Tax-benefit revealed social preferences in Croatia

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   - Parametric survey-to-survey imputation (De Agostini et al. (2017))

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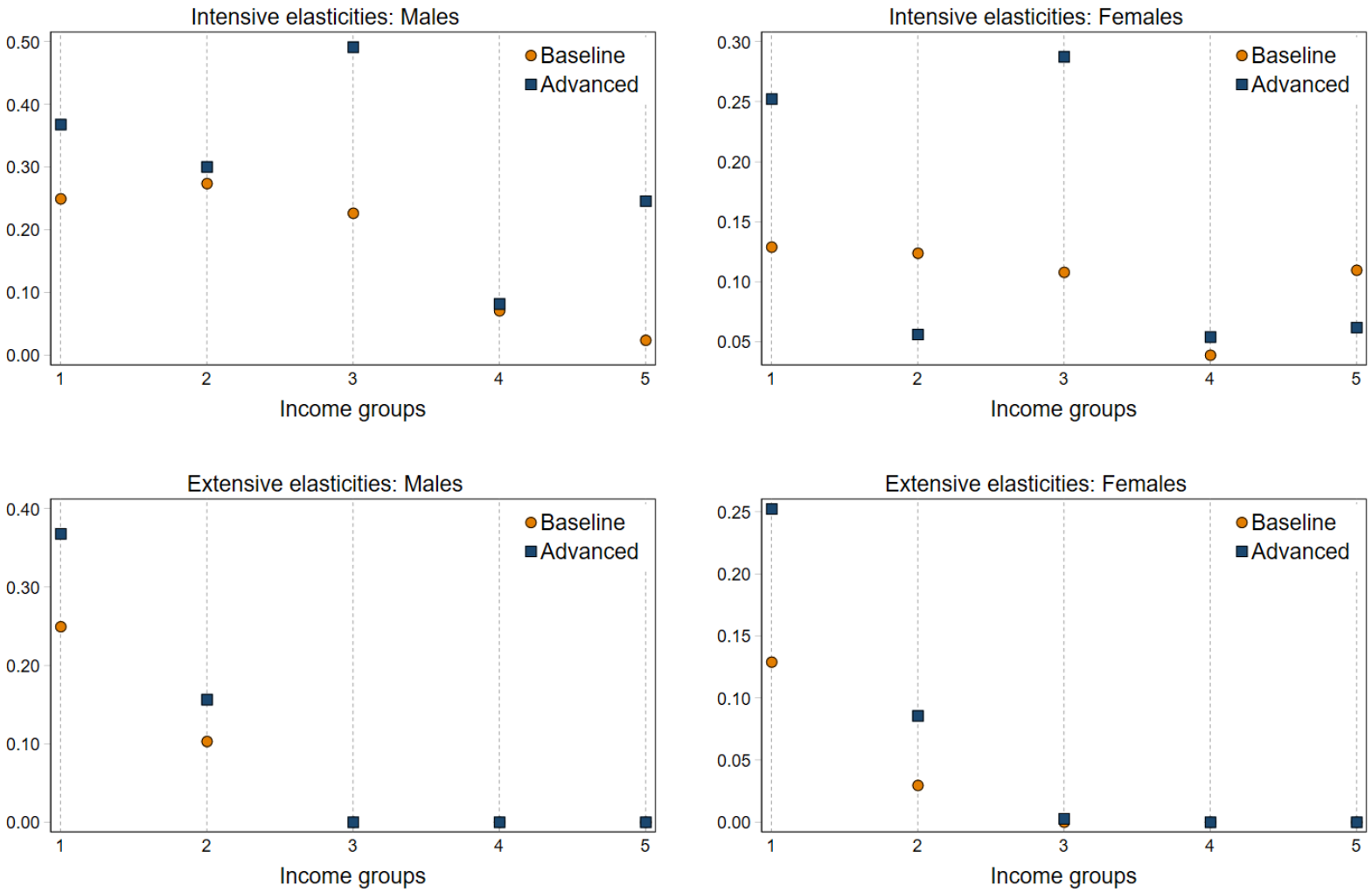
   - Translate j working hours into responses over groups i

Intensive and Extensive Elasticities



$$\zeta_i = \frac{C_i - C_{i-1}}{s_i} \frac{\partial s_i}{\partial (C_i - C_{i-1})}; \; \eta_i = \frac{C_i - C_0}{s_i} \frac{\partial s_i}{\partial (C_i - C_0)}$$

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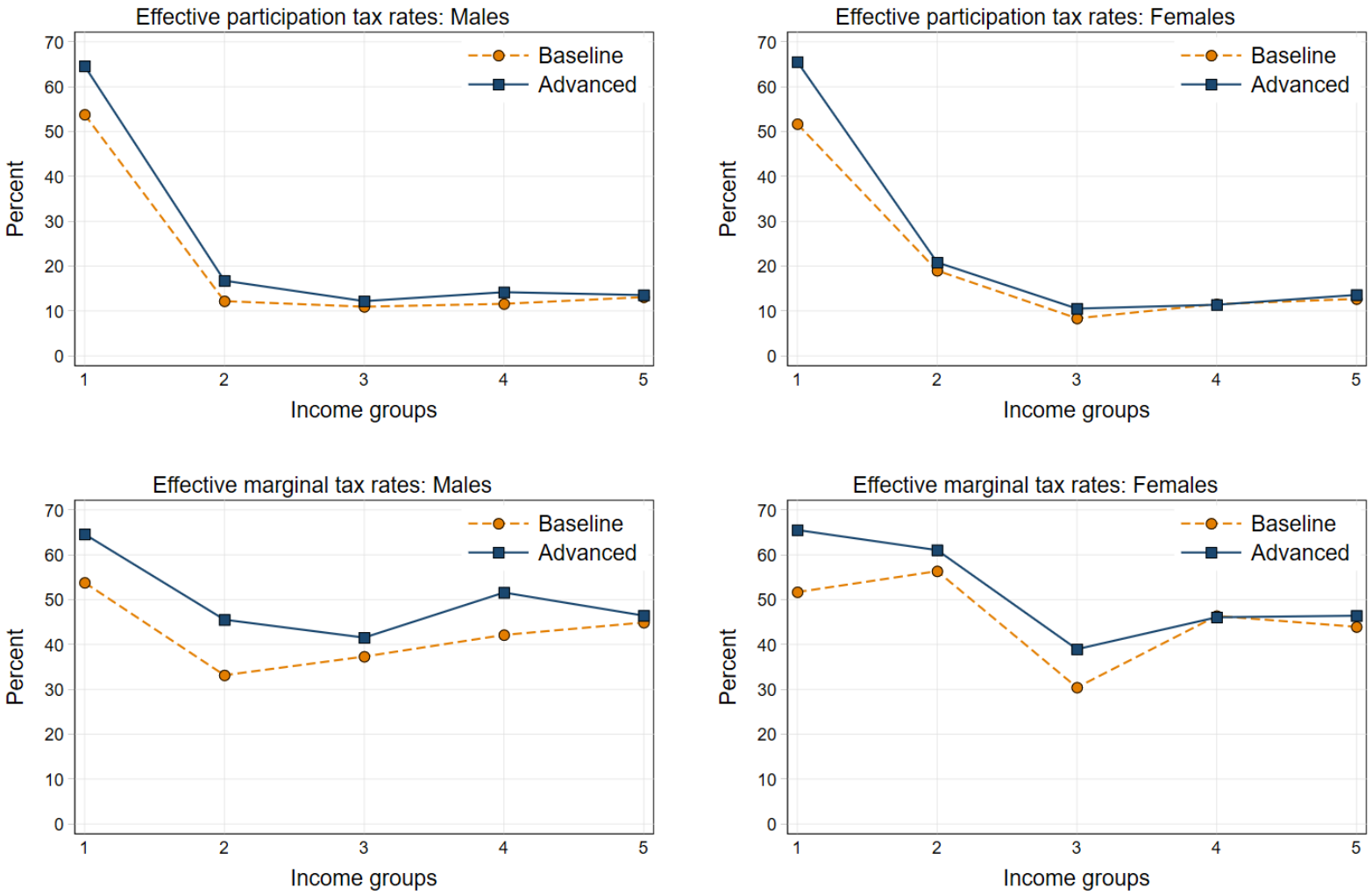
Effective Marginal and Participation Tax Rates



$$EMTR_i = \frac{T_i - T_{i-1}}{Y_i - Y_{i-1}};\ EPTR_i = \frac{T_i - T_0}{Y_i - Y_0}$$

Effective Marginal and Participation Tax Rates Table

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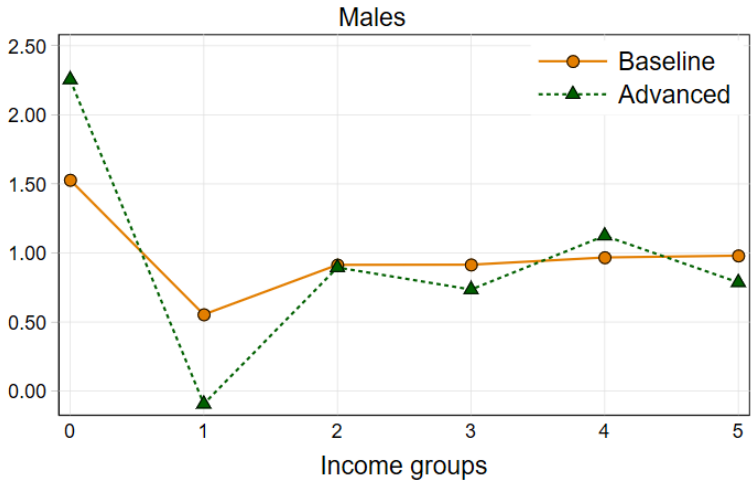

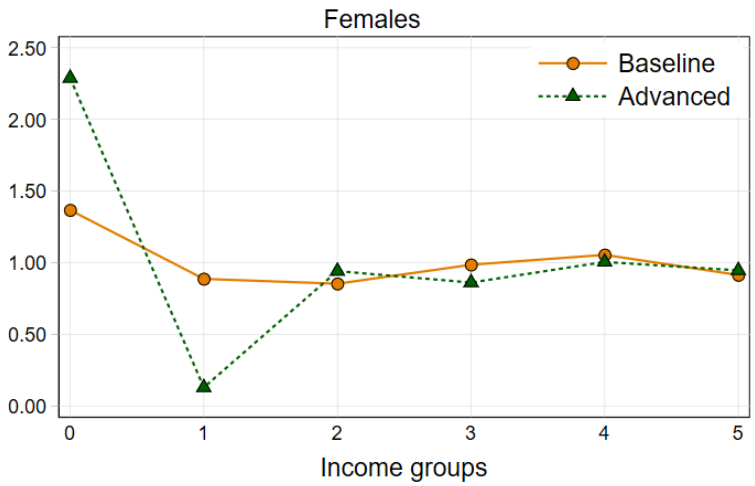

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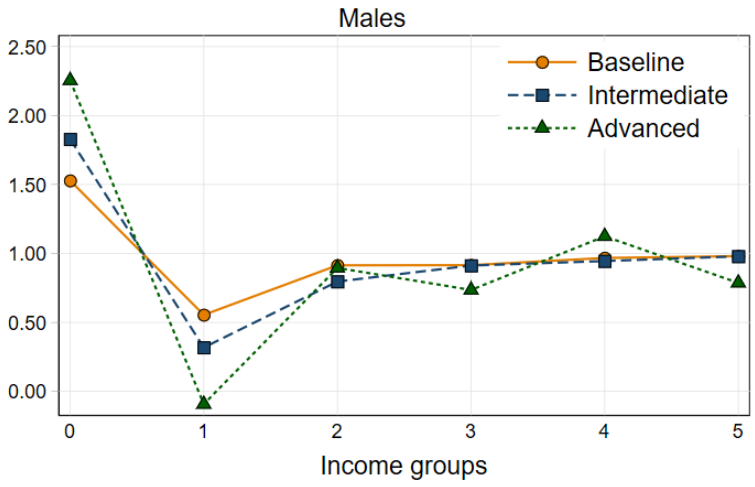
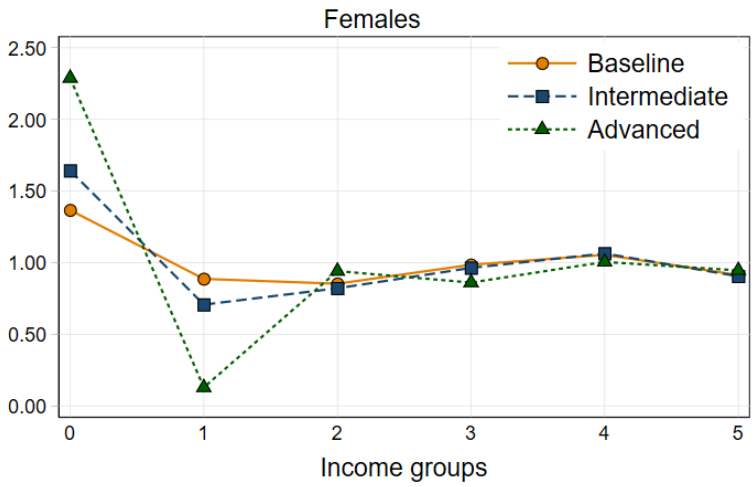


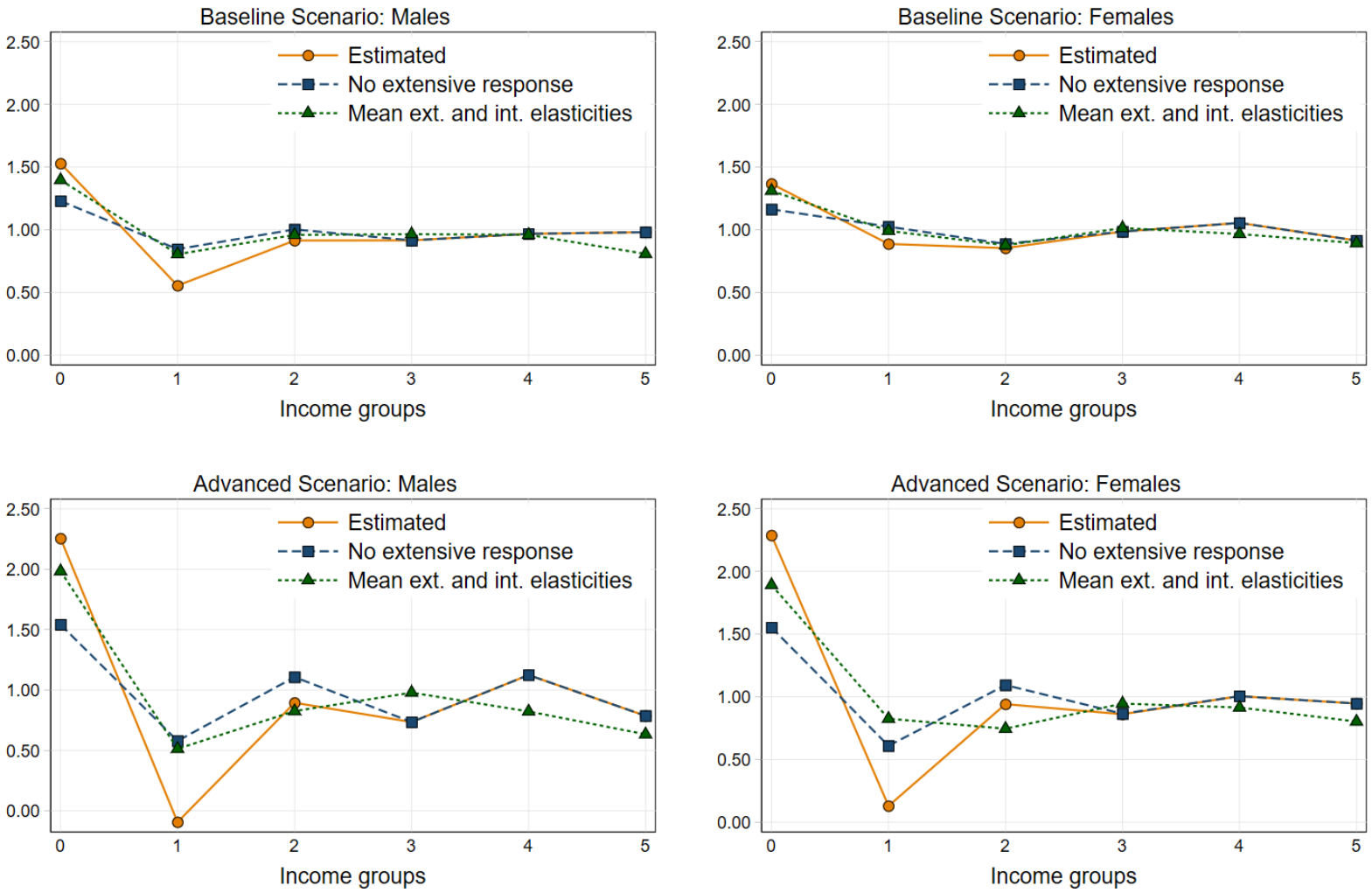


Marginal Social Welfare Weights Table

Relative Marginal Social Welfare Weights Graph

Gross and (Real) Disposable Incomes and Net Taxes Table

Marginal Social Welfare Weights: Sensitivity to Elasticities



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- Pareto improvements are feasible if the elasticities are overlooked
  - The distribution of marginal social welfare weights flattens

Tax-Benefit System in 2017

Instrument	Rate/Amount
Personal Income Tax	
Number of Tax Bands	2
Min/Max Tax Band Limits (Monthly Level)	17500/∞
Min/Max Tax Rate [%]	24/36
VAT	
Standard Rate [%]	25
Reduced Rates [%]	0, 5, 13
Employer SSC (General and Occupational Health and Employment Contributions)	
Floor (Monthly Level)	2940.82
Rate [%]	17.2
Ceiling	No
Taxable by PIT	No
Employee SSC (Pension Insurance Contributions)	
Floor (Monthly Level)	2940.82
Rate [%]	20
Ceiling	46434
Taxable by PIT	No
Social Assistance	
Maximum Amount (Monthly Level)	800
Withdrawal Rate [%]	100
Taxable	PIT: No, SSC: No
Unemployment Benefits*	
Payment Rate	60% of Gross Income
Duration	3 - 15 Months
Ceiling	70% of Average Net Wage (3979.5)
Taxable	IT: No; SSC: No

Notes: *Shown for the initial phase of unemployment for persons aged 30+ years. All monetary amounts are in HRK

Intensive and Extensive Elasticities

	Men		Women	
	Baseline	Advanced	Baseline	Advanced
Intensive Margin				
1	0.25	0.37	0.13	0.25
2	0.27	0.30	0.12	0.06
3	0.23	0.49	0.11	0.29
4	0.07	0.08	0.04	0.05
5	0.02	0.25	0.11	0.06
Extensive Margin				
1	0.25	0.37	0.13	0.25
2	0.10	0.16	0.03	0.09
3	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00

Notes: Income groups are defined by quintiles of the income distribution of single men and women. Group 0 denotes those with zero income (non-participants). Elasticities are obtained by simulating an increase of 1% of the difference in mean disposable/consumable incomes between a given income group i and the adjacent lower income group $i-1$ (intensive margin) or the group 0 of non-workers (extensive margin).

◂ Intensive and Extensive Elasticities Graph

Effective Marginal Tax Rate (EMTR) and Participation Tax Rate (EPTR)

	Men		Women	
	Baseline	Advanced	Baseline	Advanced
EMTR (%)				
1	54	65	52	66
2	33	46	56	61
3	37	42	30	39
4	42	52	46	46
5	45	46	44	46
EPTR (%)				
1	54	65	52	66
2	12	17	19	21
3	11	12	8	11
4	12	14	12	11
5	13	14	13	14

Notes: Income groups are defined by quintiles of the income distribution of single men and women. Group 0 denotes those with zero income (non-participants). EMTRs are calculated as $\frac{T_i - T_i - 1}{Y_i - Y_i - 1}$ while EPTRs are calculated as $\frac{T_i - T_0}{Y_i - Y_0}$ for all income groups $i > 0$.

◂ Effective Marginal and Participation Tax Rates Graph

Marginal Social Welfare Weights

	Men			Women		
	Baseline	Intermediate	Advanced	Baseline	Intermediate	Advanced
0	1.53	1.83	2.25	1.37	1.64	2.29
1	0.55	0.32	-0.09	0.89	0.71	0.13
2	0.91	0.80	0.89	0.85	0.82	0.94
3	0.92	0.91	0.74	0.99	0.96	0.86
4	0.97	0.94	1.12	1.05	1.06	1.00
5	0.98	0.98	0.79	0.91	0.90	0.95

Notes: Income groups are defined by quintiles of the income distribution of single men and women. Group 0 denotes those with zero income (non-participants). In the baseline scenario, we estimated the behavioral labor supply reactions (elasticities) on the disposable income (income net of direct taxes) while the inverse-optimal tax model uses the (net) tax function consisting of direct taxes. In the advanced scenario, we estimated the behavioral labor supply reactions (elasticities) on the real disposable income (income net of direct and indirect taxes) while the inverse-optimal tax model uses the (net) tax function consisting of direct and indirect taxes. In the intermediate scenario, we estimated the behavioral labor supply reactions (elasticities) on the disposable income (income net of direct taxes) while the inverse-optimal tax model uses the (net) tax function consisting of direct and indirect taxes.

◂ Marginal Social Welfare Weights Graph

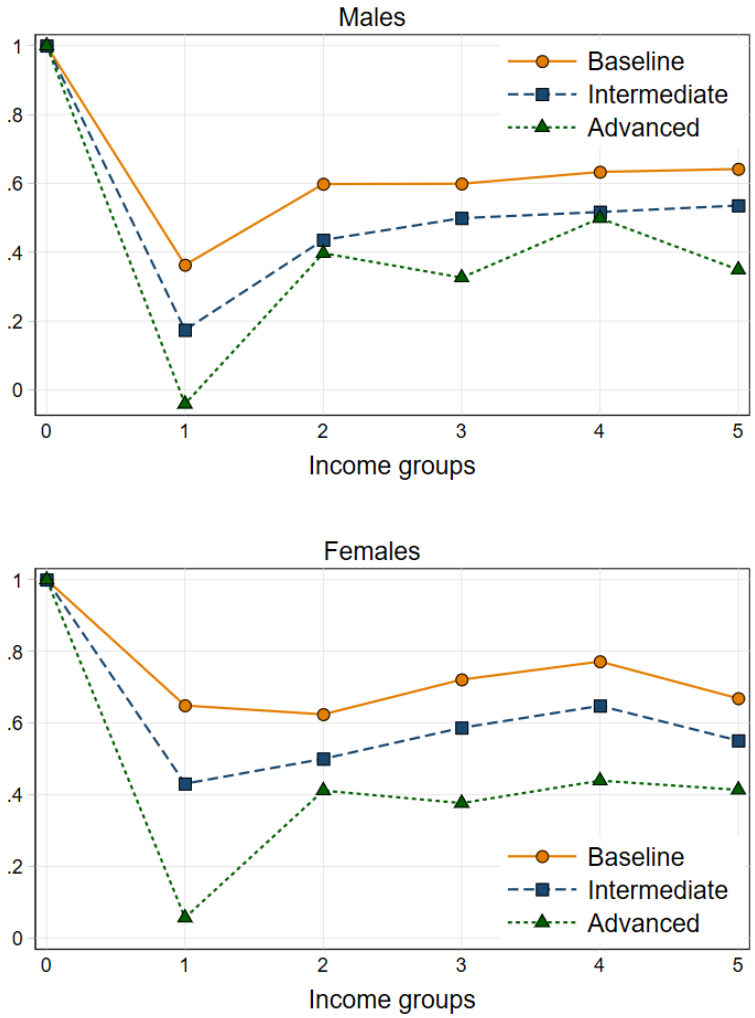
Gross Income, (Real) Disposable Income and Net Taxes

	Men		Women	
	Baseline	Advanced/ Intermediate	Baseline	Advanced/ Intermediate
Gross Income (Y)				
1	36296	36296	38034	38220
2	57436	57436	57386	58024
3	81314	81314	79136	79520
4	112189	112189	105310	105647
5	158377	158377	148081	149342
(Real) Disposable Income (C)				
0	15528	10504	19482	13892
1	32299	23355	37855	27067
2	46429	34868	46300	34782
3	61397	48827	61430	47902
4	79262	63774	75464	61990
5	104708	88511	99438	85400
Net Taxes (T)				
0	-15528	-10504	-19482	-13892
1	3997	12941	180	11153
2	11007	22568	11086	23243
3	19917	32488	17705	31618
4	32927	48415	29846	43657
5	53669	69867	48642	63941

Notes: Income groups are defined by quintiles of the income distribution of single men and women. Group 0 denotes those with zero income (non-participants).Gross and disposable incomes, net taxes and population shares represent the averages computed at the group level. Incomes and taxes are expressed annually in HRK.

◂ Marginal Social Welfare Weights Graph

Relative Marginal Social Welfare Weights



◂ Marginal Social Welfare Weights Graph