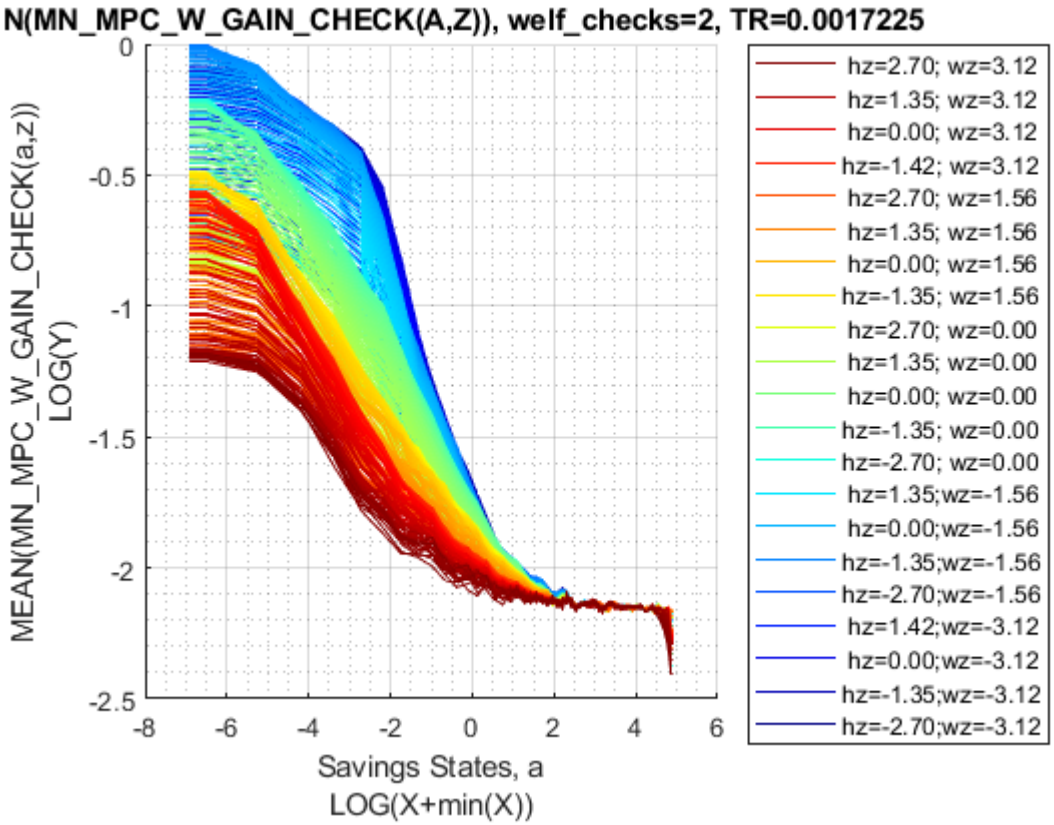




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_W\_GAIN\_CHECK(A,Z)), welf\_checks=' num2str(welf_checks) ', TR=' nu
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_MPC\_W\_GAIN\_CHECK(a,z))'};
ff_graph_grid((tb_az_c{1:end, 3:end})', ar_st_eta_HS_grid, agrid, mp_support_graph);
```





Analyze Kids and Marriage and Age

Aggregating over education, savings, and shocks, what are the differential effects of Marriage and Age.

```
% Generate some Data
mp_support_graph = containers.Map('KeyType', 'char', 'ValueType', 'any');
ar_row_grid = [...
    "k0M0", "K1M0", "K2M0", "K3M0", "K4M0", ...
    "k0M1", "K1M1", "K2M1", "K3M1", "K4M1"];
mp_support_graph('cl_st_xtitle') = {'Age'};
mp_support_graph('st_legend_loc') = 'best';
mp_support_graph('bl_graph_logy') = true; % do not log
mp_support_graph('st_rounding') = '6.2f'; % format shock legend
mp_support_graph('cl_scatter_shapes') = {...
    'o', 'd' ,'s', 'x', '*', ...
    'o', 'd', 's', 'x', '*'};
mp_support_graph('cl_colors') = {...
    'red', 'red', 'red', 'red', 'red'...
    'blue', 'blue', 'blue', 'blue', 'blue'};
```

MEAN(VAL(KM,J)), MEAN(AP(KM,J)), MEAN(C(KM,J))

Tabulate value and policies:

```
% Set
% NaN(n_jgrid,n_agrid,n_etagrid,n_educgrid,n_marriedgrid,n_kidsgrid);
ar_permute = [2,3,4,1,6,5];
% Value Function
st_title = ['MEAN(MN_V_W_GAIN_CHECK(KM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2str(
tb_az_v = ff_summ_nd_array(st_title, mn_V_W_gain_check, true, ["mean"], 3, 1, cl_mp_datasetdesc
```

```
xxx  MEAN(MN_V_W_GAIN_CHECK(KM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxx
    group    kids    marry    mean_age_18    mean_age_19    mean_age_20    mean_age_21    mean_age_22    mean_age_23
    _____    ____    _____    ___________    ___________    ___________    ___________    ___________    ___________

      1       1        0         0.028437       0.027376       0.026063       0.023822       0.021951       0.020378
      2       2        0         0.039126       0.037707       0.035888       0.032737       0.030099       0.027872
      3       3        0         0.045715       0.044315       0.042405       0.038713       0.035625        0.03302
      4       4        0         0.051932       0.050444       0.048349       0.044158       0.040655         0.0377
      5       5        0         0.056982       0.055495        0.05332       0.048744       0.044921         0.0417
      6       1        1        0.0083841      0.0079786      0.0075864      0.0068605      0.0062537      0.0057409
      7       2        1         0.011252       0.010707        0.01018      0.0092031      0.0083806      0.0076871
      8       3        1         0.013553       0.012927       0.012312       0.011135       0.010146      0.0093125
      9       4        1          0.01625       0.015528       0.014802       0.013403       0.012224       0.011225
     10       5        1         0.019767       0.018969       0.018138       0.016443       0.015025        0.01382
```

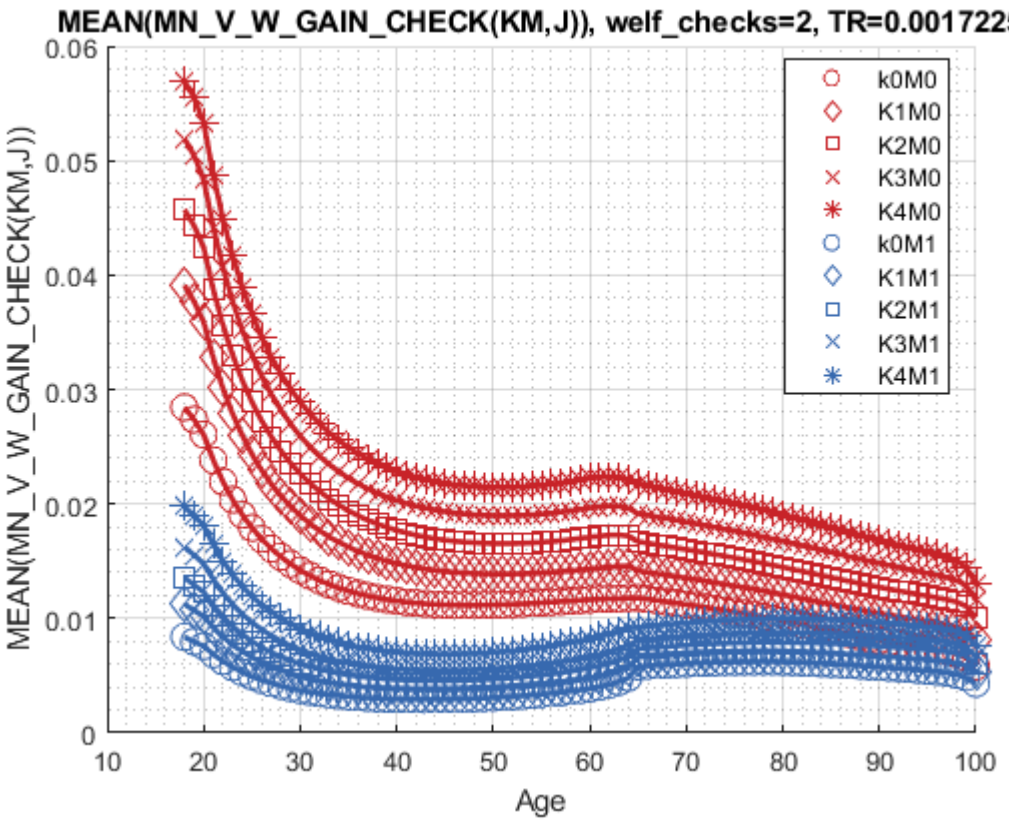
```
% Consumption Function
st_title = ['MEAN(MN_MPC_W_GAIN_CHECK(KM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_W_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

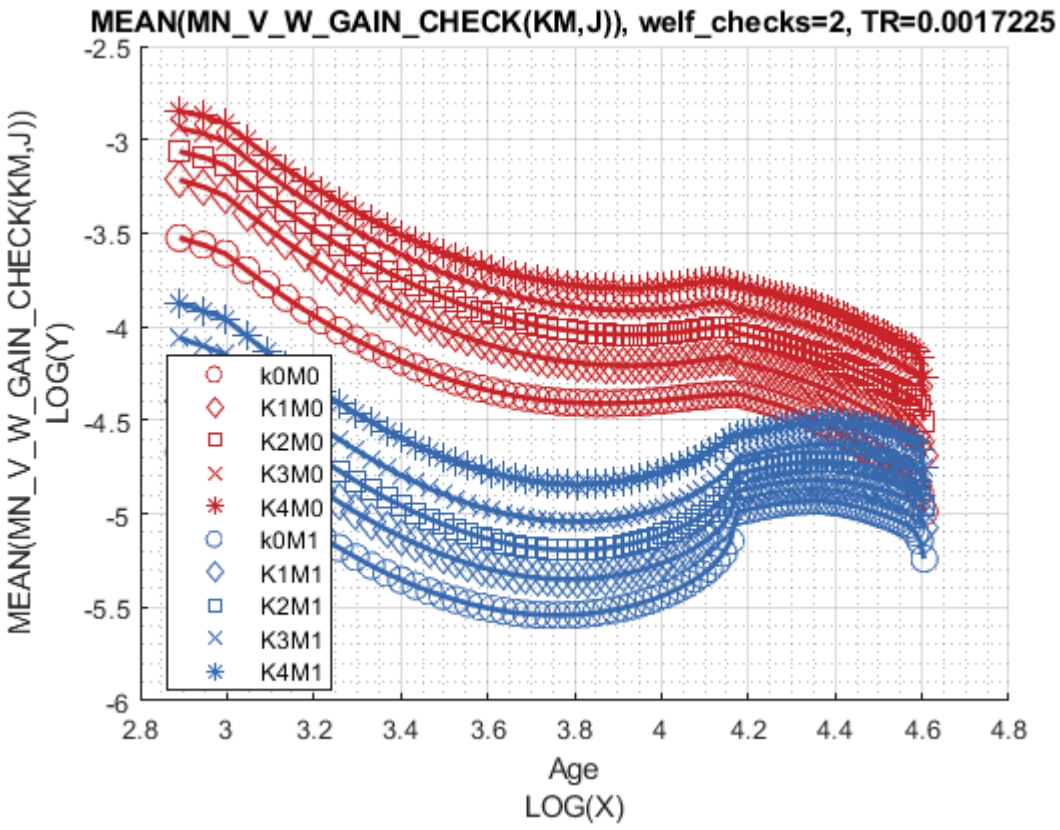
```
xxx  MEAN(MN_MPC_W_GAIN_CHECK(KM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxx
    group    kids    marry    mean_age_18    mean_age_19    mean_age_20    mean_age_21    mean_age_22    mean_age_23
    _____    ____    _____    ___________    ___________    ___________    ___________    ___________    ___________

      1       1        0         0.067662       0.074715       0.091649       0.089315       0.087212       0.085182
      2       2        0         0.075189       0.083207        0.10171       0.099915        0.09786       0.095891
      3       3        0         0.086592       0.095968        0.11575        0.11253        0.11003        0.10802
      4       4        0         0.091661        0.10083         0.1215        0.11846        0.11536        0.11327
      5       5        0         0.098586        0.10681        0.12763        0.12422        0.12139        0.11766
      6       1        1          0.10283        0.10674        0.11265         0.1115        0.11032        0.10943
```

7	2	1	0.10353	0.10779	0.11436	0.11367	0.11228	0.11099
8	3	1	0.10878	0.1138	0.12316	0.11987	0.11874	0.1184
9	4	1	0.11021	0.11558	0.12335	0.12226	0.12245	0.12007
10	5	1	0.11668	0.12332	0.13258	0.13022	0.12682	0.12511

Graph Mean Values:

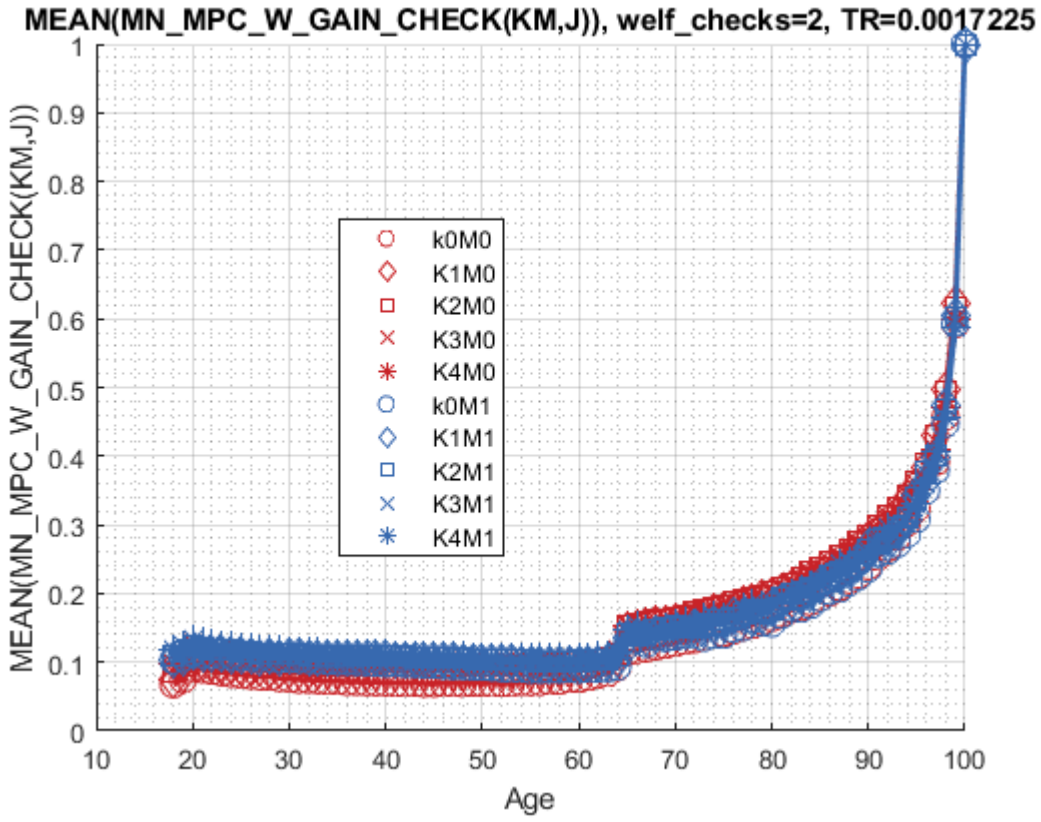
```
st_title = ['MEAN(MN\_V\_W\_GAIN\_CHECK(KM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_W\_GAIN\_CHECK(KM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);
```

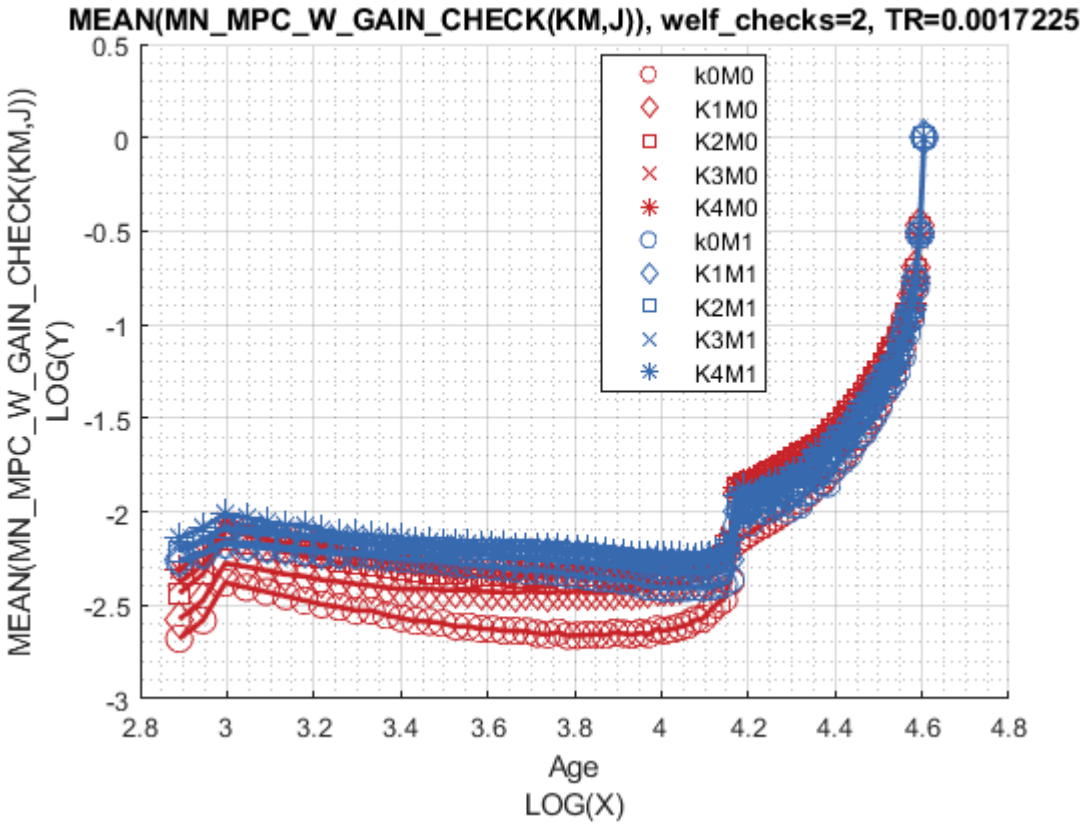




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_W\_GAIN\_CHECK(KM,J)), welf\_checks=' num2str(welf_checks) ', TR=' r
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_MPC\_W\_GAIN\_CHECK(KM,J))'};
ff_graph_grid((tb_az_c{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);
```





Analyze Education and Marriage

Aggregating over education, savings, and shocks, what are the differential effects of Marriage and Age.

```
% Generate some Data
mp_support_graph = containers.Map('KeyType', 'char', 'ValueType', 'any');
ar_row_grid = ["E0M0", "E1M0", "E0M1", "E1M1"];
mp_support_graph('cl_st_xtitle') = {'Age'};
mp_support_graph('st_legend_loc') = 'best';
mp_support_graph('bl_graph_logy') = true; % do not log
mp_support_graph('st_rounding') = '6.2f'; % format shock legend
mp_support_graph('cl_scatter_shapes') = {'*', 'p', '*','p' };
mp_support_graph('cl_colors') = {'red', 'red', 'blue', 'blue'};
```

MEAN(VAL(EM,J)), MEAN(AP(EM,J)), MEAN(C(EM,J))

Tabulate value and policies:

```
% Set
% NaN(n_jgrid,n_agrid,n_etagrid,n_educgrid,n_marriedgrid,n_kidsgrid);
ar_permute = [2,3,6,1,4,5];
% Value Function
st_title = ['MEAN(MN_V_W_GAIN_CHECK(EM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2str(
tb_az_v = ff_summ_nd_array(st_title, mn_V_W_gain_check, true, ["mean"], 3, 1, cl_mp_datasetdesc
```

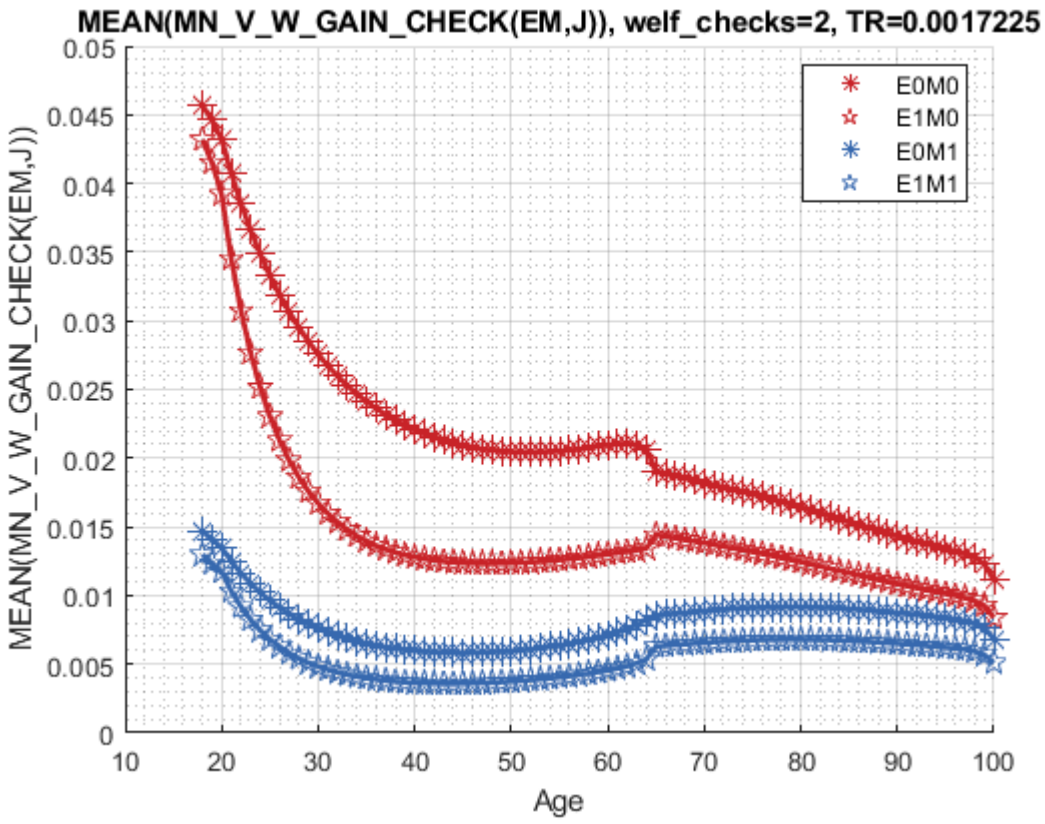
```
xxx  MEAN(MN_V_W_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    edu    marry    mean_age_18    mean_age_19    mean_age_20    mean_age_21    mean_age_22    mean_age_23
    _____    ___    _____    ___________    ___________    ___________    ___________    ___________    ___________

      1       0       0       0.045686       0.044613       0.043199       0.040738       0.038551       0.036603
      2       1       0       0.043191       0.041522       0.039211       0.034531       0.030749       0.027666
      3       0       1       0.014696       0.014078       0.013468       0.012489       0.011628       0.010873
      4       1       1       0.012986       0.012366       0.011738       0.010329      0.0091832      0.0082411
```

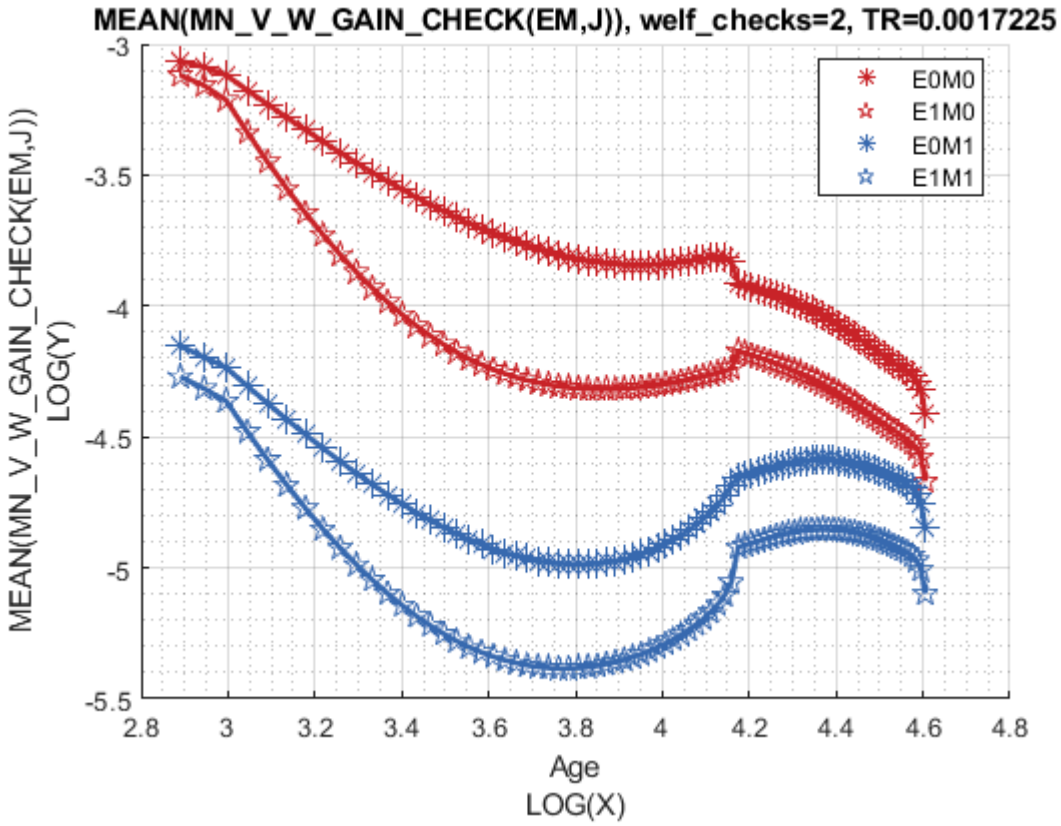
```
% Consumption
st_title = ['MEAN(MN_MPC_W_GAIN_CHECK(EM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_W_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

```
xxx  MEAN(MN_MPC_W_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    edu    marry    mean_age_18    mean_age_19    mean_age_20    mean_age_21    mean_age_22    mean_age_23
    _____    ___    _____    ___________    ___________    ___________    ___________    ___________    ___________

      1       0       0       0.075426       0.080467       0.092498       0.091865       0.091752       0.091309
      2       1       0        0.09245        0.10414         0.1308        0.12591        0.12099         0.1167
      3       0       1       0.099901        0.10366         0.1083        0.10854        0.10844         0.1078
      4       1       1        0.11691        0.12322        0.13414        0.13047         0.1278         0.1258
```

Graph Mean Values:

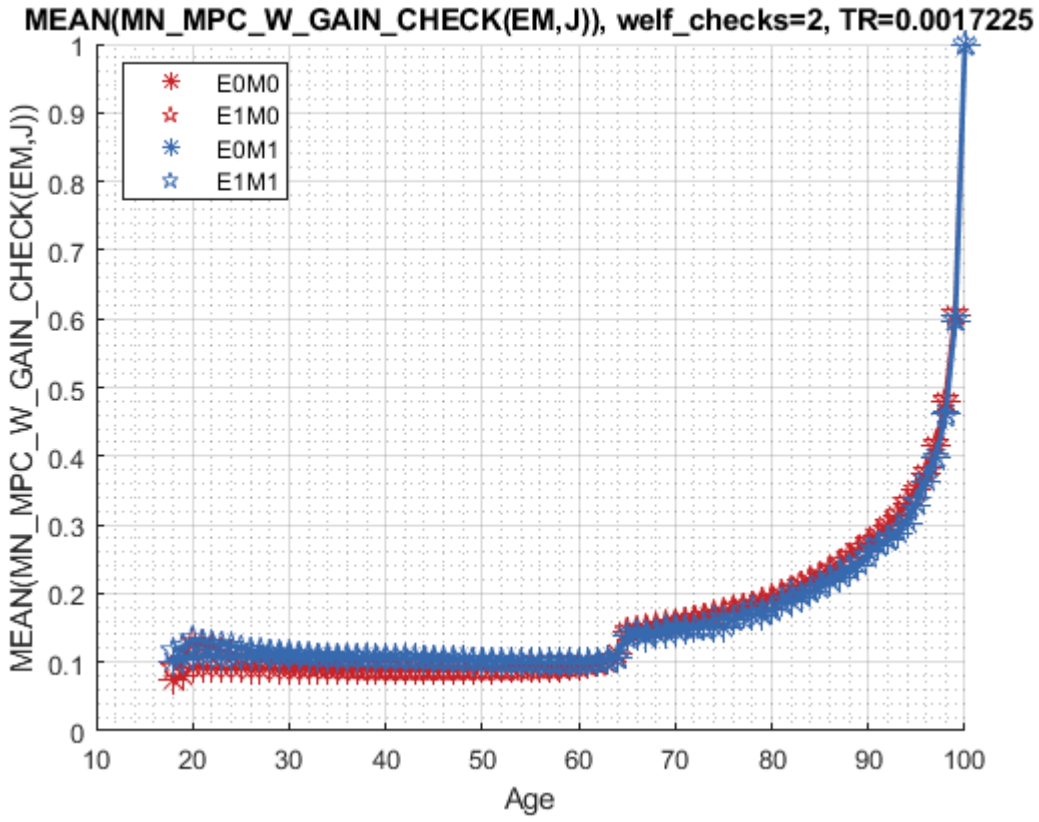
```
st_title = ['MEAN(MN\_V\_W\_GAIN\_CHECK(EM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_W\_GAIN\_CHECK(EM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);
```

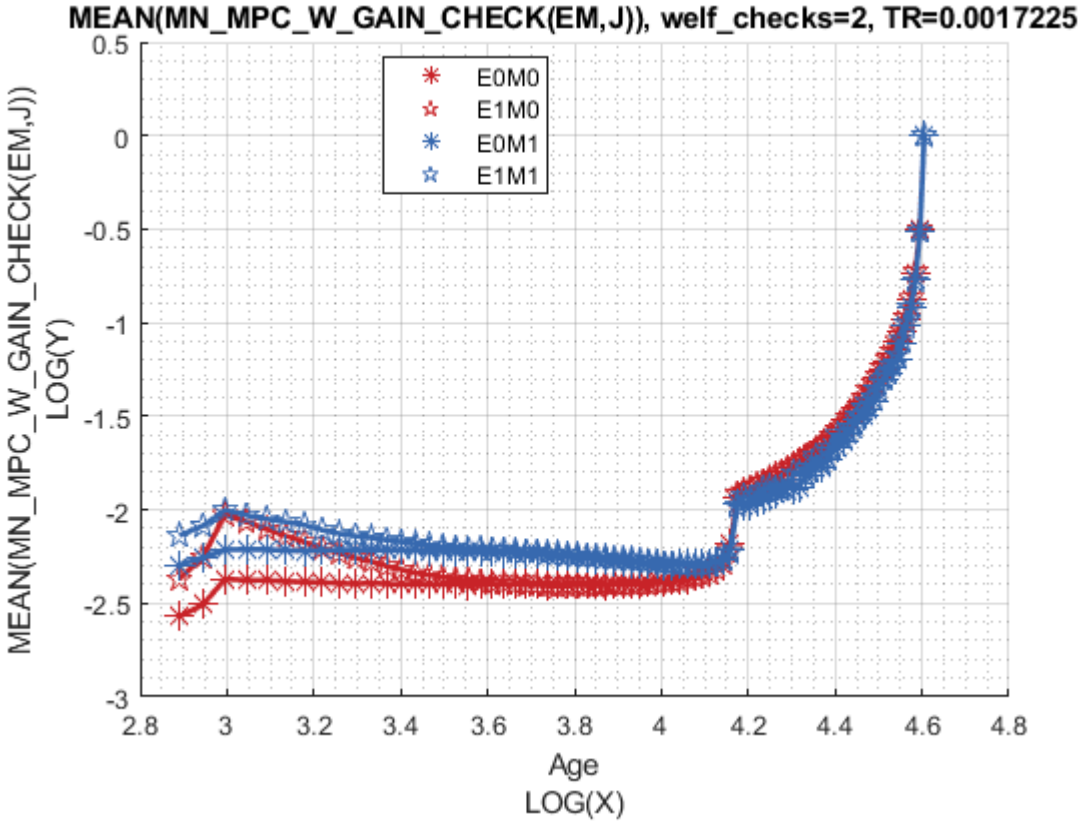




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_W\_GAIN\_CHECK(EM,J)), welf\_checks=' num2str(welf_checks) ', TR=' r
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_MPC\_W\_GAIN\_CHECK(EM,J))'};
ff_graph_grid((tb_az_c{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);
```




MEAN(MN_MPC_W_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225
E0M0
E1M0
E0M1
E1M1
MEAN(MN_MPC_W_GAIN_CHECK(EM,J))
LOG(Y)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4
4.6
4.8
Age
LOG(X)