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_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=527.9563
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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	-1.5339e+08	-3.5101	26.119	-7.441
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.4159e+09	32.402	36.798	1.1357
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.1402e+08	4.8975	8.3294	1.7007

```
xxx TABLE:V_VFI xxxxxxxxxxxxxxxxxx
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	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-346.51	-346.12	-343.63	-337.86	-328.51	21.702	21.852	22.003	22.154	22.30
r2	-334.38	-333.99	-331.51	-325.83	-316.83	21.724	21.869	22.015	22.163	22.31
r3	-322.45	-322.06	-319.6	-314.14	-305.6	21.745	21.885	22.027	22.171	22.31
r4	-310.63	-310.27	-307.99	-302.88	-294.87	21.767	21.903	22.041	22.182	22.32
r5	-299.94	-299.6	-297.46	-292.67	-285.12	21.775	21.907	22.042	22.18	22.32
r79	-9.9437	-9.9325	-9.8557	-9.6597	-9.3232	2.5394	2.5501	2.5602	2.5696	2.578

r80	-8.9023	-8.8911	-8.8143	-8.6183	-8.2818	2.3039	2.3121	2.3198	2.327	2.333
r81	-7.6363	-7.6251	-7.5484	-7.3524	-7.0159	2.0068	2.0124	2.0176	2.0226	2.027
r82	-5.9673	-5.9561	-5.8793	-5.6833	-5.3468	1.5958	1.5989	1.6018	1.6046	1.607
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	0.0005656	0.0075134	0.022901	114.75	120.41	126.27	132.38	138.8
r2	0	0	0.00051498	0.0065334	0.021549	114.86	120.53	126.41	132.54	138.95
r3	0	0	0.00051498	0.0049294	0.019875	114.97	120.65	126.56	132.7	139.12
r4	0	0	0.00051498	0.0047937	0.019672	115.73	121.42	127.34	133.51	139.92
r5	0	0	0.00048517	0.0046683	0.019484	116.5	122.21	128.15	134.32	140.74
r79	0	0	0	0	0	81.091	85.68	90.335	94.378	98.419
r80	0	0	0	0	0	76.669	80.563	84.304	88.04	91.693
r81	0	0	0	0	0	68.313	71.534	74.475	77.832	81.11
r82	0	0	0	0	0	50.126	53.467	56.953	58.745	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	0.040426	0.04363	0.048012	9.6491	9.817	9.9649	10.073	1
r2	0.036717	0.037251	0.040477	0.04461	0.049364	9.8118	9.9685	10.101	10.191	1
r3	0.036717	0.037251	0.040477	0.046214	0.051039	9.9779	10.12	10.234	10.302	1
r4	0.038144	0.038678	0.041903	0.047776	0.052666	10.131	10.258	10.354	10.405	1
r5	0.039534	0.040068	0.043323	0.04929	0.054241	10.272	10.384	10.463	10.5	
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.858	37.092	38.455	40.627	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.253	42.183	44.459	46.938	
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.587	51.19	54.266	57.123	6
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.755	69.238	71.77	76.192	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	-1.5339e+08	-3.5101	26.119	-7.441
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.4159e+09	32.402	36.798	1.1357
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.1402e+08	4.8975	8.3294	1.7007

xxx TABLE:V_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-346.51	-346.12	-343.63	-337.86	-328.51	21.702	21.852	22.003	22.154	22.30
r2	-334.38	-333.99	-331.51	-325.83	-316.83	21.724	21.869	22.015	22.163	22.31
r3	-322.45	-322.06	-319.6	-314.14	-305.6	21.745	21.885	22.027	22.171	22.31
r4	-310.63	-310.27	-307.99	-302.88	-294.87	21.767	21.903	22.041	22.182	22.32

r5	-299.94	-299.6	-297.46	-292.67	-285.12	21.775	21.907	22.042	22.18	22.32
r79	-9.9437	-9.9325	-9.8557	-9.6597	-9.3232	2.5394	2.5501	2.5602	2.5696	2.578
r80	-8.9023	-8.8911	-8.8143	-8.6183	-8.2818	2.3039	2.3121	2.3198	2.327	2.333
r81	-7.6363	-7.6251	-7.5484	-7.3524	-7.0159	2.0068	2.0124	2.0176	2.0226	2.027
r82	-5.9673	-5.9561	-5.8793	-5.6833	-5.3468	1.5958	1.5989	1.6018	1.6046	1.607
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	0.0005656	0.0075134	0.022901	114.75	120.41	126.27	132.38	138.8
r2	0	0	0.00051498	0.0065334	0.021549	114.86	120.53	126.41	132.54	138.95
r3	0	0	0.00051498	0.0049294	0.019875	114.97	120.65	126.56	132.7	139.12
r4	0	0	0.00051498	0.0047937	0.019672	115.73	121.42	127.34	133.51	139.92
r5	0	0	0.00048517	0.0046683	0.019484	116.5	122.21	128.15	134.32	140.74
r79	0	0	0	0	0	81.091	85.68	90.335	94.378	98.419
r80	0	0	0	0	0	76.669	80.563	84.304	88.04	91.693
r81	0	0	0	0	0	68.313	71.534	74.475	77.832	81.11
r82	0	0	0	0	0	50.126	53.467	56.953	58.745	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	0.040426	0.04363	0.048012	9.6491	9.817	9.9649	10.073	1
r2	0.036717	0.037251	0.040477	0.04461	0.049364	9.8118	9.9685	10.101	10.191	1
r3	0.036717	0.037251	0.040477	0.046214	0.051039	9.9779	10.12	10.234	10.302	1
r4	0.038144	0.038678	0.041903	0.047776	0.052666	10.131	10.258	10.354	10.405	1
r5	0.039534	0.040068	0.043323	0.04929	0.054241	10.272	10.384	10.463	10.5	
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.858	37.092	38.455	40.627	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.253	42.183	44.459	46.938	
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.587	51.19	54.266	57.123	6
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.755	69.238	71.77	76.192	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
----------------------------------------
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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	-1.6419e+08	-3.7572	26.502	-7.0536
ap_VFI	2	2	6	4.37e+07	83	5.265e+05	1.3972e+09	31.974	36.732	1.1488
cons_VFI	3	3	6	4.37e+07	83	5.265e+05	2.1267e+08	4.8667	8.3275	1.7111

xxx TABLE:V_VFI xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-355.34	-354.66	-350.52	-342.92	-332.4	21.638	21.791	21.943	22.095	22.2
r2	-343.21	-342.53	-338.39	-330.8	-320.53	21.66	21.807	21.955	22.104	22.25
r3	-331.28	-330.6	-326.46	-318.91	-309.12	21.682	21.824	21.967	22.112	22.2
r4	-319.13	-318.5	-314.65	-307.53	-298.32	21.7	21.838	21.977	22.119	22.26
r5	-308.13	-307.54	-303.94	-297.21	-288.52	21.705	21.839	21.975	22.113	22.25
r79	-9.9437	-9.9325	-9.8557	-9.6597	-9.3232	2.5384	2.5492	2.5593	2.5688	2.577

r80	-8.9023	-8.8911	-8.8143	-8.6183	-8.2818	2.3032	2.3114	2.3191	2.3264	2.333
r81	-7.6363	-7.6251	-7.5484	-7.3524	-7.0159	2.0063	2.0119	2.0172	2.0222	2.026
r82	-5.9673	-5.9561	-5.8793	-5.6833	-5.3468	1.5955	1.5987	1.6016	1.6044	1.60
r83	-3.5892	-3.578	-3.5012	-3.3052	-2.9687	0.97895	0.97995	0.98089	0.98178	0.9826

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xxx TABLE:ap_VFI xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c526500
r1	0	0	0	0.0017295	0.013921	112.32	117.97	123.84	129.95	136.36
r2	0	0	0	0.0014073	0.013905	112.36	118.03	123.91	130.03	136.45
r3	0	0	0	0.00051498	0.013905	112.4	118.08	123.99	130.13	136.55
r4	0	0	0	0.00051498	0.013905	112.93	118.63	124.55	130.71	137.13
r5	0	0	0	0.00051498	0.013905	113.47	119.18	125.12	131.3	137.71
r79	0	0	0	0	0	81.091	85.68	89.816	93.86	97.901
r80	0	0	0	0	0	76.378	80.051	83.793	87.528	91.181
r81	0	0	0	0	0	68.288	71.027	73.968	77.326	81.091
r82	0	0	0	0	0	50.126	53.467	56.61	58.244	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	0.040426	0.048012	9.6491	9.817	9.9649	10.073	1
r2	0.027723	0.028258	0.031999	0.040748	0.048028	9.8118	9.9685	10.101	10.191	1
r3	0.027723	0.028258	0.031999	0.041641	0.048028	9.9779	10.12	10.234	10.302	1
r4	0.028805	0.029339	0.033081	0.042722	0.049108	10.131	10.258	10.354	10.405	1
r5	0.029859	0.030394	0.034135	0.043775	0.050161	10.272	10.384	10.463	10.5	
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.339	36.573	38.455	40.627	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.033	42.183	44.459	46.938	
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.106	51.19	54.266	57.123	5
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.254	68.736	71.611	76.192	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=1500.619
```

```
% 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=428.4478
```

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=7.9254
Completed SNW_EVUVW19_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=4834.3572
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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	1.8059e+08	4.183	5.1876	1.240
ec20_jaeemk	2	2	6	4.37e+07	83	5.265e+05	2.1399e+08	4.8969	8.3295	1.70
ev19_jaeemk	3	3	6	4.3173e+07	82	5.265e+05	-1.4054e+08	-3.2554	25.136	-7.721
ev20_jaeemk	4	4	6	4.37e+07	83	5.265e+05	-1.5388e+08	-3.5212	26.147	-7.425

xxx TABLE:ec19_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.039253	0.039253	0.039822	0.044086	0.049231	9.6484	9.8085	9.9488	10.037	1
r2	0.039253	0.039253	0.039788	0.044409	0.050518	9.7796	9.9379	10.073	10.156	1
r3	0.040776	0.040776	0.041311	0.04504	0.05173	9.994	10.125	10.224	10.275	1
r4	0.042261	0.042261	0.042795	0.046467	0.053274	10.173	10.282	10.354	10.381	1
r5	0.043702	0.043702	0.044205	0.047871	0.054769	10.328	10.416	10.467	10.477	1
r78	0.2179	0.2179	0.2179	0.2179	0.21844	27.794	28.962	29.988	31.01	3
r79	0.2179	0.2179	0.2179	0.2179	0.2179	30.071	31.673	33.01	34.085	3
r80	0.2179	0.2179	0.2179	0.2179	0.2179	33.5	35.375	37.367	39.122	
r81	0.2179	0.2179	0.2179	0.2179	0.2179	40.296	41.727	43.475	45.796	4
r82	0.2179	0.2179	0.2179	0.2179	0.2179	52.118	55.559	59.15	60.996	6

xxx TABLE:ec20_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
r1	0.035995	0.036529	0.03975	0.043373	0.048012	9.6491	9.817	9.9649	10.073	1
r2	0.035995	0.036529	0.039796	0.0443	0.049257	9.8118	9.9685	10.101	10.191	1
r3	0.035995	0.036529	0.039796	0.045847	0.050797	9.9779	10.12	10.234	10.302	1
r4	0.037394	0.037928	0.041195	0.04737	0.05238	10.131	10.258	10.354	10.405	1
r5	0.038757	0.039291	0.042585	0.048848	0.053914	10.272	10.384	10.463	10.5	
r79	0.2179	0.21844	0.22216	0.23228	0.25197	35.858	37.092	38.455	40.627	4
r80	0.2179	0.21844	0.22216	0.23228	0.25197	40.253	42.183	44.459	46.938	
r81	0.2179	0.21844	0.22216	0.23228	0.25197	48.587	51.19	54.266	57.123	6
r82	0.2179	0.21844	0.22216	0.23228	0.25197	66.755	69.238	71.77	76.192	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 xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-330.68	-330.68	-330.27	-326.02	-318.4	21.591	21.741	21.892	22.045	22.11
r2	-318.19	-318.19	-317.82	-314.17	-306.96	21.61	21.755	21.902	22.052	22.11
r3	-305.88	-305.88	-305.54	-302.95	-296.09	21.628	21.769	21.913	22.06	22.11
r4	-294.75	-294.75	-294.43	-292.07	-285.66	21.648	21.785	21.925	22.069	22.10
r5	-284.65	-284.65	-284.37	-282.21	-276.18	21.653	21.787	21.924	22.066	22.08
r78	-9.95	-9.95	-9.95	-9.95	-9.9388	2.4886	2.501	2.5125	2.5234	2.533
r79	-8.9084	-8.9084	-8.9084	-8.9084	-8.9084	2.2539	2.2657	2.2765	2.2849	2.292
r80	-7.6422	-7.6422	-7.6422	-7.6422	-7.6422	1.9631	1.9708	1.9776	1.9838	1.989
r81	-5.9728	-5.9728	-5.9728	-5.9728	-5.9728	1.5603	1.5647	1.5684	1.5724	1.576
r82	-3.5937	-3.5937	-3.5937	-3.5937	-3.5937	0.95581	0.95855	0.96107	0.96221	0.9633

xxx TABLE:ev20_jaeemk xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
r1	-347.22	-346.8	-344.19	-338.27	-328.82	21.701	21.851	22.001	22.153	22.30
r2	-335.09	-334.67	-332.06	-326.23	-317.13	21.722	21.867	22.013	22.161	22.31
r3	-323.16	-322.74	-320.15	-314.53	-305.89	21.743	21.884	22.026	22.17	22.31
r4	-311.32	-310.93	-308.52	-303.26	-295.15	21.765	21.902	22.04	22.181	22.32

r5	-300.59	-300.24	-297.98	-293.04	-285.4	21.773	21.906	22.041	22.179	22.32
r79	-9.9437	-9.9325	-9.8557	-9.6597	-9.3232	2.5394	2.5501	2.5602	2.5696	2.578
r80	-8.9023	-8.8911	-8.8143	-8.6183	-8.2818	2.3039	2.3121	2.3198	2.327	2.333
r81	-7.6363	-7.6251	-7.5484	-7.3524	-7.0159	2.0068	2.0124	2.0176	2.0226	2.027
r82	-5.9673	-5.9561	-5.8793	-5.6833	-5.3468	1.5958	1.5989	1.6018	1.6046	1.607
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=7.8653
Completed SNW_EVUVW19_JAEEMK;SNW_MP_PARAM=default_docdense;SNW_MP_CONTROL=default_test;time=4826.0215
----------------------------------------
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	1.8061e+08	4.1835	5.1877	1.2
ec20_jaeemk	2	2	6	4.37e+07	83	5.265e+05	2.1401e+08	4.8974	8.3297	1.700
ev19_jaeemk	3	3	6	4.3173e+07	82	5.265e+05	-1.4e+08	-3.2427	25.089	-7.737
ev20_jaeemk	4	4	6	4.37e+07	83	5.265e+05	-1.5329e+08	-3.5078	26.096	-7.439

```
xxx TABLE:ec19_jaeemk xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
	_____	_____	_____	_____	_____	_____	_____	_____	_____	_
r1	0.041965	0.041965	0.04239	0.045342	0.049961	9.6485	9.8086	9.9489	10.037	1
r2	0.04233	0.04233	0.042797	0.046025	0.051275	9.7797	9.9379	10.073	10.156	1
r3	0.043853	0.043853	0.04432	0.046854	0.052519	9.9941	10.125	10.224	10.275	1
r4	0.045349	0.045349	0.045817	0.048322	0.054074	10.173	10.282	10.354	10.381	1
r5	0.046815	0.046815	0.047261	0.049758	0.05558	10.328	10.416	10.467	10.477	1
r78	0.22135	0.22135	0.22135	0.22135	0.22188	27.795	28.962	29.988	31.011	3
r79	0.22135	0.22135	0.22135	0.22135	0.22135	30.073	31.674	33.011	34.086	3
r80	0.22135	0.22135	0.22135	0.22135	0.22135	33.501	35.377	37.368	39.124	4
r81	0.22135	0.22135	0.22135	0.22135	0.22135	40.297	41.729	43.477	45.798	4
r82	0.22135	0.22135	0.22135	0.22135	0.22135	52.121	55.563	59.153	60.999	6

```
xxx TABLE:ec20_jaeemk xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c
	_____	_____	_____	_____	_____	_____	_____	_____	_____	_
r1	0.039035	0.039495	0.040979	0.044181	0.048566	9.6492	9.8171	9.965	10.073	1
r2	0.039071	0.039538	0.041324	0.045164	0.049841	9.8119	9.9686	10.101	10.191	1
r3	0.039071	0.039538	0.041849	0.04671	0.051404	9.978	10.12	10.234	10.302	1
r4	0.04047	0.040937	0.04329	0.048243	0.052999	10.131	10.258	10.354	10.405	1
r5	0.041855	0.042325	0.04471	0.04973	0.054543	10.272	10.384	10.463	10.5	
r79	0.22135	0.22188	0.22561	0.23572	0.25394	35.858	37.093	38.456	40.628	4
r80	0.22135	0.22188	0.22561	0.23572	0.25394	40.254	42.184	44.46	46.94	4
r81	0.22135	0.22188	0.22561	0.23572	0.25402	48.589	51.192	54.268	57.125	6
r82	0.22135	0.22188	0.22561	0.23572	0.25436	66.757	69.24	71.772	76.194	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 xxxxxxxxxxxxxxxxx
```

	c1	c2	c3	c4	c5	c526496	c526497	c526498	c526499	c52650
	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
r1	-328.44	-328.44	-328.07	-324.3	-317.04	21.591	21.741	21.892	22.046	22.11

r2	-315.98	-315.98	-315.64	-312.48	-305.65	21.61	21.755	21.903	22.052	22.11
r3	-303.83	-303.83	-303.52	-301.32	-294.84	21.628	21.769	21.913	22.06	22.11
r4	-292.84	-292.84	-292.55	-290.54	-284.48	21.648	21.785	21.925	22.069	22.10
r5	-282.87	-282.87	-282.61	-280.77	-275.07	21.653	21.787	21.924	22.066	22.08
r78	-9.8787	-9.8787	-9.8787	-9.8787	-9.8678	2.4886	2.501	2.5125	2.5234	2.533
r79	-8.8371	-8.8371	-8.8371	-8.8371	-8.8371	2.2539	2.2657	2.2765	2.2849	2.292
r80	-7.5709	-7.5709	-7.5709	-7.5709	-7.5709	1.9631	1.9708	1.9776	1.9838	1.989
r81	-5.9015	-5.9015	-5.9015	-5.9015	-5.9015	1.5603	1.5647	1.5684	1.5724	1.576
r82	-3.5225	-3.5225	-3.5225	-3.5225	-3.5225	0.95582	0.95855	0.96107	0.96221	0.9633

xxx TABLE:ev20_jaeemk xxxxxxxxxxxxxxxxx

	c1	**c2**	**c3**	**c4**	**c5**	**c526496**	**c526497**	**c526498**	**c526499**	**c52650**
r1	-344.77	-344.39	-342.18	-336.62	-327.49	21.701	21.851	22.001	22.153	22.30
r2	-332.64	-332.26	-330.08	-324.65	-315.86	21.722	21.868	22.014	22.161	22.31
r3	-320.73	-320.36	-318.24	-313.02	-304.68	21.743	21.884	22.026	22.17	22.31
r4	-309.06	-308.71	-306.74	-301.84	-294.01	21.765	21.902	22.04	22.181	22.32
r5	-298.48	-298.16	-296.31	-291.71	-284.33	21.773	21.906	22.041	22.179	22.32
r79	-9.8725	-9.8615	-9.7889	-9.6008	-9.2728	2.5394	2.5501	2.5602	2.5696	2.578
r80	-8.8311	-8.8201	-8.7475	-8.5594	-8.2319	2.3039	2.3121	2.3198	2.327	2.333
r81	-7.5651	-7.5542	-7.4816	-7.2935	-6.9665	2.0068	2.0124	2.0176	2.0226	2.027
r82	-5.8961	-5.8851	-5.8126	-5.6245	-5.2979	1.5958	1.5989	1.6018	1.6046	1.607
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	0.51002	0.47311	0.43235	0.39151	0.35308	0.31813	0.
2	0.00051498	0.51002	0.47311	0.43235	0.39149	0.35304	0.31808	0.
3	0.0041199	0.50903	0.47115	0.42958	0.38871	0.35063	0.31612	0.
4	0.013905	0.43877	0.4092	0.37682	0.34423	0.31326	0.2847	0.
5	0.032959	0.36701	0.34448	0.3198	0.29483	0.2708	0.2483	0.
6	0.064373	0.3056	0.28888	0.27048	0.25156	0.23296	0.21526	0.

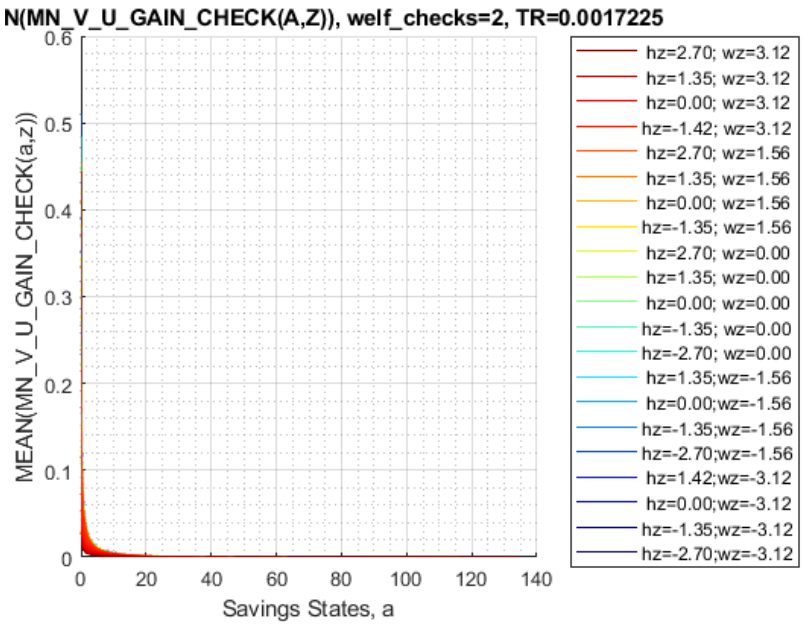
```
% Consumption
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(A,Z)), welf_checks=' num2str(welf_checks) ', TR=' num2str
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 4, 1, cl_mp_dat
```

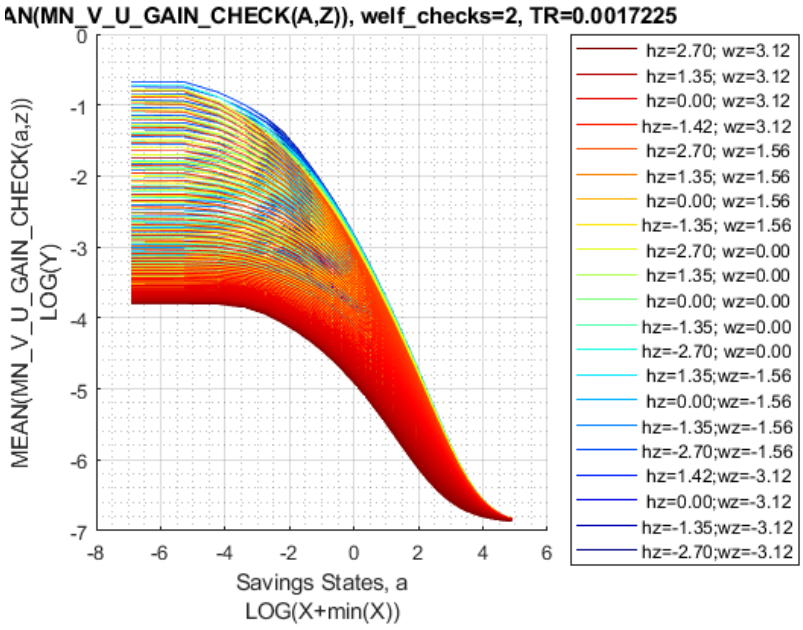
xxx MEAN(MN_MPC_U_GAIN_CHECK(A,Z)), welf_checks=2, TR=0.0017225 xxxxxxxxxxxxxxxxxxxxxxxxxxx

group	savings	mean_eta_1	mean_eta_2	mean_eta_3	mean_eta_4	mean_eta_5	mean_eta_6	mean_
1	0	0.79858	0.79639	0.79456	0.79339	0.79289	0.79281	0.7
2	0.00051498	0.79858	0.79639	0.79456	0.79338	0.79288	0.7928	0.79
3	0.0041199	0.79747	0.79444	0.79173	0.79014	0.78955	0.78958	0.78
4	0.013905	0.69033	0.68665	0.68413	0.68242	0.6814	0.68076	0.68
5	0.032959	0.60901	0.60566	0.60319	0.602	0.60204	0.60284	0.6
6	0.064373	0.53062	0.52872	0.52759	0.52722	0.52749	0.52815	0.52

Graph Mean Values:

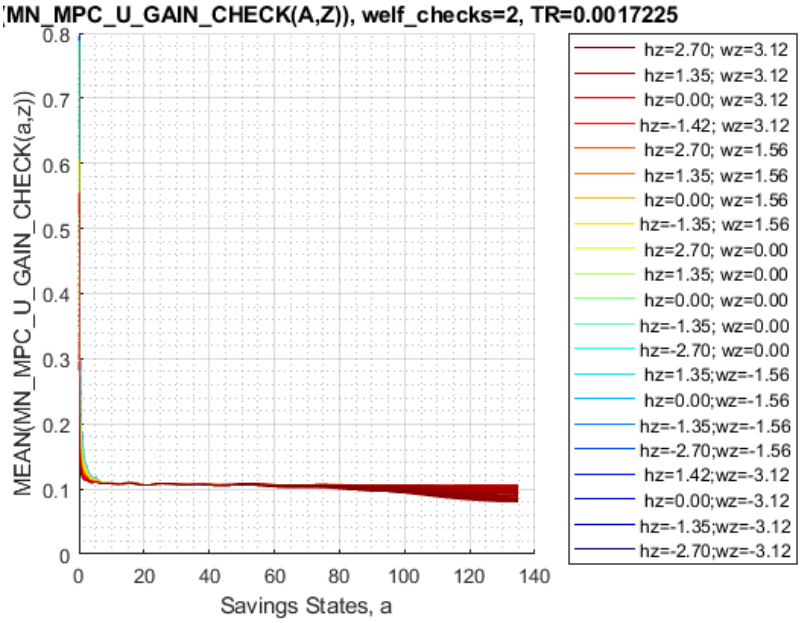
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(A,Z)), welf\_checks=' num2str(welf_checks) ', TR=' num2
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(a,z))'};
ff_graph_grid((tb_az_v{1:end, 3:end})', ar_st_eta_HS_grid, agrid, mp_support_graph);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

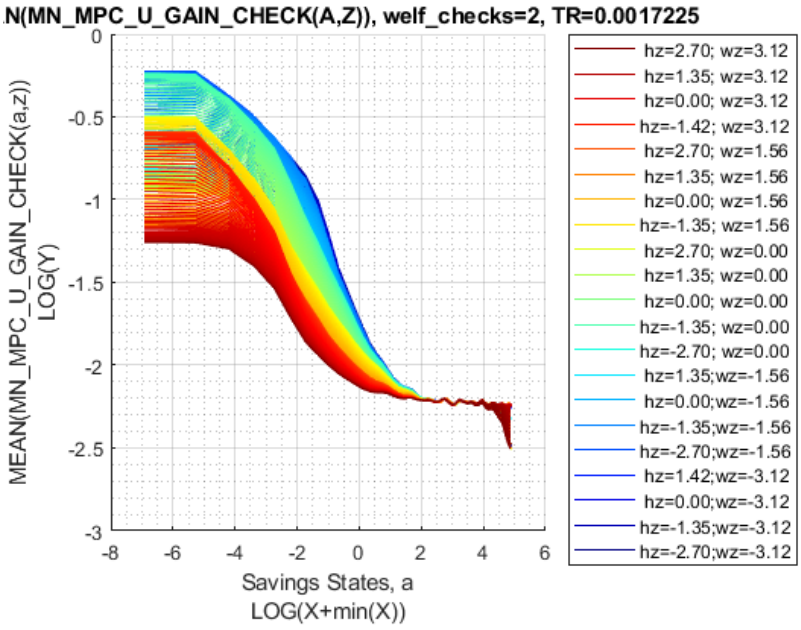




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
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;
```

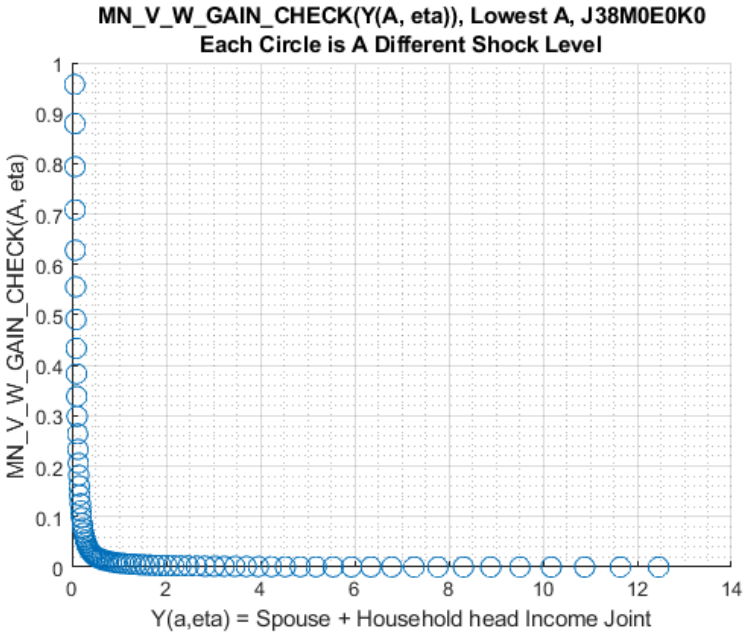
Select Age, Education, Marital, Kids Count:s

```
% 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);
```

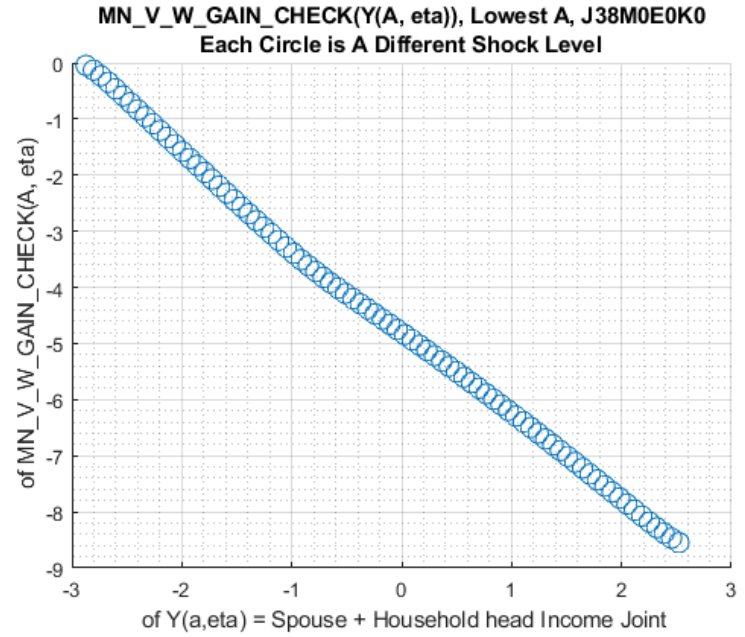
Marginal Value Gains, Color as Shock, Conditional on Age, Marital, Kids, and Education

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;
```



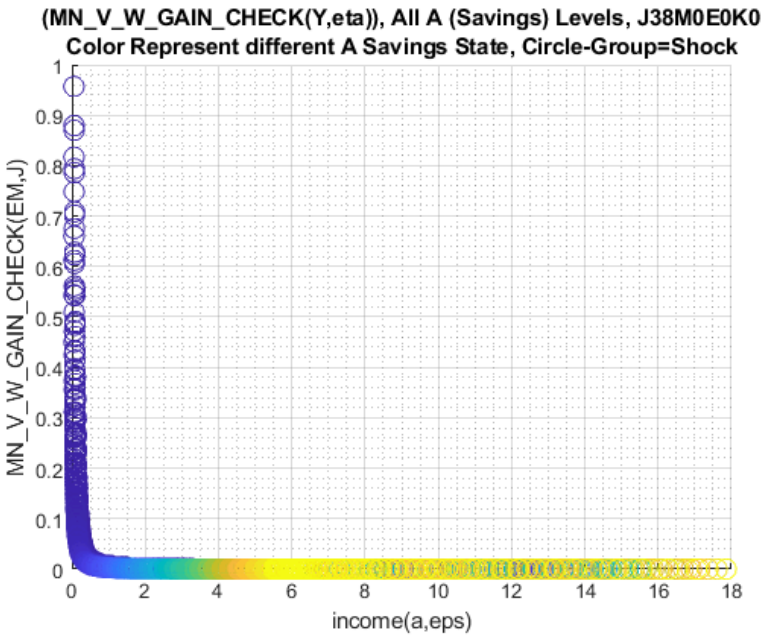

```
figure();
it_shock = 1;
scatter(log(mt_total_inc_jemk(:,it_a)), log(mt_V_W_gain_check_jemk(:,it_a)), 100);
title({'MN\_V\_W\_GAIN\_CHECK(Y(A, eta)), Lowest A, J38M0E0K0', ...
    'Each Circle is A Different Shock Level'});
xlabel(' of Y(a,eta) = Spouse + Household head Income Joint');
ylabel(' of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



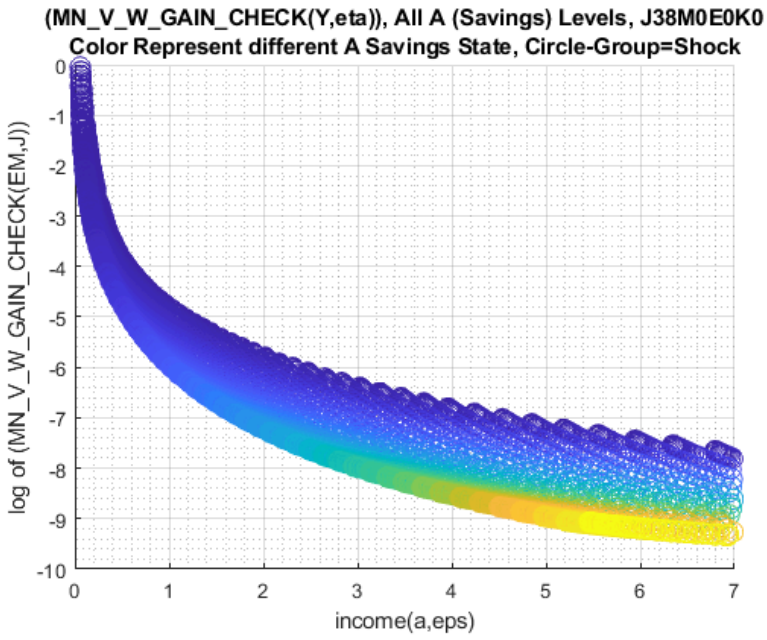
Plot all asset levels:

```
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;
```



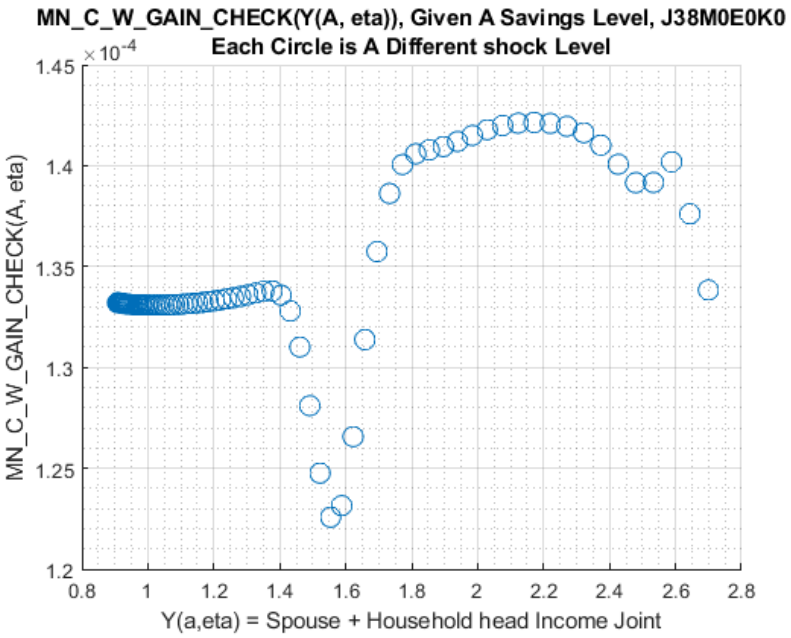

```
figure();
scatter((mt_total_inc_jemk(:)), log(mt_V_W_gain_check_jemk(:)), 100, mt_a(:));
title({'(MN\_V\_W\_GAIN\_CHECK(Y,eta)), All A (Savings) Levels, J38M0E0K0', ...
    'Color Represent different A Savings State, Circle-Group=Shock'});
xlabel('income(a,eps)');
ylabel('log of (MN\_V\_W\_GAIN\_CHECK(EM,J))');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



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

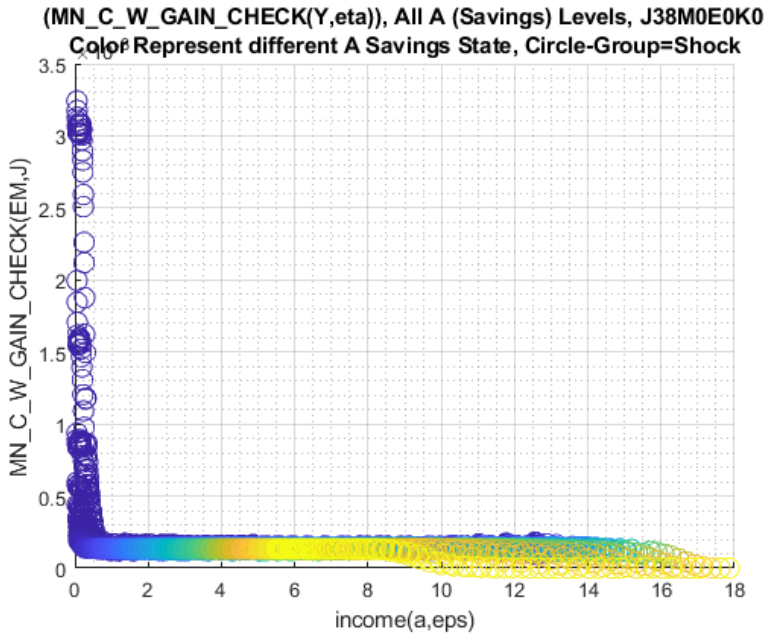
How do shocks and a impact marginal value. First plot one asset level, variation comes only from increasingly higher shocks:

```
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;
```



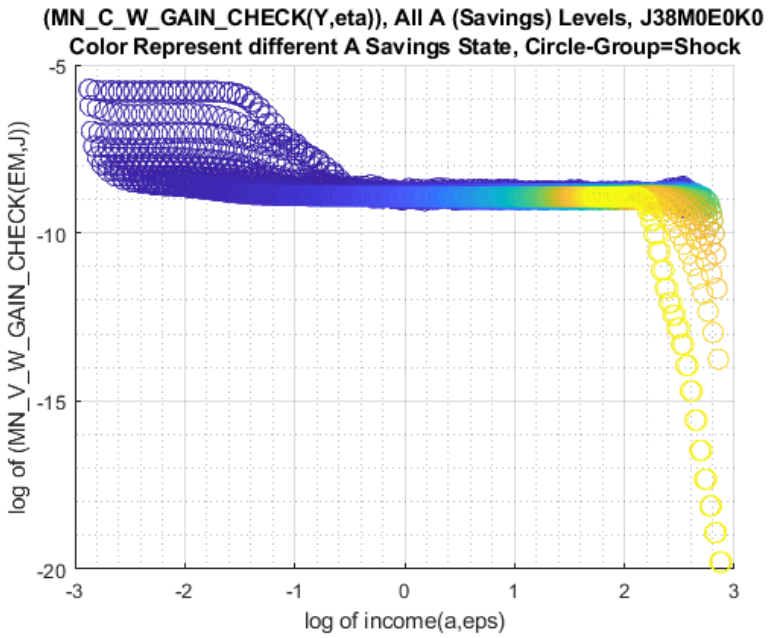
Plot all asset levels:

```
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	0.031641	0.030484	0.02834	0.026038	0.02411	0.022484
2	2	0	0.043088	0.041562	0.038594	0.035346	0.032616	0.030302
3	3	0	0.050052	0.048552	0.04484	0.041129	0.038009	0.035365
4	4	0	0.056653	0.055085	0.050837	0.046658	0.043144	0.040164
5	5	0	0.061929	0.06035	0.055674	0.051173	0.04739	0.044186
6	1	1	0.0059451	0.0055031	0.0050109	0.0045637	0.0041817	0.0038582
7	2	1	0.0083276	0.0077158	0.0070125	0.0063646	0.0058204	0.0053596
8	3	1	0.0099952	0.0092796	0.0084495	0.0076771	0.0070251	0.0064706
9	4	1	0.012363	0.0115	0.010491	0.0095402	0.0087368	0.0080453
10	5	1	0.015311	0.014353	0.013136	0.011989	0.011016	0.010187

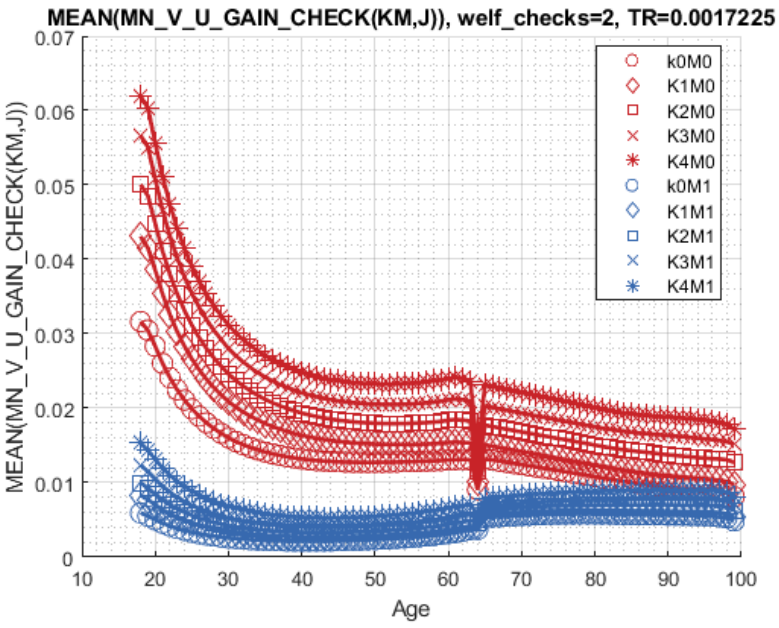
```
% Consumption Function
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(KM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

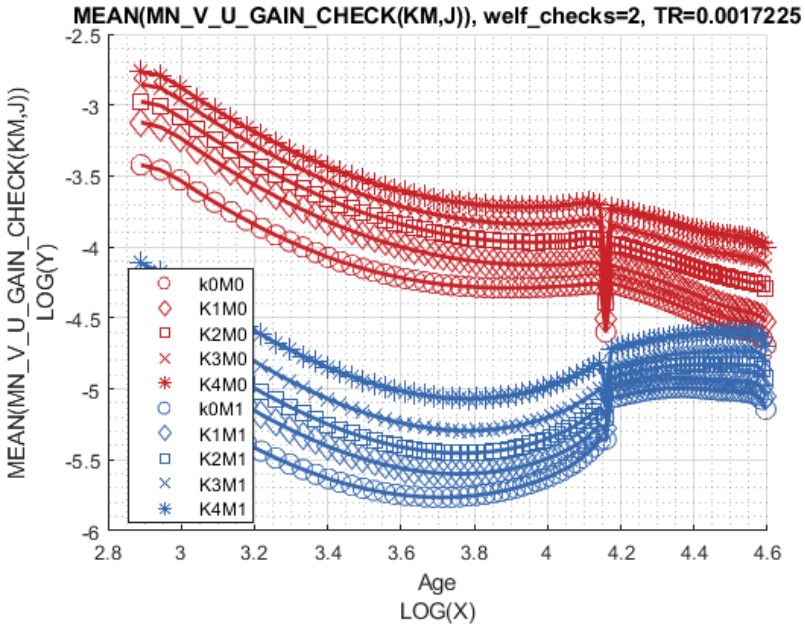
```
xxx  MEAN(MN_MPC_U_GAIN_CHECK(KM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
```

group	kids	marry	mean_age_18	mean_age_19	mean_age_20	mean_age_21	mean_age_22	mean_age_23
1	1	0	0.056223	0.069417	0.075469	0.073238	0.071407	0.069388
2	2	0	0.065756	0.079137	0.086795	0.084309	0.082576	0.080501
3	3	0	0.074976	0.0915	0.097876	0.095212	0.092901	0.090654
4	4	0	0.080849	0.097766	0.10385	0.10096	0.098266	0.095837
5	5	0	0.086722	0.10427	0.1095	0.10587	0.10288	0.10028
6	1	1	0.076254	0.076512	0.076532	0.075066	0.074001	0.071748
7	2	1	0.078384	0.08099	0.082	0.080237	0.078625	0.07747
8	3	1	0.081685	0.086418	0.087477	0.086713	0.086059	0.084174
9	4	1	0.084587	0.091629	0.092233	0.091036	0.089321	0.087109
10	5	1	0.094144	0.10366	0.10288	0.10024	0.099154	0.096111

Graph Mean Values:

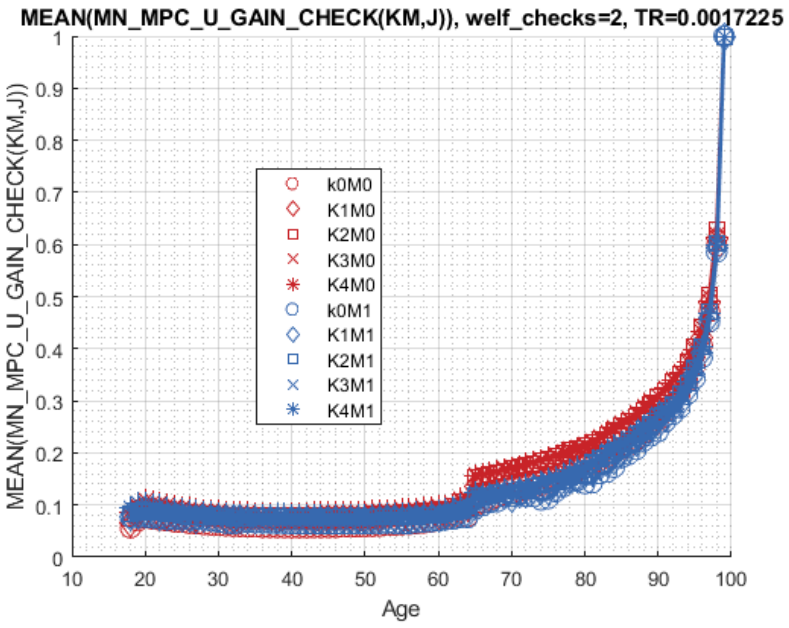
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(KM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(KM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);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

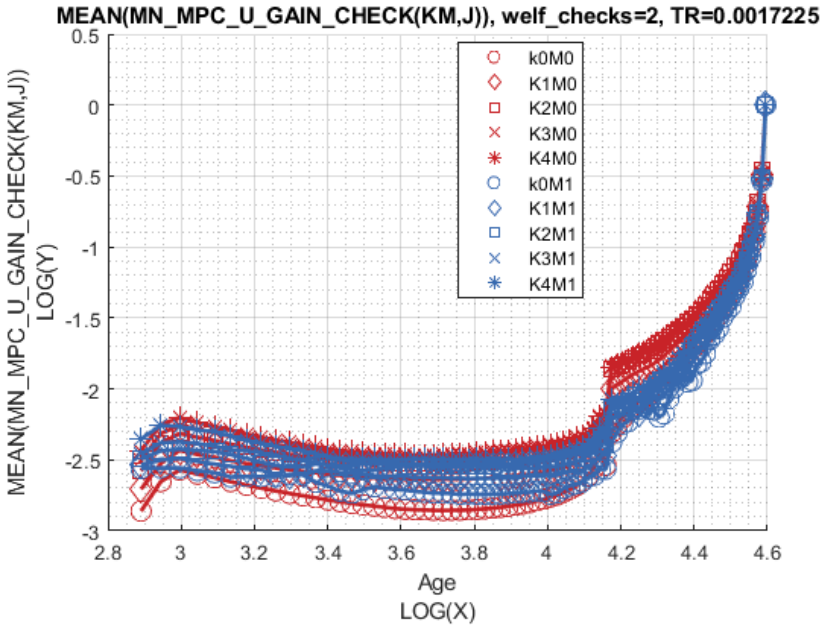




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
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       0.050402       0.049194       0.046825        0.04423       0.041921       0.039858
      2       1       0       0.046943       0.045218       0.040488       0.035907       0.032187       0.029142
      3       0       1       0.011395       0.010664      0.0098666      0.0091158      0.0084651      0.0078963
      4       1       1       0.009382      0.0086772      0.0077734      0.0069379      0.0062467      0.0056721
```

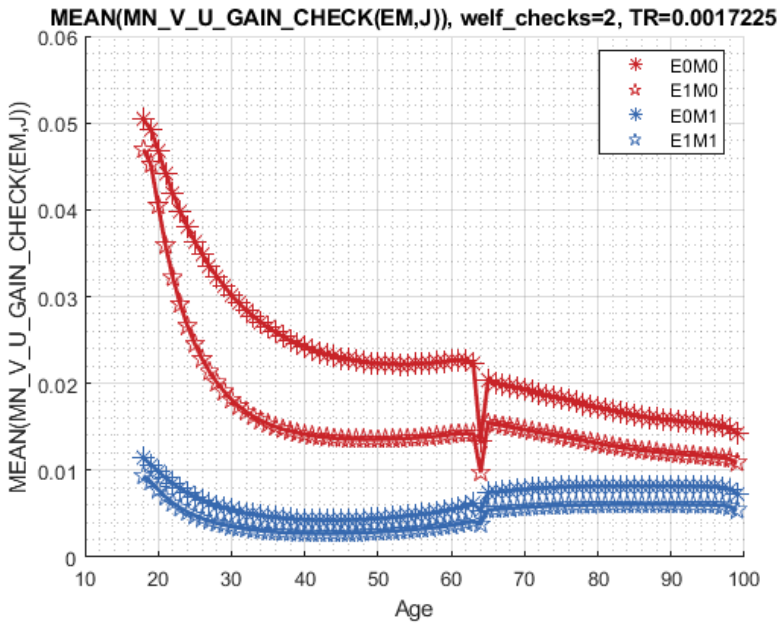
```
% Consumption
st_title = ['MEAN(MN_MPC_U_GAIN_CHECK(EM,J)), welf_checks=' num2str(welf_checks) ', TR=' num2st
tb_az_c = ff_summ_nd_array(st_title, mn_MPC_U_gain_share_check, true, ["mean"], 3, 1, cl_mp_dat
```

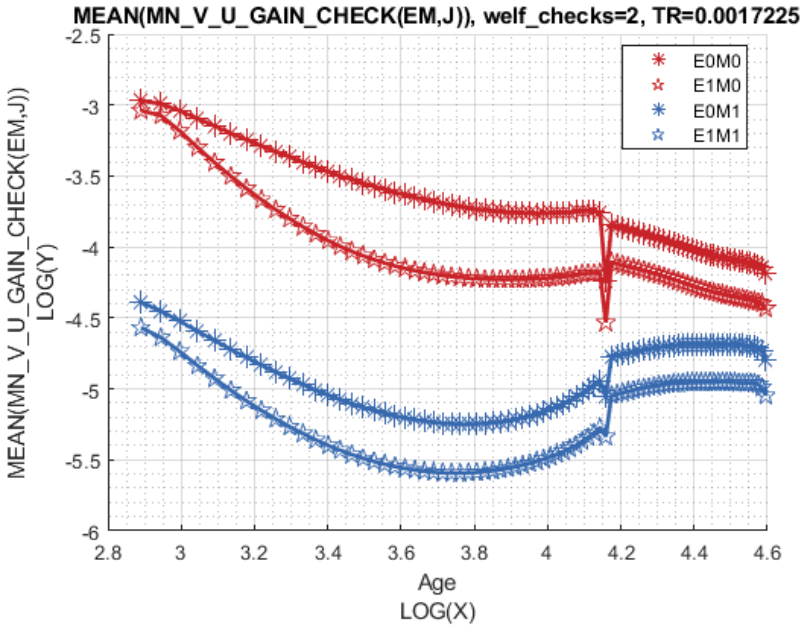
```
xxx  MEAN(MN_MPC_U_GAIN_CHECK(EM,J)), welf_checks=2, TR=0.0017225  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    edu    marry    mean_age_18    mean_age_19    mean_age_20    mean_age_21    mean_age_22    mean_age_23
    _____    ___    _____    ___________    ___________    ___________    ___________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

      1       0       0       0.063628       0.073179       0.078161       0.077574       0.077065       0.076591
      2       1       0       0.082182        0.10366        0.11123        0.10627        0.10215       0.098072
      3       0       1       0.075603       0.077333       0.078368       0.078269       0.078227       0.077206
      4       1       1       0.090419       0.098351       0.098081        0.09505       0.092637       0.089439
```

Graph Mean Values:

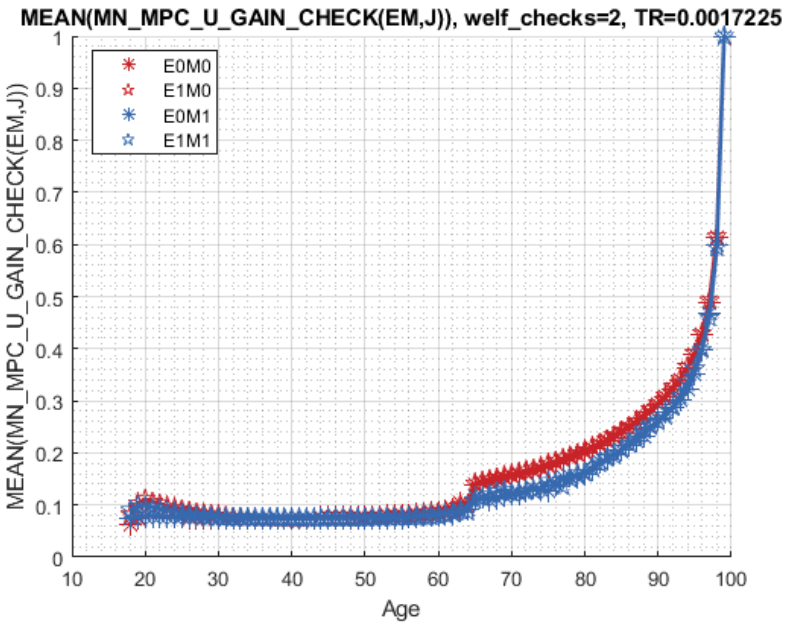
```
st_title = ['MEAN(MN\_V\_U\_GAIN\_CHECK(EM,J)), welf\_checks=' num2str(welf_checks) ', TR=' num
mp_support_graph('cl_st_graph_title') = {st_title};
mp_support_graph('cl_st_ytitle') = {'MEAN(MN\_V\_U\_GAIN\_CHECK(EM,J))'};
ff_graph_grid((tb_az_v{1:end, 4:end}), ar_row_grid, age_grid, mp_support_graph);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

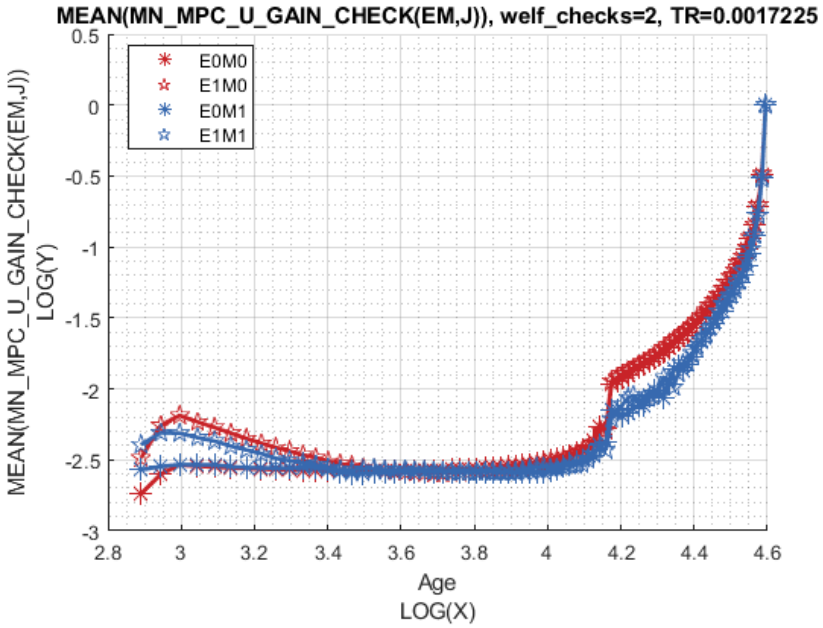




Graph Mean Consumption (***MPC: Share of Check Consumed***):

```
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)