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Acceptance of climate-oriented policy measures in times of the COVID-19 crisis

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Acceptance of climate-oriented policy measures in times of the COVID-19 crisis^{*}

June 2020

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Acceptance of climate-oriented policy measures in times of the COVID-19 crisis

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Abstract

Based on data from a representative survey among citizens in Germany during the peak of the COVID-19 crisis, this paper empirically examines the acceptance of climate-oriented economic stimulus programs and several further climate policy measures. Our descriptive analysis shows no general lower acceptance of climate policy measures compared to the time before the crisis. However, the econometric analysis reveals that individuals with higher negative emotions towards the crisis are significantly less supportive of at least some climate-oriented policy measures. Economic concerns are of particular relevance. For example, a perceived deterioration of the general economic situation due to the COVID-19 crisis has a significantly negative effect on the acceptance of climate-oriented economic stimulus programs. Concerns about the own personal economic and financial situation due to the crisis are significantly negatively correlated with the support of climate-oriented policy measures that directly lead to higher costs in daily life. Besides the relevance of this perceived self-interest, our estimation results also highlight the relevance of social aspects since individuals with a social policy identification are significantly more likely to agree with climate-oriented policy measures that are also financially beneficial for socially deprived groups, but significantly less likely to support measures that are financially unfavorable for them. We discuss several climate policy implications. For example, our estimation results suggest that successful climate policy should, especially in times of the COVID-19 crisis, also be socially oriented and consider distribution effects, for example, through financial compensations for costly measures like taxes.

Keywords:

COVID-19 crisis, climate-oriented economic stimulus programs, climate policy measures, acceptance, multivariate probit models

JEL:

Q54, Q58, Q48, O44, H12

1. Introduction

The COVID-19 crisis is certainly the biggest societal, health, and economic global crisis since World War II. Just as the huge coronavirus recession became apparent, discussions about economic stimulus programs began. While the main objective of these programs is economic recovery, it is often argued that they should also be pro-environmental and especially climate-oriented since the urgency to combat the climate crisis has not disappeared. For example, in April/May 2020 the Franco-German Climate Working Group stated that the European Green Deal, comprising climate protection as an integral component, should be the starting point for such recovery plans. In line with this view, the European Commission has suggested a large €750 billion plan for the economic recovery of the European Union (EU) that also includes the Green Deal. This European recovery plan has been complemented by individual programs in the EU member states. For example, the German Federal Government has recently agreed on a €130 billion package, which is by far the largest economic stimulus program in the history of the Federal Republic of Germany and especially comprises climate-oriented measures such as increased bonuses for the purchase of electric vehicles and the financial support of public transport.

Since it is widely accepted that the successful implementation of climate-oriented policy measures usually requires public support (e.g. Attari et al., 2009; Lee et al., 2015), insights into this support are certainly very valuable for policy makers. Previous studies show that the agreement to climate-oriented policy measures strongly depends on the corresponding type of measure. For example, subsidies (such as tax rebates for the purchase of climate-friendly products or the financial support of renewable energies) mostly receive a higher acceptance than energy or carbon taxes (e.g. Drews and van den Bergh, 2016; Rhodes et al., 2017). However, it is ambiguous whether these results can be transferred to the times of the COVID-19 crisis, where individuals might be more worried about its societal, health, and economic consequences than about the climate crisis and its long-term effects. In particular, the willingness to support climate-oriented policy measures might be generally lower compared to the time before the COVID-19 crisis.

Based on data from a representative survey among citizens in Germany during the COVID-19 crisis, this paper therefore aims to shed light on this question, specifically by examining the determinants of the acceptance of climate-oriented economic stimulus programs, i.e. economic stimulus programs to overcome the COVID-19 crisis which also include measures that contribute to climate protection. The contribution of our study is two-

fold: First, our empirical analysis does not only consider climate-oriented economic stimulus programs, but also further climate policy measures, whereby we focus on measures that were extensively discussed in Germany before the COVID-19 crisis such as the introduction of CO₂ prices or the coal phase-out. In contrast to most previous studies, which either examine hypothetical climate policy measures in stated choice experiments (e.g. Bristow et al., 2010; Carratini et al., 2017) or aggregated climate policy measures (e.g. Attari et al., 2009; Unsworth and Fielding, 2014; Carratini et al., 2017)², our analysis allows us to identify possible differences in separate climate policy measures.

Second and most important, our econometric analysis is based on individual data which were collected in Germany during and directly after Easter 2020. Therefore, the respondents answered the questions under the impression that the numbers of deaths due to the coronavirus and the resulting COVID-19 disease would continue to strongly increase as well as the impression that the strongest restrictions in daily life in the history of the Federal Republic of Germany would remain for an unforeseeable duration. This new dataset thus allows us to compare the acceptance of climate policy measures and their determinants during the peak of the COVID-19 crisis with results from before the crisis. In particular, the underlying survey comprised several coronavirus-related questions, especially with respect to negative emotions and perceived negative economic consequences due to the crisis. The inclusion of these variables in the econometric analysis allows us to examine possible direct (causal) effects of the COVID-19 crisis on the acceptance of climate-oriented policy measures.

The remainder of the paper is organized as follows: Section 2 presents the data and variables in our empirical analysis including some descriptive statistics. Section 3 discusses the main econometric results and Section 4 concludes with some climate policy implications.

2. Data and variables

Our empirical analysis is based on data collected in a large-scale web survey among 1751 citizens in Germany, which was carried out in April 2020 in cooperation with the German market research company Psyma+Consulting GmbH (Psyma). The sample was drawn from the Psyma online panel and stratified in terms of age, gender, place of residence, and education so that it is representative for these criteria. Among all respondents, the median time

² One important exception in this respect is the empirical analysis of Rhodes et al. (2017) that also considers different types of climate policy measures.

to complete the questionnaire was about 23 minutes. For our empirical analysis we only use the data from 1510 respondents. The remaining 241 respondents were screened out due to not passing several quality checks such as indicating certain response categories to check whether they read the complete questions.³

2.1. Dependent variables

The dependent variables in our econometric analysis refer to the acceptance of climate-oriented economic stimulus programs as well as seven further climate policy measures. With respect to the first measure, we asked the respondents how strongly future economic stimulus programs to overcome the COVID-19 crisis should depend on their contribution to environmental and climate protection. The five ordered response categories were “not at all”, “rather little”, “undecided”, “rather strongly”, and “very strongly”.⁴ The seven additional climate policy measures refer to the financial support of public transport, the reduction of taxes on public transport tickets, the phase-out from the mining and use of coal, the increase of taxes on flight tickets, the introduction of a speed limit on highways (“Autobahnen”), the introduction of a CO₂ price, and the increase of taxes on meat and dairy products. The respondents were asked how strongly they agree with these measures on a scale of five ordered response categories, i.e. “totally disagree”, “rather disagree”, “undecided”, “rather agree”, and “totally agree”.

According to Table 1, about 46% of the 1510 respondents support climate-oriented economic stimulus programs (i.e. indicating “rather strongly” or “very strongly”), whereas only a minority (i.e. a bit more than one fifth) disagrees. With respect to the seven further climate policy measures, Table 1 reveals a clear ranking. In line with the aforementioned previous studies, subsidies (here for public transport) receive the highest acceptance. Furthermore, the coal phase-out is also strongly supported. Interestingly, the roughly 64% acceptance rate is very similar to the results in Andor et al. (2016) on the basis of similar data from 2013. They report that about 62% of their respondents disagree with the construction of new coal-fired plants. Also in line with previous studies is that taxes are less attractive, especially on meat and dairy products. Among the seven considered climate policy measures, the introduction of CO₂ prices receives the second lowest support. Never-

³ However, the use of the data for all 1751 respondents leads to qualitatively very similar results. These results are available upon request.

⁴ The original questions and the corresponding response categories for all variables in this paper can be found in the (translated) questionnaire in the online appendix.

theless, almost 40% of the respondents agree with this strongly controversially discussed measure. This agreement rate is even higher than in some surveys before the COVID-19 crisis.⁵ In contrast, taxes on flight tickets as well as a speed limit on highways (being a hot topic in Germany) are supported by a majority of the respondents. The corresponding agreement rates are very similar to some surveys before the crisis.⁶ In sum, our descriptive results thus suggest that the support of climate policy measures has generally not decreased during the crisis.

In our econometric analysis, we use ordered probit models due to the ordered structure of the dependent variables. In line with Andor et al. (2016), we combine the two highest and the two lowest alternatives into one category for agreement and one category for disagreement, respectively, which leads to a three-alternative ordered probit model. In line with Ziegler (2019), we consider a multivariate ordered probit model for the joint analysis of all eight climate-oriented policy measures, which allows for potential correlations between the eight dependent variables in the error terms of the underlying latent variables. This model is estimated by the simulated maximum likelihood method (using 200 random draws in the underlying GHK simulator).

2.2. Explanatory variables

As a first group of explanatory variables, we consider factors that are shown to be relevant for the acceptance of some climate policy measures in previous studies such as trust in scientists and politicians (e.g. Hammar and Jagers, 2006; Jagers et al., 2010; Rhodes et al., 2017). Trust in these two groups seems to be especially interesting in times of strong restrictions in daily life due to the COVID-19 crisis, which are based on scientific advices and fast political decisions. Therefore, we asked the respondents to indicate how strongly they trust scientists and politicians, respectively, on a scale of five ordered response categories, i.e. “do not trust at all”, “trust rather weakly”, “undecided”, “trust rather strongly”, and “trust totally”. The dummy variables “trust in scientists” and “trust in politicians” take the value one if a respondent indicated one of the two latter categories, respectively. Furthermore, previous studies show that political identification is typically an important ex-

⁵ See e.g. <https://de.statista.com/statistik/daten/studie/1024519/umfrage/umfrage-zu-massnahmen-zum-klima-und-umweltschutz/> or https://www.forschungsgruppe.de/Umfragen/Politbarometer/Archiv/Politbarometer_2019/Juli_2019/

⁶ See e.g. <https://de.statista.com/statistik/daten/studie/1024519/umfrage/umfrage-zu-massnahmen-zum-klima-und-umweltschutz/> or https://www.forschungsgruppe.de/Umfragen/Politbarometer/Archiv/Politbarometer_2020/Februar_2020/

planatory variable (e.g. Hammar and Jagers, 2006; Jagers et al., 2010; Unsworth and Fielding, 2014; Carratini et al., 2017). In line with Ziegler (2017, 2019), we consider multidimensional indicators for political orientation. The dummy variables “conservative policy identification”, “liberal policy identification”, “social policy identification”, and “ecological policy identification” take the value one if the respondent rather or totally agrees to this orientation thus indicating one of the two strongest identifications on a scale of five ordered response categories, respectively.

In order to capture environmental values as another very important factor (e.g. Attari et al., 2009), we consider a New Ecological Paradigm (NEP) scale according to Dunlap et al. (2000), which is a standard instrument in social and behavioral sciences and increasingly common in economics (e.g. Kotchen and Moore, 2007, Lange et al., 2017). In line with Ziegler (2020), we consider the agreement to six statements (i.e. three environmentally positively and three environmentally negatively defined items) on a scale of five ordered response categories, which are assigned with values from one to five, whereby higher values indicate higher environmental values. The variable “NEP” is the sum of the values for the six ordinal variables and can thus vary between six and 30.⁷ We additionally construct an indicator on the basis of a subset of emotions according to Plutchik (2001) to measure perceived climate concerns or climate threat (e.g. Hammar and Jagers, 2006). Specifically, we asked the respondents how strongly the emotions fear, worry, anger, and sadness describe their feelings about climate change on a scale of five ordered response categories, which are assigned with values from one to five. The variable “negative emotions climate change” is the sum of the four values and can thus vary between four and 20.

However, our main explanatory variables refer to the COVID-19 crisis and especially to the resulting individual concerns. First of all, we consider the variable “negative emotions COVID-19 crisis”, which is technically identically constructed as the previous emotions indicator, whereby the underlying questions refer to the feelings about the crisis instead of climate change. The variable can also vary between four and 20 with higher values indicating stronger negative emotions. Furthermore, we consider two specific economic concerns due to the COVID-19 crisis. First, we address concerns about the deterioration of the own personal economic and financial situation compared to the situation before the COVID-19 crisis. The dummy variable “concern own economic situation” takes the value one if the

⁷ For details about the questions and response categories for the NEP scale as well as for the multidimensional indicators for political orientation, see the questionnaire in the online appendix.

respondent is rather or totally concerned thus indicating one of the two strongest concerns on a scale of five ordered response categories. Second, we consider the perceived short- and medium-term change of the general economic situation in Germany due to the COVID-19 crisis. The dummy variable “expectation negative economic development” takes the value one if the respondent indicated that the economic situation will “rather deteriorate”, “strongly deteriorate” or “very strongly deteriorate” and the value zero if the respondent indicated that it will “neither improve nor deteriorate” or “improve”.

Table 2 reports some descriptive statistics for these explanatory variables. It reveals that a large majority of more than 87% of the respondents expects a negative economic development in Germany due to the COVID-19 crisis, whereas only about 38% of the respondents are concerned about their own personal economic and financial situation.⁸ Interestingly, the average values for the negative emotions towards climate change and to the COVID-19 crisis are very similar. In fact, the negative emotions towards climate change and thus general concerns are even slightly higher, which is in line with the previous results that the support of climate policy measures has generally not decreased in this crisis. Table 2 also reveals that trust in scientists is on average much higher than the very low trust in politicians. While the former result could be expected due to the strong relevance of scientists (especially virologists and epidemiologists) during the COVID-19 crisis, the latter result is rather surprising given the persistent high acceptance of the policy measures in Germany.⁹ However, it seems that the high acceptance and support of these coronavirus-related policy measures and also of the government does not lead to a higher general trust of politicians.

Finally, Table 2 also reports descriptive statistics for four common socio-economic control variables. The variable “age” is measured in years and the dummy variable “female” takes the value one if the respondent is a woman. The dummy variable “higher educational degree” takes the value one if a respondent has at least a high school degree. Furthermore, we consider equivalized income. Based on the mean values of 17 monthly net income classes, the variable “equivalized income” is the corresponding weighted value in 1000 Euros. In line with official statistics (e.g. Statistisches Bundesamt and Wissenschaftszentrum Berlin

⁸ However, for the comparison of these two frequencies it should be noted that the dummy variables are differently constructed, i.e. “expectation negative economic development” refers to the three highest categories, whereas “concern own economic situation” only refers to the two highest categories on a scale of five ordered response categories in both cases.

⁹ In our survey, we also asked for the support for specific measures. For example, financial packages for employees (e.g. reduced hours compensation) and firms are supported by more than 82% of the respondents and even the closure of firms such as retail stores, service companies, or restaurants is widely supported by almost 60% of the respondents. Detailed results about the acceptance of different coronavirus-related policy measures are available upon request.

fur Sozialforschung, 2013), we weight the first adult in the household with the factor one, children with the factor 0.3, and other older household members with the factor 0.5.¹⁰

3. Econometric analysis

Table 3 reports the simulated maximum likelihood estimations of the multivariate three-alternative ordered probit model as explained above. The first column contains the estimation results for the agreement to climate-oriented economic stimulus programs. The estimation results for the seven further climate policy measures are reported in the following columns. According to the upper part of the table, trust in scientists has a significantly positive effect on the acceptance of several climate policy measures. This result is generally in line with previous studies (e.g. Rhodes et al., 2017), even if the effect on the introduction of CO₂ prices is only weakly significant and the effect on climate-oriented economic stimulus programs is insignificant. In contrast, trust in politicians is strongly significantly positively correlated with the agreement to these two policy measures. With respect to CO₂ prices, this result is completely in line with Hammar and Jagers (2006) and Jagers et al. (2010). Interestingly, trust in politicians is obviously only relevant for climate policy measures that directly lead to financial burdens in daily life (i.e. taxes and CO₂ prices) in addition to climate-oriented economic stimulus programs, which are possibly also expected to affect the own financial situation.

As expected, political identification and environmental values are also highly relevant. Table 3 reveals that ecological policy orientation, the NEP scale, and especially negative emotions towards climate change have significantly positive effects on the acceptance of all eight climate-oriented policy measures, which is widely in line with previous studies (e.g. Hammar and Jagers, 2006; Attari et al., 2009; Jagers et al., 2010; Carratini et al., 2017; Ziegler, 2017, 2019). In contrast, individuals with a conservative policy identification are significantly less likely to agree with climate-oriented economic stimulus programs and with three further climate policy measures (i.e. the phase-out from the mining and use of coal, the introduction of a CO₂ price, and the increase of taxes on meat and dairy products). In sum, our estimation results again confirm the importance of using multidimensional indicators, especially since a liberal policy orientation, which traditionally rather expresses a right-wing political identification in Germany, is not significantly correlated with the support of any of the eight climate-oriented policy measures.

¹⁰ In addition, we also include 15 dummy variables for the 16 federal states in Germany in the econometric analysis.

Most interestingly in this context of political identification are the estimation results for a social policy orientation. Both social and ecological policy identifications rather express a left-wing political orientation. Therefore, it is not very surprising that individuals with a social policy orientation are also significantly more likely to accept the two subsidy measures for public transport. In contrast, however, this specific left-wing political identification has a significantly negative effect on the support of tax increases for meat and dairy products, whereas the corresponding effect for the tax increase for flight tickets is again significantly positive. These results suggest that a social policy identification is especially supportive of climate policy measures that are also financially beneficial in daily life for socially deprived groups (i.e. subsidies for public transport) or financially unfavorable for socially privileged groups (i.e. taxes for flight tickets). In contrast, climate policy measures that lead to relatively higher costs in daily life for socially deprived groups (i.e. taxes for meat and dairy products, which are obviously considered as basic food) are obviously rather opposed by individuals with a social policy identification.

However, our major explanatory variables refer to the coronavirus-related variables. Table 3 reveals that negative emotions towards the COVID-19 crisis are insignificantly correlated with the support of most climate-oriented policy measures. This result is in line with the descriptive statistics as discussed above since they do not generally point to a lower support of climate-oriented policy measures during the COVID-19 crisis compared to the time before the crisis. However, negative emotions towards the COVID-19 crisis are significantly negatively correlated with the acceptance of tax reductions for public transport tickets as well as the phase-out from the mining and use of coal. These results suggest that strongly concerned individuals might decrease their support for some measures and especially for the coal phase-out, which is one of the most controversial climate policy measures in Germany. Interestingly, a perceived deterioration of the general economic situation due to the COVID-19 crisis only has a significantly negative effect on the acceptance of climate-oriented economic stimulus programs, whereas its effect on the support of the other seven climate policy measures is insignificant. This result suggests that the climate orientation in economic stimulus packages is obviously often perceived as less beneficial for general economic recovery than conventional economic stimulus programs.

The estimation results for concerns about the own personal economic and financial situation due to the COVID-19 crisis are also very interesting. This variable has a strong significantly negative effect on the acceptance of tax increases for flight tickets, the introduction

of CO₂ prices, and tax increases for meat and dairy products, whereas its effect on the support of the first four climate-oriented policy measures is insignificant. With the exception of the significantly negative effect on the agreement to the introduction of speed limits on highways, the estimation results suggest that concerns about the own personal economic and financial situation especially decrease the support of climate-oriented policy measures that directly lead to higher costs in daily life and thus are directly financially unfavorable. In comparison, individuals with a high equivalized income are only weakly significantly more likely to support two climate-oriented policy measures.¹¹ These results suggest that perceived self-interest, captured by the effect of individually perceived concerns about the own personal economic and financial situation, is more relevant than real self-interest, captured by the effect of equivalized income.

In order to test the robustness of our estimation results, we have examined further model specifications.¹² For example, we have considered (multivariate) binary probit models on the basis of binary dependent variables for an agreement to the climate-oriented policy measures. Furthermore, we have considered (multivariate) five-alternative ordered probit models that include all five ordered response categories in the dependent variables as discussed above. While most estimation results are qualitatively very similar across the three probit model specifications (especially with respect to the main conclusions), the significance of some effects is different. This suggests that the classification of the five ordered response categories slightly matters.¹³ In addition, we have included different groups of explanatory variables. For example, excluding the coronavirus-related variables leads to qualitatively very similar estimation results for the remaining explanatory variables.¹⁴

4. Conclusions and climate policy implications

Based on data from a representative survey among citizens in Germany during the peak of the COVID-19 crisis, this paper empirically examines the acceptance of climate-oriented policy measures. Our descriptive analysis shows no general lower agreement to these poli-

¹¹ While the support for four climate-oriented policy measures by females is surprisingly significantly lower, the pattern for the estimated effects of the remaining two socio-economic variables is ambiguous.

¹² The estimation results are not reported due to brevity, but available upon request.

¹³ However, in no single case a significantly positive effect of an explanatory variable changes to a significantly negative effect across the three model specifications.

¹⁴ According to Ziegler (2020), the inclusion of a NEP scale should be complemented by the inclusion of economic preferences such as risk and time preferences or trust (e.g. Falk et al., 2018) since omitted variables biases are possible otherwise. While the NEP scale is not a major variable in our empirical analysis, we have nevertheless also included several economic preferences in a robustness check. However, the estimation results for the NEP scale and especially for our main interesting coronavirus-related variables remain qualitatively almost identical. These results are again not reported due to brevity, but available upon request.

cy measures compared to the time before the crisis. However, our econometric analysis reveals that individuals with higher negative emotions towards the crisis are significantly less supportive of at least some climate-oriented policy measures. From a climate policy perspective this result suggests that general concerns due to the COVID-19 crisis should be addressed and ideally reduced to increase public support of climate-oriented policy measures. In particular, economic concerns should be addressed. The significantly negative effect of a perceived deterioration of the general economic situation due to the crisis on the acceptance of climate-oriented economic stimulus programs suggests that such specific economic stimulus programs are perceived as less beneficial for general economic recovery than their conventional counterparts without climate orientation. An important climate policy reaction in this respect is therefore to clarify, for example, through targeted information campaigns, that climate-oriented economic stimulus programs are not only beneficial for the climate, but also for economic recovery and that in the long run they are even economically more beneficial than less sustainable conventional economic stimulus programs.

In addition, our estimation results also point to the importance of perceived individual economic consequences and social aspects for the acceptance of climate-related policy measures. The significantly negative effects of concerns about the own personal economic and financial situation due to the COVID-19 crisis on the support of climate-oriented policy measures that directly lead to higher costs in daily life imply that perceived self-interest plays an important role. This result suggests that lowering (the fear of) individual financial losses is not only relevant from a social and societal perspective, but also for the acceptance of climate-oriented policy measures. The social perspective is highlighted by the significantly positive effect of a social policy identification on the agreement to climate-oriented policy measures that are also financially beneficial for socially underprivileged groups and its significantly negative effect on the support of policy measures that are financially unfavorable for them. These results suggest that successful climate policy should also be socially oriented and consider distribution effects, for example, through financial compensation for costly measures like taxes, especially in times of the COVID-19 crisis. For the public understanding of such compensation mechanisms, it seems to be important that they are thoroughly explained, for example, through targeted information campaigns.

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Tables

Table 1: Relative frequencies (in %) of the agreement to the eight climate-oriented policy measures among all 1510 respondents

	Strength of dependence on environmental and climate protection				
	Not at all	Rather little	Undecided	Rather strongly	Very strongly
Climate-oriented economic stimulus programs	11.52%	10.00%	32.85%	32.98%	12.65%
	Agreement to climate policy measure				
	Totally disagree	Rather disagree	Undecided	Rather agree	Totally agree
Financial support public transport	2.98%	2.05%	14.83%	36.09%	44.04%
Tax reduction public transport tickets	3.25%	4.44%	15.50%	32.78%	44.04%
Phase-out mining and use coal	6.62%	7.15%	22.38%	29.34%	34.50%
Tax increase flight tickets	11.52%	9.67%	18.15%	28.28%	32.38%
Introduction speed limit highways	16.95%	11.46%	17.81%	22.12%	31.66%
Introduction CO ₂ price	17.22%	12.91%	30.40%	23.64%	15.83%
Tax increase meat and dairy products	22.98%	23.71%	21.19%	19.34%	12.78%

Table 2: Descriptive statistics of explanatory variables among all 1510 respondents

Variables	Mean	Standard deviation	Minimum	Maximum
Trust in scientists	0.599	0.490	0	1
Trust in politicians	0.125	0.330	0	1
Conservative policy identification	0.245	0.430	0	1
Liberal policy identification	0.350	0.477	0	1
Social policy identification	0.612	0.487	0	1
Ecological policy identification	0.469	0.499	0	1
NEP	24.121	3.991	10	30
Negative emotions climate change	13.054	3.902	4	20
Negative emotions COVID-19 crisis	12.479	3.949	4	20
Concern own economic situation	0.377	0.485	0	1
Expectation negative economic development	0.874	0.333	0	1
Age	50.303	15.982	18	82
Female	0.503	0.500	0	1
Higher educational degree	0.431	0.495	0	1
Equivalized income	1.688	0.896	0.1	8.25

Table 3: Simulated maximum likelihood estimates (robust z-statistics) in a multivariate three-alternative ordered probit model, 1510 respondents

	Dependent variables							
Explanatory variable	Climate-oriented economic stimulus programs	Financial support public transport	Tax reduction public transport tickets	Phase-out mining and use coal	Tax increase flight tickets	Introduction speed limit highways	Introduction CO ₂ price	Tax increase meat and dairy products
Trust in scientists	0.016 (0.25)	0.414*** (5.13)	0.303*** (3.98)	0.173** (2.37)	0.129* (1.89)	0.034 (0.50)	0.126* (1.92)	-0.050 (-0.74)
Trust in politicians	0.407*** (3.94)	-0.241** (-2.12)	-0.224** (-2.01)	0.109 (0.93)	0.236** (2.22)	0.149 (1.45)	0.359*** (3.46)	0.297*** (2.97)
Conservative policy identification	-0.425*** (-5.30)	0.071 (0.74)	-0.010 (-0.11)	-0.334*** (-3.87)	0.001 (0.02)	-0.112 (-1.37)	-0.190** (-2.42)	-0.331*** (-4.06)
Liberal policy identification	-0.051 (-0.69)	0.044 (0.47)	-0.091 (-1.03)	0.048 (0.57)	-0.080 (-1.05)	-0.059 (-0.80)	0.006 (0.08)	0.038 (0.54)
Social policy identification	0.015 (0.20)	0.448*** (5.01)	0.256*** (2.90)	0.100 (1.21)	0.220*** (2.88)	0.032 (0.41)	0.021 (0.29)	-0.174** (-2.30)
Ecological policy identification	0.663*** (8.32)	0.247** (2.53)	0.284*** (2.97)	0.595*** (6.46)	0.311*** (3.77)	0.447*** (5.41)	0.490*** (6.34)	0.650*** (8.11)
NEP	0.015* (1.69)	0.054*** (5.02)	0.056*** (5.36)	0.045*** (4.59)	0.039*** (4.11)	0.027*** (2.91)	0.023** (2.57)	0.033*** (3.55)
Negative emotions climate change	0.085*** (7.38)	0.036*** (2.68)	0.042*** (3.27)	0.115*** (9.19)	0.081*** (6.60)	0.074*** (6.18)	0.097*** (8.26)	0.060*** (5.10)
Negative emotions COVID-19 crisis	0.016 (1.59)	-0.018 (-1.53)	-0.035*** (-3.04)	-0.037*** (-3.18)	-0.017 (-1.57)	0.007 (0.63)	-0.008 (-0.84)	-0.006 (-0.61)
Concern own economic situation	-0.002 (-0.02)	0.070 (0.84)	0.059 (0.75)	-0.116 (-1.55)	-0.197*** (-2.82)	-0.194*** (-2.86)	-0.214*** (-3.26)	-0.171** (-2.52)
Expectation negative economic development	-0.213** (-2.27)	0.051 (0.47)	0.147 (1.44)	-0.130 (-1.30)	-0.058 (-0.62)	0.011 (0.11)	-0.027 (-0.29)	-0.061 (-0.64)
Age	0.003 (1.38)	-0.000 (-0.04)	-0.002 (-0.94)	0.001 (0.37)	0.011*** (4.74)	0.007*** (3.09)	0.001 (0.27)	-0.006*** (-2.74)
Female	-0.171*** (-2.64)	-0.062 (-0.78)	-0.037 (-0.49)	-0.235*** (-3.30)	-0.206*** (-3.04)	0.070 (1.05)	-0.178*** (-2.81)	0.072 (1.13)
Higher educational degree	0.031 (0.46)	0.083 (1.02)	0.034 (0.42)	0.073 (1.00)	0.049 (0.69)	0.007 (0.10)	0.103 (1.52)	0.223*** (3.29)
Equivalized income	-0.016 (-0.44)	0.030 (0.67)	0.086* (1.89)	0.045 (1.16)	-0.045 (-1.25)	-0.040 (-1.13)	0.029 (0.79)	0.065* (1.83)
Dummy variables federal states	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes * (**, ***) means that the appropriate effect is different from zero at the 10% (5%, 1%) significance level, respectively.

**Online appendix: Survey questions for the variables in the econometric analysis
(translated into English)**

Dependent variable: “Climate-oriented economic stimulus programs”

How strongly should future economic stimulus programs to overcome the COVID-19 crisis depend on their contribution to environmental and climate protection?

Not at all	Rather little	Undecided	Rather strongly	Very strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Dependent variables: “Financial support public transport”, “tax reduction public transport tickets”, “phase-out mining and use coal”, “tax increase flight tickets”, “introduction speed limit highways”, “introduction CO₂ price”, “tax increase meat and dairy products”

How strongly do you agree with the following climate policy measures?

Measure	Totally disagree	Rather disagree	Undecided	Rather agree	Totally agree
Financial support of public transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduction of taxes on public transport tickets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase-out from the mining and use of coal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase of taxes on flight tickets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Introduction of a speed limit on highways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Introduction of a price for emissions of carbon dioxide (CO ₂ price)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase of taxes on meat and dairy products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variables: “Trust in scientists”, “trust in politicians”

How strongly do you trust the following institutions and groups in Germany?

Groups and institutions	Do not trust at all	Trust rather weakly	Undecided	Trust rather strongly	Trust totally
Scientists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Politicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variables: “Conservative policy identification”, “liberal policy identification”, “social policy identification”, “ecological policy identification”

In the next question, we would like to find out more about your personal attitude towards policy. Please indicate to what extent you agree with the following statements:

Statement	Totally disagree	Rather disagree	Undecided	Rather agree	Totally agree
I identify myself with conservatively oriented policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I identify myself with liberally oriented policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I identify myself with socially oriented policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I identify myself with ecologically oriented policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “NEP”

Please indicate to what extent you agree with the following statements?

Statement	Totally disagree	Rather disagree	Undecided	Rather agree	Totally agree
Humans have the right to modify the natural environment to suit their needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Humans are severely abusing the planet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plants and animals have the same right to exist as humans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nature is strong enough to cope with the impacts of modern industrial nations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Humans are meant to rule over the rest of nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The balance of nature is very delicate and easily upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “Negative emotions climate change”

How strongly do the following emotions describe your feelings about climate change?

Emotions	Not at all	Rather weakly	Undecided	Rather strongly	Very strongly
Fear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sadness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “Negative emotions COVID-19 crisis”

How strongly do the following emotions describe your feelings about the COVID-19 crisis?

Emotions	Not at all	Rather weakly	Undecided	Rather strongly	Very strongly
Fear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sadness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “Concern own economic situation”

How strongly are you concerned about the following specific domains due to the COVID-19 crisis?

Domain	Totally un-concerned	Rather un-concerned	Undecided	Rather concerned	Totally concerned
Deterioration of your own economic and financial situation compared to the situation before the crisis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “Expectation negative economic development”

How will the general economic situation in Germany change in the short- and medium-term due to the COVID-19 crisis?

Will improve	Will neither improve nor deteriorate	Will rather deteriorate	Will deteriorate strongly	Will deteriorate very strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanatory variable: “Age”

Please indicate your age: _____ years

Explanatory variable: “Female”

Please indicate your gender:

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>
Diverse	<input type="checkbox"/>

Explanatory variable: “Higher educational degree”

What is your highest school or university degree?

(So far) no degree	<input type="checkbox"/>
Elementary / secondary school degree (GDR: 8 th grade)	<input type="checkbox"/>
Secondary school degree / middle maturity (GDR: 10 th grade)	<input type="checkbox"/>
Graduated from polytechnic high school (8 th / 10 th grade)	<input type="checkbox"/>
University entrance qualification (completion of a technical high school degree)	<input type="checkbox"/>
High school degree (Abitur) / university entrance qualification	<input type="checkbox"/>
University degree or vocational college degree (GDR: engineering and technical high school degree)	<input type="checkbox"/>
University or college degree	<input type="checkbox"/>
Doctorate or postdoctoral qualification	<input type="checkbox"/>
Other qualifications with a high school degree (Abitur)	<input type="checkbox"/>
Other qualifications without a high school degree (Abitur)	<input type="checkbox"/>

Explanatory variable: “Equivalized income”

What is the monthly household income of all persons currently permanently living in your household? Please refer to the time immediately before the COVID-19 crisis. Please also refer to the average monthly net amount, i.e. the amount after deduction of taxes and social security contributions, and please add regular payments such as pensions, housing benefit, child benefit, BAföG, maintenance payments, etc. If you are not sure, please estimate the monthly amount.

Below 500 Euro	<input type="checkbox"/>
500 to below 1.000 Euro	<input type="checkbox"/>
1.000 to below 1.500 Euro	<input type="checkbox"/>
1.500 to below 2.000 Euro	<input type="checkbox"/>
2.000 to below 2.500 Euro	<input type="checkbox"/>
2.500 to below 3.000 Euro	<input type="checkbox"/>
3.000 to below 3.500 Euro	<input type="checkbox"/>
3.500 to below 4.000 Euro	<input type="checkbox"/>
4.000 to below 4.500 Euro	<input type="checkbox"/>
4.500 to below 5.000 Euro	<input type="checkbox"/>
5.000 to below 5.500 Euro	<input type="checkbox"/>
5.500 to below 6.000 Euro	<input type="checkbox"/>
6.000 to below 6.500 Euro	<input type="checkbox"/>
6.500 to below 7.000 Euro	<input type="checkbox"/>
7.000 to below 7.500 Euro	<input type="checkbox"/>
7.500 to below 8.000 Euro	<input type="checkbox"/>
8.000 Euro or more	<input type="checkbox"/>

Explanatory variable: Dummy variables federal states

In which federal state do you live?

Baden-Wuerttemberg	<input type="checkbox"/>
Bavaria	<input type="checkbox"/>
Berlin	<input type="checkbox"/>
Brandenburg	<input type="checkbox"/>
Bremen	<input type="checkbox"/>
Hamburg	<input type="checkbox"/>
Hesse	<input type="checkbox"/>
Mecklenburg-Western Pomerania	<input type="checkbox"/>
Lower Saxony	<input type="checkbox"/>
North Rhine-Westphalia	<input type="checkbox"/>
Rhineland-Palatinate	<input type="checkbox"/>
Saarland	<input type="checkbox"/>
Saxony	<input type="checkbox"/>
Saxony-Anhalt	<input type="checkbox"/>
Schleswig-Holstein	<input type="checkbox"/>
Thuringia	<input type="checkbox"/>