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How does an economic shock affect environmental attitudes, preferences and issue importance? *Evidence from Switzerland*

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Abstract

How do economic shocks affect pressure by the mass public for pro-environmental political action? If democratic systems are to develop and sustain ambitious environmental policy over several decades, this question is important to answer. Theoretically, we argue to look beyond changes in attitudes such as environmental concern, and trace whether and how citizen's policy preferences, and the political importance they attach to environment-related issues change when experiencing a deterioration of their personal economic situation. Empirically, we draw on high-quality population-representative panel survey data for an affluent country, Switzerland, combining tailored survey measures for quasi-random Corona-related employment and income losses, nuanced measures of environmental attitudes and policy preferences, and recently developed measures for issue importance. We neither find a decline of environmental policy support among economically affected individuals compared to the rest of the population (a population wide drop, however), nor lower importance given to environment related relative to economic issues in voting decisions. While this suggests that politicians need not fear electoral losses when pursuing environmental policies in times of economic crisis, we note that the severe extent of the Covid-induced recession, coupled with a rapid recovery, is peculiar to this economic crisis and warrants further research regarding the generalizability of our findings to economic shocks of longer duration.

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1 Introduction

The most recent report of the Intergovernmental Panel on Climate Change (IPCC 2023) emphasizes, with high confidence, both an 'emissions gap' and an 'implementation gap': the current pledges of countries to reduce emissions fall short of what would be needed to limit warming to 1.5 or even 2 degrees Celsius; even more, policies as currently implemented fall short of what countries pledged.[1] Hence, it is pivotal that countries around the globe increase their efforts to mitigate climate change. A particular responsibility falls onto industrialized democracies, given they contributed at least 23%[2] of recent and 43%[3] of historical emissions. Given the short timeframe to act (around six to eight electoral cycles), these countries' democratic publics have to continuously remain supportive of the green transformation. Already singular electoral backlash can have long-term effects that endanger this goal (Bomberg 2021), providing for very tight social boundary conditions under which the 1.5 degree Celsius goal is attainable (Peng et al. 2021). Additionally, the public not only has to support ambitious policy, but also feature the issue high up on their political agenda to incentivize politicians to act in this regard – which might be a critical constraint, as recent scholarship proposes that concurrent short-term political events can lead to a substantive deprioritization of environmental policy (Fernández-i-Marín et al. 2022).

Recent elections serve as a prime example. In the late 2010s, political observers highlighted a so-called "green wave" for elections in Europe (Schminke 2020) indicating that citizens' preferences can provide for a push of environmental policy to more ambitious levels. However, observers also noted that this changed with the onset of the economic downturn subsequent to the Corona crisis in the early 2020s. Our country case, Switzerland, provides a case in point. After an unprecedented surge in support for green parties in the 2019 national elections (Wientzek 2019), important climate policy measures were rejected by voters at the polls, and the media discussed whether citizens might have lost interest in environmental issues due to pressing economic concerns (SRF 2021). This points to our core research question: (how) do economic shocks affect citizens' environmental concern, their position on environmental issues and the importance of the latter for voting decisions?

The current literature is inconclusive on the link between economic conditions and environment-related preferences. This may be because identifying a causal association between economic conditions and environmental policy preferences is econometrically challenging, especially at the individual level. Most generally, many socio-demographic factors and attitudes that directly link to individual-level economic prospects and perceptions of the economy also link to environmental concern. Even when drawing on panel data, time-variant confounders might bias the estimation. In this regard, we should be particularly worried that economic shocks affect the attitudes of specific sections of society.

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[1] See IPCC (2023, 11), referencing the difference between "global [green-house gas] emissions in 2030 associated with the implementation of [nationally determined contributions] announced prior to COP26 [in relation to] modelled mitigation pathways that limit 1.5 °C (>50%) with no or limited overshoot or limit warming to 2 °C (>67%) assuming immediate action."

[2] See Figure TS.4 of Pathak et al. (2022): combined share of North America (12%), Europe (8%), and Australia, Japan and New Zealand (3%) emissions in the 1990–2019 period.

[3] See Figure TS.5 of Pathak et al. (2022): combined share of North America (23%), Europe (16%), and Australia, Japan and New Zealand (4%) emissions in the 1850–2019 period.

We improve on this literature by using the Covid-19-related economic crisis as a substantial shock that affected citizens from all societal groups. Combining pre-registered standard survey measures, a novel survey-embedded experiment, and drawing on original high-quality population representative panel data from Switzerland, we investigate the consequences of reduced individual employment and economic prospects for (a) environmental attitudes, (b) respective policy preferences and (c) the importance of environmental issues for voting decisions. This takes the current literature forward in several regards: first, past research mostly focused on environmental concern as dependent variable, while research on policy positions is scarce[4] and research on issue importance almost non-existent. Even more, where issue importance has been studied, it either relies on aggregate level data (e.g., Kahn and Kotchen 2011, using Google search term prevalence) or proxies issue importance via direct survey questions (e.g., Kenny 2018), which does not allow for the assessment of the relative importance of environmental policy compared to other issues, and regularly conflates issue importance with issue positions. In contrast, using the novel survey-experimental issue importance measure developed by Hanretty et al. (2020), we provide the first scholarly contribution to whether an economic crisis changes citizens' relative prioritization of economic over environmental issues. Second, we use individual-level panel data, as recent literature shows that cross-sectional approaches may be biased (e.g., Mildenberger and Leiserowitz 2017), following a recent stream of literature that exploits survey experimental approaches and/or panel data for stronger identification (e.g., Engler et al. 2021, Bergquist et al. 2022, Beiser-McGrath 2022). Even more, we exploit that the Covid-19 pandemic unexpectedly affected individuals of all socio-economic strata, to leverage quasi-experimental income loss or fear thereof as a most direct measure of an actual worsening of individual-level economic conditions. Last, research on the Covid-19 pandemic is scarce, but the shock induced may be peculiar in comparison to other economic crises[5] in that it was both severe, while of short duration (see Discussion). Here, we complement existing research on the Covid-19 pandemic that documents aggregate-level effects (Beiser-McGrath 2022; Bergquist et al. 2022), or uses general economic outlook (see Engler et al. 2021) to proxy actual affectedness.

We show that reduced employment opportunities through the Covid-19 crisis in spring 2020 cause a substantive deterioration of individuals' perception of their economic condition in the short (winter 2020), and a small deterioration in the medium term (summer 2021). Importantly, when matching on core individual characteristics, including psychological distress, this shock is neither related to individuals' prior environmental issue positions nor their prior perceptions of individual economic prospects, indicating the quasi-experimental property of this economic crisis. As a first contribution, we show that this shock neither decreases general environmental concern nor a broad range of measures for green policy preferences nor the propensity to vote for green parties, and neither in the short nor medium term. As a second contribution of this article, our results indicate that personally experiencing an economic shock – at least of the type induced by the Covid-19 pandemic – does not decrease the importance of environmental issues relative to the importance of economic issues for voting decisions. However, we observe a generally lower importance of all policy issues, irrespective of their policy area, for affected respondents compared to

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[4] For exceptions, see Engler et al. (2021), Bergquist et al. (2022), and Beiser-McGrath (2022).

[5] E.g., research on the general economic business cycle (e.g., Kahn and Kotchen 2011) or the 2008 financial crisis (e.g., Mildenberger and Leiserowitz 2017).

non-affected ones, suggesting that the former are more likely to become indifferent to issue positions of political candidates in general.

2 Theoretical argument

How do economic shocks affect the pressure that the mass public puts on elites for pro-environmental political action? Built into the notion of representative democratic systems, voters select politicians that act according to their preferences and hold politicians to account if they fail to do so. Irrespective of whether we understand the link between voters and their representatives as a forward-looking selection problem (Fearon 1999; Downs 1957), or as a backward-looking reward-punishment model (Manin et al. 1999; Key 1966), voters' preferences should link directly with the preferences of their representatives, and accordingly the policy we see implemented on the ground.[6]

2.1 State of the literature

But can we expect citizens to prefer a clean environment? Most generally, a dominant conception is that "pollution is something undesirable, almost by definition" (Vogel 2012, 20). Nevertheless, protecting the environment is regularly related to (short-term) costs,[7] and with costs attached to a clean environment it becomes unclear whether citizens actually gain utility from environmental protection. This points directly to a trade-off between environmental and economic goods that has to be resolved by citizens when forming and voicing preferences over policy.

  This trade-off should be particularly pronounced in times of scarcity, i.e., during economic crisis (Vogel 2012), an expectation that recent research tries to trace empirically. For example, Shum (2012), Kahn and Kotchen (2011) and Duijndam and van Beukering (2021) link the 2007–9 economic recession to decreased concern for climate change in the EU and US context.[8] Similarly, Scruggs and Benegal (2012) argue that deteriorated labor market conditions following the financial crisis are directly related to declining concern for climate change in the US in the late 2000s (see also Meyer 2022). However, Mildenberger and Leiserowitz (2017) find no such relationship when focusing on more fine-grained panel data for the same time-period. Mayer and Smith (2017) report that societal but not household-level changes in economic welfare link to environmental concern (see also Krosnick and MacInnis 2012), and Kachi et al. (2015) propose that these links, even if present in some contexts, are of small size. In one of the few studies analyzing the Covid-19 crisis-related economic downturn, Engler et al. (2021) propose that the perceptions of such a downturn link to reduced support for a climate-oriented economic stimulus, while Bergquist et al. (2022) find no evidence for such a

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[6] Note that empirical work casts some doubt on this type of responsiveness (e.g., Achen and Bartels 2017, but see Fowler and Hall 2018). For broader overviews, see Healy and Malhotra (2013) and Ashworth (2012), pointing both to the many instances in which literature has found evidence of voter responsiveness but also to the complexity in assessing the correct (theoretical/external) benchmarks to assess this responsiveness in the first place.

[7] These costs can, e.g., be understood as opportunity costs of foregone (economic) opportunities that are prevented through protective behavior (Vogel 2012).

[8] See also Conroy and Emerson (2014), who study a longer 1974–2012 time period for the US.

link. Analyzing panel data from the UK, Beiser-McGrath (2022) finds that individuals deprioritized environmental issues during the pandemic in 2020 as compared to before in 2019, and even more so if their material living-conditions were poor. All in all, several studies find evidence for a relation between times of economic crisis and environmental concern – however, it is unclear whether this link is only present because of confounding (e.g., Mildenberger and Leiserowitz 2017), is relevant on the individual (as opposed to the societal) level (e.g., Beiser-McGrath 2022), and travels to policy preferences and actual voting behavior (e.g., Bergquist et al. 2022).

2.2 Economic shocks and environmental concern

Theoretically, economic crises could affect mass public pressure for pro-environmental action by two major pathways: first, citizens could genuinely change their attitudes. For decades, social scientists examined the relationship between environmental concern and economic conditions. One main line of reasoning in this field identifies affluence as the main predictor of environmental concern, and if affluence is affected by an economic crisis we would consequently expect environmental concern to lessen. This affluence hypothesis builds on economic reasoning by postulating that the demand for public goods rises with income (Diekmann and Meyer 2010; Franzen 2003). This economic dimension of environmental concern has been confirmed by previous research, primarily in high-income countries (Diekmann and Preisendörfer 2003; Pampel 2014). From this line of reasoning, we could expect that:

> **Hypothesis 1a** *Individuals affected by an economic shock show decreased environmental concern.*

If correct, this expectation should hold particularly for individuals with low levels of income. However, the theoretical argument outlined above is criticized for being too deterministic (Mayer and Smith 2017). The seminal theory of post-materialism by Inglehart (1997) proposes a different mechanism for how affluence affects environmental preferences. It states that affluent societies are less concerned about basic material needs. Rather, economic welfare triggers a change in values towards a preference for post-material goods. While primarily explaining value shifts across birth cohorts, the theory has also been applied to the individual level (e.g., Kidd and Lee 1997). Recent research found a significant amount of materialistic individuals within high-income countries being indeed less environmentally concerned than their post-materialistic counterparts (Pampel 2014). Also, several studies find higher environmental concern among the affluent (Diekmann and Meyer 2010; Franzen 2003; Marquart-Pyatt 2008); but note also that others lent less support to Inglehart's hypothesis (Dunlap and York 2008; Fairbrother 2013; Knight and Messer 2012).

Still, from this line of reasoning, we could expect environmental attitudes to be relatively stable and not prone to short term fluctuations. Thus, an economic shock in an affluent society, even while decreasing perceptions of economic prospects, does *not* lower concern for the environment, as this is a deeply entrenched value. This could also explain why the prior literature on the link between economic crisis and environmental concern is inconclusive, with reported associations disappearing once individual-level attitudes are controlled for (see e.g., Mildenberger and Leiserowitz 2017; Kachi et al. 2015). We hence expect for our case also:

Hypothesis 1b Individuals affected by an economic shock do not show differential levels of environmental concern.

This hypothesis should particularly be true for individuals who hold high levels of postmaterial values.

2.3 Economic shocks, policy preferences and issue importance

Nonetheless, even if concern for the environment is a stable trait of citizens, this does not imply that green policy preferences and green issue importance – which are the core incentives that political representatives act upon – are unaffected by economic shocks. Consequently, a second pathway focuses on the practically highly consequential question how the environment-economy trade-off plays out with respect to political incentives for green policy. We propose that the trade-off could tilt towards the economic side by two related mechanisms:

On the one hand, even with stable underlying values regarding the environment, concrete policy preferences of citizens could shift (and subsequently voting behavior). Theoretically, this can be explained by the opportunity costs that environmental policy has, i.e., environmental attitudes predict green behavior only in low-cost contexts (Wyss et al. 2022). This argument has also been shown to travel to voting behavior, where Stadelmann-Steffen and Thalmann (2021) propose that for anyone but the citizens with the firmest attitudes, high-cost contexts prevent pro-environmental voting. From this, we would expect that in the presence of a more immanent crisis the attitude-behavior gap widens, whereby pro-environmental attitudes do translate less strongly into green policy preferences or green voting. We would therefore expect that:

Hypothesis 2 *Individuals affected by an economic shock show a decrease in the link between pro-environmental attitudes and green policy preferences/green voting and, on average, a decreasing propensity for green policy preferences/green voting.*

Secondly, preferences only matter for election outcomes if citizens place importance on respective party or candidate positions when forming their voting decision. Hence, it is crucial to not only trace the policy preferences that citizens' voice but likewise the importance they attach to certain topics (Hanretty et al. 2020). Standard political economy models (Downs 1957) would let us expect that citizens evaluate politicians or parties by the relative differences of this citizen's and the politicians' policy position in various policy fields. Notably, each of these differences will enter the citizen's utility function with weights – the issue importance of this policy dimension. It is likely that in times of economic crisis the weight of the economic dimension increases, at the expense of the weight of the environmental dimension. As argued above, if high-cost environments deter green behavior, this should also voice in non-green policy areas being relatively prioritized compared to green policy areas. In one of the few studies investigating this, Kenny (2020) proposes that increased unemployment (but not growth) relates to decreased prioritization of environmental policies (see also Kahn and Kotchen 2011). In a survey-experimental study, Kenny (2018) proposes that a stimulus to the salience of economic conditions reduces the prioritizing of environmental policies among individuals with a non-positive view of the economy.

Hypothesis 3 *Individuals affected by an economic shock put lower importance on a political candidate's positioning on environment-related issues, as compared to economy-related issues, when forming their voting decision.*

3 Research design

3.1 Case

We focus on the employment shock induced by the Covid-19 pandemic in Switzerland in 2020 to test our hypotheses for three reasons: first, the economic and environmental context is comparable to other high-income European countries and there is relevant within-country variation in economic conditions and environmental policy support. Secondly, Switzerland is a particularly suitable laboratory for realistic public opinion studies, as its direct-democratic institutions reinforce the relevance of public opinion for actual policy-making (Wicki et al. 2019). Lastly, studying the Covid-19 pandemic as an economic shock is particularly worthwhile because it affected household incomes across all social strata in Switzerland (Appendix Section A.2.1 provides a more detailed discussion of this case selection).

3.2 Survey data

Our study is based on data from the Swiss Environmental Panel (SEP), a large dual-mode panel survey. The sample was provided by the Federal Statistical Office and consists of a simple random draw of the Swiss resident population stratified by NUTS-2 regions. The raw sample is representative of the Swiss resident population aged 17 and above. There seems to be no relevant non-response bias with respect to the sociodemographic characteristics of respondents (Quoß et al. 2021) and no panel attrition linked to a deterioration of individuals' economic situation during the Covid-19 pandemic.

The data used here was fielded in wave 1 (2018), wave 4 (2019), wave 6 (2020), and wave 7 (2021) of the SEP with questionnaires in German, French, Italian and English. The experimental part of this study was embedded in wave 6 of the SEP and fielded between November 2020 and February 2021, i.e., approximately nine months after the outbreak of Covid-19 in Europe. This survey wave was conducted in online mode only and resulted in 6412 complete responses (response rate of 67%) of which 50% received the survey experiment we report on here.

3.3 Estimation strategy

The research design consists of two parts: a regression-based analysis of economic prospects, attitudes, and policy preferences, and an examination of issue importance applying Bayesian posterior simulation. The survey instrument and corresponding estimation strategy were pre-registered at https://osf.io/etyj2. Descriptive statistics of all variables used in the analysis are presented in Appendix Table A.3.

Table 1 Outcome variables for various impact regressions

Dependent Variables	Year	Scale
Personal economic situation	2019, **2020, 2021**	5-point Likert scale
Environmental concern	2018, 2019, **2021**	Additive index (1–5)
Environment vs. jobs	2018, 2019, **2021**	5-point Likert scale
Energy policies	2018, 2019, **2021**	Additive index (1–5)
Environmental policies	2018, 2019, **2020**	Additive index (1–5)
Green voting: municipality	2018, 2019, **2021**	5-point Likert scale
Green voting: canton/nation	2018, 2019, **2021**	5-point Likert scale
Green Party vote intention	2018, 2019, **2020, 2021**	Dichotomous variable

All variables were included in several panel waves. Variables included in surveys fielded after the primary Covid-19 shock are highlighted in bold

3.3.1 Core independent variable

Our core measure of experiencing an economic shock constitutes an individual-level indicator of reduced economic opportunities in the time of the Corona pandemic. For this, we field standard survey items in a yes/no format to respondents. For any respondent that indicated either "I was or am self-employed and affected by loss of earnings", "I have lost my job", "I was or am afraid of losing my job" or "I worked fewer hours per week for my paid job than before and therefore earned less" we coded affectedness as "1", otherwise as "0". We would expect that individuals affected by the Covid-shock experience their personal economic prospects as worse, relative to those not experiencing this shock. Our impact regressions in the results section will, akin to a manipulation check (Mutz 2011), therefore first show the relation of the economic shock to these variables, as only if these are manipulated we can actually expect that changes in preferences or importance follow.

3.3.2 Causality

The crux for causally identifying changes in environmental preferences with this measure of affectedness is whether "treated" individuals would have developed, on average, similar preferences compared to "untreated" individuals *had the shock not occured*. If this assumption is violated, the association between affectedness and changes in preferences could be mere confounding, an actual causal effect, or a mixture of both. Hence, causal claims require careful attention to research design.

Given that the part of the population in employment, and therein the lower-income strata, were more likely to be affected, we have to preclude that confounding biases our results. We therefore apply entropy balancing (Hainmueller 2012) on pre-treatment covariates that relate both to being impacted by the Covid shock and environmental policy preferences. Entropy balancing then assumes that selection into treatment is a function of observable covariates (also known as the conditional independence assumption), and that we can reduce any selection bias by accounting for imbalance in pre-treatment confounders between treated and control observations. Appendix Section 2.4 provides details on the approach. Successful placebo tests with two waves of pre-treatment data

make us confident that with this approach we arrive at an estimate with a causal interpretation. For the question whether the Covid shock affected attitudes and preferences, we also have the rare ability to work with panel data, which relaxes necessary identifying assumptions further.

3.3.3 Dependent variables on policy preferences and estimation strategy

Table 1 gives an overview of the extensive set of dependent variables that we apply to ensure the robustness of our findings, and the times when these were measured. Appendix Section 2.3 gives details on the underlying question wording and index construction. In short, a first outcome captures respondents' perceived economic situation. Further, we use two different measures to capture environmental attitudes and five measures for stated policy preferences and intended voting behavior.

To estimate effects, we draw on a difference-in-difference framework, where unit and time fixed effects allow us to control for any time-invariant unobserved confounders in treatment and control observations by relating treatment to changes in outcome variables (Brüderl and Ludwig 2015). All regressions include individual weights from entropy balancing (see Section 3.3.2 above) to make treatment and control group comparable for all time-variant factors not captured by this approach. Details on the impact regressions we run are summarized in Appendix Section 2.5.

3.3.4 Estimating issue importance

Last, we estimate the importance of different policy issues for respondents' election decisions applying a novel approach developed by Hanretty et al. (2020). It combines direct survey questions and responses to conjoint choice experiments in order to obtain a nuanced picture of issue importance across the Swiss population. In essence, issue importance is calculated based on the weights that individuals give to the deviation of a political candidate's position to their own position, additionally considering the average population agreement or disagreement with a policy proposal.

Our survey instrument consists of the following elements: first, respondents were asked to directly indicate personal agreement or disagreement with three policy proposals on a four-point Likert scale. The policy proposals were drawn randomly from a bank of 16 policy issues. Secondly, we conducted a conjoint experiment. Respondents compared two hypothetical candidates with randomly assigned positions on three policy issues in four conjoint rounds. These three issues were the same as those for which respondents had previously stated their agreement or disagreement. The candidates' positioning on the three statements was randomly assigned. Appendix Section 1.2 illustrates how the conjoint task was presented. The sixteen policy proposals represent environmental, economic and unrelated issues and are balanced with respect to importance, the ideological direction of wording and topic. Appendix Section 1.3 summarizes the item wording of all sixteen proposals, general topic area, and scale direction.

Our model is based on Bayesian posterior simulation implemented in RStan. It builds on the assumption that respondents draw their decisions based on the distance between their own and the candidate's position (i.e., the utility associated with a candidate). For the conjoint component, we estimate a logistic response model to obtain the distribution of voting either for candidate A or candidate B, given the individual utility a person associates with a candidate and a threshold parameter which takes on different values dependent on whether the two

Table 2 Linear regressions with time and respondent fixed effects of economic situation on Corona shock

	Placebo (2018–2019) (1)	Short term (2019–2020) (2)	Medium term (2019–2021) (3)
	Future econ. perception	Past econ. perception	Past econ. perception
Corona shock	0.0542	–0.352[**]	–0.0891[*]
	(0.0806)	(0.0464)	(0.0443)
Year	–0.0216	–0.151[**]	0.0171
	(0.0409)	(0.0262)	(0.0253)
Constant	3.011[**]	3.061[**]	3.059[**]
	(0.0202)	(0.0117)	(0.0104)
Entropy balancing weights	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
N (clustered)	1092	3104	3093
Control group mean	3.01	3.11	3.11
Control group sd	0.70	0.82	0.82

Model 1: Placebo effect for the pre-treatment period (2018–2019), comparing respondents later affected and not affected by the Corona with dependent variable future economic outlook. Model 2: Short-term treatment effect for pre-Corona (2019) and post-Corona (2020) period, with dependent variable current economic condition. Model 3: Medium-term treatment effect for pre-Corona (2019) and post-Corona (2021) period, with dependent variable current economic condition. Entropy balancing weights included in all models. Standard errors clustered by respondent in parantheses. $+p < 0.1$, $* p < 0.05$, $** p < 0.01$

compared profiles vary on one, two, or all three issues. For the utility component of the model, we use a linear-loss model to assess the proximity of a candidate's position to the respondent's position. The spacing of our policy alternatives for each proposal indicates how much weight respondents, on average, put on the divergence of a candidate's profile from their position. In order to measure the relative importance of an issue, we combine the information on the location of issue positions with the average distribution of agreement or disagreement on that issue among the Swiss population. By including this information, only an issue on which the public is divided is considered important for voting decisions, as issues with an extremely lopsided distribution of preferences are unlikely to be of relevance for public debate (for details, see Appendix Section 2.6).

4 Results

Turning to our empirical results, we first show that the Covid-19 shock negatively influenced respondents' economic situation, and particularly so in the short term. Second, we show that this does not substantively relate to economic concern, policy preferences or intended voting behavior when comparing affected and unaffected individuals. Third, we show that while overall importance given to policy issues declines among individuals experiencing an economic shock, there is no significant difference between economy and environment-related issue areas.

4.1 Corona shock and perceived economic well-being

Before turning to the link between economic crises and environmental attitudes, policy preferences and issue importance, we provide evidence on the magnitude of the consequences of the Covid-19 pandemic as an economic shock. As Table 2 shows, the Corona shock does influence perceptions of economic well-being.[9]

Model 2 indicates that affected respondents score about 0.35 scale points lower on the five-point scale how their personal economic situation developed. This is a substantive decrease, as it is more than twice the negative year effect, about half the control group's standard deviation in the pre-treatment year, and more than 10% of the pre-treatment control group mean. Additionally, the effect spills over to the medium term. With about 0.09 scale points, it is substantively smaller for the 2019 to 2021 period, however. Notably, the effect is likely causal in nature: pre-treatment trends between control and treatment group, as indicated by Model 1, are nearly parallel. This is indicated by a placebo effect close to zero and statistically insignificant for the 2018–2019 pre-treatment period. We therefore proceed with the question whether and how a deteriorated work situation causing this shift in perceived economic well-being influenced environmental concern, policy attitudes, or green voting.[10]

4.2 Corona shock and environmental attitudes

We now turn to our first hypothesis on the link between experiencing an economic shock and individual-level environmental concern. Since the latent concept of environmental concern was only measured in the 2018, 2019 and 2021 survey waves, we cannot estimate the short-term effect but report the medium term effect only. As indicated by Table 3, no such relationship appears, neither for the full sample (Model 1), nor for subgroups of high vs. low pre-treatment income (Models 2 and 3) or high vs. low pre-treatment levels of postmaterial values (Models 4 and 5). Effects for the individual-level Covid-shock are, albeit negative, throughout substantively small and statistically insignificant. This indicates that a sizable economic shock did not translate to decreased environmental concern *among those directly affected*, not even for subgroups where this might have been most likely to be expected (low income or high postmaterial values). The evidence therefore seems to be in line with hypothesis 1b, indicating that post-material values are relatively stable, once they have developed in an affluent society.

Note that, for the whole sample (year effect), we discern a small negative and significant decrease in environmental concern (by 0.1 scale points on average, Model 1, 3% of 2019 control group mean) in-between 2019 and 2021. This evidence speaks to the argument of Beiser-McGrath (2022) that the Covid-shock was a societal event, that decreased concern over the environment more generally, and irrespective of personal affectedness. This effect

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[9] Measures of perceived economic well-being slightly differ between 2018–2021. For 2019 and 2021, we use a scale: "In general, has your personal economic situation gotten worse or better or remained the same in the last three years?". Wording is slightly different for 2020, with "in the last 12 months". In 2018, we resort to the question: "When you think of the time three years from now: Do you expect that you will fare better or worse than you are now?".

[10] In Appendix Section 3.1 we report placebo regressions for these dependent variables, showing, as expected, null results throughout.

Table 3 Linear regressions with time and respondent fixed effects of environmental concern on Corona shock (medium term, 2019–2021)

	All respondents	High income	Low income	High env. concern	Low env. concern
	(1)	(2)	(3)	(4)	(5)
	Env. concern index	Env. concern index	Env. concern index	Env. concern index	Env. concern index
Corona shock	−0.0322	−0.0597	−0.0138	−0.0204	−0.0250
	(0.0312)	(0.0454)	(0.0405)	(0.0398)	(0.0411)
Year = 2021	−0.0978**	−0.0839**	−0.105**	−0.297**	0.0996**
	(0.0222)	(0.0299)	(0.0292)	(0.0288)	(0.0278)
Constant	3.673**	3.682**	3.672**	4.291**	3.031**
	(0.00729)	(0.0105)	(0.00954)	(0.00935)	(0.00953)
Fixed effects	Yes	Yes	Yes	Yes	Yes
Entropy balancing weights	Yes	Yes	Yes	Yes	Yes
N (clustered)	3099	1426	1670	1559	1540

Model 1: Full sample. Models 2 and 3: Split-sample regression by above/below median 2019 income. Models 4 and 5: Split-sample regressions by above/below median 2019 environmental concern. Standard errors clustered by respondent in parantheses. $+ p < 0.1$, $* p < 0.05$, $** p < 0.01$

Table 4 Linear regressions with time and respondent fixed effects of indicators for policy preferences and voting behavior on Corona shock

	Short term (2019–2020)		Medium term (2019–2021)			
	(1)	(2)	(3)	(4)	(5)	(6)
	Environmental policy index	Green vote intention	Protect environment > jobs	Green energy index	Green candidate preference	Green vote intention
Corona shock	0.0162	0.00610	−0.0477	0.00446	0.0477	0.0282
	(0.0565)	(0.0224)	(0.0640)	(0.0308)	(0.0464)	(0.0215)
Year	−0.0431	−0.00180	−0.214**	−0.0974**	−0.128**	−0.00009
	(0.0341)	(0.0115)	(0.0413)	(0.0202)	(0.0282)	(0.0116)
Constant	2.728**	0.286**	3.249**	3.418**	3.735**	0.284**
	(0.0106)	(0.00528)	(0.0150)	(0.00722)	(0.0108)	(0.00479)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Entropy balancing weights	Yes	Yes	Yes	Yes	Yes	Yes
N (clustered)	3094	2749	3076	3092	2912	2717

Dependent variable indicated in model header. Model 1–3: Short-term treatment effect for pre-Corona (2019) and post-Corona (2020) period. Model 4–6: Medium-term treatment effect for pre-Corona (2019) and post-Corona (2021) period. Entropy balancing weights included in all models. Standard errors clustered by respondent. $+ p < 0.1$, $* p < 0.05$, $** p < 0.01$

is, with our research design, not causally identified, as we cannot separate it from potential other time-varying confounders (e.g., the electoral cycle).

4.3 Corona shock and policy preferences

But might the individual-level economic shock still relate to policy preferences and voting behavior? We provide corresponding evidence in Table 4. Models 1 and 2 report effects for variables measured in the short term, i.e., in 2019 and 2020; Models 3 to 6 for the medium term, i.e., 2019 and 2021. As the substantively small and insignificant coefficients for the Corona shock indicate, this does not seem to be the case. Neither an index of environmental policy preferences, nor green party vote intention (both measured for the short term, and at the same time as the Corona shock), nor a question on preferring environmental protection over economic stability, nor green energy policy preferences, preferences for pro-environmental political candidates, or green party vote intention (all measured for the medium term) move substantively or significantly with having experienced an economic shock.

Note that, again, the year effects are throughout negative, and significant for environment over jobs (-0.21, 7% of 2019 control group mean), green energy policy preferences (-0.10, 3% of 2019 control group mean) and green candidate preferences (-0.13, 3% of 2019 control group mean), indicating that the population as a whole became less pro-environmental in its policy preferences on average.

We suggested that experiencing an economic shock could moderate the association between environmental concern and respective policy preferences or green voting. As presented in Appendix Section 3.3, we also find no strong dampening of the correlation between environmental concern and green policy preferences by the Corona-shock experience. As expected, we observe an in principle positive correlation between changes in environmental concern and stated preferences for green policy. This positive correlation is consistently reduced for individuals who experienced the shock, however with coefficients not estimated with sufficient statistical precision. To test the robustness of our findings, we ran a standard conjoint analysis for our choice experimental task fielded in 2020 on voting decisions based on candidate positionings on various environmental and non-environmental issues. Comparing marginal means and average marginal component effects (AMCEs) of respondents affected and not affected economically by the crisis allows conclusions on voters' preferences (Bansak et al. 2022). There are almost no statistically significant differences between the issue position preferences of both subgroups. The full marginal means plot is provided in Appendix Section 3.4.

Overall, we hence conclude that hypothesis 2 is not supported for our case. This indicates that survey respondents who experienced a substantive decrease in economic security due to Corona, while correctly perceiving this economic shock, still show stable pro-environmental attitudes on average, and do not de-green their stated policy preferences or intended voting behavior compared to the rest of the population.

4.4 Corona shock and issue importance

Lastly, we suggested that even if individual policy preferences are unaffected by the economic shock, there could still be changes in the importance respondents put on
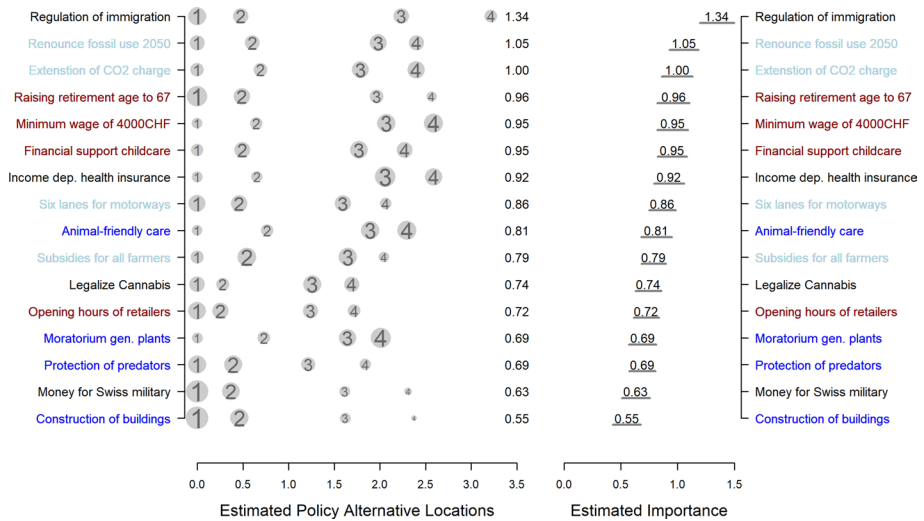
Fig. 1 Issue importance and estimated locations of policy alternatives for the control group, i.e., the sub-sample of respondents whose work situation stayed the same or improved during the pandemic ($N = 2423$). Colors indicate issue areas: environment = blue (issue 9, 13, 14, 16), economy = red (issue 4, 5, 6, 12), environment-economy = light blue (issue 2, 3, 8, 10), other = black (issue 1, 7, 11, 15)

environmental issues relative to economic issues for voting decisions. Hence, we assess whether issue importance differs depending on whether respondents experienced an economic shock.

4.4.1 Issue importance absent an economic shock

To introduce the novel measure of issue importance developed by Hanretty et al. (2020), we first want to illustrate the overall importance for each policy proposal absent an economic shock. Figure 1 displays the importance of the 16 policy proposals ordered from most to least important.

The left panel of Figure 1 shows the relative distance of the four positions for each issue, where the first position is fixed to zero, and there is no limit to the scale's upper end. The more widespread the four issue positions, the more strongly respondents penalize a candidate for diverging from their own position. The grey area surrounding the four response alternatives depicts the proportion of respondents choosing this answer as their preferred one in the direct question. The right panel displays the estimated importance score, combining both parameters and their 95% posterior intervals (grey line). On average, importance scores are highest for joint economy- and environment- related issues and lowest for purely environment-related issues.[11]

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[11] Appendix Section 3.6 provides a detailed description and interpretation of Fig. 1.
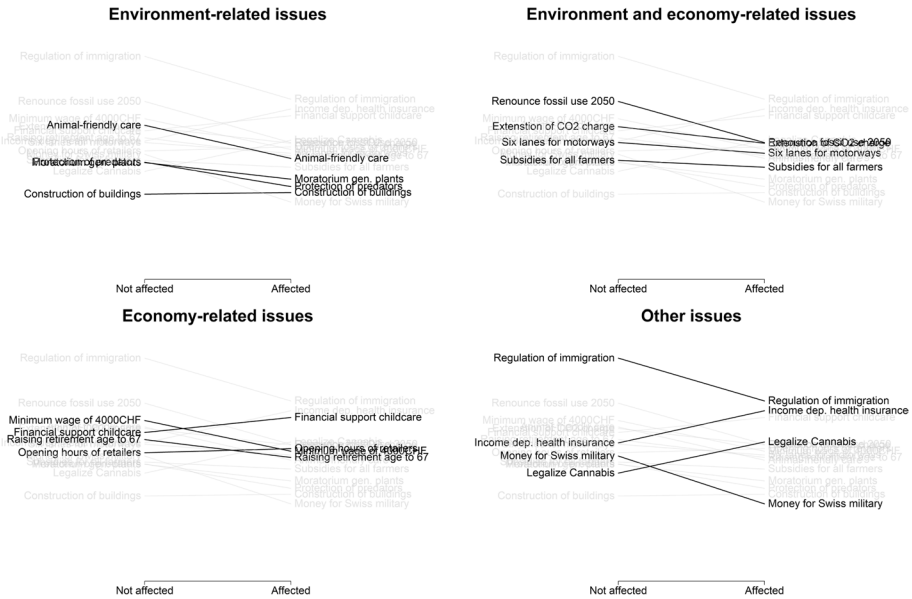
Fig. 2 Issue importance estimates for respondents affected and not affected by the economic shock. The four plots display identical issue importance scores. Each plot highlights four policies of the issue area indicated in its title. The remaining 12 policies are displayed in grey

4.4.2 Issue importance comparing those affected and unaffected by the Covid shock

Our core interest in this section is to examine whether the importance of economic vs environmental issues varies between those experiencing an economic shock and those not economically affected by the crisis. Figure 2 displays the predicted level of importance for the treatment and control group.[12]

Notably, respondents affected by a worsened work situation put, on average, less importance on all issues compared to those whose work situation stayed the same or improved. Averaged across all issues, importance scores for respondents economically affected by the Covid-19 pandemic are 10% lower than for unaffected individuals. Hanretty et al. (2020) find a similar pattern for respondents who pay low attention to politics. As the treatment and control groups are balanced on a broad range of covariates, this increased apathy in politics is likely causally related to the economic shock induced by the Corona pandemic.

Second, we observe a tendency of issue importance to drop for purely environment-related and environment-economy-related policy proposals throughout. We calculate the multiplicative effect regarding the disutility attached to voter-candidate disagreement for each issue to interpret the magnitude in variation in issue importance between both groups. This results in economically affected individuals putting, on average, 11% less utility weight on positional disagreements regarding all proposals than non-affected individuals. However, this general tendency does not support the assumption that issue importance decreases for environment-related issues compared to economy-related issues, as the

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[12] The exact estimated beta coefficients, indicating to which extent issue importance varies between treatment and control groups, are provided in Appendix Section 3.7.

importance of environmental policy proposals is not significantly lower than the average issue importance in the treatment group. In addition, uncertainty intervals of our importance scores are quite large and overlap between the treatment and control groups. Statistically significant differences in average issue importance were only found for three policy proposals: Affected respondents care relatively more about the legalization of cannabis ($p=0.01$), the introduction of income-dependent health insurance ($p=0.003$), and less about spending money on the Swiss military ($p=0.003$). Appendix Section 3.7 provides a detailed description of the results and further classifies the importance scores of treated individuals by comparing them to variation driven by other covariates.

As outlined in the theory section, we expected an economic shock to impact issue preferences differently, depending on an individual's degree of prior post-material values. However, when accounting for subgroup differences in issue importance with respect to environmental attitudes or income, we do not observe notable variation (Appendix Section 3.8).

4.5 Discussing the null-results

Drawing on high-quality population-representative panel survey data and tailored survey measures for Corona-related employment and income losses that allow us to exploit the quasi-random nature of the Covid-induced economic shock to Swiss society via entropy balancing, we are confident to be reporting causal estimates for the relation between this economic shock and environmental attitudes, stated policy preferences and issue importance. The findings of our pre-registered research design indicate neither a substantive or statistically significant decrease in environment-related attitudes, stated policy preferences, nor in the importance of environmental issues for intended voting decisions *among those respondents reporting to be negatively affected economically, compared to those reporting to be unaffected*. We consider these null results as relevant findings corroborating the emerging notion that political support for environmental issues remains strong even in times of economic insecurity. To warrant the confidence in our results, we rely on a template for reporting null findings developed by Alrababa'h et al. (2023) that allows for identifying potential problems of internal validity by focusing on statistical power, measurement strategy, and alternative theoretical pathways.

4.5.1 Statistical power

Hypotheses 1 and 2 are tested with impact regressions estimated for a sample of around 3000 respondents with two observations each (2019 and 2020/2021). Variation in sample size between the different models is due to responses for some dependent variables missing assumedly at random. Additionally, we mostly use indices as dependent variables, constructed from several indicators, for both attitudes and stated policy preferences, allowing us to reduce measurement error (Mutz 2011). Overall, the sample size is in line with or surpasses the sample sizes of similar studies in the field. Hence, the null results are unlikely to be due to an underpowered study design. The survey-experimental design to measure issue importance builds on 3151 respondents answering three out of sixteen policy questions. Thus, the average sample size for each of the direct issue questions is 3151 x (3/16) $\approx$ 591. Since we are interested in relative issue importance, our model relies on information on the combination of issues. In our sample, we have 3151 x (3/16) x (2/15)×4 $\approx$ 315 choice tasks, including any pair of issue questions. This number of observations does not allow

us to study single pairwise issue comparisons. Rather, we compare a full set of issue types (e.g., environmental issues, economic issues) to all other issues.

4.5.2 Measurement strategy and potential contamination of the treatment

We are confident that the operationalization of our treatment variable has properties akin to a randomized experiment: first, the economic shock induced by the Covid-19 pandemic unexpectedly and swiftly affected some, but not all, citizens from various societal groups, both with higher and lower incomes and from various economic sectors. However, not all societal strata were affected to the same extent. Thus, we apply entropy balancing on relevant covariates measured pre-treatment to ensure treatment and control groups are comparable on important observable predictors of economic affectedness. Note that some potential for imbalance remains, e.g., in terms of the distribution of sector of employment in treatment and control group, as we lack this information for the pre-treatment wave in 2019 to actually test for imbalance here. Second, recalling that the treatment was assembled from a survey questionnaire asking respondents about different aspects of potential affectedness, we might worry about two types of contamination: the control group could contain individuals being indirectly affected (e.g, friends and family experiencing job loss), just as the treatment group only moderately affected individuals (e.g., fear of job loss); both aspects might wash out potential treatment effects. To probe the robustness of our findings, we therefore estimated regressions with more restrictive operationalizations of treatment and control status. As reported in Appendix Section 3.5, we find no substantively and significantly consistent negative results. Hence, we conclude that the overall picture of null results for the relation between affectedness and stated environmental preferences holds likewise for strict and loose definitions of the treatment.

4.5.3 Theoretical considerations

Last, we control for an alternative treatment mechanism: that our results are driven by levels of psychological distress induced by the Covid-19 pandemic. Martínez et al. (2021) show that the mental health of the Swiss has decreased over the course of the pandemic. This trend was particularly noticeable for lower-income groups. Therefore, we balance our treatment variable by a measure of psychological distress (GHQ-12). This measure is post-treatment. Hence, it could be indicative of an alternative treatment mechanism which does not run through changes in the perception of the economy but rather through mental distress (Wirkner et al. 2021). Notably, the in- or exclusion of the psychological distress measure does not affect substantive conclusions from our analyses.

5 Conclusion

While there is abundant research on the technological prerequisites and environmental, economic and social consequences of different emission pathways, the conditions under which democratic publics will develop and uphold support for ambitious climate policy is not yet well understood (Peng et al. 2021). Our research contributes to this emerging literature in three ways:

First, recent research of Mildenberger and Leiserowitz (2017) and Mayer and Smith (2017) finds null results for the relation between economic shocks and environmental

concerns on the individual level, casting into doubt earlier research of Shum (2012) or Kahn and Kotchen (2011) who report such associations. We add to this emerging picture: even though respondents perceive a strong decrease in their personal economic security and even for subgroups theoretically most likely to show an association, personal experience of an economic shock does not relate to decreased environmental concern. This supports theoretical arguments of Inglehart (1997) that citizens in affluent countries, having developed a strong value set consistent with environmental protection on average, uphold such values also when affected by economic crises.

Second, we propose theoretically that despite non-changes in environmental concern, the attitude-behavior gap could nonetheless widen with deteriorating economic conditions, leading to reduced demand for pro-environmental policy. However, when putting this proposition to an empirical test, we find no substantive or significant decrease, at least for our measures of stated preferences and intended voting behavior.[13] This indicates that the room to maneuver with respect to pro-environmental policy that governments possess does not shrink from the perspective of the public. Also, it is in line with findings of Bergquist et al. (2022) that citizens do not necessarily see a trade-off between pro-economic and pro-environmental policy, even in times of crisis – and that politicians can, therefore, develop policy solutions that address economic and environmental challenges at the same time.

Third, current research mostly overlooked that issue importance could change as a consequence of economic crisis experience. Theoretically, we would expect that changes in issue importance affect the nature of the political game, and could disincentivize parties to address ecological relative to other issues. Drawing on novel, tailored measures of issue importance, we find no significant difference between the importance of economic issues relative to environmental issues among affected individuals. However, our results suggest that personal affectedness relates to a substantive decrease in the average importance of all political issues.

We see several avenues for future research: first, our research design investigates the consequences of personal affectedness relative to other citizens not being affected. Notably, we find that for our whole sample, environmental concern and support for climate policy measures decreased on average in the post-Covid-shock survey waves. This decrease could be a consequence of the economic shock driven by sociotropic considerations of citizens (Beiser-McGrath 2022) but might also be due to time confounding. Future research could investigate the role of such sociotropic considerations, which have been proposed to matter in related areas such as trade policy (Schaffer and Spilker 2019) or sustainable supply chains (Rudolph et al. 2023).

Second, future research could investigate how the diversion of attention to politics induced by exposure to an economic (or similar) shock, as we find it with the overall decrease in issue importance for the affected population, affects the political game at large. For instance, this could result in fractions of the population that are not affected by the economic shock to be gaining relatively more prominence in political decision-making.

Third, while our research design is tailored to provide results with high internal validity, it is an open question to what extent our conclusions travel to other contexts. We particularly

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[13] It would be very worthwhile for future research to extend a research design such as ours to measures of actual behavior. While past research has particularly relied on aggregate level data for voting behavior (e.g., Bergquist et al. 2022) – which would neither allow for individual-level measures for exposure to economic shocks nor for an experimental approach to vote choice, a key strength of our design – new options for combining survey data with digital trace data could provide for fruitful options in this regard (Stier et al. 2020).

consider three relevant dimensions in this regard: the study population, government policy, and the crisis context. While we report results for an address-based sample of the Swiss resident population, and hence are confident that we can generalize to preferences of the Swiss citizenry, this population might be particular. For example, null effects for environmental concern and policy preferences could be a consequence of higher average affluence in Switzerland, given a proposed u-formed relation between income and support for environmental policy (Vogel 2012).[14] Nonetheless, we also observe a relevant amount of low-income citizens in our sample, where the environment-economy tradeoff likewise does not materialize. Even more, comparisons from cross-country survey data show that Switzerland is comparable both regarding average levels of environmental concern (see Rudolph et al. 2022: Appendix A.4.2) and regarding preferences for regulatory policy on the environment and business in general (see Rudolph et al. 2023: Appendix A.4). In addition, we know citizens can be very attentive to how governments manage crises (e.g., Healy and Malhotra 2013). Here, the crisis seemed well managed insofar as government aid for both citizens and companies cushioned its consequences – particularly notable are the social safety net, mitigating inequality, 'short-time work compensation' programs, preventing mass lay-offs, and credit lines for companies and rent support for small and medium enterprises (Geiser 2020). This might have buffered citizens' reactions, consistent with our finding that affected citizens show no decrease in their expectations of *future* economic well-being. At the same time, this highlights that how well governments manage the consequences of economic shocks is likely crucial for voter reactions (e.g., Cole et al. 2012), here in order to sustain green policy support. Notably, while being more affluent in absolute terms, Switzerland provided government aid at a level of around the average of G20 countries (Chudik et al. 2021) and generally provides social protection benefits at about the EU average (in percent of GDP).[15] Also, the package of economic policy measures applied was – to a similar extent and effect – used in other developed, particularly European, economies (Herr and Nettekoven 2022). Last, the Covid-induced shock to the Swiss economy was severe, with a decline in GDP of around 7% in the second quarter of 2020 (annual drop of around 3%), exceeding any recession since the 1980s, including the 2008 financial crisis – though, at the same time, with a much quicker recovery within one year.[16] In international comparison, the decline and bounceback of GDP in 2020/2021 was in extent and duration comparable to the experience of other advanced economies (with an average drop of about 10% in the second quarter, see Gagnon et al. 2023). Compared to other economic downturns, while the extreme quarterly drop in GDP in 2020 resembles a severe depression, the annual GDP loss is not much different from average recessions: "In a typical recession, GDP falls by about 2¾ percent, [while depressions can be] severe, with peak-to-trough declines in output exceeding 10 percent" (Kannan et al. 2014, 243). Also, concerning duration, the Covid shock is not peculiar, as "[a] typical recession persists for about a year" (Kannan et al. 2014, 243). Taken together, our case does not stand out regarding Covid effects on the economy and government crisis management, and we expect that our results travel well to other country contexts and times with at

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[14] But note that while the Swiss median equalized disposable income is ranked third in Europe, economic inequality is in line with the EU average, as is citizens' satisfaction with their financial situation (BfS 2022a, b).

[15] See https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Social_protection_statistics_-_social_benefits

[16] See Swiss State Secretariat for Economic Affairs SECO, time series for "GDP, income approach, seasonally and calendar adjusted", 1980–2023, https://www.seco.admin.ch/seco/en/home/wirtschaftslage---wirtschaftspolitik/Wirtschaftslage/bip-quartalsschaetzungen-/daten.html

least similar levels of governmental crisis buffering and social protection – while noting that the severe drop with rapid economic bounce-back seems to be a particularity of the Covid-induced economic crisis, and it would be worthwhile to compare to recessions that last into the medium term. While credible research designs are difficult to accomplish for such events (for exceptions see, e.g., Mildenberger and Leiserowitz 2017, similarly finding no evidence for an environment-economy trade-off at the individual level), our research design hopefully provides for a useful template to study this in other countries, and for other types of economic crises.

To conclude, our results are in line with the view that governments can, with effective economic policy, sufficiently avail economic pressure that could undermine demand for stringent environmental or climate policy. However, our correlational evidence that green preferences dropped for affected and unaffected citizens alike throughout the crisis and the finding that the attention of affected citizens to political issues drops almost across the board is at the same time worrying – the former could reflect an environment-economy trade-off based on sociotropic concerns, while the latter could detach governments from the oversight of a particular subset of the citizenry, affecting to whom government is responsive to, and hence its priorities.[17]

Declarations

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[17] Through the backdoor, this could also allow for a change in the prioritization of environmental policy (see Fernández-i-Marín et al. (2022), who report such an empirical pattern).

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