Online Appendix
Climate Policy under Economic Uncertainty: Confidence in the Welfare State and Support for Carbon Taxation

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Appendix A: Descriptive Statistics and Sample Sizes

Table A1 reports pooled descriptive statistics for all variables entering the main models (Tables 2 and 3). Continuous and ordinal variables are summarized by their mean, median, standard deviation, and range; categorical variables are summarized by category frequencies. Sample sizes vary across variables because employment risk was only fielded to respondents in work (see Section 3.2).

Table A1: Descriptive statistics of variables used in the main models (pooled sample)

Variable	N	Mean	Median	SD	Min	Max
Fossil Fuel Tax Support	10058	4.02	4.00	3.34	0.00	10.00
Income Difficulty	10270	2.50	2.00	0.95	1.00	4.00
Employment Risk	7119	2.36	2.00	1.29	1.00	5.00
Social Policy Satisfaction	9892	3.69	4.00	2.70	0.00	10.00
Age	10968	48.87	50.00	16.15	18.00	91.00
Right-leaning orientation	9085	5.02	5.00	2.71	0.00	10.00
Climate Change Vulnerability (z)	10477	0.00	0.07	0.82	-2.11	1.74
CEI (z)	10968	0.00	-0.39	1.00	-0.81	4.00

Categorical variables:

Variable	Category	N	%
Gender	Female	5668	51.7
	Male	5300	48.3
Education (ISCED)	High	3668	33.4
	Low	2385	21.7
	Mid	4915	44.8
Occupational class	Clerical service workers	2987	27.2
	Higher-grade service	2732	24.9
	Lower-grade service workers	1437	13.1
	No answer	1246	11.4
	Not in work	652	5.9
	Production workers	1438	13.1
	Small business owners	476	4.3

Note: Climate Change Vulnerability and CEI enter the models as standardized (z-scored) variables. Statistics are unweighted.

Country-level means are reported in Table 1 in the main text (Section 4.1). Table A2 below repeats those exact values for appendix reference and reports the actual cleaned analysis-data N by country.

Table A2: Cross-country means of key variables

Country	Welfare Regime	Analysis N	FFT Support (mean)	Income Difficulty (mean)	Employment Risk (mean)	SP Satisfaction (mean)
France	Continental	1564	3.60	2.76	2.38	3.66
Germany	Continental	1510	3.65	2.48	2.30	3.88
Italy	Southern	1524	3.86	2.57	2.46	3.60
Poland	Eastern	1528	3.84	2.51	2.72	3.39
Spain	Southern	1527	4.10	2.69	2.43	4.06
Sweden	Nordic	1539	4.10	2.25	2.13	3.86

Country	Welfare Regime	Analysis N	FFT Support (mean)	Income Difficulty (mean)	Employment Risk (mean)	SP Satisfaction (mean)
United Kingdom	Liberal	1776	4.89	2.32	2.09	3.43

Note: Means are unweighted cell means and use all non-missing observations for each variable.

Table A3: NUTS-1 regional sample sizes (by country)

The cleaned analysis file covers 57 NUTS-1 regions across the seven countries. Table A3 summarizes, for each country, the number of NUTS-1 regions and the total, smallest, and largest regional sample sizes. The `Analysis N` totals use the same country-level denominator as Table A2. Standard errors in all main analyses are clustered at the NUTS-1 level to account for within-region correlation.

Country	NUTS-1 regions	Analysis N	Smallest region (N)	Largest region (N)
France	12	1564	64	288
Germany	16	1510	13	325
Italy	5	1524	169	402
Poland	7	1528	153	321
Spain	7	1527	74	447
Sweden	3	1539	262	677
United Kingdom	7	1776	27	593

Appendix B: Standardized-IV Specifications

The main results in Section 4.2 use the raw scales of the explanatory variables, so that coefficients carry interpretable units (a one-point increase on the 1–4 income-difficulty scale corresponds to a β-point change on the 0–10 fossil fuel tax support scale). To support the relative-magnitude comparison reported in Section 4.2.1, we additionally re-estimate Tables 2 and 3 with the three key explanatory variables (income difficulty, employment risk, and social policy satisfaction) standardized to zero mean and unit variance. The dependent variable and all controls are left on their original scales, so the standardized coefficients read as "fossil fuel tax support points (0–10) per 1 SD increase in the explanatory variable" and are directly comparable across the three. Note that *Income Difficulty* (1–4) and *Employment Risk* (1–5) are ordinal Likert items; standardizing treats them as continuous, consistent with their treatment in the main OLS models.

Table B1: Main effects with standardized IVs (replication of Table 2)

	Model B1	Model B2	Model B3
Income Difficulty (z)	-0.405***		
	(0.037)		
Employment Risk (z)		0.249***	
		(0.054)	
Social Policy Satisfaction (z)			0.620***
			(0.051)
Age	-0.006*	-0.004	-0.006*
	(0.003)	(0.003)	(0.003)
Gender: Male	0.397***	0.451***	0.370***
	(0.070)	(0.074)	(0.073)
Edu: Low (Ref. - High)	-0.565***	-0.626***	-0.607***
	(0.135)	(0.150)	(0.132)
Edu: Mid	-0.472***	-0.526***	-0.533***
	(0.080)	(0.094)	(0.075)
Right-leaning orientation	-0.131***	-0.110***	-0.143***
	(0.024)	(0.024)	(0.019)
Climate Change Vulnerability	1.800***	1.770***	1.656***
	(0.053)	(0.065)	(0.062)
CEI	0.089**	0.097***	0.064*
	(0.028)	(0.027)	(0.026)
Num.Obs.	8248	5875	8135
Controls	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

- $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Occupational class controlled but not shown. Standard errors clustered by NUTS-1 level in parentheses. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B2: Interaction models with standardized IVs (replication of Table 3)

	Model B4	Model B5
Income Difficulty (z)	-0.297***	
	(0.038)	
Employment Risk (z)		0.193***
		(0.052)
Social Policy Satisfaction (z)	0.567***	0.663***

	Model B4	Model B5
	(0.053)	(0.057)
Income Diff. (z) × SP Sat. (z)	-0.001	
	(0.035)	
Emp. Risk (z) × SP Sat. (z)		0.148***
		(0.037)
Num.Obs.	7877	5652
Controls	Yes	Yes
Country FE	Yes	Yes
• $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Note: Controls include age, gender, education, occupational class, left-right scale, climate vulnerability, and CEI. Standard errors clustered by NUTS-1 level in parentheses. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The substantive conclusions of Tables 2 and 3 are unchanged under standardization. Models B1–B3 confirm that one-standard-deviation increases in income difficulty and social policy satisfaction shift fossil fuel tax support by similar absolute magnitudes (in opposite directions), while employment risk shows a smaller but still positive standardized association. Models B4–B5 reproduce the H4a/H4b asymmetry, with the income-difficulty × satisfaction interaction remaining statistically indistinguishable from zero while the employment-risk × satisfaction interaction is positive and significant.

Appendix C: Multilevel Model Robustness

To account for the multilevel structure of the data (individuals nested within NUTS-1 regions nested within countries), we replicate the main OLS models (Tables 2 and 3) using mixed-effects models with random intercepts at the NUTS-1 level. Country fixed effects are replaced by country-level random intercepts in the full multilevel specification. All models use the same controls as in the main analysis (age, gender, education, occupational class, left-right scale, climate change vulnerability, CEI) and the same NUTS-1-clustered standard errors for comparability.

Table C1: Multilevel replication of Table 2 main effects (NUTS-1 random intercept)

	Model C1	Model C2	Model C3
Income Difficulty	-0.44***(0.04)		
Employment Risk		0.19***(0.03)	
Social Policy Satisfaction			0.23***(0.01)
NUTS-1 Random Intercept	Yes	Yes	Yes
Country Random Intercept	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Num.Obs.	8,248	5,875	8,135

Table C2: Multilevel replication of Table 3 interaction models (NUTS-1 random intercept)

	Model C4	Model C5
Income Difficulty	-0.34***(0.06)	
Employment Risk		-0.02(0.05)
Social Policy Satisfaction	0.20***(0.03)	0.14***(0.03)
Income Difficulty × SP Satisfaction	0.00(0.01)	
Employment Risk × SP Satisfaction		0.04***(0.01)
NUTS-1 Random Intercept	Yes	Yes
Country Random Intercept	Yes	Yes
Controls	Yes	Yes
Num.Obs.	7,877	5,652

Note: Coefficients and standard errors from mixed-effects models (lme4). Standard errors are conditional on the random-effect structure. As in the main analysis, the employment-risk models (C2, C5) are estimated on the H2-eligible subsample, while the remaining models use the full sample.

Appendix D: Missing Data Analysis and Same-Sample Robustness

The employment risk variable (A4_3) is missing for approximately 35% of respondents because the question was only fielded to those currently in employment or self-employment. This missingness is systematic by design, since pensioners, students, homemakers, and unemployed individuals were not asked this question. To demonstrate that coefficient differences across Models 1–3 in Table 2 are not artifacts of sample composition, we re-estimated the income difficulty model (Table 2, Model 1), the social policy satisfaction model (Table 2, Model 3), and the income × SP interaction model (Table 3, Model 1) on the H2-eligible subsample, i.e. the same n ≈ 5,600–5,900 respondents used in Table 2 Model 2 and Table 3 Model 2.

Table D1 below presents these results alongside the standard H2 model for reference.

	Model D1	Model D2	Model D3	Model D4
Income Difficulty	-0.47***			-0.36***
	(0.04)			(0.07)
Employment Risk		0.19***		
		(0.04)		
Social Policy Satisfaction			0.25***	0.23***
			(0.02)	(0.04)
Income Difficulty × SP Satisfaction				0.00
				(0.01)
Num. Obs.	5684	5875	5652	5473
Controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes

- $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Analytic sample restricted to respondents with non-missing employment risk (employed or self-employed). Controls include age, gender, education, occupational class, left-right scale, climate vulnerability, and CEI. Standard errors clustered by NUTS-1. *** $p < 0.001$.

Table D1: Main models replicated on H2-eligible (employed) subsample

Income difficulty and social policy satisfaction coefficients are stable in sign and magnitude compared to the full-sample estimates in Table 2, and the null income × SP interaction is also replicated. This confirms that the observed patterns across Table 2 models reflect genuine differences in what the variables capture rather than differences in sample composition.

Appendix E: Alternative Dependent Variable

This appendix presents two robustness checks that vary the operationalization of the dependent variable: first, a binary recoding of the fossil fuel tax support scale (E1); second, an entirely different climate policy item — support for banning inefficient appliances — as an alternative outcome (E2).

E1: Binary Fossil Fuel Tax Support (LPM)

To address the concern that the spike at zero in the fossil fuel tax support distribution (27% of respondents score exactly 0) may bias OLS estimates, we recode the outcome as a binary indicator equal to 1 for respondents scoring above 5 on the 0–10 scale (i.e., scores 6–10; 33.8% of the full sample) and 0 otherwise. We re-estimate all five hypothesis models using a linear probability model (LPM) with the same formula, clustered standard errors, and survey weights as the main analysis. LPM is preferred over logit here because its coefficients are directly comparable to the OLS estimates and because interaction terms remain additively interpretable — a requirement for the H4a/H4b comparison.

Table E1a: LPM main effects (replication of Table 2, binary DV)

	Model E1a-1	Model E1a-2	Model E1a-3
Income Difficulty	-0.051***		
	(0.005)		
Employment Risk		0.033***	
		(0.006)	
Social Policy Satisfaction			0.025***
			(0.003)
Num.Obs.	8248	5875	8135
Controls	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

- $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table E1b: LPM interaction models (replication of Table 3, binary DV)

	Model E1b-1	Model E1b-2
Income Difficulty	-0.025**	
	(0.009)	
Employment Risk		-0.004
		(0.010)
Social Policy Satisfaction	0.032***	0.009
	(0.006)	(0.006)
Income Difficulty × SP Satisfaction	-0.004+	
	(0.002)	
Employment Risk × SP Satisfaction		0.008***
		(0.002)
Num.Obs.	7877	5652
Controls	Yes	Yes
Country FE	Yes	Yes

- $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Outcome = 1 if fossil fuel tax support > 5 (0–10 scale; 33.8% of sample). Linear probability model. Occupational class controlled but not shown. Standard errors clustered by NUTS-1. † p <

0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

The results are consistent with the main OLS findings. Income difficulty is negatively associated with the probability of supporting a fossil fuel tax (β = -0.05), employment risk positively (β = 0.03), and social policy satisfaction positively (β = 0.03). Among the interaction models, the income difficulty × satisfaction interaction is again null while the employment risk × satisfaction interaction is positive and significant (β = 0.01), replicating the H4a/H4b asymmetry from Table 3.

E2: Support for Banning Inefficient Appliances

To assess whether our findings are specific to fossil fuel taxation or generalize to a broader set of climate policies, we replicate the main models using support for *"Banning the sale of cheap but energy-inefficient household appliances"* as an alternative dependent variable. This item is a regulatory (command-and-control) rather than a fiscal approach to climate policy. If the mechanisms identified in the main analysis are not artifacts of the specific tax framing, we would expect broadly consistent results.

Table E2: Replication with alternative DV (ban inefficient appliances)

	Model E2-1	Model E2-2	Model E2-3	Model E2-4	Model E2-5
Income Difficulty	-0.21***			-0.10	
	(0.04)			(0.06)	
Employment Risk		-0.15***			-0.26***
		(0.03)			(0.06)
Social Policy Satisfaction			0.09***	0.12***	0.02
			(0.01)	(0.03)	(0.03)
Income Difficulty × SP Satisfaction				-0.02	
				(0.01)	
Employment Risk × SP Satisfaction					0.03*
					(0.01)
Num.Obs.	8316	5924	8181	7920	5695
Controls	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes

- p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: For the employment risk × SP interaction with the alternative DV, the interaction coefficient is β = 0.03 (p < 0.05), consistent with the main analysis. All models include full controls (age, gender, education, occupational class, left-right scale, climate vulnerability, CEI) and country FE. Standard errors clustered by NUTS-1. * p < 0.05, ** p < 0.01, *** p < 0.001.

Most relationships are directionally consistent with the main analysis. Income difficulty is again negatively associated with support (β = -0.21, p < 0.001), social policy satisfaction again positively associated (β = 0.09, p < 0.001), the income × SP interaction again null, and the employment-risk × SP interaction again positive (β = 0.03, p < 0.05). The mechanism centered on social policy satisfaction (both its main effect and its moderation of employment risk) therefore extends beyond the fiscal instrument to a regulatory one.

One result diverges, and informatively so. For the appliance ban, the employment-risk *main effect* is negative (β = -0.15, p < 0.001), aligning with income difficulty rather than running opposite to it as in the fossil fuel tax models (β = 0.19). In other words, the unexpected positive association between employment risk and support is specific to the fossil fuel *tax*. When the policy is a regulatory restriction rather than a revenue-raising instrument, perceived employment risk behaves like a conventional

economic-cost concern and lowers support. This fits our structural-transformation-salience reading, on which respondents attentive to economic change may favor interventions that raise revenue (and could fund adjustment) while resisting pure regulatory restrictions. We flag the mechanism behind this contrast as a question for future research.

Appendix F: Eco-Social Divide Robustness

A potential confound is that the relationship between social policy satisfaction and fossil fuel tax support could be driven by *ideological sorting*: individuals with consistently 'eco-social' preferences, combining strong welfare state support with pro-environmental attitudes, may score high on both satisfaction and fossil fuel tax support for ideational rather than policy-feedback reasons. To assess this, we split the sample by welfare preferences at the country-specific median and estimate the main models separately for the high and low welfare preference groups.

Welfare preferences are measured with an additive index constructed from six items asking about support for government spending across family and child services, unemployment benefits, social assistance, job training services, pensions, and education. Items are scored on a common scale and averaged; higher values indicate stronger welfare state preferences.

Table F1: Main models by welfare preference group (median split)

	H1 (Low)	H2 (Low)	H3 (Low)	H4b (Low)	H1 (High)	H2 (High)	H3 (High)	H4b (High)
Income Difficulty	-0.34***				-0.54***			
	(0.05)				(0.06)			
Employment Risk		0.14*		0.09		0.23***		-0.02
		(0.06)		(0.08)		(0.05)		(0.09)
Social Policy Satisfaction			0.21***	0.19***			0.25***	0.15**
			(0.02)	(0.04)			(0.02)	(0.06)
Employment Risk × SP Satisfaction				0.02				0.04**
				(0.02)				(0.01)
Num.Obs.	4129	3082	4072	2960	4076	2767	4038	2677
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Sample split at country-specific welfare preference median. Controls include age, gender, education, occupational class, left-right scale, climate vulnerability, and CEI. Standard errors clustered by NUTS-1. ** $p < 0.01$, *** $p < 0.001$.

The results show that social policy satisfaction is positively associated with fossil fuel tax support in *both* low and high welfare preference groups, ruling out pure ideological sorting as the mechanism. However, the key moderating effect of social policy satisfaction on the relationship between employment risk and support is significantly stronger among those with high welfare preferences ($\beta = 0.04$, $p < 0.01$) than among those with low welfare preferences ($\beta = 0.02$, n.s.). This is consistent with a *reinforcement* interpretation of policy feedback, in which the institutional-confidence mechanism operates most powerfully among individuals who are already broadly supportive of social protection and most likely to extend that confidence to the climate policy domain.

Appendix G: Welfare Regime Group Estimates

To assess whether the individual-level mechanisms identified in the main analysis hold across different welfare state contexts, we re-estimated the key models separately for each of five welfare regime groups: Nordic (Sweden), Continental (France and Germany), Southern (Italy and Spain), Eastern (Poland), and Liberal (United Kingdom). For each group we extract five coefficients: the income difficulty, employment risk, and social policy satisfaction main effects, the income difficulty × SP satisfaction interaction term (H4a), and the employment risk × SP satisfaction interaction term (H4b). To benchmark the regime-specific estimates against the full sample, we additionally plot the corresponding pooled estimates (drawn from Tables 2 and 3) at the top of each panel. All models use the same controls as in the main analysis; country fixed effects are included for multi-country groups (e.g., Continental) and dropped for single-country groups where the term is not identified.

Figure G1 presents the resulting coefficient plot with 95% confidence intervals (clustered by NUTS-1 within each group).

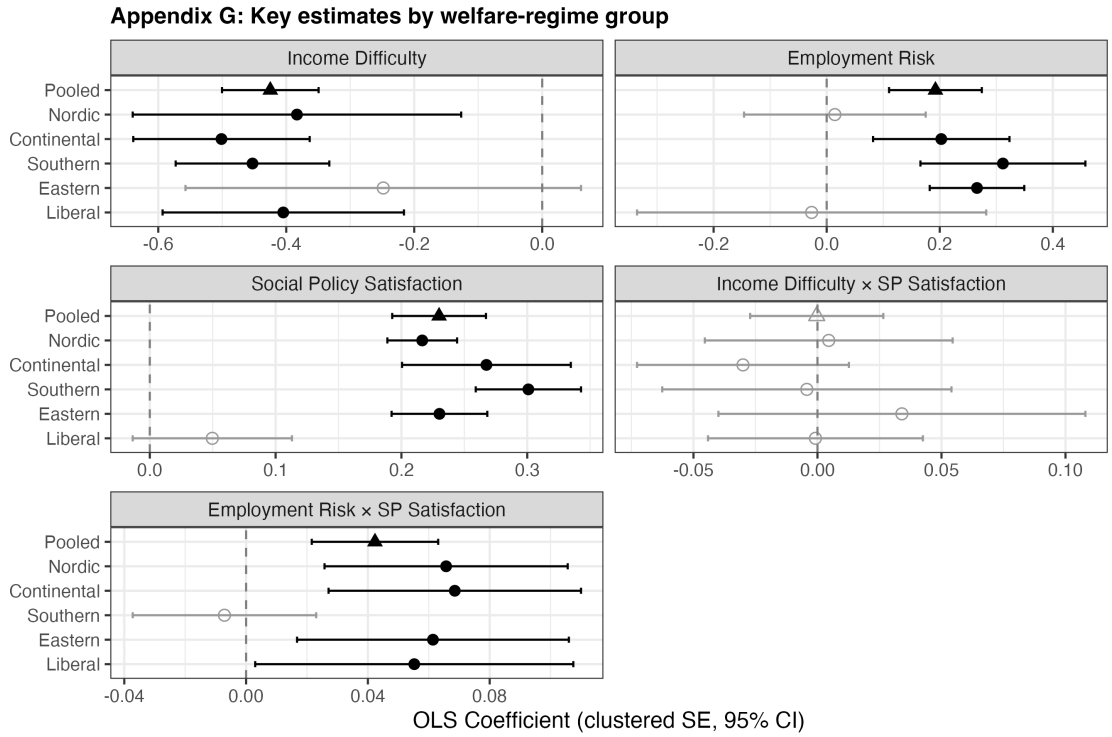


Figure G1: Key estimates by welfare-regime group

The results are broadly consistent across welfare regime groups, and the regime-specific estimates cluster around the pooled benchmarks shown at the top of each panel. Point estimates for single-country groups (Nordic, Eastern, Liberal) should be interpreted with caution given the absence of within-group country-level variation and smaller effective sample sizes. Overall, the cross-regime consistency supports treating the pooled estimates in Tables 2 and 3 as reflecting general mechanisms rather than artifacts of a specific welfare state configuration.

More specifically, income difficulty is negatively associated with fossil fuel tax support across all five regimes, though the coefficient is somewhat larger in the Eastern (Poland) group. Employment risk is positively associated with the tax support except Nordic and Liberal regimes. Social policy satisfaction is positively associated with fossil fuel tax support across most regime contexts, with the Liberal (UK) group showing a somewhat attenuated effect. The attenuation is consistent with the possibility that

regime-level satisfaction variation partially absorbs the individual-level signal when the number of countries per group is small. The income difficulty × SP satisfaction interaction (H4a) is statistically indistinguishable from zero in every regime, mirroring the null pooled estimate and reinforcing the interpretation that immediate consumption costs are not buffered by general institutional confidence. The employment risk × SP satisfaction interaction (H4b) is positive in most groups (except Southern), suggesting that the moderating role of welfare state confidence operates across institutional contexts.

Figure G2 presents the same model coefficients estimated separately for each of the seven countries. The patterns are broadly consistent with the regime-group estimates.

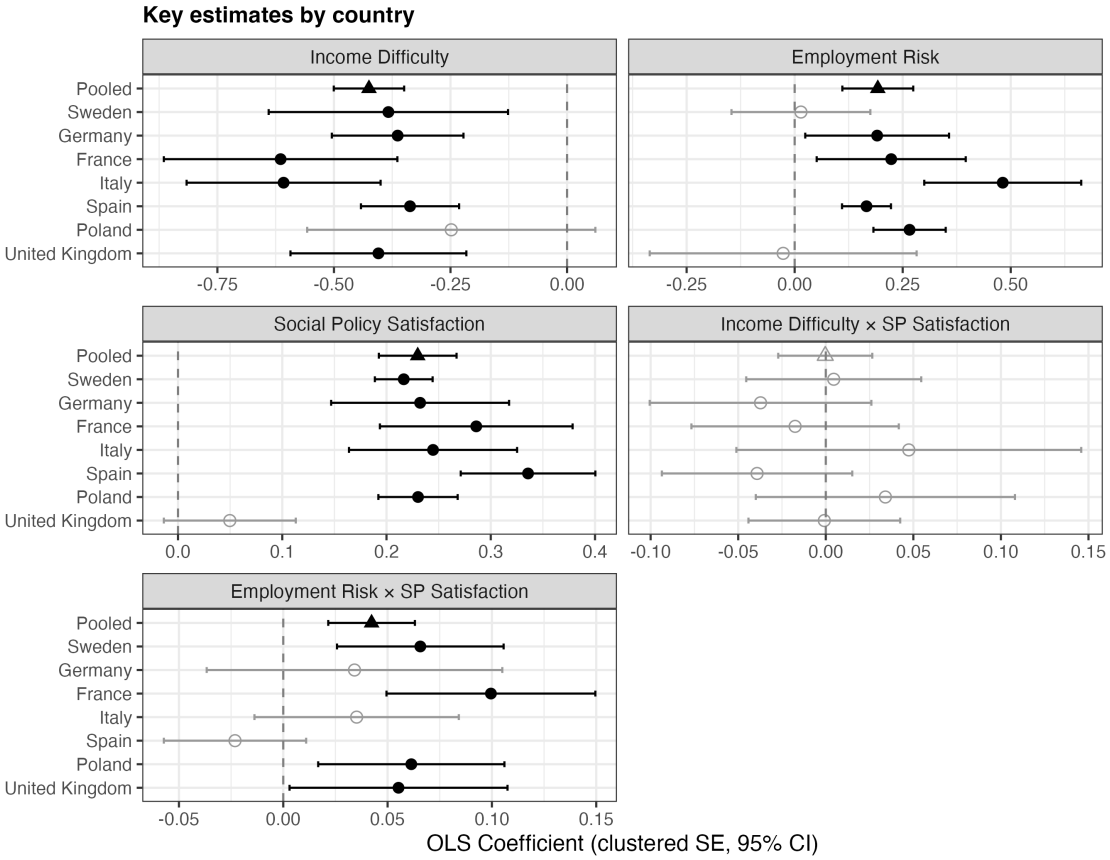


Figure G2: Key estimates by country