Determinants of Altruistic Willingness-to-Pay for an Environmental Tax

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Determinants of Altruistic Willingness-to-Pay (WTP) for an Environmental Tax: Evidence from Germany, Sweden and Italy

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1. Executive Summary

As climate change intensifies and public debate shifts to framing it as a social issue, understanding the determinants of altruistic willingness-to-pay (WTP) for environmental taxes is critical to ensuring fair and socially acceptable climate action across Europe. Building on the theoretical and empirical studies on climate policy acceptance, this study integrates attitudes towards climate change and sociodemographic mediators to explain variations in altruistic WTP, aligning with prior research on environmental taxation and public support. Estimating Ordinal Logistic (OLR) and Partial Proportional Odds Models (PPOM), we analyse EIB Climate Survey 2023 data for Germany, Sweden, and Italy to identify key predictors of altruistic WTP.

Climate concern stands out as the most influential predictor of WTP for environmental taxes, increasing the odds of belonging to a higher WTP category in all countries (up to 149% in Germany); followed by trust in government, which also has a strong positive effect (increasing odds by 91% in Germany and 69% in Sweden). In contrast, belonging to older age groups (50+) significantly reduces odds of higher WTP in every country. Political orientation, employment status, and self-assessed financial need show context-dependent effects.

To increase public support for environmental taxes, the EIB should invest in institutional trust by promoting reliance and efficiency of governments. Climate communication should focus on urgency and possible consequences of inaction in everyday life. Intergenerational climate engagement should be supported by involving older citizens through education, dialogue, and joint initiatives with younger generations. By mainstreaming climate communication through linking it to economic resilience, cost of living, energy security, and social wellbeing climate policy can be aligned with wider societal values, increasing WTP. Ensuring policies are progressive, equitable, and inclusive of vulnerable groups like older populations and the unemployed is also essential.

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2. Introduction

2024 was the hottest year on record. In Europe, it was marked by extreme heat, widespread wildfires, droughts, and devastating floods. As the effects of climate change have become increasingly visible, public and political debate has shifted from viewing it as a technocratic issue to recognising it as a societal challenge with important distributional implications. It is now widely understood that even within the confines of the European Union (EU), individuals do not bear equal costs from climate change, nor from policies that address it. Although 81% of Europeans support reaching carbon neutrality by 2050 (Eurobarometer, 2025), there is no clear consensus on how to distribute the cost of such a large-scale undertaking.

The potentially regressive nature of climate policies was demonstrated by the Yellow Vest movement, which protested the disproportionate impact of a fuel tax on French working and middle classes, especially in rural areas. By framing such a tax as having unacceptable distributional effects, the movement invited us to consider what a socially desirable climate policy would mean in terms of cost sharing. In democratic countries such as EU member states, decision makers must take public opinion into account when crafting policies. It is therefore vital to understand not just how much individuals are willing to pay for climate policy, but also how much they find acceptable to spend to benefit those less well off.

Drawing on data collected by the European Investment Bank's yearly surveys on attitudes towards climate change, our research focuses on altruistic WTP and the attitudinal factors that shape it. We thus ask: what are the main predictors of altruistic WTP for environmental taxes? In doing so, we seek to recontextualise altruism in its national context, providing insights and recommendations for a diverse set of European stakeholders.

3. Literature / Data Review

In the context of climate change policy, WTP can be understood as the highest price a citizen is willing to pay to reduce greenhouse gas emissions or limit the adverse impacts of climate change.

Generally, the literature on WTP for climate policy focuses on attitudes and socio-demographic factors (such as income, education, etc.) as key explanatory variables. Building on the Theory of Planned Behavior (Ajzen, 1991), attitudes are seen as significant predictors of behavioral intentions (i.e. WTP) because they define how individuals evaluate specific behaviors. Therefore, positive attitudes toward climate change policy should strongly predict higher WTP. Similarly, socio-demographics are used because the context from which an individual evaluates such policies meaningfully impacts both attitudes and behavioral intention. As previous authors have pointed out, (Cai et al., 2010; Anderson et al., 2017), there is a distributional element to these mechanisms: perceived costs and benefits play a major role, but so does the fairness of how those costs and benefits are allocated. Utility estimations may then not be purely self-interested but altruistic, where an individual derives utility from the well-being of others.

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In the 2023-2024 EIB Climate Survey, WTP is operationally defined through the item: "How much extra tax on your yearly income would you be willing to pay to finance climate policies that benefit people with lower income than yourself?" (EIB, 2024, Q20). Respondents' WTP is thus expressed as the percentage of their annual tax contribution they are prepared to allocate to climate policy initiatives in addition to their current tax burden. The variable also captures an altruistic/prosocial dimension in that it reflects an individual's willingness to redistribute personal resources in favor of those who are economically more disadvantaged.

Building on these insights, this paper aims to analyze to what extent these "classic" predictors of WTP (attitudes towards climate change and socio-demographic covariates) hold when individuals are explicitly confronted with such downward re-distribution.

3.1 Attitudes towards Climate Change

3.1.1 Climate Concern In all EIB Climate Surveys, one question (EIB, 2024, Q1) asks respondents to identify the three most pressing issues facing their country. We argue that selecting climate change among these can be understood as an expression of climate/environmental concern because it reflects a prioritization of climate issues as urgent and threatening, which signals awareness and worry. In the literature, such a higher concern for climate change has been shown to be a consistent predictor of WTP across European countries, China and the United States, both over time and regardless of national wealth levels (Carlsson et al., 2012; Dienes, 2015; Li et al., 2016; Bernard et al., 2025). A problem is the independence of this relationship: as Li et al. (2016) point out, concern is correlated with knowledge on climate change which itself is strongly associated with WTP.

3.1.2 Knowledge Several studies have demonstrated that both knowledge and awareness of environmental issues significantly increase WTP for green policies and individual pro-environmental action (Li et al., 2016; Myung et al., 2018, Bernard et al., 2025). In the EIB Climate Survey, there is a range of knowledge questions that we combine into one indicator based on the percentage of correct answers an individual had. We expect that a higher score should be a positive predictor of altruistic WTP.

3.1.3 Expected Costs, Benefits and Perceived Financial Need While attitudes towards climate change can be predictive for climate action, this relationship is mediated by financial constraints (Tobler et al., 2012). As Sunstein (2007) shows, WTP is significantly impacted by the *perceived* costs and benefits of a policy to an individual's welfare. One hurdle in conducting this type of research concerns the valuation of and conceptualization of co-benefits (Urge-Vorsatz et al, 2014; Mayrhofer, 2015). Abildtrup et al. (2023), found that caring about the impact of climate policy on air quality increased WTP for policy implementation within the country of the respondent. Furthermore, Svenningsen and Thorsen (2021) found that framing climate change in terms of losses led to a higher WTP, as well as a higher valuation of present-day co-benefits. We would, therefore, expect that perceiving climate policy to have further benefits (EIB, 2024, Q15) would positively impact altruistic WTP. Similarly, an individual's perceived need for financial support during the climate transition (EIB, 2023, Q19) should account for perceived benefits of altruistic climate policy, and we thus expect it to have a positive impact.

3.1.4 Trust in Government Capacity Evidence suggests that trust in one's government increases WTP for environmental taxes. Kitt et al (2021) find that trust was consistently positively associated across five policies tested. Kulin and Seva (2020) differentiate trust between impartial institutions, which enforce policies, and partial institutions, which enact laws. They find that trust in both partial and impartial government institutions are statistically significant predictors for climate policy preferences, with trust in impartial government

institutions having a marginally weaker effect than trust in partial government institutions (Kulin and Seva, 2020).

3.1.5 Political Views The literature shows that political views (left/right) predict WTP for environmental taxes. Left-leaning individuals are generally more supportive than right-leaning ones (Winden et al., 2018; Davidovic et al., 2020;). This relationship is moderated by trust in the government. In countries with higher trust, leftists show stronger WTP, whereas when trust is lower, WTP is lower (Davidovic et al., 2020). Based on these insights, being leftist is expected to increase WTP for environmental taxes. In low-trust contexts this relationship may decrease or even invert.

3.2 Socio-demographic Covariates

3.2.1 Inequality High income inequality can depress aggregate social WTP for climate financing, especially where trust in institutions and perceived fairness are low (Diederich & Goeschl, 2020; Baumgärtner et al., 2017). Emmerling et al. (2024) showed that unchecked climate impacts will exacerbate within-country inequality, reinforcing the urgent need for integrated fiscal policies that balance mitigation with equity. Based on these results, we expect WTP to decline sharply beyond a critical threshold of inequality, as social polarization rises and collective support for public climate investment weakens, with wealthier individuals substituting private green consumption for public financing (Cassin et al. 2021).

3.2.2 Gender The literature consistently finds that women show stronger pro-environmental values and intentions than men (Zhao et al., 2021; OECD, 2022). Yet, men are more willing to pay higher environmental taxes, though less ready to lower their living standards (Tien & Huang, 2023). However, correlations between gender and environmental taxation remain underexplored (Cottrell, 2025). Socioeconomic factors such as regressive taxes (Lahey, 2018), the gender pay gap (Joshi et al., 2020), women's lower emissions (Coelho et al., 2022), and perceptions of tax burden and ability to pay may shape these attitudes into WTP. Hence, women's stronger environmental attitudes do not always translate into higher WTP, and we thus do not expect a strong relationship between them.

3.2.3 Urban-Rural Divide Research finds that rural dwellers are generally less willing to pay for environmental taxes, as they are disproportionally impacted by such policies. Spiller et al (2017) find that taxes on gasoline impact rural dwellers more, while Young-Brun (2023) finds that rural households need more necessary energy products than urban households. These findings suggest that rural dwellers are only opposed to policies that impact them disproportionally. Indeed, Arndt et al (2023) and Tallent (2025) independently conclude that rural dwellers oppose climate policies with concentrated costs on their communities, but not those with diffuse costs. Insofar as our dependent variable is expressed in terms of percentage of income, and it thus equally impacts rural and urban populations, we do not expect place of residence to have a statistically significant impact.

3.2.4 Income and (Un)employment Higher average income tends to increase support for climate policies (Zoric & Hrovatin, 2012; Hojnik et al., 2021), though with diminishing marginal returns (Shao et al., 2018). However, the role of unemployment is less established. While, to our knowledge, no study directly quantifies its impact on WTP, job loss reduces disposable income, likely lowering individuals' willingness to support additional financial burdens. Furthermore, Benegal (2018) showed that climate change denial goes up under increasing economic insecurity. We therefore expect higher income to positively influence WTP.

3.2.5 Child under 18 The impact of parenthood on environmental concern is not well understood (Milfont & Poortinga, 2020), and to the best of our knowledge, past publications

have not directly studied impact on WTP for an environmental tax. We hypothesize that having children can influence adults' WTP for an environmental tax. Parents with children under 18 should be more likely to support environmental taxation, because they may perceive climate action as an investment in their children's future well-being. We thus expect it to have a positive effect on altruistic WTP.

3.2.6 Education level Education, which the EIB Climate survey operationalizes as "highest degree obtained", has been shown to a be a significant positive predictor of WTP across the literature (Diederich & Goeschl, 2014; Li et al, 2016; Kotchen et al., 2023). We expect this association to hold in the context of altruistic WTP.

3.2.7 Age The literature often finds no consistent significant relationship between age and WTP for environmental taxes. Indeed, Poteralska (2025) finds that although younger generations tend to be more supportive of paying higher environmental taxes, the difference is not statistically significant in the majority of EU Member States. Similarly, Muth et al (2024) find that although age decreased the WTP for an environmental tax in Hungary, the effect was not statistically significant. In contrast, Rotaris and Danielis (2019) find a statistically significant negative impact of age on WTP for a carbon tax in Italy (on a non-representative sample). Ayalon (2022) finds that, when controlling for sex and education, age is positively correlated with concern with WTP, results being statistically significant in the Israeli context. Given this evidence, we expect the impact of age to vary across countries within our dataset.

4. Methodology

We estimate altruistic WTP for an additional tax to finance climate policies using data from the European Investment Bank (EIB) Climate Survey 2023. The dependent variable is ordinal with five categories. Country-level analyses were conducted separately for Germany, Italy, and Sweden due to their contrasting political and welfare models. Germany's tax system is built around social insurance contributions, Italy's around high labor taxes and lower redistributive efficiency, and Sweden's around universalist, consumption-financed welfare (OECD, 2025). Moreover, there are strong differences in inequality levels (Eurostat, 2025) and trust in government (EIB, 2024). These contrasts provide a solid framework to analyze how altruistic WTP for environmental taxes differs across institutional and socio-economic settings. Each country dataset initially contained 1,000 observations; model fitting for the ordinal logistic regression (OLR) excluded observations with missing values, leaving n = 887 (Germany), n = 789 (Italy), and n = 844 (Sweden). To account for regional inequality, we integrated the 2023 income quintile share ratio (S80/S20) at the NUTS 2 regional level (Eurostat, 2025) in each country-level analysis.

The baseline model, a proportional-odds ordinal logistic regression (POM/OLR), is given by

$$logit\,[(Pr(WTP \leq k \mid X)] = \theta_k - X\beta, k = 1, \dots, 4$$

where θ_k are category-specific threshold (cutpoint) parameters, and $X\beta$ represents the linear predictor. The same coefficient vector β applies across all cumulative logits, which reflects the proportional-odds assumption. The model specification included the following covariates, for which a description is included in the Appendix:

$$WTP \sim ClimateKnowledge + ClimateConcern + TrustGov + ExpectedBenefits$$
$$+ FinancialNeed + Inequality + Age\_group + Region$$
$$+ ChildUnder18 + Education + PolLeftRight$$

We conducted several diagnostic checks to assess model validity, especially for the proportional odds (parallel slopes) assumption, multicollinearity, and model fit: the Brant test was used to assess the parallel-slopes assumption overall and by predictor. Only the Italian model did not reject the global null hypothesis of proportionality. For Germany and Sweden, some predictors violated the assumption. Given the observed violations of proportionality for some predictors, Partial Proportional Odds Models (PPOMs) were estimated for Germany and Sweden. In these models, proportionality was enforced for covariates where the Brant test suggested it was reasonable, while allowing non-parallel slopes for predictors that violated the assumption. This approach preserves parsimony where the proportional-odds assumption holds, while accommodating category-specific effects where needed. Generalized variance inflation factors (GVIFs) were examined via a linear-model proxy; all GVIF^(1/2*Df)) values were below the common threshold of 5, indicating no problems for multicollinearity. Considering the model fit, McFadden pseudo-R^2 values yielded 0.1994 (Germany), 0.2133 (Sweden), and 0.2515 (Italy), which reflects an explanatory power typical of survey-based models.

To facilitate interpretation for policymakers, covariate profiles were constructed using mean values for continuous variables and modal values for categorical variables. Prediction grids across key covariates were then used to compute predicted probabilities, allowing visualization of heterogeneous effects. All analyses were performed in R (RStudio); replication code is available on request.

5. Findings and Analysis

5.1 Descriptive Insights

Most respondents across the EU indicate at least some (1% tax) altruistic WTP for climate policies: 59% of respondents agree to pay a tax to finance climate policies (EIB, 2024). Among these, 43% would agree to pay a tax of 1% or 2% of their income; 13% to pay 5% or 10% (EIB, 2024). General agreement in the German sample (55%) is lower than the EU27 average, and higher in Italy and Sweden (both at 62%). Acceptance of higher tax rates is more prevalent in Sweden (17% agree with 5 or 10% tax) than Italy (14%) and lowest in Germany (13%).

Average climate knowledge is highest in Sweden (0.66), followed by Germany (0.62) and Italy (0.61). The share of respondents identifying climate change as a top three challenge (climate concern) is highest in Germany (47.1%), followed by Sweden (41%) and Italy (40.3%). Trust in government, which is measured on a 4-point scale where 4 corresponds to high trust, is higher in Sweden (2.42) than in Germany (2.27) and Italy (2.24). Expected benefits of climate policies (ranging from 0 to 1, where 1 is a fully positive outlook) are very similar across countries, around 0.45 on average. Reported financial need for the transition to a low-carbon economy is similar in Italy (63.3%) and Germany (62.5%), while evenly split and lower in Sweden (50.5%). Self-assessed political orientation on a 10-point scale where 1 corresponds to the far left is, on average, center-right for all countries; it ranges from 5.43 (Germany) to 5.65 (Italy). The average income group is highest in Germany (6.35), followed by Italy (5.99) and Sweden (5.64). However, this does not necessarily mirror inequality: the country-level

income quintile share ratio (2023) is lowest in Germany (4.4), higher in Sweden (4.7) and highest in Italy (5.3). Age and gender distributions are broadly consistent across countries, with a slight concentration in the 30–49 and 50–64 age brackets and near-equal gender balance. The economically active share is highest in Sweden (60.5%) and Germany (60%), and lower in Italy (48.2%). Unemployment is low in all countries, reaching up to 6.5% in Italy. Urban residence is most common in Sweden (46%), followed by Germany (38.7%) and Italy (34.8%). Education levels are similar: high education is most frequent in Sweden (36.7%), followed by Germany (34.7%) and Italy (34.1%). The share of respondents with children under 18 is at 33% largest in Sweden, and at 27% for both Germany and Italy.

5.2 Model Insights

Looking at the results from the OLR model, we find that there are four predictors that are statistically significant across the three countries studied: climate concern, trust in government to address climate change, age groups (above 49 years), and political beliefs (see Appendix). A range of other predictors were significant for at least one country's sample.

Of these predictors, climate concern had the strongest impact, as it is estimated to increase the odds of being in a higher WTP category by 149% for Germany, 66% for Italy, and 110% for Sweden. Higher trust in government is associated with an increase in the odds of belonging to a higher WTP group by 91% in Germany, 38% in Italy, and 69% in Sweden. Belonging to the 50–64 age group is found to decrease the odds of being in a higher WTP category by 72% in Germany, 52% in Italy, and 65% in Sweden. Similarly, belonging to the 65+ age group reduces the odds of being in a higher WTP group by 54% in Italy and 72% in Germany.

It is worth noting that age is an important predictor of WTP, as eight out of the twelve age-country combinations (four age groups per country) are statistically significant. Interestingly, the 20–29 age group never shows a statistically significant effect on WTP, while the middle-aged group (30–39) is significant in Sweden and Germany. The two older groups are significant in all three countries. From this, we can infer that being older decreases the odds of belonging to a higher WTP category. Furthermore, this negative effect becomes more pronounced with age, and the associated p-values become smaller.

Regarding political orientation, the results were strongest in Sweden, where moving one unit to the right on the political scale (1 = far left, 10 = far right) was associated with a 15% decrease in the odds of belonging to a higher WTP category. In Germany, the decrease was 10%, and in Italy, it was 8%. This aligns with findings by Davidovic et al. (2020), where trust in government moderates the effect of political orientation: in higher-trust Sweden, left-leaning political orientation has a stronger association with higher WTP than in lower-trust Germany or Italy.

A few predictors are significant in only two of the countries studied. For instance, being unemployed is associated with a 49% decrease in the odds of belonging to a higher WTP category in Italy and a 56% decrease in Sweden (not significant for Germany). This can likely be explained by national employment rates: in 2023, Italy and Sweden had unemployment rates of around 8% (Statista, 2025) Germany's was closer to 3% (Statista, 2025a). It is reasonable to assume that when unemployment is higher, unemployed individuals expect an increasing difficulty and time-intensity to find new employment, rendering them more affected by their employment status. Furthermore, perceiving a personal need for financial support to navigate the transition to a low-carbon economy is associated with a 25% decrease in the odds of being in a higher WTP group in Germany and a 32% decrease in Sweden. Finally, OLR results suggest that having children under 18 is associated with a 53% (Germany) or 46% (Italy) increase in the odds of belonging to a higher WTP group (not significant for Sweden).

The PPOM, estimated for Sweden and Germany, allows a nuanced interpretation of non-monotonic effects of variables in violation of the PO assumption (full results given in the Appendix). Generally, PPOM results confirm OLR outputs: in Germany, respondents concerned over climate change are much less likely to remain in lower WTP categories and substantially more likely to support higher tax rates. Increasing levels of education are also associated with higher WTP, which holds for both middle and high education. In Sweden, the trust in government effect is positive for lower/mid, neutral at the 5%, and negative at the highest cutoff. Thus, trust strongly drives acceptance of moderate (1-2%), though not the steepest environmental tax (10%). The negative WTP effect for Swedish women (OLR) was confirmed in the PPOM: compared to men, female respondents were less likely to choose higher WTP categories; coefficients become increasingly negative as tax rates increase. Political orientation also confirmed OLR results, as moving right consistently reduced WTP across all thresholds.

6. Conclusions and Recommendations

The literature on WTP for climate policy identifies attitudes and socio-demographic factors as key determinants. The 2023 EIB Climate Survey (EIB, 2024) extends this by introducing an altruistic dimension; WTP is measured by the additional tax rate respondents would be willing to commit to finance climate policies benefitting people with lower income. Across the attitudinal predictors, the literature shows that climate concern and environmental knowledge consistently raise WTP, although the two are often correlated; perceived co-benefits (e.g., better air quality) and trust in government strengthen support for environmental taxes, while financial constraints can moderate these effects; politically left-leaning and high-trust individuals typically express higher WTP. Regarding socio-demographic variables high inequality reduces aggregate WTP; women express stronger environmental values but not necessarily higher WTP, likely due to economic disparities. Higher income and education generally increase WTP, while unemployment lowers it. Having children under 18 tends to increase WTP.

This study builds on this by examining WTP when explicitly involving downward redistribution. Across the EU, most respondents (59%) report at least some WTP an additional income tax for climate policies benefiting lower-income groups; most favor modest tax levels (1–2%). In our three-country sample, Sweden shows the highest, and Germany the lowest average WTP. Four consistently significant predictors of WTP are found in all model specifications: political orientation, climate concern, trust in government, and age. Most strongly, WTP is raised by higher climate concern, which is consistently associated with increased odds of accepting a higher environmental tax rate. Trust in government also has a strong positive effect, particularly in Germany and Sweden. Age has a clear negative relationship with WTP, as individuals above 50 are found to be significantly less likely to accept higher tax rates. For political orientation, we confirm the expected, as moving further to the right reduces WTP; this effect is strongest in Sweden. Unemployment decreases WTP (IT/SE); perceived financial need for the green transition lowers WTP (DE/SE). Having children under 18 increases WTP (DE/IT). Education positively affects WTP (DE/SE). Women's odds of supporting higher environmental tax rates are lower than men's (SE).

Overall, our results show that attitudinal variables, particularly climate concern and trust in governments to implement effective and inclusive climate change policies are strong

determinants of altruistic WTP. Building on this evidence, the following practical recommendations can be made:

1. Invest in measures strengthening institutional trust. Given that trust in government significantly increases WTP (OR = 1.38-1.91), the EIB should support initiatives that strengthen public trust in institutions. This includes transparent reporting on project outcomes, evidence-based communication, and participatory decision-making processes (OECD, 2024). Trust-building is essential for the social acceptability of green fiscal measures.

2. Focus on climate awareness and perception of urgency. Climate concern emerges as the most robust and consistent predictor of WTP (OR ≈ 1.66-2.49). The EIB should therefore invest in evidence-based communication accentuating the present trajectory of climate change and the risks of inaction, rather than emphasizing individual benefits, which did not attain statistical significance. Such communication integrates itself into policy design, clarifies goals from the outset, and links scientific information to perceived threats and tangible outcomes (UNEP, 2005).

3. Integrate older generations into climate engagement. Older cohorts (50+) consistently exhibit lower WTP (OR = 0.28–0.48). EIB programs should therefore include educational and intergenerational components, such as lifelong learning on green transition and participation frameworks that bring older citizens into the decision-making process. These could include facilitating dialogue forums across age groups, so that more senior participants contribute to and learn about green investments' benefits or developing communication that connects the legacy of today's actions with grandchildren's futures, possibly appealing to older voters' sense of inter-generational responsibility. It could also support inter-generational climate project teams to build shared ownership of environmental transitions. This way, the EIB can help bridge the attitudinal gap and enhance support among older cohorts.

4. Mainstream climate communication. Political orientation significantly influences WTP (OR = 0.85–0.92), with right-leaning respondents generally less supportive of environmental taxation. To enhance policy acceptance, the EIB's communication should adopt inclusive, evidence-based narratives that resonate with a wide range of societal values, linking environmental investments not only to ecological goals but also to economic resilience, cost of living, energy security, and social wellbeing.

5. Support financially vulnerable populations in the green transition. In Sweden (-0.39 POM; -0.33 PPOM) and Germany (-0.29 POM), financial need significantly reduces WTP. To increase WTP and ensure inclusive development, needs-based financial support is essential in the transition to a low-carbon economy. Tax design should explicitly account for social equity, as largely supported by EU27 citizens: 68% support a progressive tax on carbon emissions, 75% agree with a carbon wealth tax (EIB, 2024). Progressive taxes should be favored over flat (studied here) or even regressive systems. The EIB could also highlight how its projects directly benefit low-income or vulnerable households, for example by investing in disadvantaged areas - this social dimension should appear clearly in its communication

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Appendix

1. Tables

Below, results of our quantitative analysis are displayed: Table 1 presents descriptions of variables included in the model; descriptive statistics are found in Table 2. OLR results are presented in Table 3, for which Table 4 displays the related Odds Ratios (ORs). Table 5 and 6 show the results of multicollinearity and Brant tests. The PPOM output for Sweden and Germany is displayed in Table 7.

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Table 1: Variable Descriptions

Variable (Label)	Source	Coding / Values
WTP (Q20)	How much extra taxes on your yearly income would you be willing to pay to finance climate policies that benefit people with lower income than yourself?	1 = Nothing; 2 = 1%; 3 = 2%; 4 = 5%; 5 = 10%
Climate Concern (Q1r4)	Climate change — What are the three biggest challenges that people in your country are currently facing?	0 = No (not selected); 1 = Yes (selected climate change)
Climate Change Knowledge (Q2–Q13)	Proportion of correct answers to 12 knowledge questions	Scored by share of correct options
Financial Need (Q19)	Do you believe that you personally need financial support to go through the transition to a low-carbon economy?	1 = Yes; 0 = No
Trust in Government (Q16)	How confident are you in your country's ability to adopt climate change policies that reduce GHG and address inequality?	1 = Not confident at all; 2 = Not really confident; 3 = Rather confident; 4 = Very confident
Expected Benefits (Q15i–Q15iii)	What impact will climate policies have?	Share of positive expectations across 3 binary items (cost of living, income inequalities, unemployment): 0 = Fully negative; 0.33 = Mostly negative; 0.66 = Mostly positive; 1 = Fully positive
Age (agerecode)	How old are you?	1 = 15–19; 2 = 20–29; 3 = 30–49; 4 = 50–64; 5 = 65+
Gender (sd1)	What is your gender?	1 = Male; 2 = Female
Employment Status (occupation)	What is your current occupation?	1 = Net economically active; 2 = Unemployed; 3 = Not economically active
Income (sd5_)	What is your annual net income?	*For Germany:* 1 = Less than 11 220 €; 2 = 11 220 € to under 14 420 €; 3 = 14 420 € to under 16 930 €; 4 = 16 930 € to under 19 320 €; 5 = 19 320 € to under 21 920 €; 6 = 21 920 € to under 24 590 €; 7 = 24 590 € to under 28 070 €; 8 = 28 070 € to under 32 540 €; 9 = 32 540 € to under 40 100 €; 10 = 40 100 € and more; 11 = Prefer not to say
Region (SD9)	Do you live in...	1 = City/metropolis; 2 = Small or medium-sized town; 3 = Rural area
Political Views (sd6b)	When discussing politics, people often mention "right" and "left." Where would you say your political position lies on this scale?	1 = Very left-wing → 10 = Very right-wing; 11 = Do not wish to reply
Child under 18 (sd8)	Do you have children under 18 years old?	1 = Yes; 0 = No
Education Level (SD8recode_dupe1)	What is the highest level of education you have achieved?	1 = Low; 2 = Middle; 3 = High
Inequality	Regional Inequality (Eurostat)	2023 income quintile share ratio (S80/S20) at the NUTS-2 regional level

Table 2: Descriptive Statistics — Sweden, Germany, and Italy

Variable	Sweden	Germany	Italy
Continuous (Mean, SD)			
Climate Knowledge	0.66 (0.18)	0.62 (0.19)	0.61 (0.17)
Regional Inequality	4.68 (0.87)	4.37 (0.39)	4.59 (0.92)
Income Group (1–10)	5.64 (3.14)	6.35 (3.03)	5.99 (3.15)
Political Left–Right (1–10)	5.63 (2.47)	5.43 (1.73)	5.65 (2.39)
Country-level Inequality	4.70 (—)	4.40 (—)	5.30 (—)
Categorical (% of respondents)			
Willingness to Pay (WTP)			
Nothing	37.8	45.2	37.4
1%	22.7	21.3	25.0
2%	22.7	20.4	23.1
5%	12.4	11.0	11.7
10%	4.4	2.1	2.9
Climate Concern (Yes)	41.0	47.1	40.0
Trust in Government (1–4)			
1 = Not confident at all	14.3	18.7	15.5
2 = Not really confident	38.6	43.1	52.1
3 = Rather confident	37.5	30.5	25.7
4 = Very confident	9.6	7.7	6.7
Expected Benefits (0–1 scale)			
0 = Fully negative	9.1	8.3	6.7
0.33 = Mostly negative	53.3	56.6	51.1
0.66 = Mostly positive	33.0	30.1	39.6
1 = Fully positive	4.6	5.0	2.6
Child Under 18 (Yes)	32.9	26.6	26.9
Age Group (%)			
15–19	7.5	5.8	5.5
20–29	15.7	13.8	12.7
30–49	31.8	32.9	34.8
50–64	22.3	23.6	22.9
65+	22.7	23.9	24.1
Gender (Female)	50.5	51.6	52.5
Employment Status (%)			
Economically Active	60.5	60.0	47.8
Unemployed	4.5	3.3	6.4
Not Economically Active	35.0	36.7	45.8
Financial Need (Yes)	50.5	62.5	63.0
Region (%)			
City / Metropolis	46.0	38.7	34.5
Small / Medium Town	35.2	40.3	48.7
Rural Area	18.8	21.0	16.8
Education (%)			
Low	14.5	19.9	15.0
Middle	48.8	45.4	51.2
High	36.7	34.7	33.8

Table 3: Ordinal Logistic Regression — Sweden, Germany, Italy

Variable	Sweden	Germany	Italy
ClimateKnowledge	-0.7129 (0.4170)	-0.6112 (0.4025)	0.6597 (0.4449)
ClimateConcernYes	0.7410*** (0.1356)	0.9138*** (0.1381)	0.5074*** (0.1365)
TrustGov	0.5257*** (0.0855)	0.6461*** (0.0861)	0.3258*** (0.0945)
ExpectedBenefits	0.3667 (0.2773)	0.6156* (0.2795)	0.5090 (0.3158)
FinancialNeedYes	-0.3894** (0.1420)	-0.2881* (0.1420)	-0.2551 (0.1457)
Inequality	0.1462 (0.0774)	-0.0415 (0.1751)	0.0212 (0.0760)
Age20–29	-0.2696 (0.3137)	0.0022 (0.3331)	0.0506 (0.3783)
Age30–49	-0.7388* (0.3026)	-0.7012* (0.3198)	-0.6460 (0.3388)
Age50–64	-1.0641*** (0.3120)	-1.2660*** (0.3351)	-0.7238* (0.3527)
Age65+	-1.1460*** (0.3232)	-1.2845*** (0.3423)	-0.7772* (0.3578)
GenderFemale	-0.3436** (0.1324)	-0.1015 (0.1359)	-0.1416 (0.1387)
EmplUnemployed	-0.8156* (0.3369)	-0.0969 (0.4438)	-0.6823* (0.3311)
EmplNotEconActive	-0.1070 (0.2013)	0.1919 (0.1559)	-0.2358 (0.1752)
IncomeGroup	-0.0031 (0.0279)	0.0359 (0.0248)	0.0614* (0.0244)
RegionTown	-0.0372 (0.1510)	0.0130 (0.1469)	-0.1507 (0.1461)
RegionRural	-0.0254 (0.1867)	-0.1710 (0.1816)	0.0165 (0.2001)
ChildUnder18	-0.0449 (0.1617)	0.4244* (0.1695)	0.3812* (0.1615)
EducationMiddle	0.2179 (0.2131)	0.4094* (0.1832)	0.4088 (0.2183)
EducationHigh	0.3918 (0.2299)	0.3326 (0.1919)	0.6453** (0.2361)
PolLeftRight	-0.1623*** (0.0284)	-0.1056** (0.0405)	-0.0879** (0.0297)
Nothing—1%	-0.6292 (0.6496)	0.3749 (0.9885)	0.3892 (0.6730)
1%—2%	0.4953 (0.6499)	1.4979 (0.9892)	1.5272* (0.6743)
2%—5%	1.8709** (0.6511)	2.9550** (0.9914)	2.9465*** (0.6800)
5%—10%	3.4186*** (0.6654)	4.9253*** (1.0111)	4.9068*** (0.7102)
Pseudo R^2	0.213	0.199	0.251

Note: Estimates are log-odds coefficients; standard errors are shown in parentheses. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 4: Ordinal Logistic Regression Odds Ratios — Sweden, Germany, Italy

Variable	Sweden	Germany	Italy
ClimateKnowledge	0.4902	0.5427	1.9342
ClimateConcernYes	2.0981***	2.4938***	1.6609***
TrustGov	1.6916***	1.9082***	1.3851***
ExpectedBenefits	1.4429	1.8508*	1.6636
FinancialNeedYes	0.6775**	0.7497*	0.7748
Inequality	1.1575	0.9594	1.0215
Age20–29	0.7637	1.0022	1.0519
Age30–49	0.4777*	0.4960*	0.5241
Age50–64	0.3450***	0.2820***	0.4849*
Age65+	0.3179***	0.2768***	0.4597*
GenderFemale	0.7092**	0.9035	0.8680
EmplUnemployed	0.4424*	0.9077	0.5055*
EmplNotEconActive	0.8985	1.2116	0.7900
IncomeGroup	0.9969	1.0366	1.0633*
RegionTown	0.9635	1.0131	0.8601
RegionRural	0.9749	0.8429	1.0166
ChildUnder18	0.9561	1.5287*	1.4640*
EducationMiddle	1.2434	1.5059*	1.5051
EducationHigh	1.4796	1.3945	1.9066**
PolLeftRight	0.8502***	0.8998**	0.9159**

Note: Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 5: Multicollinearity Check (VIF) — Sweden, Germany, Italy

Variable	Sweden	Germany	Italy
ClimateKnowledge	1.142	1.146	1.111
ClimateConcernYes	1.057	1.065	1.024
TrustGov	1.071	1.091	1.098
ExpectedBenefits	1.024	1.024	1.018
FinancialNeedYes	1.106	1.055	1.074
Inequality	1.058	1.022	1.019
Age_group	1.131	1.094	1.103
GenderFemale	1.030	1.056	1.069
EmploymentStatus	1.243	1.094	1.168
IncomeGroup	1.362	1.142	1.164
Region	1.047	1.022	1.018
ChildUnder18	1.200	1.200	1.130
Education	1.058	1.032	1.057
PolLeftRight	1.057	1.062	1.089

Note: GVIF$^{1/(2Df)}$ values are shown for each predictor; all below 5.

Table 6: Brant Test for Proportional Odds Assumption — Sweden, Germany, Italy

Variable	Sweden	Germany	Italy
Omnibus	0.0013**	0.0053**	0.4251
ClimateKnowledge	0.1846	0.0595	0.5901
ClimateConcernYes	0.0502*	0.0057**	0.5732
TrustGov	0.0106**	0.0765	0.7092
ExpectedBenefits	0.0649	0.3887	0.0367*
FinancialNeedYes	0.6920	0.4375	0.4660
Inequality	0.3941	0.9437	0.2302
Age20–29	0.5364	0.3997	0.9738
Age30–49	0.3395	0.3609	0.6547
Age50–64	0.4449	0.5200	0.7076
Age65+	0.5369	0.0193*	0.7363
GenderFemale	0.0073**	0.6923	0.8530
EmplUnemployed	0.9091	0.2776	0.1446
EmplNotEconActive	0.2102	0.6086	0.9212
IncomeGroup	0.5046	0.8558	0.6733
RegionTown	0.4945	0.4515	0.4678
RegionRural	0.6592	0.7873	0.3125
ChildUnder18	0.4675	0.4982	0.3073
EducationMiddle	0.4189	0.1531	0.8688
EducationHigh	0.8081	0.0375*	0.8570
PolLeftRight	0.0396*	0.1961	0.6020

Note: Entries are p-values from the Brant test for the proportional odds assumption. Lower p-values indicate violations of the assumption for the respective variable. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 7: Partial Proportional Odds Model — Sweden, Germany

Variable	Sweden	Germany
ClimateKnowledge	-0.9488* (0.4128)	0.5292 (0.4029)
ClimateConcernYes:1	0.7084*** (0.1379)	-1.1924*** (0.1545)
ClimateConcernYes:2		-0.4236** (0.1528)
ClimateConcernYes:3		0.0510 (0.1743)
ClimateConcernYes:4		1.0156*** (0.2716)
TrustGov:1	0.8130*** (0.0946)	-0.5285*** (0.0874)
TrustGov:2	0.4377*** (0.0895)	
TrustGov:3	0.0527 (0.1011)	
TrustGov:4	-0.4915** (0.1495)	
ExpectedBenefits	0.3140 (0.2796)	-0.4662 (0.2848)
FinancialNeedYes	-0.3329* (0.1434)	0.2212 (0.1422)
Inequality	0.1350 (0.0778)	0.0443 (0.1789)
Age20-29	-0.3378 (0.3195)	0.2018 (0.3516)
Age30-49	-0.7787* (0.3056)	0.8319* (0.3383)
Age50-64	-1.1491*** (0.3160)	1.2972*** (0.3522)
Age65+	-1.2187*** (0.3265)	1.2980*** (0.3590)
GenderFemale:1	0.0188 (0.1556)	0.1138 (0.1381)
GenderFemale:2	-0.4685** (0.1520)	
GenderFemale:3	-0.8656*** (0.1946)	
GenderFemale:4	-1.2050*** (0.3439)	
EmplUnemployed	-0.8190* (0.3456)	-0.0723 (0.4346)
EmplNotEconActive	-0.0920 (0.2057)	-0.1617 (0.1584)
IncomeGroup	-0.0031 (0.0281)	-0.0304 (0.0250)
RegionTown	-0.0664 (0.1530)	0.0034 (0.1488)
RegionRural	-0.0858 (0.1869)	0.1829 (0.1837)
ChildUnder18	-0.0733 (0.1608)	-0.3410* (0.1722)
EducationMiddle:1	0.2573 (0.2115)	-0.7466*** (0.2017)
EducationMiddle:2		-0.2434 (0.2033)
EducationMiddle:3		0.7456*** (0.2234)
EducationMiddle:4		1.8763*** (0.2976)
EducationHigh:1	0.4695* (0.2280)	-0.6134** (0.2109)
EducationHigh:2		-0.2539 (0.2122)
EducationHigh:3		0.7089** (0.2333)
EducationHigh:4		2.4710*** (0.3870)
PolLeftRight:1	-0.1525*** (0.0314)	0.0838 (0.0405)
PolLeftRight:2	-0.1482*** (0.0306)	
PolLeftRight:3	-0.1884*** (0.0373)	
PolLeftRight:4	-0.2075*** (0.0587)	

Note: Estimates are log-odds coefficients from a Partial Proportional Odds Model (PPOM); standard errors are shown in parentheses. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

1. Figures

Figure 1: Average altruistic WTP for an environmental tax in EU27 countries, as found in the EIB Climate Survey 2023.

Mean WTP (1–5)

2.0   2.2   2.4   2.6   2.8

Note: WTP coded as 1 = Not willing to pay,
2 = Willing to pay 1% of Income, 3 = Willing to pay 2% of Income,
4 = Willing to pay 5% of Income, 5 = Willing to pay 10% of Income

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Figure 2-9: Predicted Probabilities of WTP by Determinant for Germany

Predicted Probability of WTP by Age Group
Germany, 2023

Predicted Probability of WTP by Child Under 18

Predicted Probability of WTP by Climate Concern
Germany, 2023

Predicted Probability of WTP by Education Level
Germany, 2023

Predicted Probability of WTP by Expected Benefits

Germany, 2023

WTP Levels
- Nothing
- 1%
- 2%
- 5%
- 10%

Expected Benefits (Proportion of Positive Answers)

Predicted Probability of WTP by Financial Need

Germany, 2023

WTP Levels
- Nothing
- 1%
- 2%
- 5%
- 10%

Financial Need

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Predicted Probability of WTP by Political Orientation
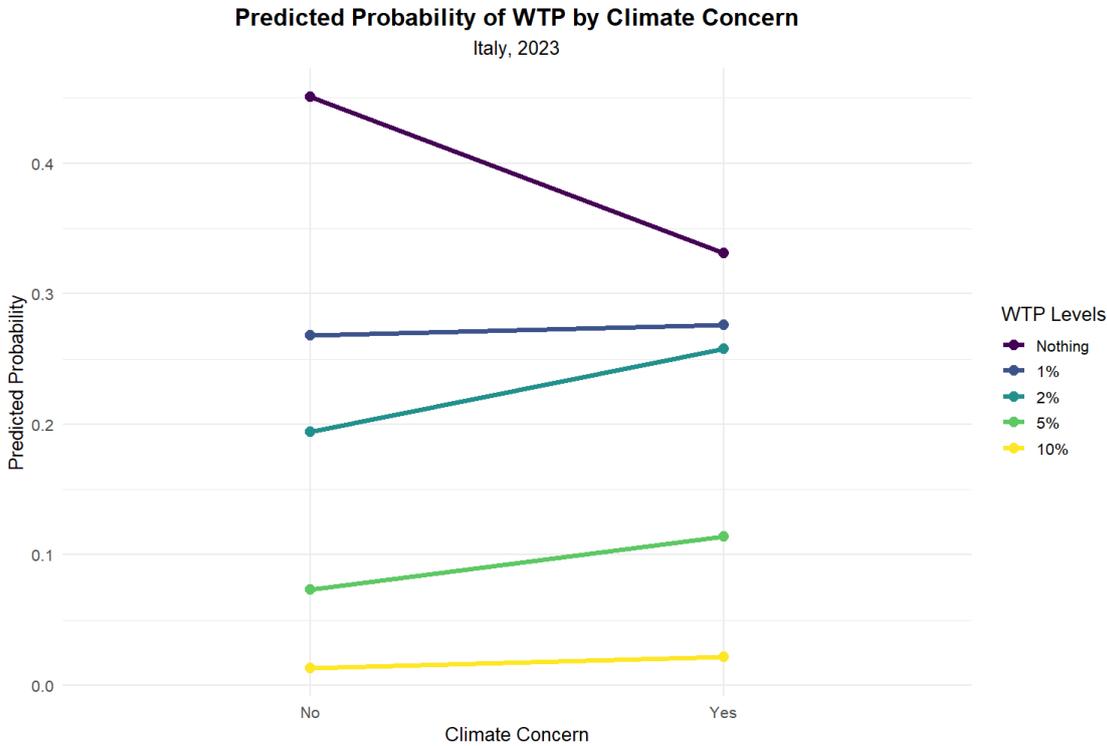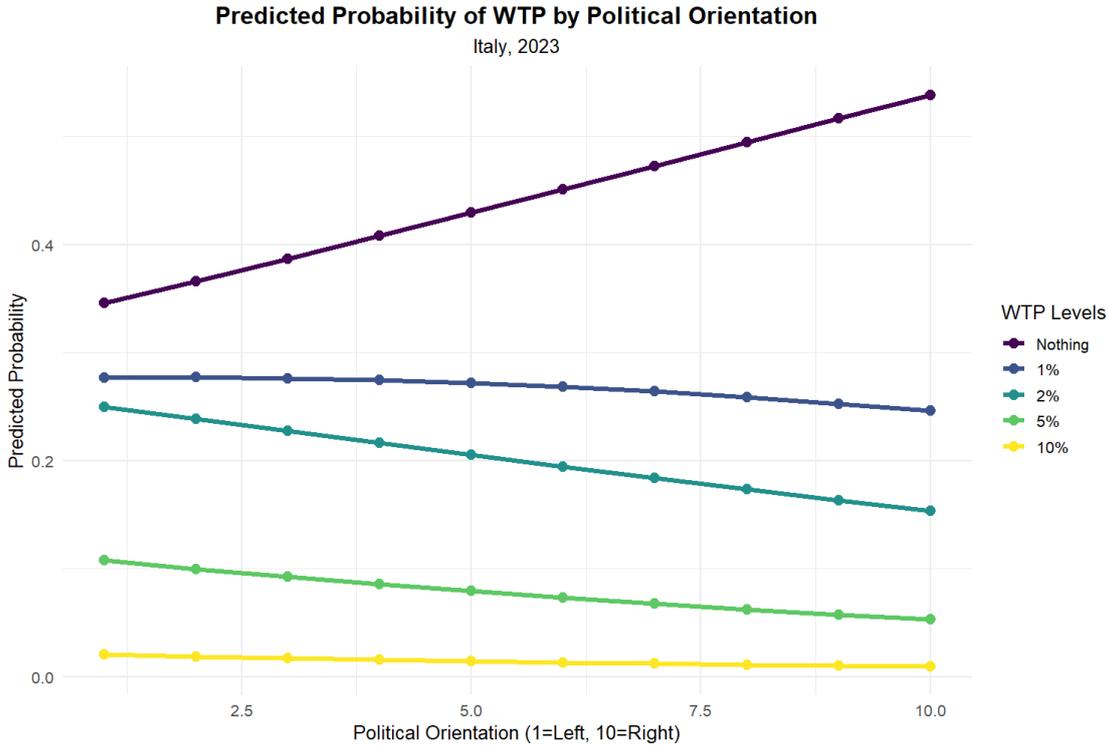
Germany, 2023

Predicted Probability of WTP by Trust in Government

Germany, 2023

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Figure 10-17: Predicted Probabilities of WTP by Determinant for Sweden

Predicted Probability of WTP by Age Group
Sweden, 2023

Predicted Probability of WTP by Child Under 18
Sweden, 2023

Predicted Probability of WTP by Education Level

Sweden, 2023

Predicted Probability of WTP by Climate Concern

Sweden, 2023

Predicted Probability of WTP by Expected Benefits

Sweden, 2023

Predicted Probability of WTP by Financial Need

Sweden, 2023

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Predicted Probability of WTP by Political Orientation

Sweden, 2023

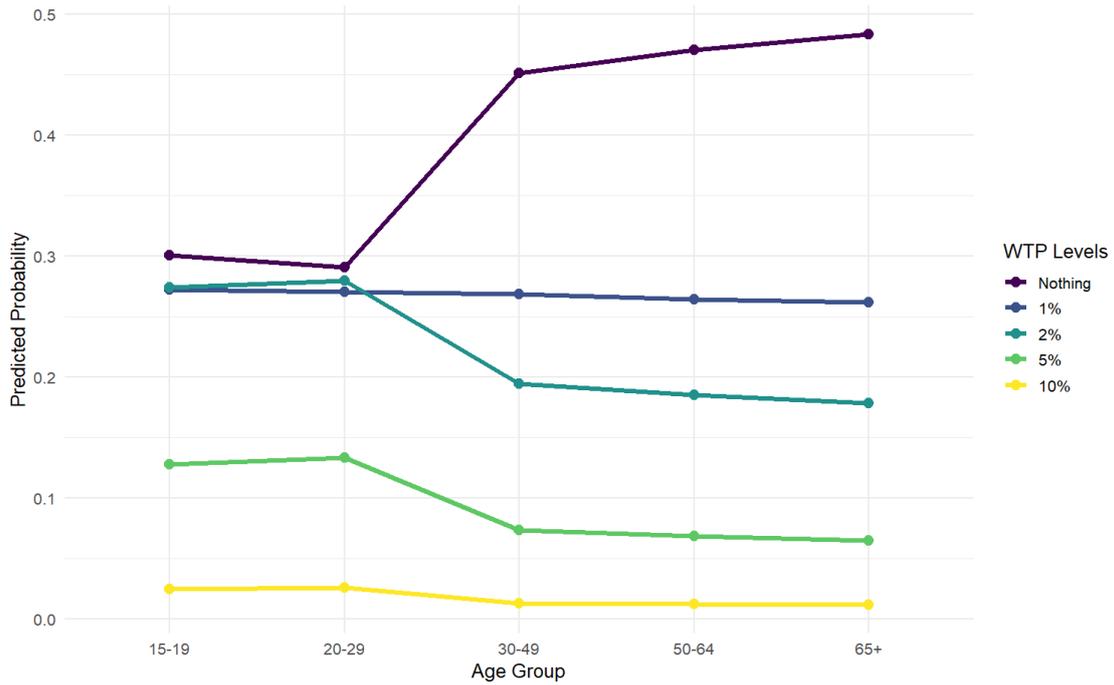**Predicted Probability of WTP by Trust in Government**

Sweden, 2023

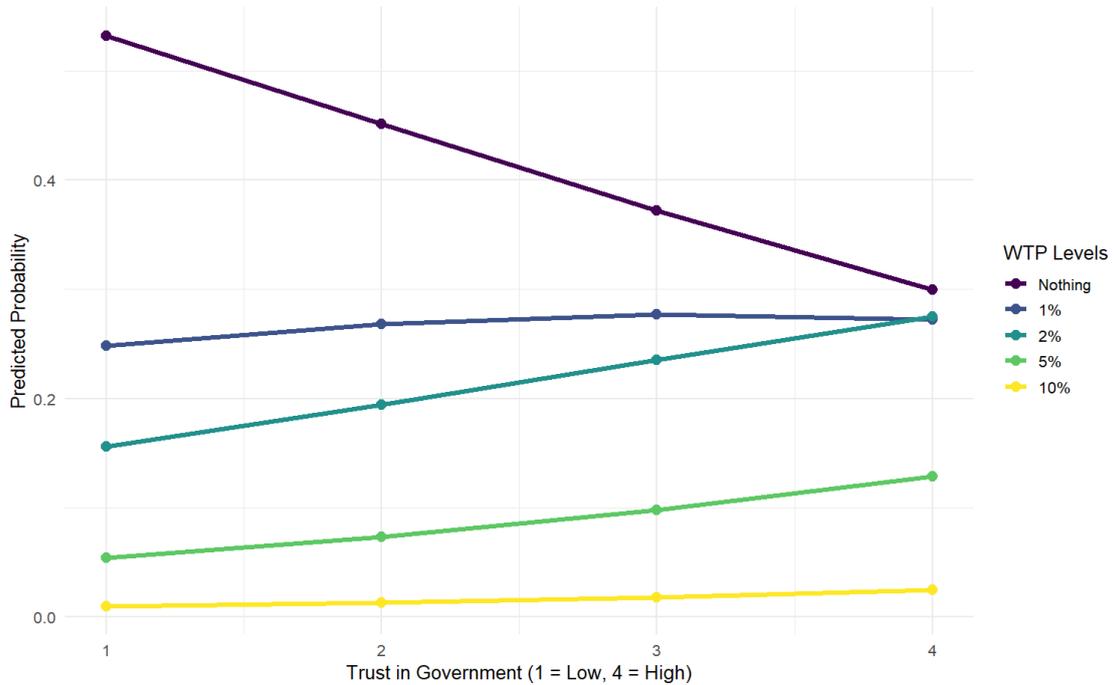**Figure 18-25:** Predicted Probabilities of WTP by Determinant for Italy

Predicted Probability of WTP by Political Orientation
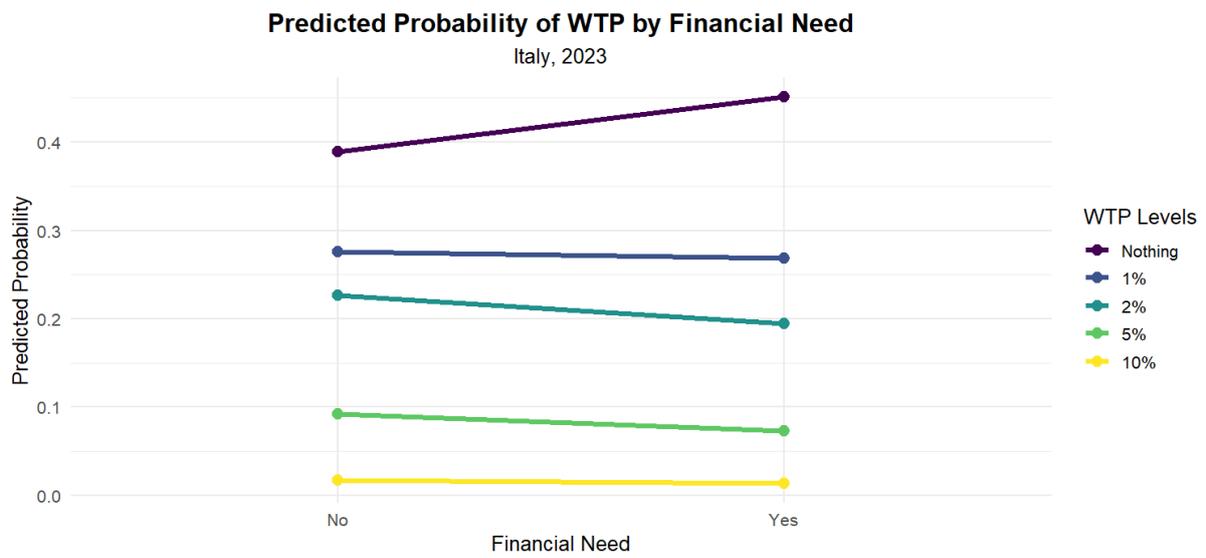
Italy, 2023

Predicted Probability of WTP by Climate Concern

Italy, 2023

Predicted Probability of WTP by Age Group
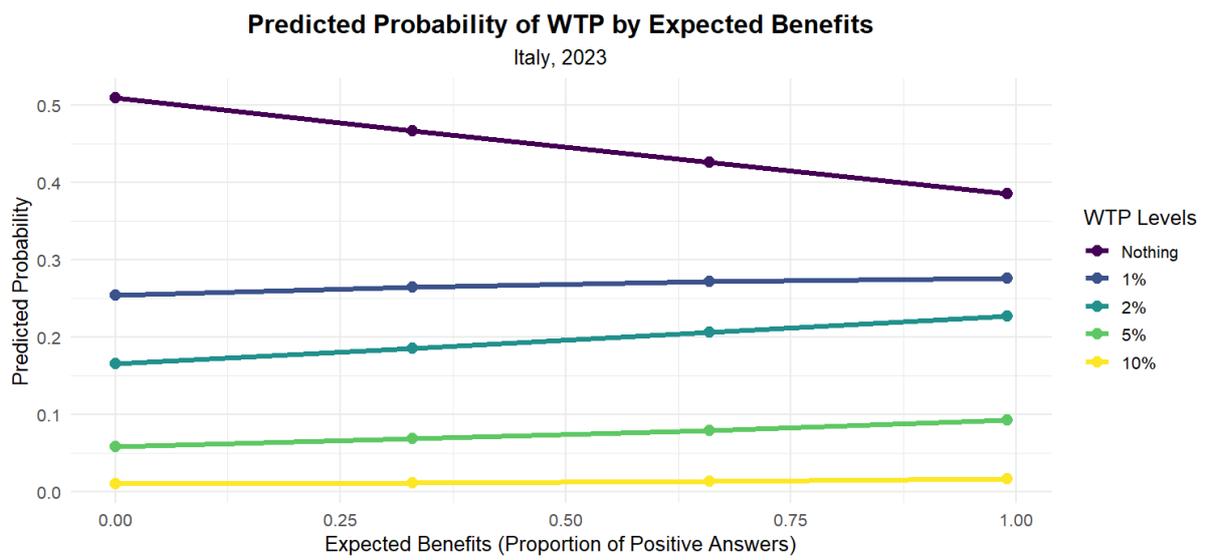Italy, 2023

Predicted Probability of WTP by Trust in Government
Italy, 2023

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Predicted Probability of WTP by Expected Benefits

Italy, 2023

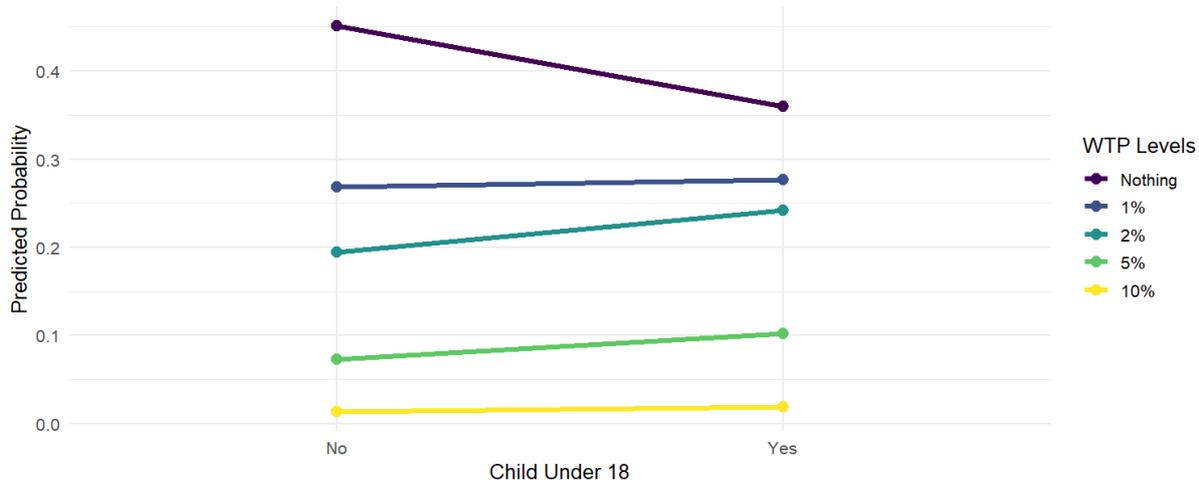**Predicted Probability of WTP by Financial Need**

Italy, 2023

Predicted Probability of WTP by Child Under 18

Italy, 2023

Predicted Probability of WTP by Education Level

Italy, 2023

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