Mass Support for Dynamic Climate Policy

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December 18, 2018

Study Information

1. Title: Mass Support for Dynamic Climate Policy
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3. Research Questions
   - 3.1. What is the level of support for dynamic climate policy?
   - 3.2. To what extent does climate policy support reflect time preferences, risk preferences, reciprocity, inequality aversion, and the distribution of costs over time?
   - 3.3. Does climate policy support depend on the magnitude of costs to households?
   - 3.4. Does climate policy support depend on the timing of incurring costs from policy change?
   - 3.5. Does climate policy support depend on the policy mix (adaptation vs. mitigation)?
   - 3.6. Does climate policy support depend on the implementation of these same policies in other major economies?
   - 3.7. Do conjoint results depend on how many profiles are presented to respondents simultaneously?
   - 3.8. Do voters have transitive policy preferences?
   - 3.9. What is the correlation between measures of time and risk preferences when measured using different approaches (convex time budget, self-assessed)?
   - 3.10. Does climate policy support depend on expectations about the benefits or effectiveness of climate action?
   - 3.11. What is the relationship between policy support and expectations about policy effectiveness?
   - 3.12. What effects individual expectations about climate action effectiveness?
   - 3.13. To what extent to the answers to the questions above differ across subgroups including partisanship, ideology, knowledge, sex, race, education, age, parental status, income, other sociodemographic characteristics, fairness norms and beliefs, subjective assessments of economic and environmental conditions, objective economic and environmental conditions, and policy priorities?
   - 3.14. Does support for local infrastructure investment depend on time preferences or other factors?
   - 3.15. What is the preferred mix of adaptation and mitigation policy interventions?
   - 3.16. What is the effect of multilateralism on expectations about policy impact?

Study Design and Sampling Plan

4. Study design

This is a cross-sectional, single wave survey that includes randomized conjoint experiments and various vignette experiments that generate within-subjects and between-subjects variation.

5. Data

As of the date of submission, the data collection has not been started and none of the data has been quantified, constructed, observed, or reported by any of the researchers.

6. Data collection procedures.

We will field the online survey to a representative sample of the adult population in the US. Respondents will be recruited via YouGov. Subjects will be compensated. The surveys will be fielded in December 2018 and January 2019.

7. Sample size

About 4,000.

8. Sample size rationale

The sample size is mainly driven by power considerations. Since we include several experiments, we would like to make sure to have enough observations in the various treatment conditions (see below).

9. Stopping rule

We will stop sampling once we have reached at least the targeted number of observations and the sociodemographic quotas. In practice, YouGov employs matched sampling which means that it will oversample and then match down to approximately 4,000 observations.

10. Blinding

Respondents will not know the treatment group to which they have been assigned.

Survey Instrument and Analysis

Climate Costs Distribution Experiment

This is a vignette experiment that randomly assigns average household costs of climate action in a hypothetical climate agreement and asks respondents to indicate how strongly they support this agreement.

“As you probably know, many experts say that countries should take action to address global warming.

Generally speaking, how strongly do you support or oppose [your country] joining an international agreement to reduce greenhouse gas emissions if implementing the agreement would mean that each household would have to pay $[53, 107, 213, 267] more per month through, for example, higher energy prices.”

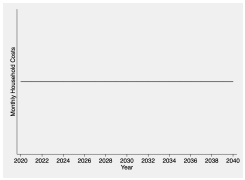
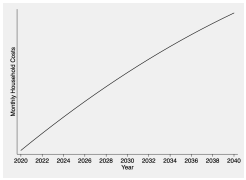
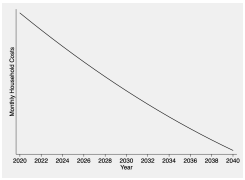
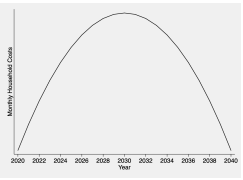
Answer scale: Strongly support (1),…, strongly oppose (10)

We will estimate the effect of household costs by regressing support on the treatment categories (less the default category) and the treatment categories, with sociodemographic controls. We will also interact the household cost treatment categories with time preference measures described below.

Dynamic Climate Cost Path Preferences

This is a stated preference item that asks respondents how they would like to distribute the costs of climate action over time.

"Regardless of your previous answer, suppose United States is going to implement that international agreement and the household costs would still be $[same costs as above] on average. However, there are different ways of distributing these costs over time. The figures below indicate four alternatives. If you had to select one of the options in a referendum, which would you chose? Please carefully consider the available options. In addition, you can rate each option individually."

Option 1	Option 2	Option 3	\Option 4
[constant costs graph] 	[increasing costs graph] 	[decreasing costs graph] 	[inverse U costs graph] 
Costs remain the same over the entire period.	Costs are lower initially and higher later.	Costs are higher initially and lower later.	Costs are lower initially, higher in the middle, and lower later

Please let us know why you chose this response."

We will estimate the level of support for each of the cost path alternatives and model this preference in a regression as a function of the costs, time and risk preferences and other covariates such as environmental and political attitudes and sociodemographics.

Dynamic Climate Policy Conjoint

We estimate preferences over global climate action in randomized conjoint experiments. The attributes and attribute levels are given below. We reshape the data so that each observation corresponds to an individual choosing or not choosing a given scenario choice. We then regress this dichotomous choice variable on dummy variables for each attribute level, less the base category for each dimension. We will model individual preferences as a function of the attributes and perform additional tests that examine the sensitivity of the results across subgroups, specifically, partisanship, ideology, knowledge, sex, race, education, age, parental status, income, other sociodemographic characteristics, fairness norms and beliefs, subjective assessments of economic and environmental conditions, objective economic and environmental conditions, and policy priorities. These subgroup analyses will be conducted by running the

baseline specifications on each subgroup of interest. We also plan on estimating individual-level sensitivities using a Bayesian hierarchical model which allows us to investigate subgroup heterogeneity conditioning on other individual-level characteristics.

There are two main versions of the conjoint. The Climate Cost Path Conjoint is administered to a random half of all respondents while the other half receives the Climate Cost Timing Conjoint. Within this conjoint version, we randomize whether respondents receive a conjoint that shows them 2, 3, or 4 options simultaneously.

In addition, there is block randomization of two sets of attributes. The US block and the "other major economies" block. The order of these two blocks and the order of the attributes within each block are randomized within individuals. For all conjoints, subjects will make 10 sets of choices.

In the United States:
For the climate cost path conjoint: Distribution of costs over time in the US [gradually increasing, constant over time, gradually decreasing] For the climate cost timing conjoint: Year in which household contributions would start (2020(1)2040)
Average household costs per month $53, $107, $213, $267
Percentage invested in adaptation efforts (e.g., developing new technology, building dams, improving disaster resilience of housing) Percentage invested in mitigation (e.g., reducing greenhouse gas emissions and removing greenhouse gases from the atmosphere) [Randomly draw integers x from (0,100)% for adaptation and compute mitigation share as (100-x)%]
In other major economies:
Percentage invested in adaptation efforts in other major economies (e.g., developing new technology, building dams, improving disaster resilience of housing) Percentage invested in mitigation in other major economies (e.g., reducing greenhouse gas emissions and removing greenhouse gases from the atmosphere) [Randomly draw integers x from (0,100)% for adaptation and compute mitigation share as (100-x)%]
For the climate cost timing conjoint: Distribution of costs over time in other major economies [gradually increasing, constant over time, gradually decreasing] For the climate cost timing conjoint: Year in which household contributions would start (2020(1)2040)
Average Household costs per month in other major economies $53, $107, $213, $267
For the climate cost path conjoint: Which of these scenarios do you prefer? For the climate cost timing conjoint: Please rank these scenario in the order that you prefer?

The conjoints also ask respondents about how effective or ineffective they think each of the scenarios will be at addressing climate change. The answer scale will be from not effective at all (1) to very effective (10).

We plan to use this rating as an additional outcome for which we will repeat the analysis described above with this variable as the dependent variable. We will also employ the rating as a predictor of dynamic climate policy preferences.

Climate Costs and Benefits Experiment
This vignette experiment varies both the costs and benefits of climate action. The goal is to be able to determine how these two factors affect support since normally expectations about either one of the two is left unspecified. We expect that higher benefits increase support and higher costs decrease it. We are particularly interested in testing whether the sensitivity to costs and benefits increases as they become more distant and whether this effect depends on individual-level time preferences. The idea is that more patient individuals are more averse to future costs, but also value future benefits more.

“Experts suggest that the US and other major economies should reduce greenhouse gas emissions today and over the coming years at a level that would raise energy prices in the United States by about $213 per month and household. These costs would be equivalent to two percent of the US gross domestic product.

Suppose that this would avoid [most, some, few, very few] of the economically and environmentally damaging consequences of climate change by [2030, 2040, 2050].

Do you approve or disapprove of the United States implementing those policies?”

Answer scale: 1 (strongly approve)-10(strongly disapprove)

Waterpipe Problem
This question asks respondents to choose between two cost distributions over time to fix a local problem. The goal is to examine decisions in a scenario in which the investment to be made will fix the problem to remove the uncertainty about whether the benefits will actually be realized. One of the cost distributions is very front-loaded. The other is back-loaded. Since the benefits are supposed to be certain and will be realized at the same time under both investment plans, we expect that respondents will generally prefer the back-loaded option because of time-discounting. Building on this logic, we expect that more patient respondents will be more likely to prefer the front-loaded option because they discount future costs less strongly which renders the net present value of the investment lower.

“Now we would like you to consider the following scenario related to water supply issues in your region.

Suppose that the water pipe system in your region is deteriorating. Upgrades and repairs seem vital to secure the supply of fresh water to households.

Engineers have determined that either of the following repair plans will work, although the required timing of household contributions is different.

Please let us know which of the following two options you prefer:

[Randomize order of options]
Option 1

Year	2020	2021	2022	2023	2024
Monthly household contributions	$50	$50	$50	$50	$50

Option 2

Year	2020	2021	2022	2023	2024
Monthly household contributions	$20	$20	$20	$95	$95

Climate Action Consequences Experiment
This item manipulates whether the United States implements climate policies unilaterally or multilaterally and asks respondents to indicate their expectations about the likely consequences of the policy.

"If the United States [and other major economies] implement[s] policies to address climate change, which of the following statements below do you think are true? Will this …
[Randomly draw: on its own / in cooperation with other countries], it will... [RANDOMIZED ORDER]

- … provide better life for children and grand children
- …help with distributing the costs of climate change more fairly
- …save many plant and animal species from extinction
- …improve people's health
- …lead to more government regulation
- …cause energy prices to rise
- …cost jobs and harm the economy"

We will regress responses to each of those questions on a treatment variable that indicates whether a respondent has received the unilateral or the multilateral version of the question.

Time and Risk Preferences
We measure time and risk preferences using the standard self-assessed survey item (see

questionnaire) and the convex time budget (CTB) method described in Andreoni et al. (2015, JEBO). Our instrument follows their laboratory protocols and asks respondents to make 24 choices between combinations of sooner and later payments. No actual payments are promised. The options range from $0 to $19 for the sooner and $0 to $20 for the later payment.

The key instructions are: “In this example, you are asked to choose your favorite combination of payment today and payment in 5 weeks. As you can see, the sooner payment varies in value from $19 to $0 and the later payment varies in value from $0 to $20. Note that there is a trade-off between the sooner payment and the later payment across the options. As the sooner payment goes down, the later payment goes up. In this set of questions, we are not providing any actual payout to you. However, we nevertheless ask you to carefully think about each decision that you make in the survey, and to think about how you would respond if money was at stake. Hence, please make your choices between options as if the amounts would in fact be paid out to you at the sooner and later date stated in the questions.”

Here is an example budget: “Please choose one of the following options of payment TODAY and payment in 5 WEEKS from today.

- Payment TODAY of $19.00 and payment in 5 WEEKS of $0 (1)
- Payment TODAY of $15.20 and payment in 5 WEEKS of $4.00 (2)
- Payment TODAY of $11.40 and payment in 5 WEEKS of $8.00 (3)
- Payment TODAY of $7.60 and payment in 5 WEEKS of $12.00 (4)
- Payment TODAY of $3.80 and payment in 5 WEEKS of $16.00 (5)
- Payment TODAY of $0 and payment in 5 WEEKS of $20.00 (6)”

See questionnaire for further details of the CTB instrument.

The estimation of individual-level time preferences follows Andreoni et al. (2015). This approach rests on individual-level estimations that regress the logged allocation ratio for the chosen option on a present period indicator, the delay k in days, and the logged price ratio of the options in the budget.

Fairness, Policy Views, Sociodemographics, Other

These variables include individual-level measures of reciprocity and inequality aversion estimated as described in Bechtel/Scheve (2013, PNAS), Bechtel/Scheve (2017, JEPS), and Bechtel/Liesch/Scheve (2018, PNAS).

For these and other additional fairness, policy view, and sociodemographic measures, see attached questionnaire for further details on measurement and question design.