Institutional determinants of protest responses in stated preference studies

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Preliminary version - Comments welcome

Abstract

In stated preference surveys, institutional context is often found to be an important determinant of protest responses. However, the very same institutional context does not change within one survey, enabling no strong conclusion about its effect on the protest behavior. Moreover, although the importance of the institutional context on the choice of a payment vehicle has been suspected, no study is specifically devoted to the way their interaction affects the protest rate. This paper tries to fill these gaps by relying on meta-data on stated preference studies for environmental goods along with institutional variables at the country level. Results show that institutional variables are significant determinants of the protest rates, but there is no significant evidence to suggest that the choice of a payment vehicle affects differently the probability of protesting depending on the institutional context.

1 Introduction

Stated preference studies aim to elicit the preferences of the respondents for a non market good. A fictional scenario for the provision of this non market good is presented, then the respondents are asked their willingness to pay (WTP) for this provision. However, some respondents to valuation surveys refuse to state their true preferences and give a zero amount instead, because they disagree with some features of the survey. For instance, they think someone else should pay for the good, the choice of payment vehicle is not adequate, they don't find the scenario credible enough, etc. Usually, follow-up about the reasons for the zero amount are used to detect these protest responses.

Even assuming we are able to perfectly detect these protest responses and remove them from the sample, the distribution of protest respondents is very unlikely to be random. This means that the samples on which the aggregate WTP are computed are not representative, posing a threat to some of the fundamental hypothesis of cost-benefit analysis. For this reason, understanding the motivations of protest behaviors and finding ways to mitigate them is of major importance.

Various determinants of protest responses have been explored in the literature. Some are related to survey characteristics (see Meyerhoff and Liebe (2010) for a meta-study). Other determinants

are related to individual characteristics of the respondents. Some examples of justifications are "I shouldn't have to pay for the goods", "I can't put a price on nature" or "I don't trust the actor providing the good". While some reasons come from personal preferences and attitudes, other depend on the position of the respondent toward the institutional context.

Several studies conducted in developing countries observe that mistrust in the government causes protest behaviors (Hadker et al. (1997); Whittington et al. (1991); Choe et al. (1996)). Cunha-e Sá et al. (2012) accounts for justifications related to institutions for the protest behavior, they identify a class of protest respondents that justify their behavior by a lack of trust in the institutions. On the other hand, two recent articles Oehlmann and Meyerhoff (2017) and Remoundou et al. (2012) look at the impact of a change in the authority in charge of the project on stated WTP. Both studies don't find any effect on the WTP. Remoundou et al. (2012) also test for an impact on the protest rates, but they don't find any. Overall, we face a paradox: in some studies, some protest bidders justify their responses with respect to the institutions, but studies that look at the effect of changing the managing institution in the survey don't find any impact.

Another issue in this literature is that almost all the studies looking at these determinants only exploit the variations among individuals, and not the variations of institutional variables. Since surveys are conducted in one place at one time, the institutional context that surrounds the respondents doesn't change. Therefore nothing can be said about the effect of the institutional factors that motivate the protest. Oehlmann and Meyerhoff (2017) and Remoundou et al. (2012) proposed a way to overcome this issue through survey design. However, it might not be possible to fully mitigate a lack of trust in institutions simply by changing the managing authority in the survey. Mistrust in the institutions could lead to a systematic defiance towards all public entities. Moreover, a distrustful respondent may not believe that the stated managing authority in the survey is the true authority in charge. For these reasons, identifying the effect of institutional factors through survey design might present caveats and should not be considered as a perfect substitute for an actual variation in the institutional context.

One stated preference study uses such a variation: Schläpfer and Bräuer (2007) conducted two identical contingent valuation studies in Switzerland and Germany to account for the differences in perception of the framing. They find significant differences in the results between the two locations, which they suspect coming from differences in countries institutions (habits of voting for local policies). However, this study does not investigate the effect of specific institutional characteristics on the protest rate.

Finally, although the importance of the institutional context on the choice of payment vehicle has been suspected in the literature, there are no thorough study on the effect of interaction between both aspects on the protest rate. Some practitioners are careful when choosing a payment vehicle because a lack of trust in the institution in charge of it would lead to protest responses, but I did not find any study analysing which institutional variables are of importance and which payment vehicles are affected.

This paper tries to fill these gaps by relying on meta-data on stated preferences studies for environmental goods along with institutional variables at the country level. I exploit intra-country variations in the perceptions of institutions to estimate their impact on the protest rate.

The remainder of the paper proceeds as follows. Section 2 provides an explanation of the data, the choice of variables and the identification of the effect of the institutional variables. Section 3

presents the results of the descriptive statistics, the bivariate and the multivariate analyses. Section 4 concludes.

2 Methods and data

In order to identify the effect of institutional factors on the protest rate, I use meta-data on environmental valuation studies. The dataset was built by Meyerhoff and Liebe (2010). There are observations for 222 independent samples from 131 different stated preference studies (several studies have split samples) from 1988 to 2009 across 34 countries. Notably, it contains information about elicitation methods, payment vehicles, survey methods, protest rates, and year and country of data collection. The data was collected using the Google Scholar search engine and the webpages of journals in the field of environmental economics. Only studies with reported number of protest responses[1] and sufficient informations about survey characteristics were used. See Meyerhoff and Liebe (2010) for more information.

This dataset has been merged by year and country with institutional variables. The latter were chosen based on the literature on Tax morale. Luttmer and Singhal (2014) defines Tax morale as non-pecuniary (or internal) motivations for tax compliance as well as factors that fall outside the standard, expected utility framework. This concept is linked with the concept of protesting in stated preferences since in both behavior the individual refuses to contribute to a public good because of an irrational motivation. Unlike the literature about protesting in stated preference survey, there exist some studies that analyses the impact of institutional factors on Tax morale. In their literature survey about the determinants of Tax morale, Daude et al. (2012) finds that the most common institutional factors are trust in the institutions and corruption. Therefore these two variables were chosen as potential determinants of the protest rate[2].

Trust in the institutions, is measured using the World Value Survey (WVS (2015)) and European Value Survey (EVS (2011)). Respondents from a representative sample of each country were asked whether they trusted the government (from "A great deal" to "Not at all"). They were several Waves of surveys for each country, which were not more distant than 10 years. Thus each stated preference survey could be matched with a WVS Wave which was closer than 5 years at most. I computed the mean by country and year to obtain a global measure of trust in the institutions. The variable was rescaled to be in a range from 0 to 100, where 100 is "A great deal" of trust in the government.

To measure Corruption, the Transparency International's Corruption Perceptions Index (CPI) [3] is used. The CPI measures the perception of corruption in the public sector, as seen by business people, risk analysts and the general public (before 2002). Corruption is defined as the abuse of public office for private gain. The fact that this measure is based on perception is the main

[1] The protest responses are detected based on answers of follow-up questions after a respondent stated a zero WTP.

[2] Clearly, there is an important link between trust in the institutions and corruption. Morris and Klesner (2010) observe that the literature on political corruption shows that there is a mutual causal relationship between trust and corruption. Corruption can be a cause of a lack of political trust. For instance, Seligson (2002) finds using survey data from four Latin America countries that exposure to corruption "erodes belief in the political system". Corruption can also be a consequence of a lack of political trust. Indeed, according to Della Porta (2002) "lack of confidence in government actually favors corruption insofar as it transforms citizens into clients and bribers who look for private protection to gain access to decision-makers".

[3] Transparency International (2015). "Corruption Perceptions Index". Transparency International.

criticism against it, but here we actually want a perception of corruption rather than the true level of corruption, since it is the perception that will affect the respondent's behavior. As for the trust in government, this variable is scaled from 0 to 100, where 100 is the maximum level of perceived corruption.

Additional variables were used as control.

Main survey characteristics were accounted for using the variables collected by Meyerhoff and Liebe (2010), which are the Payment vehicle, the elicitation format and the Survey method. Besides survey characteristics, I account for the nature of the good (public vs. private), since it is likely to affect the probability to protest.

I added Country fixed effect in order to control for any specificity of countries (mostly cultural aspects). Consequently, I had to remove 10 surveys that were alones in their countries. The addition of country fixed effect mean that the only variation left in the dependent variable comes from (besides sample randomness) the characteristics of the surveys and the variability of context variables across time[4]. I also tried one specification with Region fixed effect to have more variability, while still being able to capture some unobserved components.

I control for Tax revenue. Indeed, respondents may feel like they give already too much money for the collectivity and this could affect their probability to protest. I used OECD data of Total Tax revenue as a percentage of GDP (OECD (2017b)). GDP per capita is also accounted for, since a correlation between income and the probability to protest has been repeatedly observed in stated preference studies.

Finally, there may be an indirect effect coming from the fact that quality of institutions are linked to public good provision (Deacon (1999); Bernauer and Koubi (2009)). Therefore, the institutional context should matter in CV studies for public goods such as environmental goods, since the respondent statements are affected by the original level of the public good. For instance, in countries where the original level of the public good being valued is low, the marginal utility for this good would tend to be high, thus there would tend to be a small protest rate. This calls for the need to account for the level of environmental good. To do so I used the ratio of public environmental expenditures as a fraction of total public expenditures from OECD (OECD (2017a)). Clearly, this is not optimal since it is only a global proxy of environmental quality, and may not capture the difference in the level of the specific good being valued.

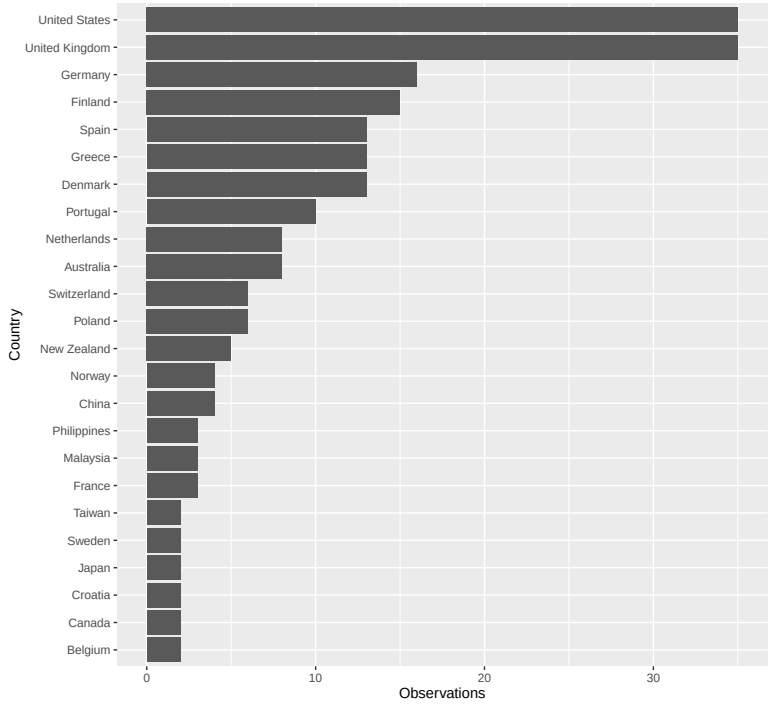
The model used is OLS. One specification adds quadratic terms for the institutional variable to detect some non linearities.

Payment Vehicle Channel

Besides the global effect of institutions on the protest rate, it should be useful to know if there are some particular characteristics in the survey that enhance this effect, or some that mitigate it. A particular feature is the choice of payment vehicle. For instance, lack of tax enforcement can be a cause of protest values when a tax PV is used Adaman et al. (2011) . Morrison et al. (2000) observe a significant share of respondents thinking that tax PV is inappropriate because some people don't

[4]Intra-country variations could also have an impact, but they are impossible to capture without losing almost all of the variability.

Figure 1: Number of observations by Country



pay taxes. Kato and Hidano (2002) are concerned that the easiness for self-employed people in Japan to under report their income may affect the perception of tax payment.

I will look at how the choice of payment vehicle, and more specifically the tax vehicle, affect the relation between institutions and protest rate. In order to do this, I introduce interaction terms between a dummy variable for the use of a tax vehicle in the survey and the institution variables.

3 Results

3.1 Descriptive Statistics

Out of the full sample of 222 observations, 69 were deleted, either due to missingness or because the survey was the only one conducted in a given country. Figure 1 shows the number of survey per countries. US and UK are the most represented countries, with around 40 surveys each. Western Europe countries are also present. There are very few developing countries (China, Philippines, Malaysia). Since a large share of stated preference studies are conducted in developed countries, the sample is logically biased towards them. This could be an issue in term of external validity, but I should be able to provide findings for developed countries.

Table 1 describes the dataset. The first part of the table shows the frequency of each survey characteristics, and the second part provides statistics for other variables. One can see that the tax

Table 1: Descriptive statistics

Payment Vehicle	Tax	Donation	Bill	Special Fund	Entrance Fee	Other
%	41%	9%	18%	13%	10%	10%
Survey Design	On Site	Mail	Phone	Face to face	Web	Other
%	9%	37%	7%	36%	3%	7%
Elicitation Format	Choice Experiment	Dichotomous Choice	Open Ended	Payment Card	Other	
%	17%	40%	19%	22%	2%	
	Mean	SD	Min	Max	N	
Protest rate	19.0	11.2	0	59.3	212	
Trust in Government	43.63	7.20	17.71	54.33	179	
Corruption Perception Index	26.21	18.88	3	77	197	
Tax revenue	33.6	6.23	23.02	48.98	196	
Share of environmental public expenditures	0.01	0.01	0	0.04	182	
GDP/Capita	32105	9251.74	5821	62434	200	
Public good	0.98	0.15	0	1	211	

payment vehicle is the most used. As explained above, reactions to tax payments are likely to be affected by the quality of the institutions. Therefore, the fact that it is so widely used shows the importance of having a throughout investigation on the impact of payment vehicle on protest rates in different institutional contexts. Other vehicles are less likely to prime an attitude of protesting related to institutions.

About survey design, Phone interview is the most frequent, followed by Face to face and Mail. There doesn't seem to be a consensus in the literature on the effect of particular survey design on the protest rate. Similar as the survey design, there are no clear evidence on the impact of a specific elicitation format on the protest rate, but it could affect the reason to protest. For instance, dichotomous choice, which is the most used elicitation formats in the data, could lead to protest against procedural fairness (Jorgensen et al. (1999)). Unfortunately, I only have the global protest rate, and no data on specific reasons to protest, so I can't verify this hypothesis.

On average, 20% of the stated preferences are not the true preferences. This rate can go up to 60%. This shows that protest responses should be a major concern for stated preference studies, and that it can greatly bias the aggregate WTP.

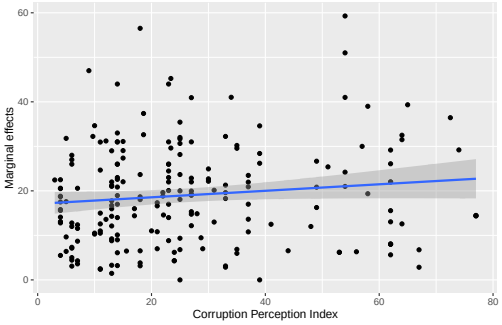
Note that the value of the institutional variables are by no mean representative. This is only the values merged with the meta-data, thus only for the country and years for which a stated preference study was conducted.

The mean of Trust in the government is below 50, so there seem to be a global lack of trust in the country and the years corresponding to the surveys. The values spans from a quite low range since the maximum is only at 54. Perception of Corruption seems to be more variable, the standard deviation is twice as large. The distribution is more skewed towards to the left since the mean is around 26.

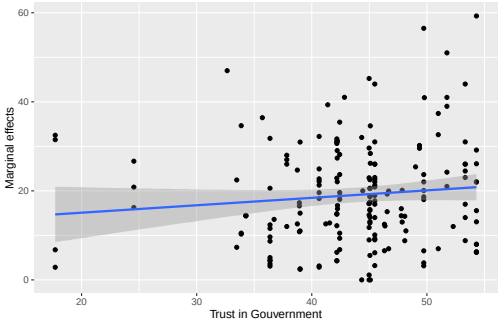
Finally, the very high share of of public good is noticeable. This is because that all the goods valued are environmental goods, which tend to be public by nature.

Table 2: Bivariate analysis

Perception of corruption



Trust in the Government



3.2 Bivariate Analysis

In Figure 2 I look at the bivariate relation between the institutional variables and protest rate. The blue lines represents linear fits.

The left part of the figure shows a positive relation between the perception of corruption protest rate, which is significant at a 10% risk (p=0.07). This is consistent with expectations, since respondents would be less willing to give money to institutions, in fear of it ending in the wrong pocket.

The right part of Figure 2 shows the relation between trust in government and protest rate. This time the relation seems positive, however not significant (p=0.15). This could suggest that trusting the government leads to higher probability to protest. However, this is not a ceteris paribus effect, thus different effects could be at play to explain this relation. Therefore, the following multivariate analysis should provide more insights on this matter.

3.3 Multivariate Analysis

The different specifications are reported in Table 3. Model 1 is the most basic linear model with no fixed effects. Models 2 and 3 respectively add control for region and country fixed effects. Model 4 keeps the country fixed effects and use a quadratic terms for institutional variables.

Regarding the effect of survey characteristics, the findings are consistent with Meyerhoff and Liebe (2010). Signs and significance of coefficients almost never change across specifications.

The choice of Payment vehicle seems to have an important impact on the probability to protest. The reference alternative is the tax vehicle. Using tax seems to lead to more protest responses than adding the payment to an existing bill, but it performs better than entrance fees or participation to a fund. Elicitation methods have no significant effects on the protest rate. Once controlled for country fixed effects, one can observe that on-site survey tends to produce significantly less protest responses than face to face (at the respondent's residence) surveys. Surveys using other survey design seem to also lead to less protest responses. However this is likely to be the results of outliers.

Focusing on institutional variables, the first model shows that there is a significantly positive effect of corruption on protest rate, while the models 2 and 3 show that this effect increases once we

control for region and country fixed effect. An increase of ten points in the corruption index leads on average to 11.75 more percentage points in the protest rate. This is quite a large impact.

For these three models, the effect of trust in the government is not significantly different from zero. However it is interesting to note that the coefficient becomes negative once we account for region or country fixed effects, so this suggests that the positive bivariate relation of the previous section is due to unobserved characteristics of the countries.

Model 4 adds the quadratic terms of corruption and trust in the government. For both variables the term of order one is negative and the term of order two is significantly positive. This means that there is a convex relation between these two institutional variables and the protest rate. One can compute the marginal effects as a function of the variable by taking the derivative. Figure 4 shows the marginal effect[5] in vertical axis and the institutional variable in horizontal axis. The red lines represent the marginal effects for the quadratic specification and the black lines represent the marginal effect for the linear specification.

Consistently with the linear model, the effect of corruption is mainly positive. The opposite relation can be observed for the effect of trust in government. The impact is negative for countries which have a low level of trust in the government, meaning that the more trusted the political institutions, the lower the protest rate. Both effects fade away as countries have a larger level of trust in the gouvernment or a lower level of corruption, which implies that the effect of mistrust in the institutions tends to be more important for countries in which institutions lack in credibility.

Payment Vehicle Channel

One potential aspect of the survey that could prime the respondent's attitude regarding the institutions is the payment vehicle. As explained in Section 2, the tax payment vehicle is the more likely to have an interacting effect with institutional factors. Table 5 shows the results of a probit model explaining the probability to use a tax vehicle. The two columns show bivariate models with institutional variables as regressors. One can see that corruption decreases significantly the probability that the tax vehicle is used in the survey. This result suggests that practitioners tend to be reluctant to use tax vehicle when they fear that it would lead to protest responses due to the poor quality of the institutions.

In order to test for this suspected effect, I introduce in the previous models the interaction of the institutional variables with a tax vehicle dummy. However I am not able to reject the null hypothesis of joint nullity of the coefficients of the interactions.[6] Therefore, unlike what is often suspected, the impact of the payment vehicle doesn't seem to be affected by the institutional context, nor does the impact of other types of vehicles.

4 Discussion

This paper investigates the relation between institutional variables and protest rate of stated preference surveys for environmental goods. Using meta-data merged with institutional variables and

[5] How much does the protest rate vary when the covariate increases by one.
[6] P-values are 0.47 for Tax, 0.97 for donations, 0.83 for bills, 0.71 for funds, 0.23 for entrace fees.

Table 3: Multivariate Analysis

	Dependent variable:			
	Protest rate			
	(1)	(2)	(3)	(4)
PV Bill	-6.935^{**}	-6.437^{**}	-6.465^{**}	-6.415^{**}
PV Donation	-2.122	0.220	-1.086	-0.747
PV Entrance fee	9.407^{**}	12.259^{***}	14.528^{***}	13.980^{**}
PV Fund	4.708	10.020^{**}	9.303^{**}	10.670^{**}
PV Other	10.085^{***}	13.448^{***}	11.998^{***}	13.900^{***}
EF Dicho. Choice	-3.323	-3.248	-3.224	-3.335
EF Open Ended	-2.270	0.796	-2.901	-2.419
EF PC	-4.182	-3.264	-3.638	-3.693
EF Other	-10.384	-8.640	-10.265	-12.305
SD Mail	-2.630	-0.686	1.172	3.854
SD On site	-7.057^{*}	-6.046	-8.658^{*}	-9.058^{*}
SD Phone	-0.887	4.329	3.743	4.506
SD Other	-13.396^{***}	-19.253^{***}	-17.204^{***}	-23.880^{***}
SD Web	-3.973	-2.633	-3.649	-1.967
Gdp/capita	-0.0002	-0.00005	-0.0005	-0.0002
Public	-5.635	-4.747	-5.646	-7.758
Env. Exp	82.166	8.717	49.329	-231.693
Tax revenue	-0.335^{*}	-0.132	-0.264	-0.019
Trust gouv.	-0.019	-0.275	-1.028	-9.778^{**}
Trust gouv.^{2}				0.106^{*}
Corruption	0.248^{**}	0.511^{***}	1.175^{**}	-1.190
Corruption^2				0.031^{*}
Region		X		
Country			X	X
Constant	41.524^{**}	25.505	80.245^{*}	276.558^{**}
Observations	153	153	153	153
R^2	0.306	0.367	0.408	0.435
Adjusted R^2	0.200	0.242	0.210	0.233
Residual Std. Error	10.285	10.012	10.220	10.073
F Statistic	2.904^{***}	2.944^{***}	2.066^{***}	2.155^{***}
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 4: Marginal effects

Perception of corruption

Trust in the Government

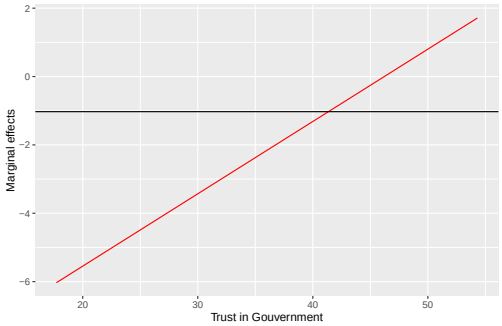


Table 5: Use of Tax vehicle and institutions

	Dependent variable:	
	Tax vehicle	
	(1)	(2)
Corruption	0.010**	
Trust gouv.		0.005
Constant	−0.908**	−0.481
Observations	206	186
Log Likelihood	−138.530	−125.337
Akaike Inf. Crit.	281.061	254.675
Note:	*p<0.1; **p<0.05; ***p<0.01	

exploiting intra-country variations in these institutional variables, I find that political trust and corruption have significant effects on the probability to protest. More political trust and less corruption lead to fewer protests.

These results contribute to the literature on protest responses by quantifying the impact of institutional context, abstracting away the effect of each studies' specificities. It provides insights to practitioners on how the protest rate can be affected depending on the country where a survey is conducted.

The influence of institutions does not seem to vary with the payment vehicle. This result goes is in line with the findings of Oehlmann and Meyerhoff (2017) and Remoundou et al. (2012), in the sense that a change in the survey design (in their case the managing authority, in mine the payment vehicle) seems to have no effect on the protest responses caused by mistrust in the institutions. Respondents protesting for reasons related to institutions seem to have a global lack of trust in the institutions, which can only be mitigated by actual institutional changes.

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