2019 Full States EV and EC of One Check

This is the example vignette for function: **snw_evuvw19_jaeemk** from the **PrjOptiSNW Package.** 2019 integrated over VU and VW, given optimal savings choices, unemployment shocks and various expectations.

Test SNW_EVUVW19_JAEEMK Defaults

Call the function with defaults.

```
clear all;
st_solu_type = 'bisec_vec';

% Solve the VFI Problem and get Value Function
mp_params = snw_mp_param('default_docdense');
mp_params('beta') = 0.95;
% mp_params = snw_mp_param('default_dense');
mp_controls = snw_mp_control('default_test');

% set Unemployment Related Variables
mp_params('a2_covidyr') = mp_params('a2_covidyr_manna_heaven');
% mp_params('a2_covidyr') = mp_params('a2_covidyr_tax_fully_pay');

% Solve for Unemployment Values
mp_controls('bl_print_vfi') = false;
mp_controls('bl_print_vfi_verbose') = true;
mp_controls('bl_print_ds') = false;
mp_controls('bl_print_ds_verbose') = false;
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;

% Solve the Model to get V working and unemployed
[V_ss,ap_ss,cons_ss,mp_valpol_more_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=488.7831
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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
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	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

```
inc_VFI = mp_valpol_more_ss('inc_VFI');
spouse_inc_VFI = mp_valpol_more_ss('spouse_inc_VFI');
total_inc_VFI = inc_VFI + spouse_inc_VFI;
% Solve employment, same as 2020, except with possible change in tax
mp_params('xi') = 1;
mp_params('b') = 0;
[V_emp_2020,~,cons_emp_2020,~] = snw_vfi_main_bisec_vec(mp_params, mp_controls, V_ss);
```

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

	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

```
% Solve unemployment, different income than under ss due to income losses
mp_params('xi') = 0.50;
mp_params('b') = 0.50;
[V_unemp_2020,~,cons_unemp_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
----------------------------------------
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	-1.3655e+08	-3.1246	21.031	-6.7306
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.3778e+09	31.529	36.357	1.1531
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.3211e+08	5.3114	8.4428	1.5895

xxx TABLE:V_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-283.64	-282.96	-278.82	-271.25	-260.97	14.399	14.494	14.589	14.682	14.77
r2	-274.13	-273.45	-269.31	-261.74	-251.67	14.454	14.546	14.637	14.727	14.81
r3	-264.61	-263.93	-259.79	-252.24	-242.65	14.51	14.598	14.686	14.773	14.85

r4	-254.66	-254.03	-250.17	-243.06	-234.04	14.565	14.65	14.734	14.817	14.89
r5	-245.67	-245.08	-241.48	-234.76	-226.24	14.611	14.693	14.774	14.854	14.93
r79	-9.6662	-9.655	-9.5783	-9.3823	-9.0457	2.4688	2.4792	2.489	2.4982	2.506
r80	-8.7031	-8.6919	-8.6152	-8.4192	-8.0826	2.2523	2.2603	2.2679	2.275	2.281
r81	-7.5138	-7.5026	-7.4258	-7.2298	-6.8933	1.9743	1.9799	1.9851	1.99	1.994
r82	-5.9155	-5.9043	-5.8275	-5.6315	-5.295	1.5817	1.5848	1.5878	1.5905	1.593
r83	-3.5892	-3.578	-3.5012	-3.3052	-2.9687	0.97895	0.97995	0.98089	0.98178	0.9826

xxx TABLE:ap_VFI xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c526500
r1	0	0	0	0.0011815	0.013905	109.97	115.52	121.25	127.17	133.28
r2	0	0	0	0.00090277	0.013905	109.94	115.49	121.22	127.14	133.25
r3	0	0	0	0.00051498	0.013905	109.9	115.44	121.17	127.09	133.2
r4	0	0	0	0.00051498	0.013905	110.33	115.88	121.6	127.52	133.64
r5	0	0	0	0.00048777	0.013905	110.78	116.32	122.05	127.97	134.09
r79	0	0	0	0	0	80.977	84.854	88.823	92.746	96.839
r80	0	0	0	0	0	75.625	79.248	82.93	86.483	90.439
r81	0	0	0	0	0	67.452	70.146	73.182	76.669	81.091
r82	0	0	0	0	0	50.126	53.467	55.817	57.4	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	0.027723	0.028258	0.031999	0.040974	0.048028	11.996	12.272	12.557	12.851	1
r2	0.027723	0.028258	0.031999	0.041253	0.048028	12.23	12.508	12.794	13.089	1
r3	0.027723	0.028258	0.031999	0.041641	0.048028	12.483	12.762	13.05	13.345	1
r4	0.028805	0.029339	0.033081	0.042722	0.049108	12.728	13.008	13.297	13.593	1
r5	0.029859	0.030394	0.034135	0.043802	0.050161	12.963	13.245	13.534	13.83	1
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.453	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	57.78	5
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.254	68.736	72.404	77.036	8
r83	0.2179	0.21844	0.22216	0.23228	0.25197	116.37	122.19	128.21	134.43	1

```
[Phi_true] = snw_ds_main(mp_params, mp_controls, ap_ss, cons_emp_2020, mp_valpol_more_ss);
```

```
Completed SNW_DS_MAIN;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=1911.1684
```

```
% Get Matrixes
cl_st_precompute_list = {'a', ...
    'inc', 'inc_unemp', 'spouse_inc', 'spouse_inc_unemp', 'ref_earn_wageind_grid',...
    'ap_idx_lower_ss', 'ap_idx_higher_ss', 'ap_idx_lower_weight_ss'};
mp_controls('bl_print_precompute_verbose') = false;
[mp_precompute_res] = snw_hh_precompute(mp_params, mp_controls, cl_st_precompute_list, ap_ss, P
```

```
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=358.215
```

Solve for 2019 Evuvw With 0 and 2 Checks

```
% Call Function
welf_checks = 0;
[ev19_jaeemk_check0, ec19_jaeemk_check0, ev20_jaeemk_check0, ec20_jaeemk_check0] = snw_evuvw19_
    welf_checks, st_solu_type, mp_params, mp_controls, ...
    V_emp_2020, cons_emp_2020, V_unemp_2020, cons_unemp_2020, mp_precompute_res);
```

```
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=0.5;SNW_MP_PARAM=default_docdense;SNW_MP_CON
Completed SNW_EVUVW20_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=8.2469
Completed SNW_EVUVW19_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=5058.1482
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CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
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	i	idx	ndim	numel	rowN	colN	sum	mean	std	coefva
ec19_jaeemk	1	1	6	4.3173e+07	82	5.265e+05	1.9762e+08	4.5774	5.3272	1.163
ec20_jaeemk	2	2	6	4.37e+07	83	5.265e+05	2.3357e+08	5.3448	8.4447	1.5
ev19_jaeemk	3	3	6	4.3173e+07	82	5.265e+05	-1.2119e+08	-2.8072	20.003	-7.125
ev20_jaeemk	4	4	6	4.37e+07	83	5.265e+05	-1.2937e+08	-2.9604	20.785	-7.02

xxx TABLE:ec19_jaeemk xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.036494	0.036494	0.037029	0.041925	0.048857	12.024	12.296	12.576	12.864	1
r2	0.036494	0.036494	0.037029	0.041745	0.049665	12.268	12.541	12.822	13.111	1
r3	0.037912	0.037912	0.038127	0.041994	0.050655	12.503	12.777	13.06	13.349	1
r4	0.039293	0.039293	0.039401	0.043382	0.052052	12.761	13.036	13.319	13.607	1
r5	0.040635	0.040635	0.04064	0.044725	0.053494	13.01	13.286	13.569	13.855	1
r78	0.2179	0.2179	0.2179	0.2179	0.2179	27.797	28.793	29.808	30.995	3
r79	0.2179	0.2179	0.2179	0.2179	0.2179	30.454	31.684	32.756	33.984	3
r80	0.2179	0.2179	0.2179	0.2179	0.2179	33.715	35.537	37.399	38.98	4
r81	0.2179	0.2179	0.2179	0.2179	0.2179	40.14	41.425	43.212	45.644	4
r82	0.2179	0.2179	0.2179	0.2179	0.2179	52.118	55.559	58.496	60.127	6

xxx TABLE:ec20_jaeemk xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.033462	0.033996	0.037408	0.043215	0.048855	12.249	12.534	12.827	13.127	1
r2	0.033462	0.033996	0.037408	0.043883	0.049712	12.485	12.771	13.065	13.366	1
r3	0.033462	0.033996	0.037604	0.045059	0.050801	12.739	13.026	13.321	13.621	1
r4	0.034763	0.035298	0.038972	0.046376	0.052249	12.985	13.273	13.568	13.866	1
r5	0.036032	0.036566	0.040303	0.047654	0.053654	13.221	13.51	13.805	14.101	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

xxx TABLE:ev19_jaeemk xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-264.92	-264.92	-264.47	-260.13	-252.27	14.364	14.458	14.551	14.643	14.72
r2	-254.9	-254.9	-254.45	-250.7	-243.18	14.418	14.509	14.599	14.688	14.76
r3	-244.75	-244.75	-244.59	-241.74	-234.51	14.473	14.56	14.646	14.732	14.8
r4	-235.6	-235.6	-235.52	-232.8	-226.09	14.529	14.612	14.695	14.777	14.84
r5	-227.32	-227.32	-227.32	-224.7	-218.45	14.576	14.656	14.736	14.814	14.8
r78	-9.6725	-9.6725	-9.6725	-9.6725	-9.6725	2.4176	2.4297	2.441	2.4518	2.462
r79	-8.7092	-8.7092	-8.7092	-8.7092	-8.7092	2.2043	2.215	2.2241	2.2322	2.240
r80	-7.5196	-7.5196	-7.5196	-7.5196	-7.5196	1.9308	1.938	1.9447	1.9507	1.956
r81	-5.9209	-5.9209	-5.9209	-5.9209	-5.9209	1.5463	1.55	1.5539	1.558	1.562
r82	-3.5937	-3.5937	-3.5937	-3.5937	-3.5937	0.95581	0.95855	0.96061	0.96167	0.9633

xxx TABLE:ev20_jaeemk xxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-278.01	-277.51	-274.43	-268.08	-258.6	14.436	14.53	14.623	14.715	14.80

r2	-268.49	-268	-264.92	-258.61	-249.41	14.491	14.582	14.671	14.76	14.84
r3	-258.97	-258.47	-255.41	-249.23	-240.47	14.546	14.633	14.719	14.805	14.88
r4	-249.24	-248.78	-245.93	-240.13	-231.89	14.602	14.686	14.768	14.85	14.93
r5	-240.44	-240.01	-237.35	-231.89	-224.12	14.65	14.73	14.81	14.888	14.96
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

```
% Call Function
welf_checks = 2;
[ev19_jaeemk_check2, ec19_jaeemk_check2, ev20_jaeemk_check2, ec20_jaeemk_check2] = snw_evuvw19_
    welf_checks, st_solu_type, mp_params, mp_controls, ...
    V_emp_2020, cons_emp_2020, V_unemp_2020, cons_unemp_2020, mp_precompute_res);
```

```
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=0.5;SNW_MP_PARAM=default_docdense;SNW_MP_CON
Completed SNW_EVUVW20_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;timeEUEC=7.8042
Completed SNW_EVUVW19_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=4864.3569
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_outcomes ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	ndim	numel	rowN	colN	sum	mean	std	coefva
ec19_jaeemk	1	1	6	4.3173e+07	82	5.265e+05	1.9765e+08	4.578	5.3272	1.163
ec20_jaeemk	2	2	6	4.37e+07	83	5.265e+05	2.3359e+08	5.3454	8.4448	1.579
ev19_jaeemk	3	3	6	4.3173e+07	82	5.265e+05	-1.2064e+08	-2.7944	19.95	-7.139
ev20_jaeemk	4	4	6	4.37e+07	83	5.265e+05	-1.2878e+08	-2.947	20.729	-7.034

xxx TABLE:ec19_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.039586	0.039586	0.040055	0.043746	0.049764	12.024	12.296	12.576	12.865	1
r2	0.039751	0.039751	0.040251	0.043953	0.050609	12.268	12.541	12.822	13.111	1
r3	0.041192	0.041192	0.041395	0.044454	0.051633	12.503	12.777	13.06	13.349	1
r4	0.042594	0.042594	0.042696	0.045859	0.053051	12.761	13.036	13.319	13.607	1
r5	0.043937	0.043937	0.043942	0.04725	0.054513	13.01	13.286	13.569	13.855	1
r78	0.22135	0.22135	0.22135	0.22135	0.22135	27.797	28.794	29.809	30.996	3
r79	0.22135	0.22135	0.22135	0.22135	0.22135	30.455	31.685	32.757	33.985	3
r80	0.22135	0.22135	0.22135	0.22135	0.22135	33.717	35.539	37.401	38.981	4
r81	0.22135	0.22135	0.22135	0.22135	0.22135	40.142	41.427	43.215	45.646	4
r82	0.22135	0.22135	0.22135	0.22135	0.22135	52.121	55.563	58.5	60.13	6

xxx TABLE:ec20_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.036651	0.037139	0.039378	0.044197	0.049529	12.25	12.534	12.827	13.127	1
r2	0.036651	0.037139	0.039605	0.044899	0.050459	12.485	12.771	13.065	13.366	1
r3	0.036804	0.037319	0.040134	0.046059	0.051622	12.739	13.026	13.321	13.621	1
r4	0.038157	0.038682	0.041485	0.0474	0.053101	12.985	13.273	13.568	13.867	1
r5	0.039474	0.040008	0.042798	0.048699	0.054535	13.221	13.51	13.805	14.101	1
r79	0.22135	0.22188	0.22561	0.23572	0.25394	35.859	37.401	39.449	41.741	4
r80	0.22135	0.22188	0.22561	0.23572	0.25397	40.787	42.988	45.322	47.984	5
r81	0.22135	0.22188	0.22561	0.23572	0.25434	48.944	52.073	55.054	57.951	
r82	0.22135	0.22188	0.22561	0.23572	0.25469	66.757	69.24	72.406	77.038	8
r83	0.22135	0.22188	0.22561	0.23572	0.25541	116.87	122.69	128.71	134.93	1

xxx TABLE:ev19_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650

r1	-262.28	-262.28	-261.88	-258.26	-250.89	14.364	14.458	14.551	14.643	14.72
r2	-252.28	-252.28	-251.88	-248.84	-241.85	14.418	14.509	14.599	14.688	14.76
r3	-242.33	-242.33	-242.18	-239.92	-233.24	14.473	14.56	14.646	14.732	14.8
r4	-233.33	-233.33	-233.27	-231.09	-224.88	14.529	14.612	14.695	14.777	14.84
r5	-225.21	-225.21	-225.2	-223.1	-217.31	14.576	14.656	14.736	14.814	14.8
r78	-9.6013	-9.6013	-9.6013	-9.6013	-9.6013	2.4176	2.4297	2.441	2.4518	2.462
r79	-8.6379	-8.6379	-8.6379	-8.6379	-8.6379	2.2043	2.215	2.2241	2.2322	2.240
r80	-7.4483	-7.4483	-7.4483	-7.4483	-7.4483	1.9308	1.938	1.9447	1.9507	1.956
r81	-5.8497	-5.8497	-5.8497	-5.8497	-5.8497	1.5463	1.55	1.5539	1.558	1.562
r82	-3.5225	-3.5225	-3.5225	-3.5225	-3.5225	0.95582	0.95855	0.96061	0.96167	0.9633

xxx TABLE:ev20_jaeemk xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-275.12	-274.68	-272.28	-266.43	-257.32	14.436	14.53	14.623	14.715	14.80
r2	-265.6	-265.16	-262.78	-257.01	-248.18	14.491	14.582	14.671	14.76	14.84
r3	-256.09	-255.66	-253.32	-247.71	-239.31	14.546	14.633	14.72	14.805	14.88
r4	-246.56	-246.15	-243.96	-238.69	-230.79	14.603	14.686	14.769	14.85	14.93
r5	-237.94	-237.56	-235.5	-230.54	-223.08	14.65	14.73	14.81	14.888	14.96
r79	-9.595	-9.584	-9.5115	-9.3234	-8.9958	2.4698	2.4801	2.4898	2.4989	2.507
r80	-8.6319	-8.6209	-8.5484	-8.3603	-8.0332	2.253	2.261	2.2685	2.2756	2.282
r81	-7.4426	-7.4316	-7.3591	-7.171	-6.8443	1.9749	1.9803	1.9855	1.9904	1.99
r82	-5.8443	-5.8333	-5.7608	-5.5727	-5.2463	1.582	1.5851	1.588	1.5907	1.593
r83	-3.518	-3.507	-3.4345	-3.2464	-2.9207	0.97904	0.98004	0.98097	0.98185	0.9826

Differences between Checks in Expected Value and Expected Consumption

```
mn_V_U_gain_check = ev19_jaeemk_check2 - ev19_jaeemk_check0;
mn_MPC_U_gain_share_check = (ec19_jaeemk_check2 - ec19_jaeemk_check0)./(welf_checks*mp_params('
```

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 = 18:99;
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_U_GAIN_CHECK(A,Z)), welf_checks=' num2str(welf_checks) ', TR=' num2str(m
tb_az_v = ff_summ_nd_array(st_title, mn_V_U_gain_check, true, ["mean"], 4, 1, cl_mp_datasetdesc
```

```
xxx  MEAN(MN_V_U_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        0.5996       0.55567       0.50718       0.45861       0.41293        0.3714       0.
      2      0.00051498        0.5996       0.55567       0.50718       0.45861       0.41293        0.3714       0.
      3       0.0041199       0.59858       0.55412       0.50516       0.45663       0.41125       0.37004       0.
      4        0.013905       0.49775       0.46232       0.42566       0.38891       0.35398       0.32177       0.
      5        0.032959       0.39069       0.36715       0.34122       0.31498       0.28971       0.26606       0.
      6        0.064373       0.31749       0.30013       0.28105       0.26146       0.24228       0.22405       0.
```

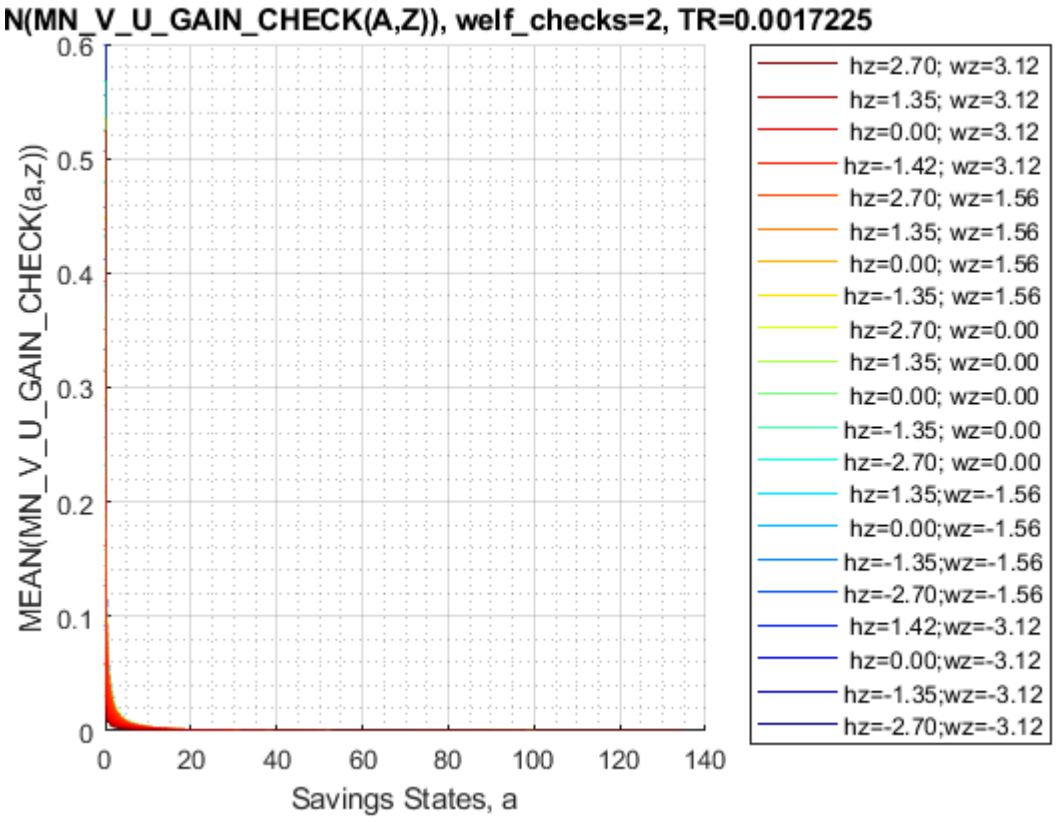
```
% Consumption
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(A,Z)), welf_checks=' num2str(welf_checks) ', TR=' num2str
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 4, 1, cl_mp_dat
```

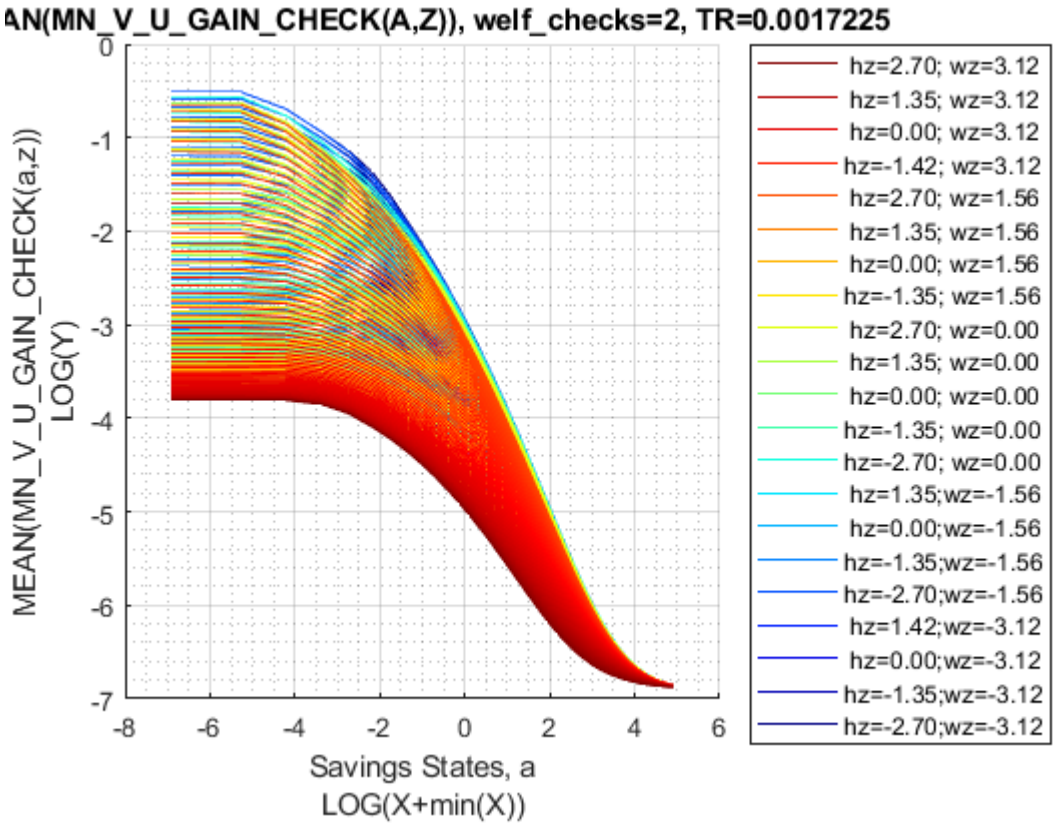
```
xxx  MEAN(MN_MPC_U_GAIN_CHECK(A,Z)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     savings      mean_eta_1    mean_eta_2    mean_eta_3    mean_eta_4    mean_eta_5    mean_eta_6    mean_
    _____    _________    __________    __________    __________    __________    __________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

      1              0       0.81458       0.81464       0.81469       0.81468       0.81453       0.81424       0.81
      2      0.00051498       0.81458       0.81464       0.81469       0.81468       0.81453       0.81424       0.81
      3       0.0041199       0.81443       0.81422       0.81395       0.81376       0.81357       0.81328        0.8
      4        0.013905       0.74362       0.73968       0.73889       0.73872       0.73889       0.73924       0.73
      5        0.032959       0.66095       0.66107        0.6621       0.66413       0.66676       0.66957        0.6
      6        0.064373       0.56543       0.56521       0.56569       0.56689       0.56869       0.57092       0.57
```

Graph Mean Values:

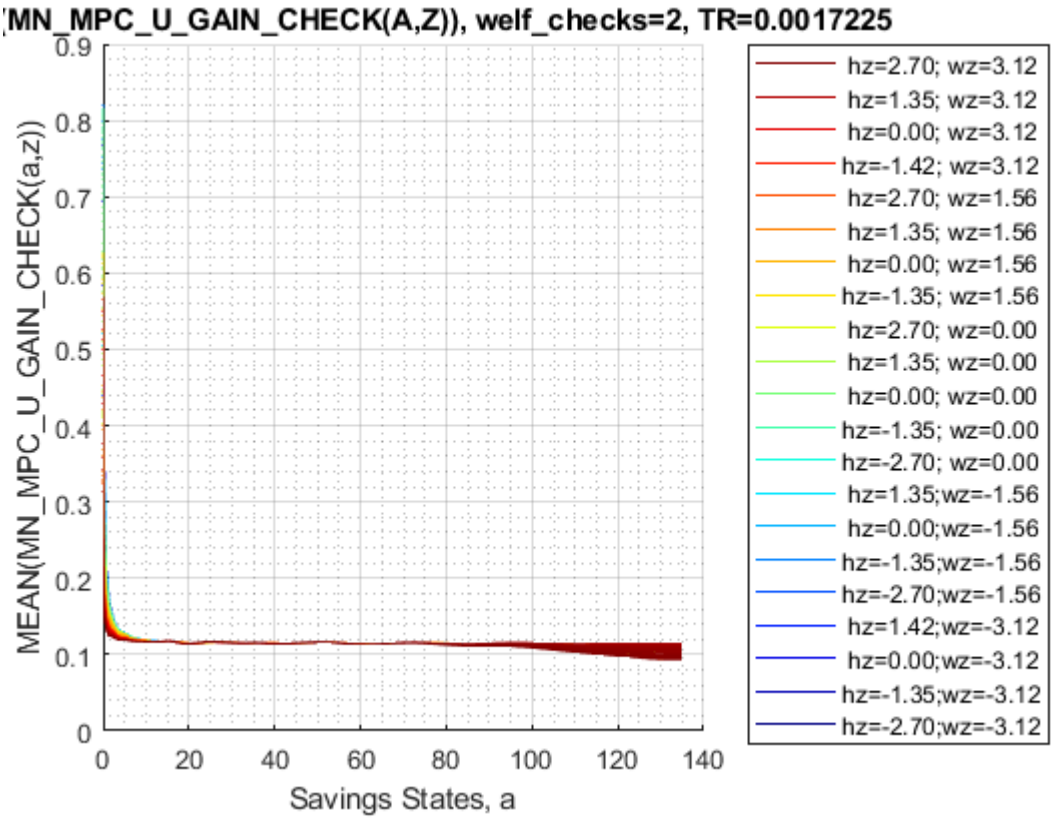
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(A,Z)), welf\_checks=' num2str(welf_checks) ', TR=' num2
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(a,z))'};
ff_graph_grid((tb_az_v{1:end, 3:end})', ar_st_eta_HS_grid, agrid, mp_support_graph);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

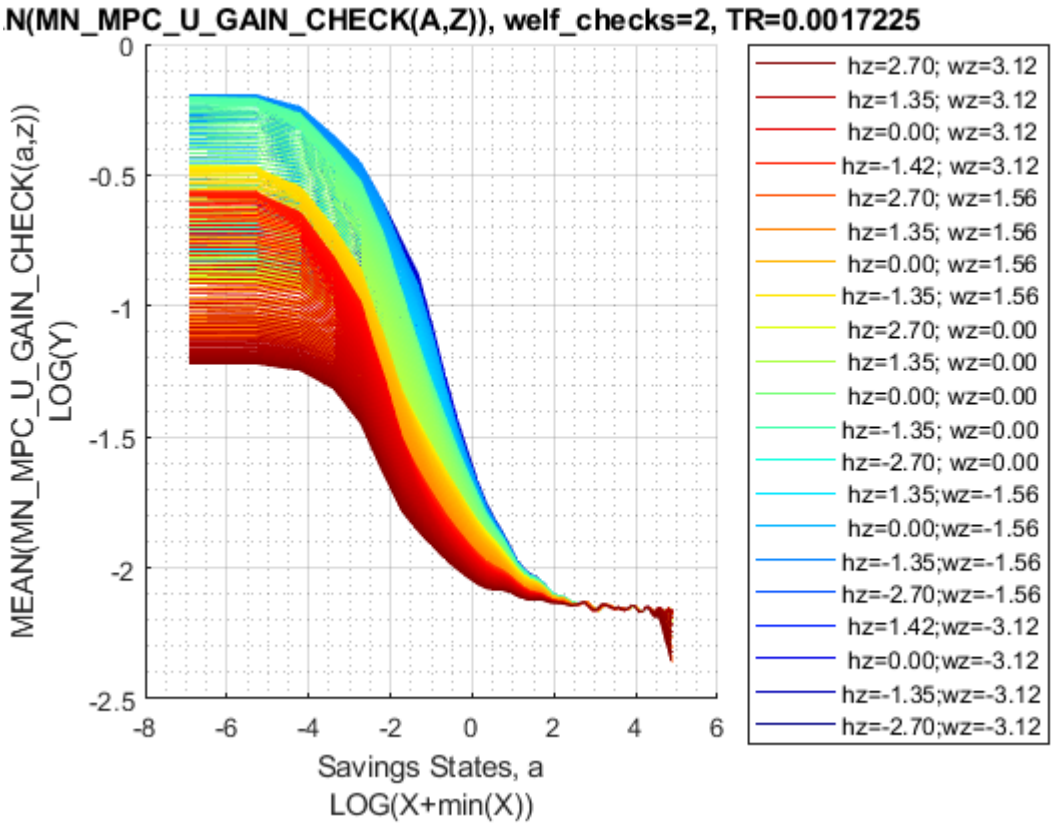




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_U\_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\_U\_GAIN\_CHECK(a,z))'};
ff_graph_grid((tb_az_c{1:end, 3:end})', ar_st_eta_HS_grid, agrid, mp_support_graph);
```





Analyze Marginal Value and MPC over Y(a,eta), Conditional On Kids, Marry, Age, Education

Income is generated by savings and shocks, what are the income levels generated by all the shock and savings points conditional on kids, marital status, age and educational levels. Plot on the Y axis MPC, and plot on the X axis income levels, use colors to first distinguish between different a levels, then use colors to distinguish between different eta levles.

Set Up date, Select Age 37vn

, unmarried, no kids, lower education:

```
% NaN(n_jgrid,n_agrid,n_etagrid,n_educgrid,n_marriedgrid,n_kidsgrid);
% 38 year old, unmarried, no kids, lower educated
% Only Household Head Shock Matters so select up to 'n_eta_H_grid'
mn_total_inc_jemk = total_inc_VFI(19,:,1:mp_params('n_eta_H_grid'),1,1,1);
mn_V_W_gain_check_use = ev19_jaeemk_check2 - ev19_jaeemk_check0;
mn_C_W_gain_check_use = ec19_jaeemk_check2 - ec19_jaeemk_check0;
```

Select Age, Education, Marital, Kids Count:s

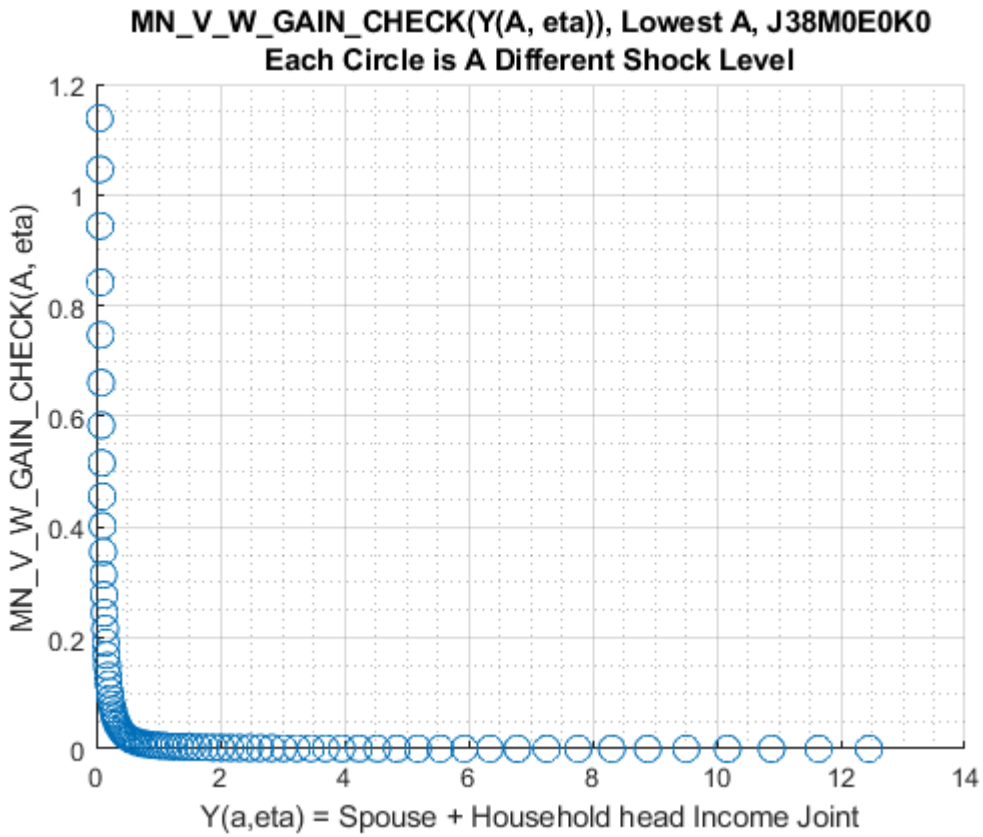
```
% Selections
it_age = 21; % +18
it_marital = 1; % 1 = unmarried
it_kids = 1; % 1 = kids is zero
it_educ = 1; % 1 = lower education
% Select: NaN(n_jgrid,n_agrid,n_etagrid,n_educgrid,n_marriedgrid,n_kidsgrid);
```

```
mn_C_W_gain_check_jemk = mn_C_W_gain_check_use(it_age, :, 1:mp_params('n_eta_H_grid'), it_educ,
mn_V_W_gain_check_jemk = mn_V_W_gain_check_use(it_age, :, 1:mp_params('n_eta_H_grid'), it_educ,
% Reshape, so shock is the first dim, a is the second
mt_total_inc_jemk = permute(mn_total_inc_jemk,[3,2,1]);
mt_C_W_gain_check_jemk = permute(mn_C_W_gain_check_jemk,[3,2,1]);
mt_C_W_gain_check_jemk(mt_C_W_gain_check_jemk<=1e-10) = 1e-10;
mt_V_W_gain_check_jemk = permute(mn_V_W_gain_check_jemk,[3,2,1]);
mt_V_W_gain_check_jemk(mt_V_W_gain_check_jemk<=1e-10) = 1e-10;
% Generate meshed a and shock grid
[mt_eta_H, mt_a] = ndgrid(eta_H_grid(1:mp_params('n_eta_H_grid')), agrid);
```

Marginal Value Gains, Color as Shock, Conditional on Age, Marital, Kids, and Education

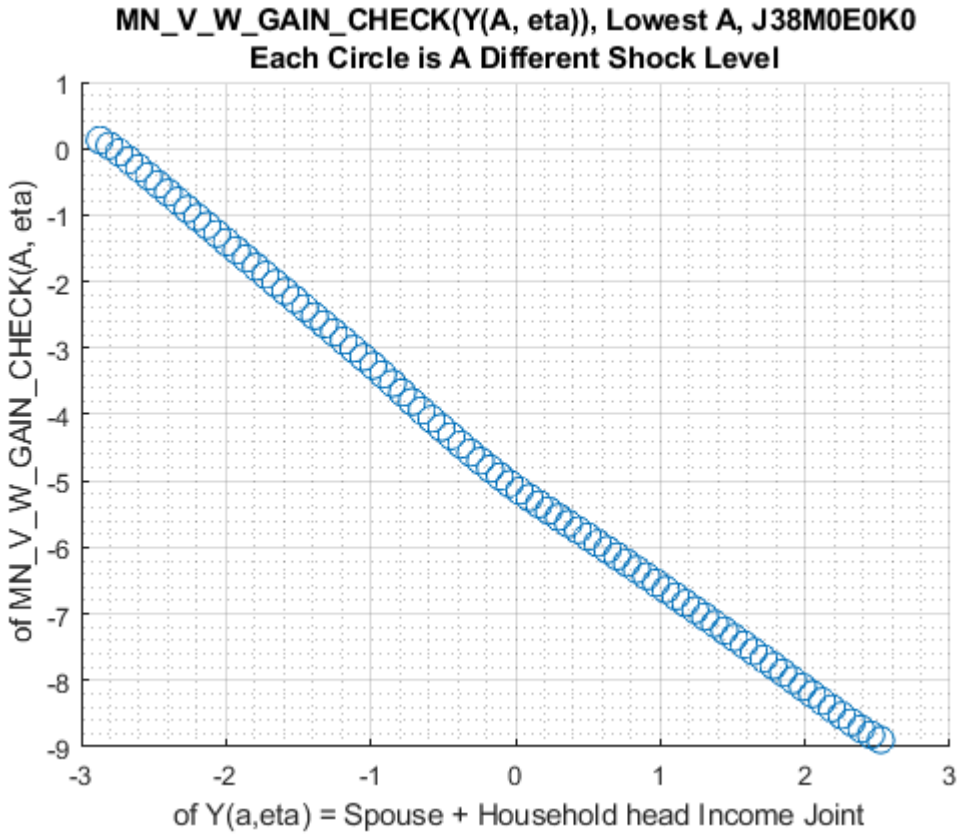
How do shocks and a impact marginal value. First plot one asset level, variation comes only from increasingly higher shocks:

```
figure();
it_a = 1;
scatter((mt_total_inc_jemk(:,it_a)), (mt_V_W_gain_check_jemk(:,it_a)), 100);
title({'MN\_V\_W\_GAIN\_CHECK(Y(A, eta)), Lowest A, J38M0E0K0', ...
    'Each Circle is A Different Shock Level'});
xlabel('Y(a,eta) = Spouse + Household head Income Joint');
ylabel('MN\_V\_W\_GAIN\_CHECK(A, eta)');
grid on;
grid minor;
```



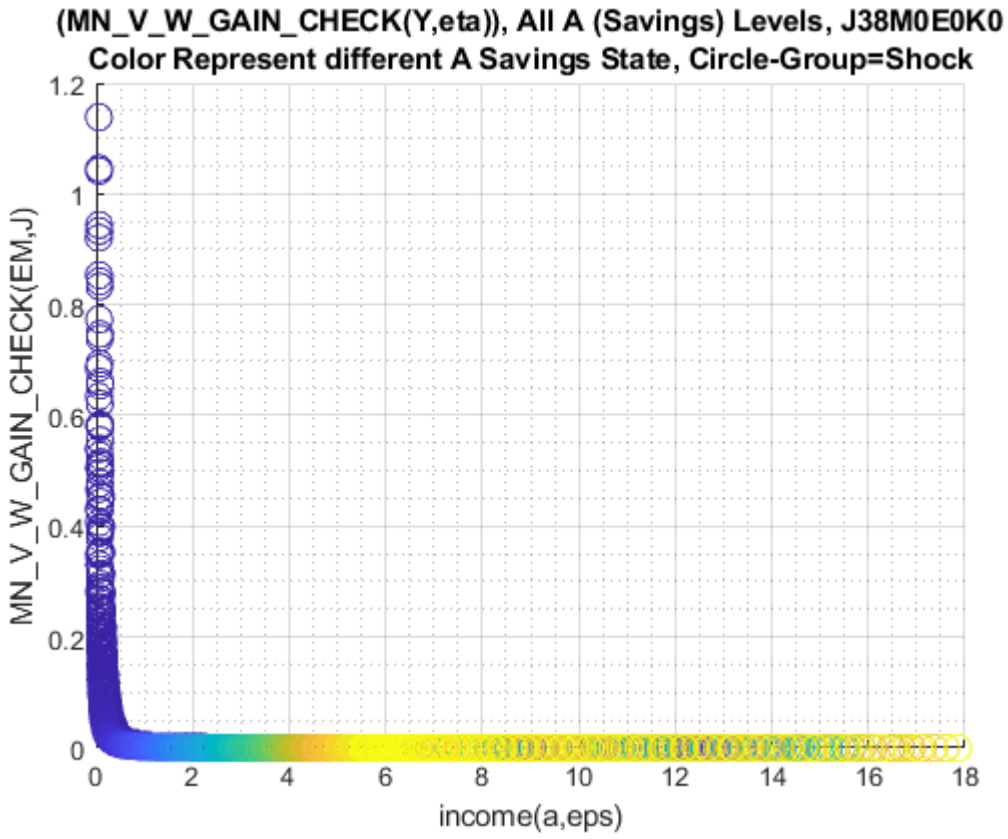

```
figure();
```

```
it_shock = 1;
scatter(log(mt_total_inc_jemk(:,it_a)), log(mt_V_W_gain_check_jemk(:,it_a)), 100);
title({'MN\_V\_W\_GAIN\_CHECK(Y(A, eta)), Lowest A, J38M0E0K0', ...
    'Each Circle is A Different Shock Level'});
xlabel(' of Y(a,eta) = Spouse + Household head Income Joint');
ylabel(' of MN\_V\_W\_GAIN\_CHECK(A, eta)');
grid on;
grid minor;
```

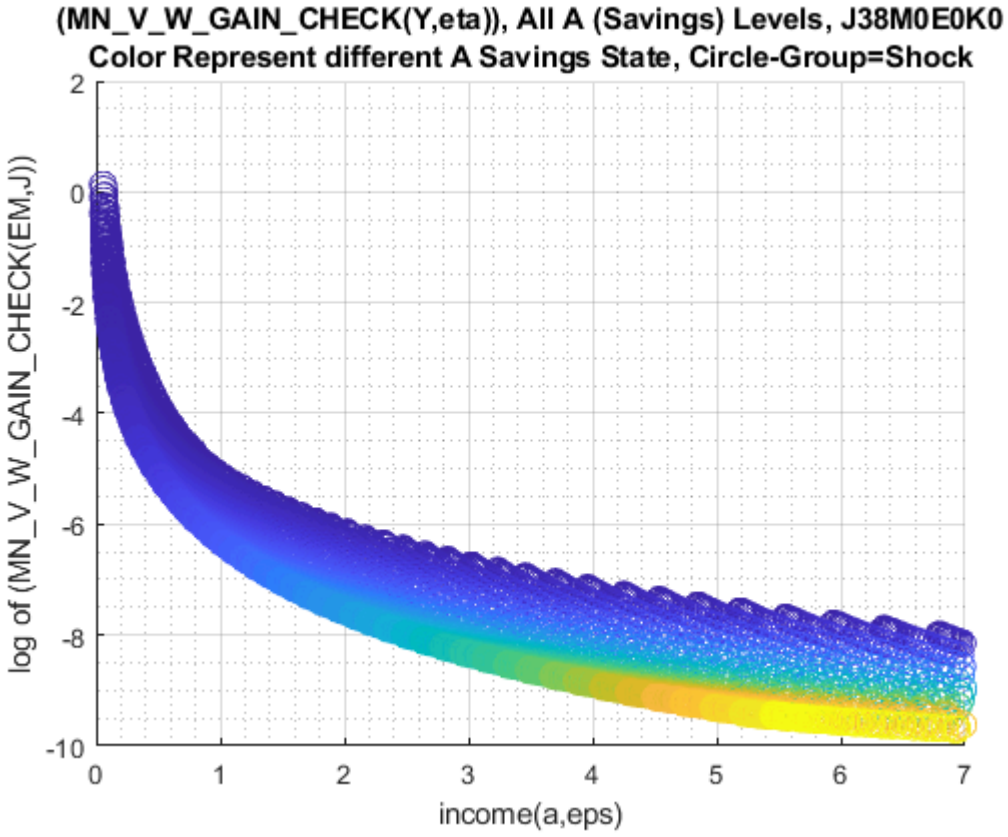


Plot all asset levels:

```
figure();
scatter((mt_total_inc_jemk(:)), (mt_V_W_gain_check_jemk(:)), 100, mt_a(:));
title({'(MN\_V\_W\_GAIN\_CHECK(Y,eta)), All A (Savings) Levels, J38M0E0K0', ...
    'Color Represent different A Savings State, Circle-Group=Shock'});
xlabel('income(a,eps)');
ylabel('MN\_V\_W\_GAIN\_CHECK(EM,J)');
grid on;
grid minor;
```



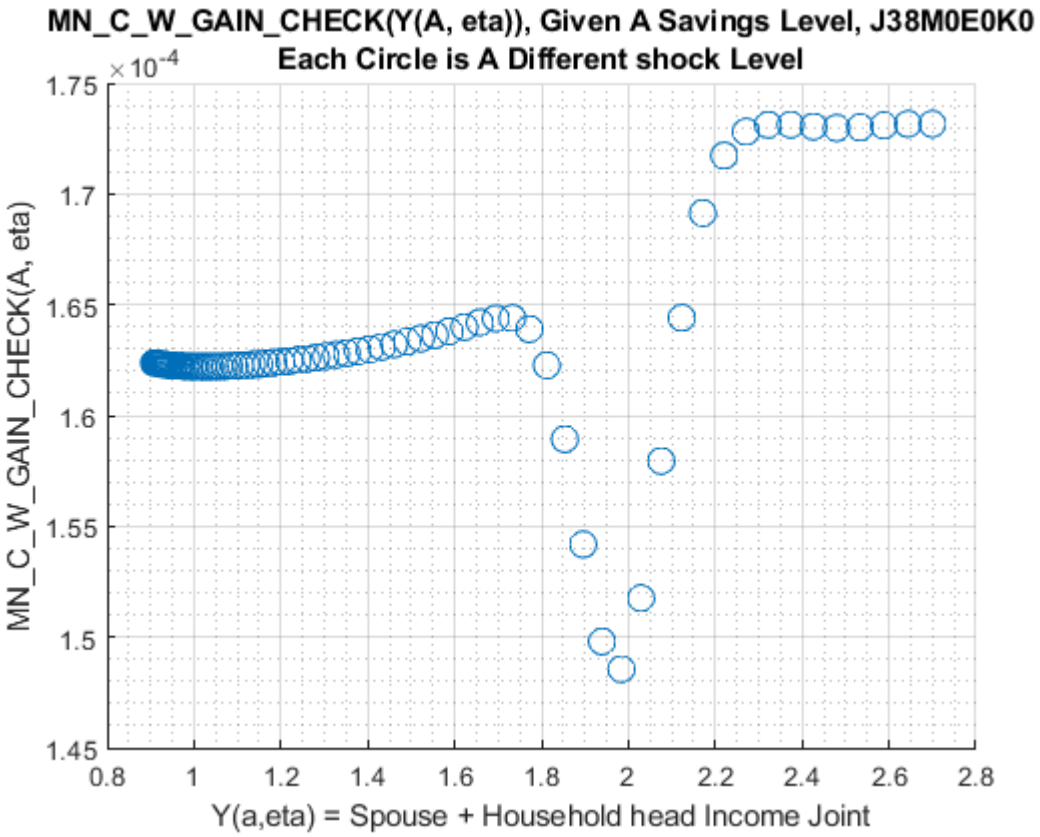

```
figure();
scatter((mt_total_inc_jemk(:)), log(mt_V_W_gain_check_jemk(:)), 100, mt_a(:));
title({'(MN\_V\_W\_GAIN\_CHECK(Y,eta)), All A (Savings) Levels, J38M0E0K0', ...
    'Color Represent different A Savings State, Circle-Group=Shock'});
xlabel('income(a,eps)');
ylabel('log of (MN\_V\_W\_GAIN\_CHECK(EM,J))');
xlim([0,7]);
grid on;
grid minor;
```



Marginal Consumption Gains, Color as Shock, Conditional on Age, Marital, Kids, and Education

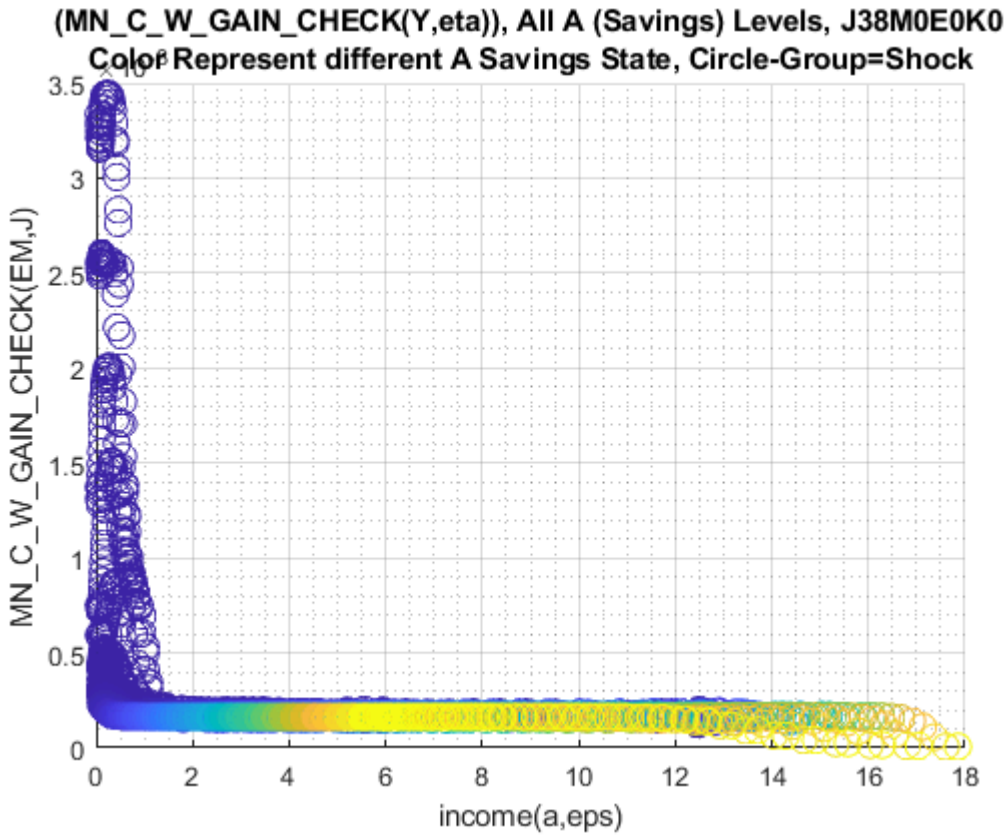
How do shocks and a impact marginal value. First plot one asset level, variation comes only from increasingly higher shocks:

```
figure();
it_a = 50;
scatter(log(mt_total_inc_jemk(:,it_a)), mt_C_W_gain_check_jemk(:,it_a), 100);
title({'MN\_C\_W\_GAIN\_CHECK(Y(A, eta)), Given A Savings Level, J38M0E0K0', ...
    'Each Circle is A Different shock Level'});
xlabel('Y(a,eta) = Spouse + Household head Income Joint');
ylabel('MN\_C\_W\_GAIN\_CHECK(A, eta)');
grid on;
grid minor;
```

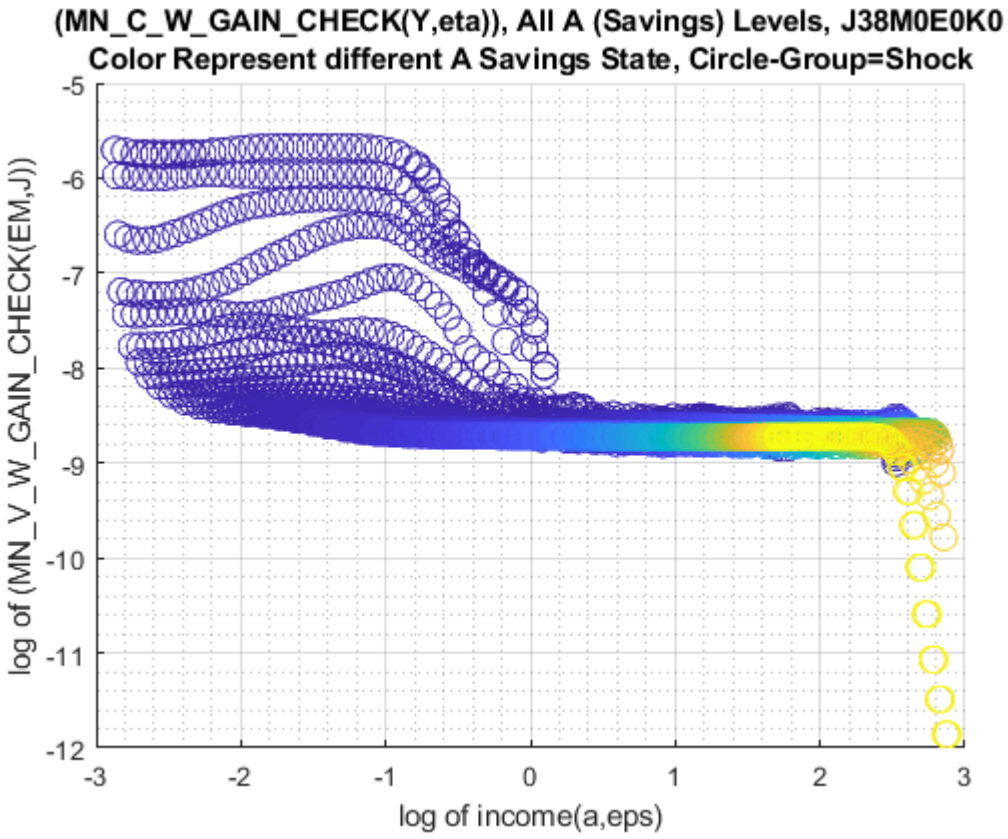


Plot all asset levels:

```
figure();
scatter((mt_total_inc_jemk(:)), (mt_C_W_gain_check_jemk(:)), 100, mt_a(:));
title({'(MN\_C\_W\_GAIN\_CHECK(Y,eta)), All A (Savings) Levels, J38M0E0K0', ...
    'Color Represent different A Savings State, Circle-Group=Shock'});
xlabel('income(a,eps)');
ylabel('MN\_C\_W\_GAIN\_CHECK(EM,J)');
grid on;
grid minor;
```




```
figure();
scatter(log(mt_total_inc_jemk(:)), log(mt_C_W_gain_check_jemk(:)), 100, mt_a(:));
title({'(MN\_C\_W\_GAIN\_CHECK(Y,eta)), All A (Savings) Levels, J38M0E0K0', ...
    'Color Represent different A Savings State, Circle-Group=Shock'});
xlabel('log of income(a,eps)');
ylabel('log of (MN\_V\_W\_GAIN\_CHECK(EM,J))');
grid on;
grid minor;
```



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_U_GAIN_CHECK(KM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2str(
tb_az_v = ff_summ_nd_array(st_title, mn_V_U_gain_check, true, ["mean"], 3, 1, cl_mp_datasetdesc
```

```
xxx  MEAN(MN_V_U_GAIN_CHECK(KM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
```

group	kids	marry	mean_age_18	mean_age_19	mean_age_20	mean_age_21	mean_age_22	mean_age_23
1	1	0	0.032313	0.031538	0.029203	0.026718	0.024639	0.022886
2	2	0	0.044673	0.043637	0.04037	0.036851	0.033899	0.0314
3	3	0	0.052552	0.051453	0.047283	0.043234	0.03984	0.036967
4	4	0	0.059787	0.058589	0.053843	0.049266	0.045426	0.042177
5	5	0	0.06554	0.064322	0.059162	0.054211	0.05006	0.046547
6	1	1	0.0059295	0.0054975	0.0049865	0.0045164	0.0041185	0.0037811
7	2	1	0.0083787	0.0077803	0.0070563	0.0063837	0.0058177	0.0053346
8	3	1	0.010146	0.0094404	0.0085806	0.0077709	0.0070881	0.0065113
9	4	1	0.012661	0.011814	0.01075	0.0097404	0.0088898	0.0081607
10	5	1	0.015891	0.014939	0.013651	0.012419	0.011375	0.010485

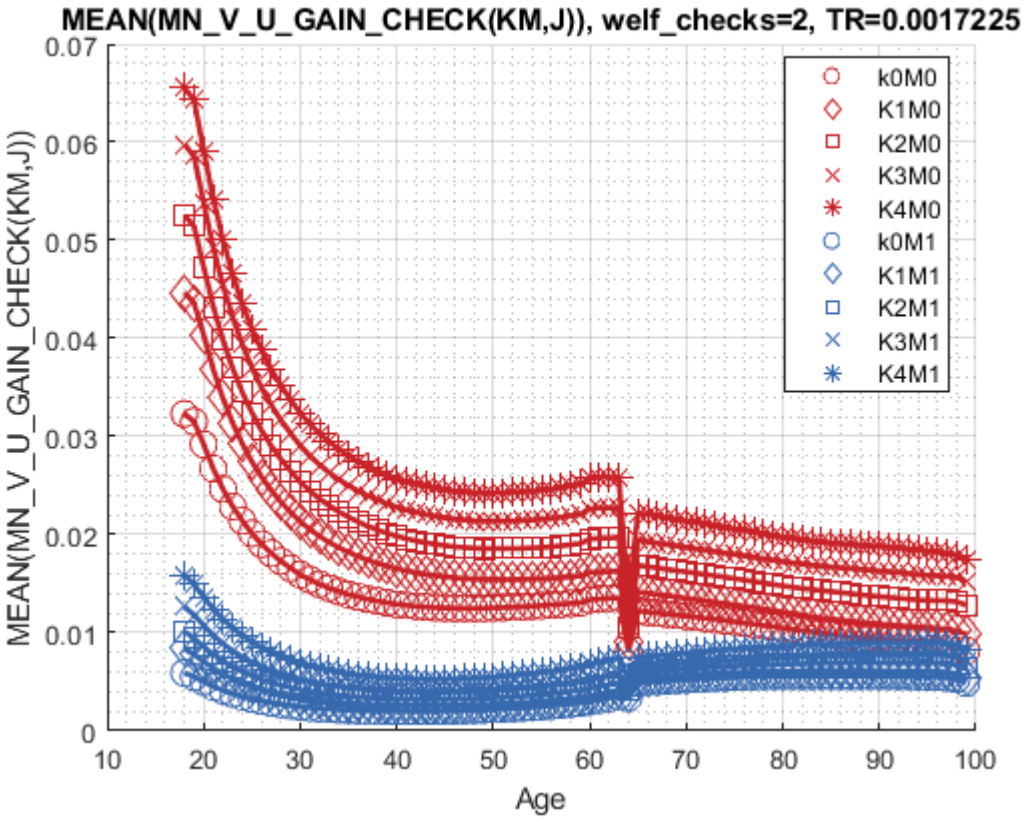
```
% Consumption Function
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(KM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

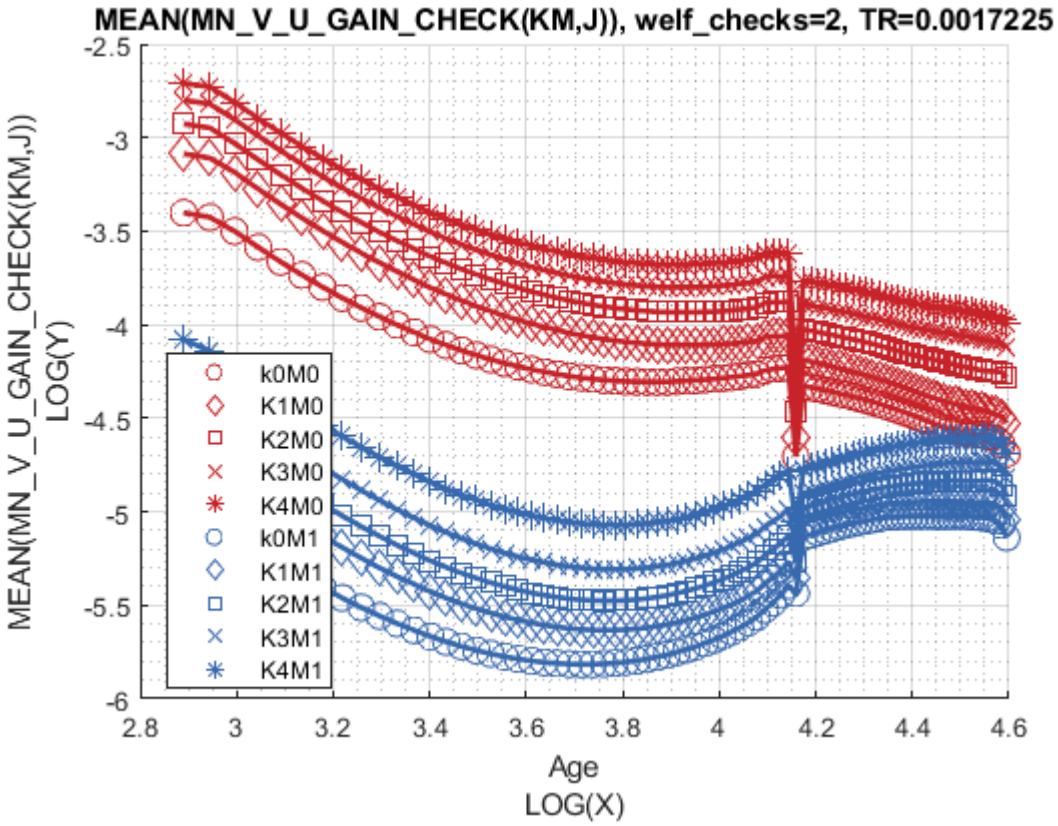
```
xxx  MEAN(MN_MPC_U_GAIN_CHECK(KM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
```

group	kids	marry	mean_age_18	mean_age_19	mean_age_20	mean_age_21	mean_age_22	mean_age_23
1	1	0	0.084565	0.099857	0.10794	0.10516	0.10247	0.099966
2	2	0	0.096126	0.11139	0.12136	0.11819	0.11553	0.11307
3	3	0	0.1078	0.12631	0.13473	0.13138	0.12786	0.12514
4	4	0	0.114	0.13339	0.14178	0.13811	0.13446	0.13124
5	5	0	0.11992	0.14069	0.14855	0.14469	0.14011	0.13651
6	1	1	0.096646	0.10442	0.10672	0.10443	0.10194	0.099587
7	2	1	0.10031	0.1093	0.11166	0.10931	0.10836	0.10496
8	3	1	0.10594	0.11757	0.11904	0.11731	0.11604	0.11334
9	4	1	0.11209	0.12204	0.12456	0.12263	0.12006	0.11837
10	5	1	0.12333	0.13314	0.13686	0.13165	0.12869	0.12899

Graph Mean Values:

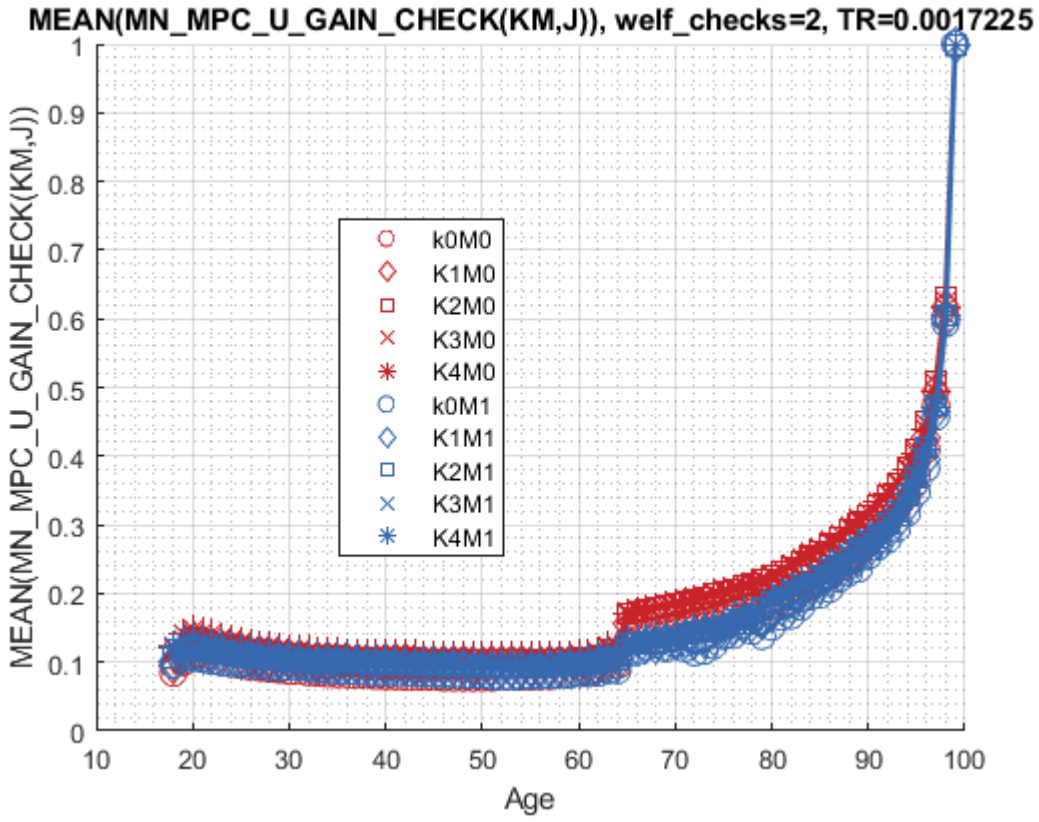
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(KM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(KM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);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

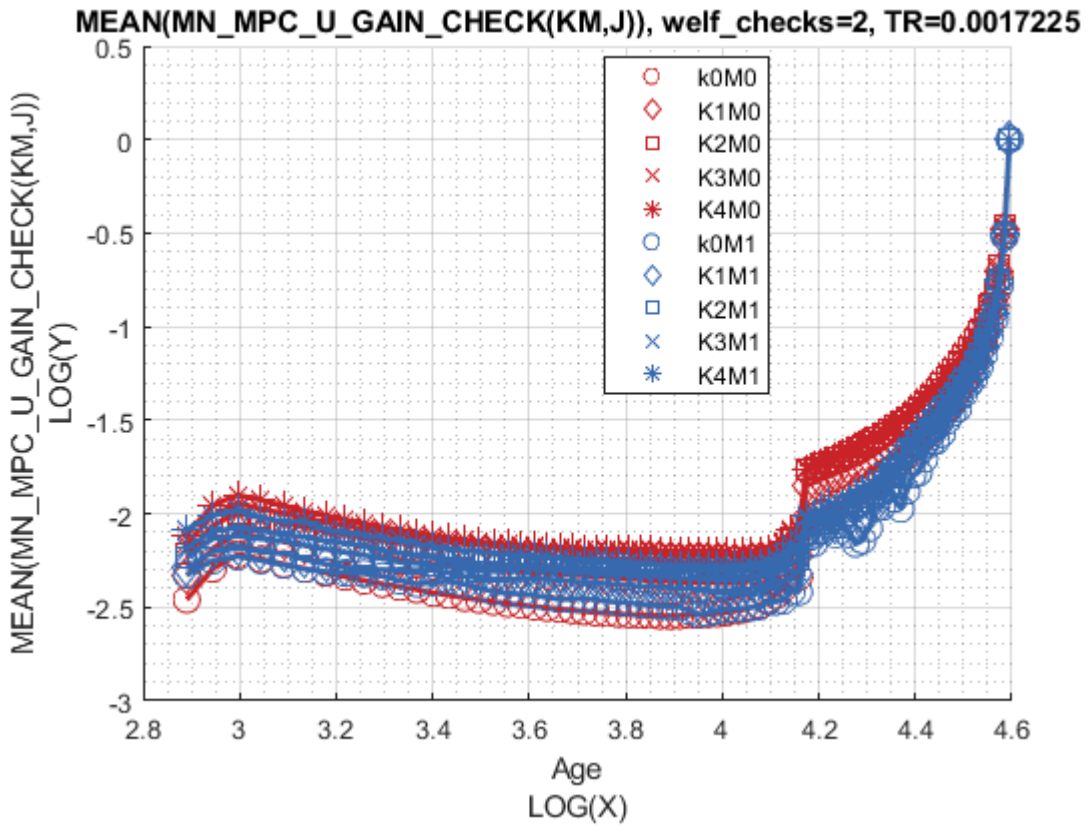




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_U\_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\_U\_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_U_GAIN_CHECK(EM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2str(
tb_az_v = ff_summ_nd_array(st_title, mn_V_U_gain_check, true, ["mean"], 3, 1, cl_mp_datasetdesc
```

```
xxx  MEAN(MN_V_U_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	0.052161	0.051299	0.048759	0.045984	0.043519	0.041317
2	1	0	0.049785	0.048517	0.043186	0.038128	0.034027	0.030674
3	0	1	0.011544	0.010825	0.010006	0.0092235	0.0085439	0.0079503
4	1	1	0.0096585	0.0089631	0.0080043	0.0071088	0.006372	0.0057587

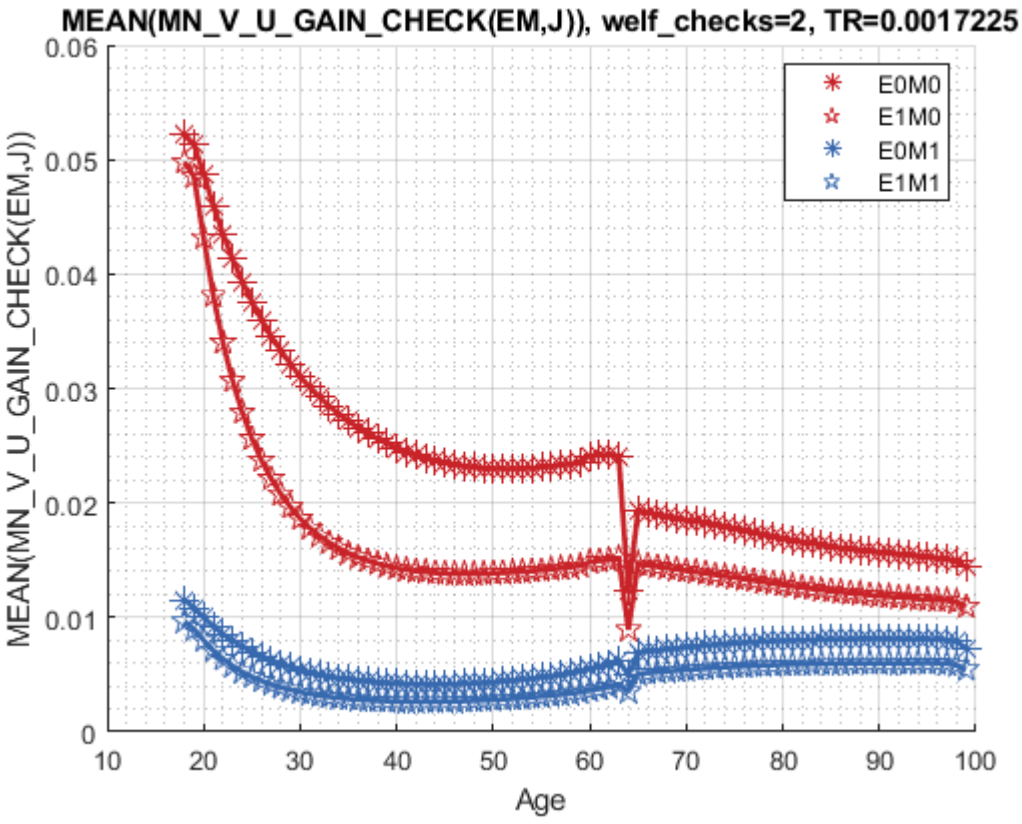
```
% Consumption
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(EM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

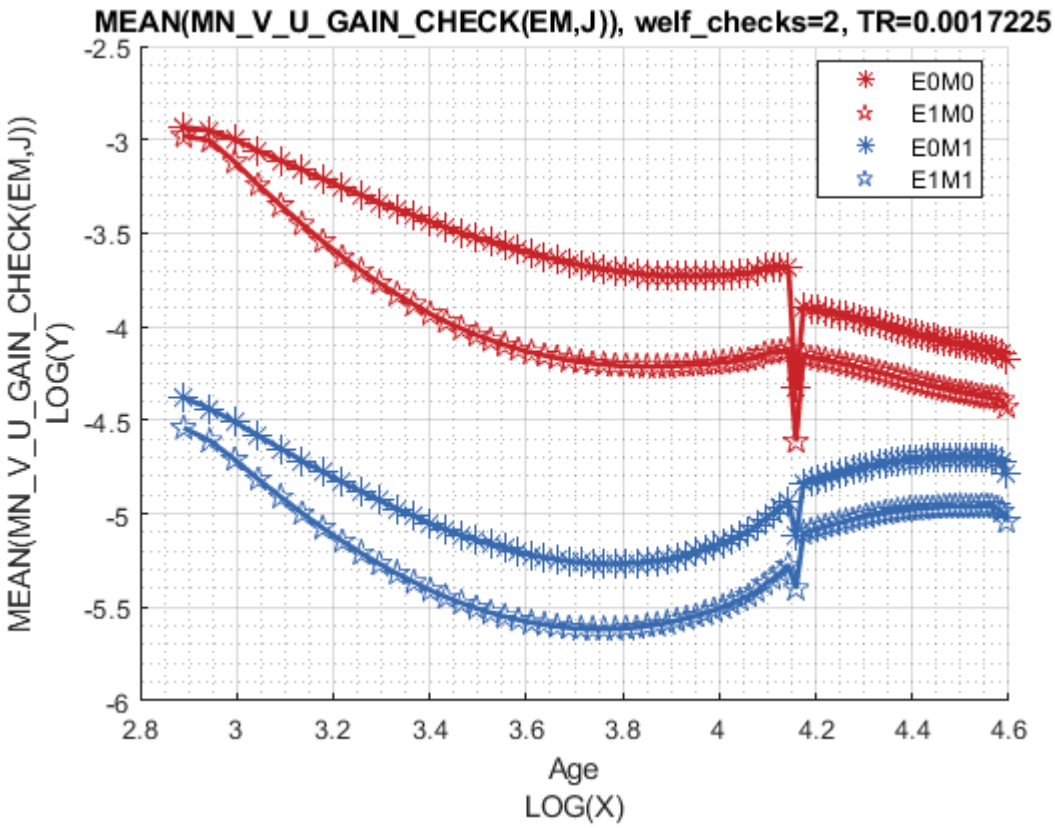
```
xxx  MEAN(MN_MPC_U_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
```

group	edu	marry	mean_age_18	mean_age_19	mean_age_20	mean_age_21	mean_age_22	mean_age_23
1	0	0	0.09247	0.10277	0.10886	0.10804	0.10737	0.10669
2	1	0	0.11649	0.14189	0.15288	0.14697	0.1408	0.13569
3	0	1	0.09821	0.10337	0.10589	0.10515	0.10424	0.1031
4	1	1	0.11712	0.13122	0.13364	0.12898	0.12579	0.12299

Graph Mean Values:

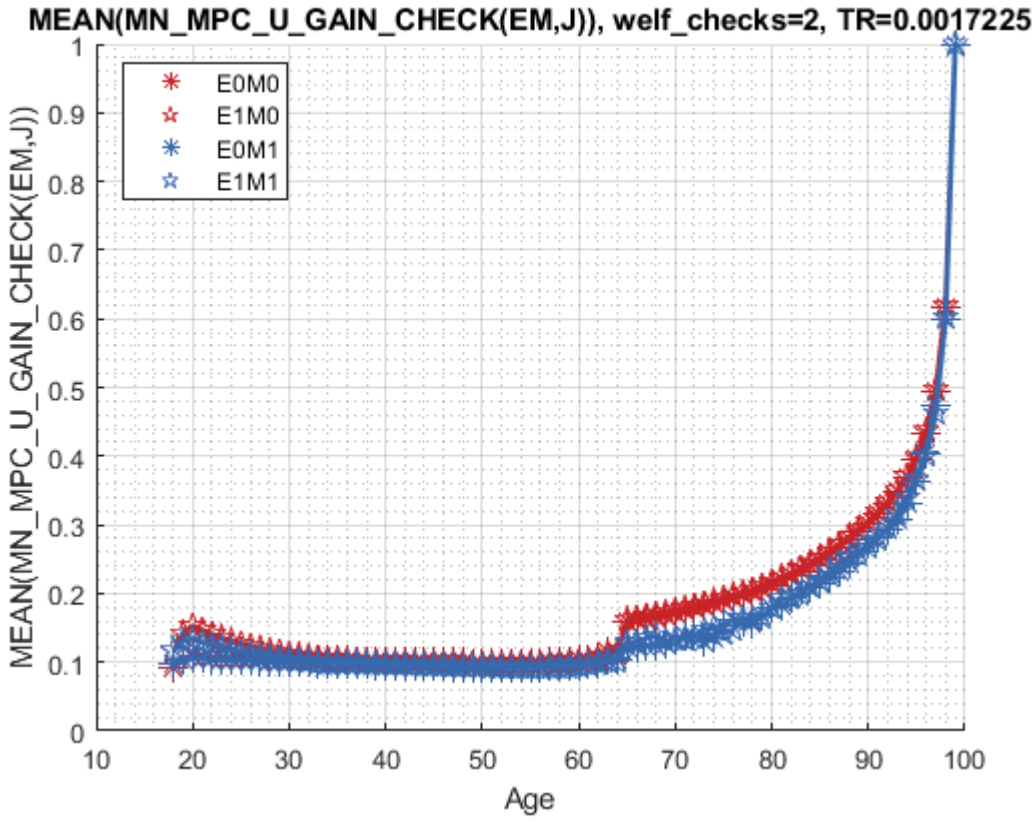
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(EM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(EM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);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

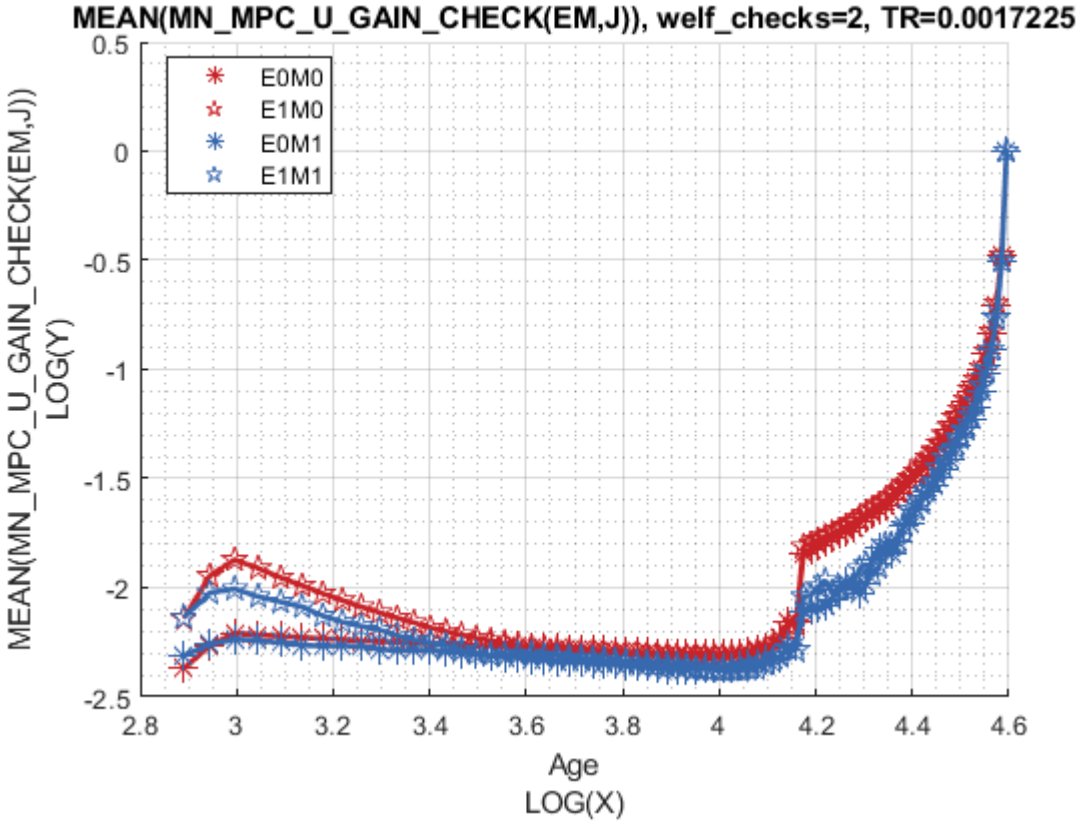




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
st_title = ['MEAN(MN\_MPC\_U\_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\_U\_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_U_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225
E0M0
E1M0
E0M1
E1M1
MEAN(MN_MPC_U_GAIN_CHECK(EM,J))
Age


MEAN(MN_MPC_U_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225
E0M0
E1M0
E0M1
E1M1
MEAN(MN_MPC_U_GAIN_CHECK(EM,J))
LOG(Y)
Age
LOG(X)