



Citizen preferences on private-public co-regulation in environmental governance: Evidence from Switzerland[☆]

Dennis Kolcava^{a,*},¹ Lukas Rudolph^{a,b,2}, Thomas Bernauer^{a,3}

^a ETH Zurich, Haldeneggsteig 4, 8092 Zürich, Switzerland

^b LMU Munich, Geschwister-Scholl-Platz 1, 80539 München, Germany

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ABSTRACT

Environmental policy is touching on ever more aspects of corporate and individual behavior, and there is much debate over what combinations of top-down (government-imposed) and bottom-up (voluntary private sector) measures to use. In democratic societies, citizens' preferences over such combinations are crucial because they shape the political mandates based on which policymakers act. We argue that policy designs that involve private-public co-regulation receive more citizen support if they are based on inclusive decision-making, use strong transparency and monitoring mechanisms, and include a trigger for government intervention in case of ineffectiveness. Survey experiments in Switzerland (N = 1941) provide strong support for these arguments. Our research demonstrates that differences in co-regulation design have major implications for public support. Another key finding is that there seems to be a contradiction between inclusiveness and democratic accountability for policy outcomes. The findings are surprisingly consistent across two very different green economy issues we focus on empirically (decarbonization of finance, pesticides). This suggests that our study design offers a useful template for research that explores public opinion on green economy policy designs for other issues and in other countries.

1. Introduction

The term 'ecological overshoot' succinctly describes the discrepancy between current economic activity and nature's (re)generative capacity (Wackernagel et al., 2019), where anthropogenic environmental impacts extend well beyond levels required for the stability of ecosystems globally (Dao et al., 2018; Li et al., 2019; Mammides, 2020). One important driver of the ecological overshoot problem are externalities associated with market economic activities (Buchanan and Stubblebine, 1962; Pigou, 1920), particularly so in democracies of the global North, and with corporations (firms) as central actors (e.g. Duro et al., 2020; Peters et al., 2011; Lutter et al., 2016; Weinzettel et al., 2013).

Most governments have been laggard to respond with appropriate regulatory measures to mitigate the overshoot problem and thus 'green the economy' – mainly due to political gridlocks and distributional conflicts over societal costs of policy interventions (see, e.g. Swainson and Mahanty, 2018). This has led to renewed calls for accelerated efforts aimed at sustainable development via closer collaboration between public authorities and the private sector (Pitkänen et al., 2016; Folke et al., 2019), although such co-regulation or co-governance efforts remain contested with a view to issues of effectiveness and accountability. We thus explore under which conditions citizens, whose preferences are important for policy-choices in this respect, support public-private co-regulation in environmental governance. In

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* Corresponding author.

E-mail addresses: dennis.kolcava@ir.gess.ethz.ch (D. Kolcava), lukas.rudolph@gsi.uni-muenchen.de (L. Rudolph), thbe0520@ethz.ch (T. Bernauer).

¹ <https://orcid.org/0000-0002-5511-4094>.

² <https://orcid.org/0000-0001-8977-4480>.

³ <https://orcid.org/0000-0002-3775-6245>.

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particular, we inquire whether citizens' preferences on this subject form along the lines of theoretically important concepts of regulatory frameworks in public goods production (e.g. inclusiveness of the decision-making process, monitoring, transparency), and how citizens consider accountability issues when forming their policy preferences.

By implication, we focus on the conditions under which citizens view corporations as part of a regulatory solution in addressing environmental problems. Corporations are obviously central to production and consumption processes that bring about the overexploitation of environmental resources. They can, in principle, contribute to problem solving due to their financial means and informational advantages. Hence, they can be pivotal in speeding up (Potoski and Prakash, 2013; Thorlakson et al., 2018) or slowing down (Kinderman, 2016; Vesa et al., 2020) progress in greening economic activity. Yet, only democratically elected policymakers are in a legitimate position to hold corporate actors accountable for deficient contributions to environmental goods (Héritier and Eckert, 2008; Héritier and Lehmkuhl, 2008; Mayer and Gereffi, 2010).

Given this constellation of roles in society, environmental policies have increasingly been construed as public-private 'hybrids' that combine state-led regulatory elements with voluntary private sector action (Derx and Glasbergen, 2014; Knodt and Schoenefeld, 2020; Renckens, 2020). This trend has been documented by recent research (see, e.g. Westerwinter, 2019; Kaczan et al., 2020), and has brought forth internationally prominent examples, such as the UN Global Compact (Williams, 2004), the 'Partnership for Sustainable Textiles' in Germany (Jastram and Schneider, 2015), and dozens of public-private initiatives in climate governance (Michaelowa and Michaelowa, 2017).

However, these public-private initiatives have also been subject to political contestation (for the case of the UN Global Compact, see Sethi and Schepers, 2014). For instance, critics of public-private initiatives related to sustainability in corporate supply chains are demanding mandatory due diligence regulation – see, e.g. current debates in the EU (Smit et al., 2020), Germany (Siakala and Müller, 2020; Bonschab and Kappel, 2020), or Switzerland, where such a regulatory proposal received a majority in a national vote (but failed to reach a 'state majority') (Schöchli, 2020).

There is also much debate in the academic literature on whether business involvement in policy-making, in particular via private sector self-regulation, could help overcome political gridlocks (Baron, 2014) and contribute to greening the economy (Delmas et al., 2019). Some scholars highlight the potential merits of (voluntary) self-regulation in the private sector (Denicolò, 2008; Urpelainen, 2011) and argue that involving firms in the policy process is conducive to policy success and policy efficiency (Provost, 2012). Others note that self-regulation in sustainable development must be viewed with caution because firms tend to exhibit green behavior mainly to reduce regulatory pressure and public scrutiny of their business (Kolcava et al., 2021; Malhotra et al., 2018; Maxwell et al., 2000).

We contribute to this literature by examining whether and why particular policy design features of co-regulation efforts are likely to increase (or decrease) public support. Recent research in fact emphasizes the role of public opinion in political debates about strategies to green the economy (Bain et al., 2019; Kolcava et al., 2020). In democracies, public support is an essential source of political mandates for policymakers to intervene and address societal issues by regulatory means in the first place (Dalton, 2013; Bakaki et al., 2019; Soroka and Wlezien, 2009). In addition, however, specific policy design choices depend on the strength of these mandates, because the degree of government intervention is likely to evolve with the preferences of the median voter (see, e.g. Anderson et al., 2017; Congleton, 2004), and with public preference adjustments in response to policy output (see the so called 'thermostat model', Wlezien, 1995).

Our contribution speaks to two debates over sustainable development. First, it has been argued that private sector self-regulation can be effective in solving environmental problems as long as firms are acting

within an appropriate institutional framework that helps coordinate and ascertain collective action (see, e.g. Balleisen and Moss, 2009). We contribute to this debate by exploring which elements of theoretical blueprints in this regard are valued by the public. Second, particular forms of environmental policy and governance more generally, especially those centered on independent regulatory agencies and non-governmental actors, such as the private sector and civil society, have been controversial for allegedly lacking democratic quality and accountability (Kübler and Schwab, 2007; Skelcher et al., 2011). We assess to what extent this is actually the case from a public opinion perspective.

To test our arguments, we rely on original data from a survey administered to a representative sample of Swiss (voting age) citizens (N = 1941) in November and December 2019. In terms of the effect of public opinion on policy choices, Switzerland is a 'most direct case', as its direct democratic institutions give Swiss citizens a direct say on, and veto power over which policies are implemented. In other words, we focus on a case where citizens are used to evaluating real-world policies (Hainmueller et al., 2015). Nevertheless, the Swiss context is, by and large, comparable to other high-income countries with respect to citizens' general environmental attitudes and attitudes towards regulatory policy (see Appendix Section A.6 and Figure A.14 for a comparison based on data from the International Social Survey Programme *ISSP Research Group*, 2018). The survey was pre-registered at Harvard Dataverse.⁴ Based on a conjoint and a vignette experiment embedded in this survey, we find that inclusiveness, transparency, monitoring, and new legislation in case of (voluntary) policy failure have positive effects on public support. At the same time, though, we observe that citizens assign somewhat lower responsibility, and hence accountability, for policy outcomes to parliament, if the policy has been conceived under the inclusion of non-state actors.

2. How policy design may affect public support

Much of the literature on public support for environmental policy focuses on predictors pertaining to respondent characteristics, such as socio-demographic factors and political ideology (e.g. Drews and van den Bergh, 2016). Less attention is paid to policy design characteristics, and even less is known about the effect on public support of using particular combinations of government-led (top-down) and voluntary private-sector measures (bottom-up) (Sabel and Victor, 2017). Many studies have discussed possible advantages and disadvantages of including voluntary corporate initiatives in the design of environmental policy (e.g. Lyon and Maxwell, 2008). Some argue that voluntary self-regulation could, in principle, improve on policy outcomes achieved by 'traditional' command-and-control regulation (e.g. Ren et al., 2018). One key reason is that firms usually have an informational advantage vis-a-vis regulatory authorities concerning particular environmental impacts of economic activity (Provost, 2012; Thorlakson et al., 2018). This knowledge, paired with the incentive to maximize profit, is expected to enable firms to develop effective and relatively cost-efficient solutions to environmental problems (e.g. Mills, 2016).

Other studies point to adverse side effects and risks associated with a strong reliance on private sector self-regulation in environmental policy. Among those risks are decreased public support for more stringent (government-led) environmental regulation (Kolcava et al., 2021; Malhotra et al., 2018), reduced scrutiny in policy enforcement (Hong and Liskovich, 2016), and shirking – with firms only marginally (if at all) improving environmental performance while still trying to reap the benefits of 'appearing green' (e.g. Lyon and Montgomery, 2015). Consequently, critics argue that, absent external oversight, private sector self-regulation is unlikely to reduce environmental impacts of

⁴ Link to pre-registration file on Harvard Dataverse: <https://doi.org/10.7910/DVN/SZ10OP>.

economic activity substantially and, thus, will lead to an undersupply of environmental public goods (Ostrom, 1990).

Some scholars suggest though that policies combining the cost-efficiency of voluntary private-sector initiatives with the binding character of state-led regulation might be a meaningful solution. Several studies thus propose blueprints for the design of state-led co-regulation frameworks to tackle free-riding and shirking incentives in green economy policy (e.g. Provost, 2019). Different blueprints tend to agree that to effectively apply co-regulatory control to private sector initiatives, transparency, monitoring, and a regulatory threat – i.e. the anticipation of command-and-control regulation in the case of shirking and policy failure – are needed (Balleisen and Moss, 2009; Dauvergne, 2018). While the implications of particular policy designs (blueprints) for economic efficiency and problem solving effectiveness are a concern, generating a powerful political mandate in terms of obtaining sufficient public support is at least equally important. It remains unclear, however, whether citizens prefer co-regulation to fully voluntary firm-led environmental policy on the one hand, or to state-led command-and-control measures on the other. Accordingly, we lack evidence on the extent of co-regulation in terms of transparency, monitoring, and regulatory threat citizens would be willing to support. Moreover, we do not know much about whether citizens value extensive co-regulation frameworks in general, or whether they support them strategically, i.e. only if they have a strong preference for certain policy goals (notably, reducing a particular environmental impact). Moreover, we know rather little about the extent to which citizens appreciate the inclusion of private sector actors in policy design processes, and whether such inclusion could be at odds with democratic accountability.

The first two hypotheses (expected empirical implications) in our argument relate to the above-mentioned policy design aspects (i.e. transparency, monitoring, and regulatory threat) aimed at facilitating assessment of policy performance on the part of citizens, civil society, policymakers, and reverting to top-down government regulation if co-regulation performs poorly.

Related to this argument, we expect citizens to evaluate policies – in this case, co-regulation frameworks – in light of their perceived effectiveness, that is, their potential for improving environmental conditions (Bechtel and Scheve, 2013; Huber et al., 2020). Moreover, in line with the Environmental Kuznets Curve model and post-material values arguments, we expect the average citizen to care about and, in general, support policies that enhance environmental quality (Bradley et al., 2020; Lo and Chow, 2015; McGrath and Bernauer, 2017). We still expect, however, that citizens will vary in their environmental attitudes and support for environmental policy. Accordingly, we expect rather high support for extensive co-regulation on average, but a moderating effect emanating from environmental attitudes in general and with respect to specific environmental issues. Hypotheses H1 and H2 summarize these expectations:

Hypothesis H1. *Citizens are more likely to support a co-regulation framework if it is extensive, i.e. if it includes transparency and monitoring provisions as well as a regulatory threat in case voluntary action turns out to be ineffective in problem solving.*

Hypothesis H2. *Citizens are particularly likely to support extensive co-regulation if they hold strong preferences in favor of environmental problem solving – be it concerning the environment in general, or be it concerning specific environmental problems.*

Many studies show that, besides regulatory design as such, the properties of policy-making processes matter for public acceptance as well (Bernauer and Gampfer, 2013; Bernauer et al., 2019). On the one hand, we argue that inclusive decision-making – i.e. decision-making involving multiple societal stakeholders – may be perceived as increasing responsiveness to societal needs (e.g. by including otherwise potentially marginalized stakeholders). On the other hand, inclusive decision-making may also improve on the expected environmental

outcome resulting from a policy, as it takes advantage of information and know-how available to societal stakeholders (e.g. firms), thereby increasing problem solving capacity (Bernauer and Gampfer, 2013; Beyers and Arras, 2020; Jäske, 2019).

The effect of civil society participation deserves particular attention in this regard. It can have both effects stated above. In particular, though, civil society involvement may also help increase the level of (societal) accountability of firms (e.g. McDonnell et al., 2015). Potentially, such societal ‘checks and balances’ may even be perceived as a safe-guard against regulatory capture and shirking by the business sector. If, indeed, citizens support civil society involvement due to its effect on corporate accountability, we should observe that support by individuals with stronger environmental attitudes particularly depend on civil society involvement in decision-making. Hypothesis H3 reflects these arguments.

Hypothesis H3. *Citizens are more likely to support co-regulation if it is inclusive, in the sense of involving non-state stakeholders in the decision-making process.*

Alternatively, if citizens believe that business sector involvement could compromise environmental quality (e.g. due to regulatory capture, shirking, see above), and other stakeholders cannot ameliorate this problem, we should observe that citizens do not support inclusive decision-making. In that case, they are more likely to support command-and-control measures, i.e. measures set top-down by government/parliament.

Despite potential upsides, multi-stakeholder governance by means of co-regulation is politically controversial also because of a potential dilution of accountability of elected representatives vis-a-vis citizens (Bekkers et al., 2016; Papadopoulos, 2003). We thus investigate whether this is actually the case from citizens’ perspective. In principle, a wider range of actors who jointly design and implement a co-regulation policy (in a bottom-up process involving multiple stakeholders), may reduce the extent to which citizens can hold elected politicians accountable for policy output and performance. The simple reason is that responsibility becomes diffused amongst multiple actors. Hence, irrespective of whether citizens prefer accountability over inclusiveness, or vice versa, we hypothesize that additional stakeholders’ inclusion may dilute accountability. If such a trade-off exists, we should observe that:

Hypothesis H4. *Citizens’ perceived responsibility of elected politicians for policy out-comes decreases when non-state stakeholders are involved in the decision-making process.*

3. Methods

To test these arguments, we implemented a conjoint (Hainmueller and Hopkins, 2015) and a vignette experiment (Mutz, 2011). We embedded these experiments in a survey fielded between November 20 and December 10, 2019, in Switzerland. The quota sample for the survey was drawn from Intervista’s online panel. Non-quota characteristics such as environmental concern and political attitudes are very similarly distributed in our sample when compared to an address-based dual-mode sample of the Swiss population (see Appendix Figure A.13).

We sampled Swiss citizens (N = 1941) of age 18 or older (eligible to vote). The quotas were set on age and gender (interlocked), education, and regional provenance to mirror distributions of these parameters within the Swiss voting population. The survey was administered in the country’s three main languages: German, French, and Italian. The procedure and survey instrument were approved by the ETH Zurich’s Ethics Review Commission (decision EK 2019-N-143).

Concerning the empirical measures for our theoretical concepts, the conjoint experiment serves to test Hypotheses H₁ and H₂, where we argue that citizens support more extensive co-regulation frameworks, and Hypothesis H₃, which holds that citizens prefer decision processes on co-regulation to include non-state stakeholders. Respondents were

asked to complete five choice tasks in which they had to compare and choose between two policy proposals, A and B, presented side by side. Each consisted of four policy attributes expressing different combinations of private sector self-regulation with state co-regulation aimed at reducing the environmental impact of a particular economic sector. The expressions on the attributes composing policies A and B were drawn randomly from the full set of attribute expressions, as shown below.

Three items were used to capture preferences concerning the policy proposals presented. For the main outcome (response) variable in the conjoint experiment, respondents were asked to indicate which of the two policy proposals they prefer (forced choice). We then asked respondents to indicate which policy they regarded as more effective in environmental problem solving terms (perceived effectiveness), and which policy they regarded as more responsive to what society wants (perceived responsiveness). The policy preference item was always presented first, the order of the other two response items was randomly assigned per respondent and then kept identical across all five choice tasks. Appendix Figure A.3 depicts such a choice task, and Appendix Figure A.4 illustrates the response items as displayed to survey participants.

To make the experiment realistic, easy to grasp, and relevant from a policy viewpoint, we decided to focus on two specific green economy issues, rather than a stylized, generic policy scenario. Specifically, we confronted respondents with climate-damaging investments by the financial sector and the overuse of pesticides in the agricultural sector. We have no theoretical expectations on how policy design preferences of citizens might differ across these two issues. Rather, we chose the two issues with a 'most different case design' logic in mind (e.g. [Engelmann et al., 2019](#)). To the extent the results are similar across these two different issues, we can have greater confidence in the relevance of our findings across different green economy issues.

Respondents were randomly assigned to one of the two green economy issues, for which they completed all experimental components of the survey. Before entering the sequence of choice tasks, respondents were provided a text to read about the respective issue. These texts were excerpts from actual (mainstream) newspaper coverage and summarized the most important aspects of the issue. On the next screen, respondents were given information that the national government has set a target stating by how much environmental impacts in the financial/agricultural sector should be reduced (e.g. reducing financial investments in fossil fuel based companies by 70% by 2050). We chose these targets to correspond to targets actually relevant to political debates in the country (we provided respondents with links to official information on current policy (debates) concerning the green economy issues covered at the end of the survey). Then, respondents were introduced to the policy attributes and their potential levels (expressions). We told respondents that these were different options for working towards the government-set target. [Table 1](#) summarizes all conjoint attributes. Appendix Section A.2 provides an English translation (from German) of the information respondents were given about the green economy issues and each of the attribute levels.

The first attribute ('decision attribute') denotes who decides on the specific measures to be implemented (see H_3). Increasing the number of actors involved in the decision-making process increases its inclusiveness. Accordingly, if Hypothesis H_3 holds, we expect public support to increase as the number of decision makers increases. Attributes two to four serve to test H_1 and H_2 . The second attribute ('transparency attribute') indicates how firms are to report on their environmental progress. Making environmental reporting by the private sector *public* increases reputation stakes for firms, which in turn is likely to increase the effectiveness of a policy. The third attribute ('monitoring attribute') identifies if the accuracy of corporate reporting will be monitored, and if yes by whom. Monitoring increases the degree to which authorities and civil society are able to hold firms accountable. The fourth attribute ('regulatory threat attribute') specifies at what point the government would implement binding (top-down) regulation if firms fail to meet the

Table 1
Overview of co-regulation attributes in conjoint experiment.

Attributes	Levels
Decision: Who decides on specific measures?	<ul style="list-style-type: none"> • Firms only • Parliament only • Firms and Parliament • NGOs and Parliament • Firms and NGOs • Firms, NGOs and Parliament
Transparency: How are firms to report on their progress?	<ul style="list-style-type: none"> • Non-public (confidential) report • Public report
Monitoring: Will corporate reports be monitored?	<ul style="list-style-type: none"> • No monitoring • Yes, by federal administration only • Yes, by NGOs only • Yes, by federal administration and NGOs
Regulatory threat: Will the government introduce binding regulation if firms fail to meet target?	<ul style="list-style-type: none"> • No regulation • Yes, binding regulation by 2045 • Yes, binding regulation by 2035 • Yes, binding regulation by 2025

target, i.e. regulatory threat. A regulatory threat increases pressure on firms to contribute to environmental problem solving and also puts pressure on free-riders in the respective sector. Hence, it should make a policy more effective and thus increase public support. For conjoint attributes two to four, we expect, if Hypothesis H_1 holds, that policy support *increases* with the attribute levels.

In Hypothesis H_2 , we argue that support for extensive co-regulation is influenced by citizens' level of interest in environmental problem solving. We employ a two-pronged approach to measure this preference. On the one hand, we measure respondents' general concern for the environment, implementing the scale developed by [Diekmann and Preisendörfer \(2003\)](#). On the other hand, we confronted respondents with a list of environmental problems currently relevant both in Switzerland and abroad, all of them at least partially caused by Swiss economic activity (see Appendix Section A.1). We then asked respondents to select the three green economy issues they perceived as most salient. We differentiate respondents' policy preferences by estimating the conjoint results for respondent subgroups separated at tertile values of environmental concern, and for respondent subgroups perceiving the green economy issues treated in the survey experiment as (not) salient.

Concerning the empirical measures for Hypothesis H_4 , where we propose that citizens perceive elected representatives as less responsible for policy outcomes if those policies have been jointly designed by multiple stakeholders, we conduct a vignette experiment. After respondents had completed the conjoint experiment, we reminded them of the government-set target for the respective issue (see above) and confronted them with a hypothetical policy scenario of intermediate regulatory extent, identical for all respondents (within a given green economy issue group). The hypothetical policy scenario consisted of *public reporting, monitoring by the federal administration, and introduction of binding regulation by 2030 if co-regulation performed poorly*. Appendix Section A.3 includes an English translation of this scenario

We added four treatment vignettes to this otherwise constant policy scenario. These vignettes varied on two dimensions, with respondents randomly assigned to one of the vignettes. First, the treatments differed on whether the policy was set *top-down* by parliament, or whether it was co-designed *bottom-up* by corporate and civil society representatives before being accepted by parliament. Second, the treatment varied on whether it included an emphasis frame that a top-down (bottom-up) process strengthens (dilutes) accountability. [Table 2](#) summarizes our vignette design. Appendix Section A.3 includes English translations of

Table 2
Overview of top-down vs. bottom-up policy treatment vignettes.

Treatment	1	2	3	4
How was the policy decided upon?	Top-down, by parliament	Top-down, by parliament	Bottom-up, with stakeholders	Bottom-up, with stakeholders
Information on accountability?	No mention	Yes, emphasis on parliament's accountability	No mention	Yes, emphasis on dilution of accountability

all treatment texts.

Following the treatment, we asked respondents to rate the policy on a 7-point Likert scale. In a final step, respondents were randomly assigned to a scenario indicating either the policy's success or failure. They were then asked to pick at least one and a maximum of three actors from a list and rank those actors according to their responsibility for meeting/missing the target (see Appendix Section A.3). Thus, if Hypothesis H₄ holds, we expect respondents who were assigned to the bottom-up policy scenario to indicate lower levels of responsibility of elected representatives.

In the conjoint experiment, given two policies each in five choice tasks, our sample of 1,941 respondents generated 19,410 observations. We estimated average marginal component effects (AMCEs, see Hainmueller et al., 2014) and marginal means (Leeper et al., 2020) to analyze the data resulting from the five choice tasks. The estimation of AMCEs employs the following linear regression model:

$$Y_{ijk} = \alpha + \delta D_{ijk} + \gamma T_{ijk} + \lambda M_{ijk} + \theta R_{ijk} + \varepsilon_{ijk} \quad (1)$$

Y_{ijk} is an outcome (e.g. the binary policy choice) recorded for respondent i concerning the j th policy in the respondents k th choice task. The coefficients δ , γ , λ , and θ represent the estimators for the AMCEs, depending on the levels of the attributes 'decision' D , 'transparency' T , 'monitoring' M , and 'regulation' R . The coefficients represent the average effect of a change from the baseline attribute level on the probability of a policy being chosen (Louviere et al., 2000). Standard errors are clustered by respondent. We further calculate marginal means (Leeper et al., 2020), which report the average choice probabilities across all policy combinations in which specific attribute levels were presented to respondents. Following the recommendation of Leeper et al. (2020) we also employ this approach to analyze respondents' preferences in subgroups (e.g. with different levels of environmental concern).

Concerning the vignette experiment, we analyzed the data by comparing conditional means for the bottom-up vignette treatments. We did so by estimating a linear regression model of the following form:

$$Y_{ni} = \beta_1 + \beta_2 T_{2i} + \beta_3 T_{3i} + \beta_4 T_{4i} + \varepsilon_i \quad (2)$$

Y_{ni} represents a response by participant i on survey item n (dependent variable is a binary indicator of whether parliament was seen as accountable in the ranking task). The baseline were the top-down treatments (see Table 2). The constant β_1 can be understood as the average support absent any treatment and given a top-down framework. The coefficients β_2 to β_4 indicate treatment effects for the binary vignette treatments T_2 to T_4 . Appendix Section A.7 lists the software used in the analysis.

4. Results

We first investigate whether citizens are more likely to support extensive co-regulation (with respect to transparency, monitoring, and regulatory threat (H₁)), and whether they are supportive of inclusive decision-making in co-regulation (H₃). In a second step, we examine whether citizens' environmental preferences moderate the effect of policy design features on support levels (H₂). Finally, we assess whether citizens perceive a trade-off between inclusiveness and accountability (H₄).

4.1. Effects of inclusiveness and extent on policy support

Fig. 1 displays marginal means for policy support (i.e. average choice probabilities given specific attribute levels) pooled across green economy issues (see Appendix Figure A.5 for the respective AMCEs). Concerning the inclusiveness of decision-making, respondents show strong support for co-regulation if a multitude of actors is involved. Average support levels range from around 32% with *Firms only* to around 53% if at least two actors co-design the policy, to around 65% with decision-making by *Firms & NGOs & Parliament*. Moreover, respondents show a strong preference for inclusion of non-governmental stakeholders, compared to decision-making by parliament alone (support of about 43%). We do not find substantive differences between the marginal means for the *Firms & NGOs* (0.52), *Firms & Parliament* (0.53), and *NGOs & Parliament* (0.55) attribute levels.

Turning to the attributes capturing the extent of regulation, we find that public support increases as the regulatory extent increases. For transparency, a *Public report* increases support by 13 percentage points over a *Confidential report*. Respondents also show strong support for monitoring of firm behavior by third-party actors. Monitoring by *Administration only* (52%) or *NGOs only* (50%) garners significantly more support than *No monitoring* (37%). Monitoring by *Administration & NGOs* obtained the highest support (60%). Finally, we observe that respondents support a regulatory threat sooner rather than later. Regulation from *2025 (2035, 2045)* on significantly increases support by 18 (12, 5) percentage points compared to the *No Regulation* attribute level. Note that only regulatory threats from *2035* on and from *2025* on move support levels above 50% on average.

In sum, our findings support Hypotheses H₁ and H₃. Citizens prefer extensive environmental co-regulation of corporate activity by subjecting firms to transparency and monitoring requirements and adding a near-term regulatory threat in case of (voluntary) policy failure. Moreover, citizens value the involvement of multiple stakeholders in regulatory decision-making. Notably, we observe a substantial increase in public support from the *Firms & Parliament* attribute level to the *Firms & NGOs & Parliament* level, and at the same time, respondents prefer monitoring by *Administration & NGOs* over monitoring by the *Administration only*. The latter might be an indication of respondents valuing the additional societal accountability of firms that civil society can contribute to environmental governance.

4.2. Green economy issues and mechanisms

We report results for each green economy issue separately in Appendix Figure A.6. We find only minor differences between the two issues. Given that the two issues differ very much in terms of stakeholders, economic implications, and other factors, this suggests that our results are likely to be relevant to a broader set of green economy issues. In Appendix Figures A.7 to A.10 we show results for our additional dependent (outcome) variables that provide insights into potential mechanisms underlying the hypothesized effects – perceived effectiveness and perceived responsiveness. Overall, the conjoint attributes relate to all three outcome variables with a similar pattern, indicating that the calculus of the respondents is similar (at least in our survey framework) for preferred choice, perceived effectiveness and perceived responsiveness of a policy proposal.

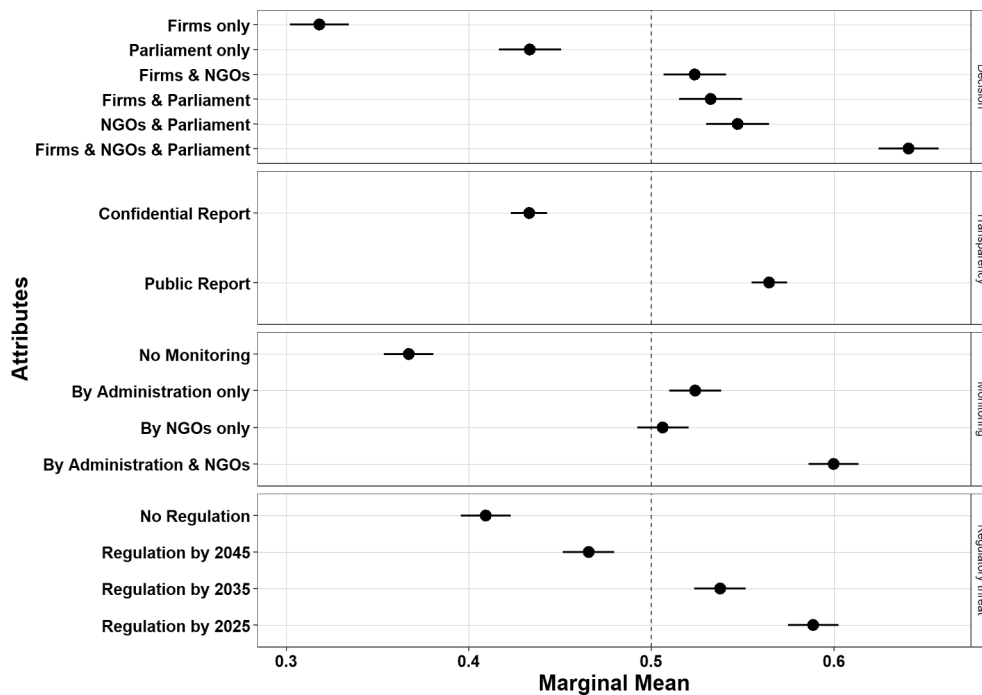


Fig. 1. Marginal means from conjoint choice experiment for dimensions decisionmaking, transparency, monitoring and regulatory threat, with 95% confidence intervals (respondent level clustered standard errors). Individual choice based on preference towards a policy proposal is the dependent variable.

To further probe into the causal underpinnings of the results, we collected additional information on respondents’ attitudinal priors and presumptions about inclusive policy-making (see also Appendix Section A.5). We asked citizens to indicate their agreement with statements that “When parliament, business and environmental associations work closely together, the political decisions are... a) better for firms”, b) “better for citizens”, and c) “more comprehensible for citizens”. For all three items, respondents indicated a rather positive assessment of inclusive policy design – the mean and median are both well above the middle category (see Fig. 2). This aligns with our main findings in the conjoint experiment, and the finding for the perceived responsiveness mechanism insofar as policies are perceived to be more reflective of what citizens want.

4.3. Environmental preferences and policy combinations

Marginal means analysis further allows us to examine differences between subgroups and thus test Hypothesis H₂. The left panel of Fig. 3 illustrates marginal means pooled for the two green economy issues at tertiles of respondents’ environmental concern. The right panel displays marginal means for subgroups of respondents who did (‘high saliency’) and did not (‘low saliency’) mention their assigned green economy issue (finance, pesticides) among their three most salient green economy issues (prior to being introduced to ‘their’ issue for the experiments). The separate analyses depicted in the left and right panels allow us to leverage our two-pronged measurement of respondents’ environmental attitudes (see Methods Section). For all attributes, interest in problem solving (irrespective of measurement in terms of saliency or environmental concern) increases support for extensive co-regulation. Differences are modest for the transparency and monitoring attributes, where a Confidential report as opposed to a Public report and Monitoring (by the administration and/or NGOs) as opposed to No monitoring results in slightly higher support levels with higher interest in problem solving. Differences are sizable for the regulatory threat attribute: Preferences shift in favor of (against) a more near-term regulatory threat (no regulation) with increasing environmental concern/high saliency of the environmental issue. Hence, the evidence corroborates Hypothesis H₂.

Respondents with a stronger interest in problem solving are, on average, more likely to support extensive co-regulation frameworks.

It is noteworthy that high (low) environmental concern/saliency go hand in hand with a preference (distaste) for NGO monitoring and NGO inclusion in decision-making. Specifically, we find that respondents with a strong interest in environmental problem solving hold an absolute preference for highly inclusive policy designs, but a relatively weaker preference for designs that emphasize firm (as opposed to NGO) involvement in decision-making. This indicates that Hypothesis H₃ also applies to citizens with a strong interest in environmental problem solving, and cuts against alternative expectations that such citizens should have a strong preference for top-down command-and-control measures. Nonetheless, the value that respondents with a high interest in environmental problem solving assign to NGO participation corroborates that NGOs contribute to a higher perceived level of corporate accountability which parliament alone cannot provide.

4.4. Trade-offs between policy features

Overall, our findings provide nuanced insights into the type of political mandate citizens are willing to endow policymakers with to implement green economy policies. Lastly, we investigate whether specific attribute combinations are complementary or substitutional to each other. Fig. 4 depicts shares of public support for particular combinations of attribute levels – i.e. policy characteristics – in our conjoint experiment. For example, a share of 50% in Fig. 4 indicates that a policy combination was ‘preferred’ in half of the choice tasks in which it was part of the choice set (of two policies). Accordingly, Fig. 4 highlights the following findings: First, the pool of policies supported by a majority of respondents increases in a mostly linear-additive fashion as the decision-making mode becomes more inclusive, and as regulatory extent increases. This indicates that a policy’s inclusiveness can compensate for lesser regulatory extent, and vice versa. Second, some policy design features related to regulatory extent can compensate for each other; others are dependent on levels of co-features. This finding suggests that some policy elements can be thought of as complementary, and others as substitutes in respondents’ utility function. For example, a policy

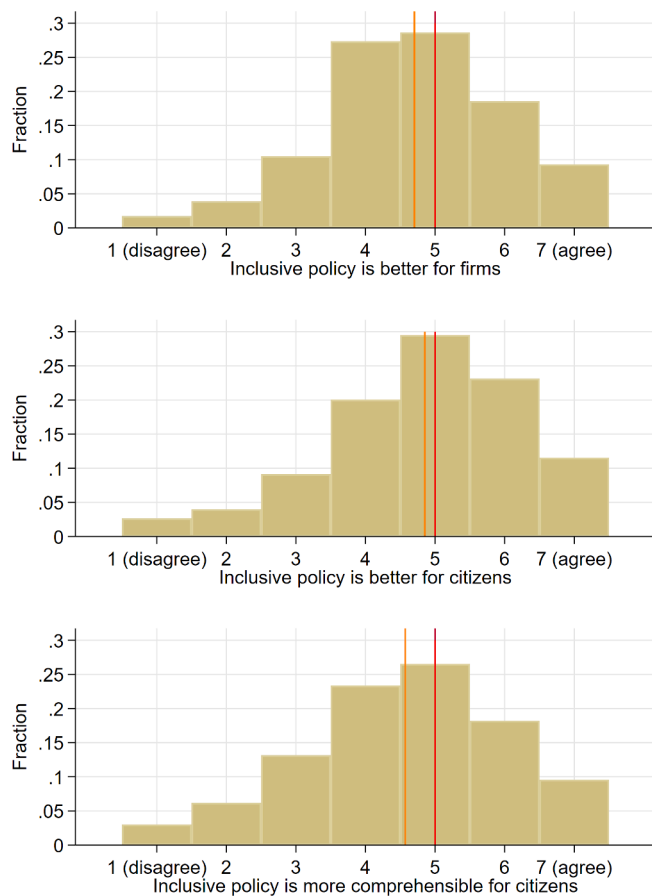


Fig. 2. Distribution of respondents' evaluations of statements about inclusive policy design on 7-point scales. Red (orange) line depicts median (mean) responses. Wording of survey item: "When parliament, business and environmental organizations work closely together policy decisions are made... a) which are better for firms b) which are better for citizens c) which are more comprehensible for citizens." Number of observations by panel: Top N = 1847, middle N = 1881, bottom N = 1862.

combining a regulatory threat by 2025 and monitoring by *Administration & NGOs* has one of the three highest choice shares across all decision-making modes, despite relying on a *Confidential report*.

4.5. Trade-off between accountability and inclusiveness?

Finally, we turn to the question whether stakeholder inclusion can change the accountability of elected representatives by reducing the extent to which citizens perceive elected politicians as responsible for policy output and performance (as proposed in H_4).

This is indeed what we find – we presented respondents with a hypothetical, moderate policy scenario in which we included an experimental vignette for whether A) a broad parliamentary majority adopted the policy (top-down), or whether B) a broad parliamentary majority appointed a commission of business and NGO representatives and adopted the policy upon their proposal (bottom-up). We then asked respondents to what extent they see parliament as responsible for the policy outcome.

As shown in the top-most panel of Fig. 5, the degree by which respondents perceive parliament as responsible (on a 4-point scale) decreases with the inclusive policy vignette (left panel), as does the share of respondents who perceive parliament as responsible at all (right panel, binary indicator whether parliament is chosen among the top 3 most responsible actors). This decrease is statistically significant (at the 5% level), but only moderate in size. In the left panel, the coefficient size

amounts to about 11% of the dependent variable's standard deviation. In the right panel, perceived responsibility decreases by about 5 percentage points.

Does this trade-off between accountability and inclusiveness hold in differing scenarios? The middle and bottom panels show effects for additional experimental subgroups. First, to examine the hypothesized trade-off both for negative and positive policy outcomes, we assigned a random policy success vs. failure vignette. The direction of outcomes makes no difference for the observed shift in perceived responsibility, though. Second, concerning the green economy issue, responsibility is perceived to decline in both cases, with a slightly stronger decline (though not significantly so) for the green finance issue when compared to the pesticides issue. Third, we added an emphasis frame that explicitly highlighted that inclusive decision-making could weaken accountability. This frame does not significantly moderate responses. Hence, respondents are probably already aware that an inclusive policy design might reduce accountability, irrespective of emphasis. In brief, for both green economy issues and irrespective of a success or failure scenario, bottom-up designs seem to be associated with reduced perceived responsibility/accountability of parliament.

5. Conclusion

Should government regulation and/or private sector self-regulation be the preferred strategy for greening the economy? Previous research on green economy policy has usually approached this question from an 'either-or' perspective and has identified potential trade-offs between the two – e.g. potential crowding out of public demand for government intervention because of (pre-emptive) private sector self-regulation (Malhotra et al., 2018; Kolcava et al., 2021). In this paper, we adopt a more comprehensive perspective inspired by the literature on hybrid governance (Tosun et al., 2016; Westerwinter, 2019). We do so in light of current multi-stakeholder efforts, both at national and international levels, where private and public regulation is combined, and different types of actors jointly engage in decision-making and policy implementation (see, e.g. Newton et al., 2013; Partzsch et al., 2019; Pitkänen et al., 2016).

We start with the assumption that firm-based solutions to environmental problems could be more efficient in principle (e.g. due to informational advantages), but that companies often lack incentives for effective policy implementation (e.g. due to competitive pressure and sectoral coordination failures) (Olson, 1965). A blueprint for organizing sustainable development could, therefore, consist of combining voluntary private sector initiatives with extensive oversight by government and a regulatory threat to provide strong incentives for policy implementation (see, e.g. Balleisen and Moss, 2009; Dauvergne and Lister, 2012).

However, besides achieving the intended environmental outcomes in an efficient and effective manner, policymakers seeking to 'green the economy' also need to be concerned with receiving a sufficiently strong political mandate by citizens. Based on evidence from a conjoint experiment in Switzerland, we find that, overall, differences in policy design have major implications for public support. In combination, variation in policy design features causes the rates at which co-regulatory designs are chosen in the conjoint experiment to shift from around 10% for the least popular up to around 90% for the most popular co-regulatory design.

Concerning our singular dimensions of co-regulation, on average, variation in inclusiveness changes support levels by up to 33 percentage points, whereas variation in transparency shifts support levels by 13 percentage points. Moreover, variation in monitoring changes support levels by up to 23 percentage points and variation in regulatory threat shifts support levels by up to 18 percentage points. Hence, the findings presented in this paper show that citizens prefer self-regulatory frameworks that include strong government provisions for assessing progress and stepping in if voluntary measures perform poorly. These preferences

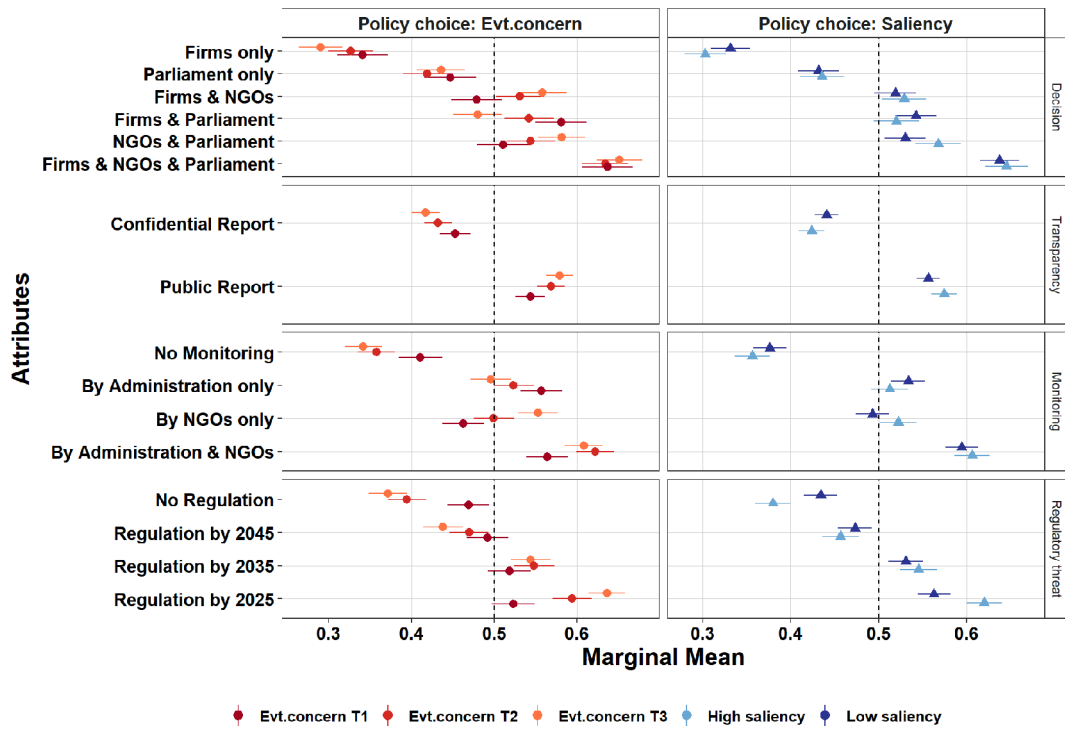


Fig. 3. Marginal means from conjoint choice experiment for dimensions decisionmaking, transparency, monitoring, and regulatory threat with 95% confidence intervals (respondent level clustered standard errors). Individual choice based on preference towards a policy proposal is the dependent variable. Marginal means are shown separated for subgroups at different levels (tertiles) of environmental concern (light orange: high, dark orange: medium, red: low environmental concern); and for subgroups including (light blue, 'high saliency') and not including (dark blue, 'low saliency') their assigned green economy context in their top three salient green economy issues list.

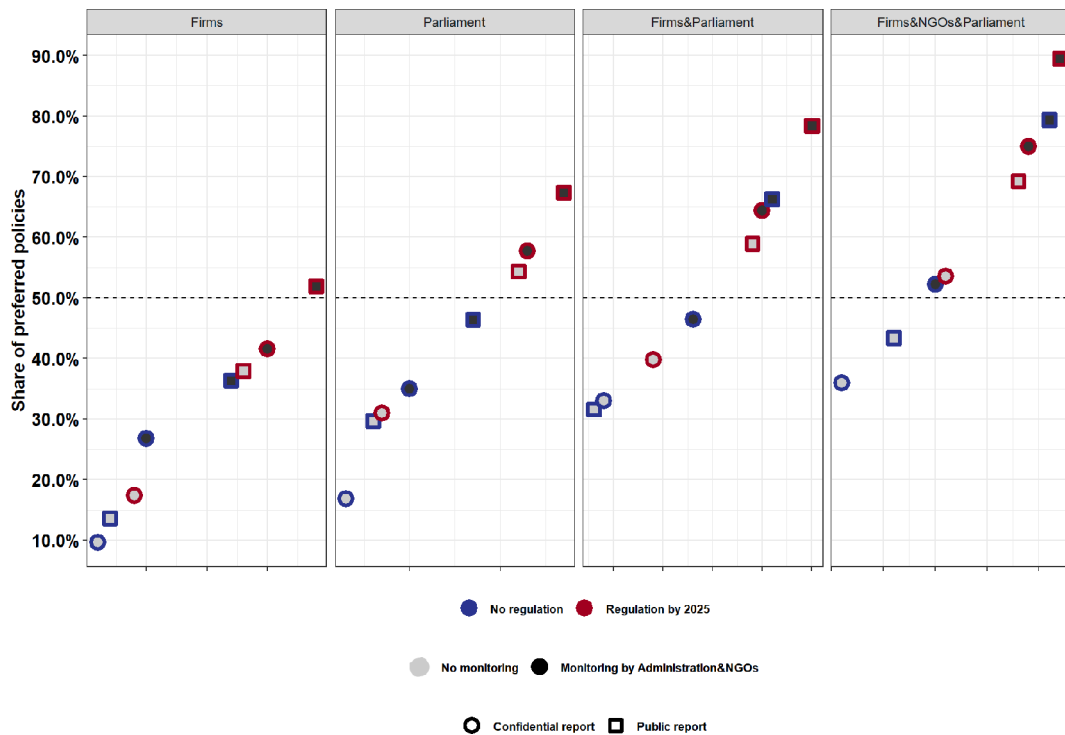


Fig. 4. Choice shares of particular policy combinations in the conjoint experiment. The y-axis depicts the percentage at which specific policy combinations were "preferred", i.e. chosen, across all choice tasks. The point markers are visually differentiated by reporting (shape), monitoring (fill), and regulatory threat (shape colour). The panels indicate different modes of decision-making.

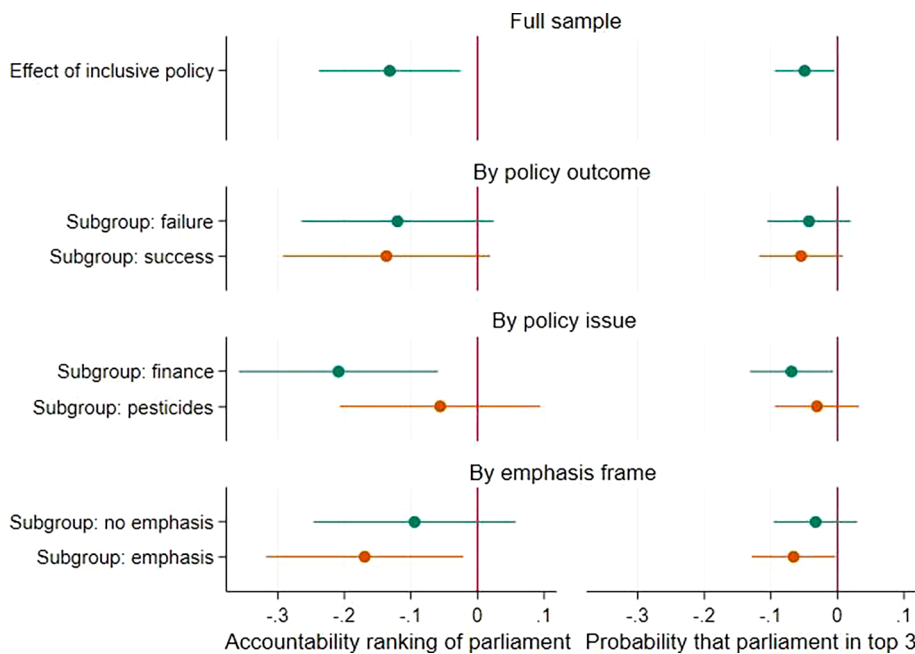


Fig. 5. Effect of bottom-up vs. top-down policy design on the perceived responsibility of parliament for the policy outcome. Left panel: Rating parliament on a scale from 0 (not among top 3 responsible actors), 1 (third-most responsible), 2 (second-most responsible) to 3 (most responsible actor) is the dependent variable. Right panel: Probability that parliament is ranked among the top 3 most responsible actors (binary indicator) is the dependent variable. The top-most panel shows results for the full sample; in the panels below, subgroup effects for experimental variations of the policy scenario are depicted. 95%-confidence intervals shown. Full sample N: 1909; Policy subgroup outcome N: Failure N = 958, success N = 951; Issue subgroup N: Finance N = 961, Pesticides N = 948; Emphasis subgroup N: No emphasis N = 956; Emphasis N = 953.

are even more pronounced amongst citizens with a strong personal interest in (environmental) problem solving. We further show that citizens prefer multi-stakeholder decision-processes, i.e. the inclusion of firms and civil society in decision-making on co-regulatory frameworks. Future survey experimental work building on our findings could try to identify in more detail the mechanisms driving public preferences in favor of civil society involvement in green economy policy. In sum then, citizens appear to be most willing to endow policymakers with an environmental policy mandate characterized by robust government oversight whilst maintaining inclusive decision-making structures.

Critics of co-regulatory approaches have noted that hybrid modes of governance could dilute democratic accountability (Bernstein and Cashore, 2007; Mattli and Büthe, 2005). In line with this literature, we find that more inclusiveness in co-regulation decreases the extent to which citizens hold policymakers accountable for policy performance, although the effects are moderate in size. Future research could explore how ‘scope conditions of democracy’ factor into the assignment of accountability. The policy vignette in our study focuses on the perception of accountability of parliament as such, and not of the ruling party. Thus, whether and how the accountability of incumbent/opposition parties in parliament is affected by hybrid modes of governance is a promising area for additional research. Moreover, the assignment of responsibility could also depend on the political orientation of respondents, and to what extent it aligns with parties/individuals in government. Along these lines, another area of future inquiry could be how citizens perceive the responsibility of different government levels in federal systems.

Finally, as is very common in public opinion research, we focus on one country in order to understand in-depth how citizens form their preferences with respect to particular forms and issues of environmental governance. Yet, we believe that our findings have broader implications, notably because they are consistent across two very different green economy issues (decarbonizing finance, minimizing pesticide use in agriculture). Our research could thus provide a useful template for conducting similar studies in other countries and for additional green economy issues, including those where transnational supply chains need to become more sustainable to mitigate total environmental impacts of consumption (Kaczan et al., 2020).

Data and code availability statement

Statistical replication materials (code and data) are available on Harvard Dataverse: <https://doi.org/10.7910/DVN/J2YAHR>.

Ethics statement

Respondents provided their informed consent. The study design was approved by the Ethics Review Commission of ETH Zurich (decision EK 2019-N-143).

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.gloenvcha.2021.102226>.

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