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Environmental Damage**

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# **The Determinants of Individuals' Attitudes Towards Preventing Environmental Damage**

## **Summary**

This paper investigates empirically the determinants of individuals' attitudes towards preventing environmental damage in Spain using data from the World Values Survey and European Values Survey for the periods 1990, 1995 and 1999/2000. Compared to many previous studies, we present a richer set of independent variables and found that strongly neglected variables such as political interest and social capital have a strong impact on individuals' preferences to prevent environmental damage. An interesting aspect in our study is the ability to investigate environmental preferences over time. The results show strong differences over time. Finally, using disaggregated data for Spanish regions, we also find significant regional differences.

**Keywords:** Environment, Regional and time Preferences, Political interest, Social capital

**JEL Classification:** Q260, R220, Z130, I210

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## I. INTRODUCTION

There is a wide range of studies that have valued environmental preferences. Interest in environmental attitudes began in the early 1970s (Bord and O'Connor 1997). The preferences for protecting environmental goods has been a controversial issue in the last few years. The majority of those studies focused on specific and limited environmental goods or areas (Whitehead 1991, Stevens et al. 1994, Danielson et al. 1995, Cameron and Englin 1997, Blomquist and Whitehead 1998, Carlsson and Johansson-Stenman 2000, Popp 2000, Bulte et al. 2004, Dupont 2004).

Thus, it is difficult to find contributions related to a country or a group of countries and considering an environmental damage perspective as a whole (Engel and Pötchske 1998, Witzke and Urfei 2001, Israel and Levinson 2004). They furthermore have the disadvantage of an excessive simplification, because individuals are asked about the environment in general. As Witzke and Urfei (2001, p. 208) pointed out, this is likely to bias downwards environmental preferences, because people did not know what they should pay for. However, with a general perspective, embedding effects which are usually linked to specific environmental commodities, can be avoided (Diamond and Hausman 1994).

It is a promising line to consider empirically citizens' environmental preferences and search for factors that shape it. Relatively new surveys such as the *World Values Surveys* or the *European Values Survey* allow to find a proxy for and thus to check the impact on environmental attitudes. This attempt is in line with the growing inclination among economists to use surveys (see, e.g., Knack and Keefer 1997, for social capital studies, or Frey and Stutzer 2002, who intensively investigated happiness, or Torgler

2005, focusing on tax morale). One reason might be that survey research now uses more sophisticated statistical techniques and designs compared to early years. Furthermore, a main advantage is that surveys include many control variables. We will take advantage of it and use a rich set of independent variables to investigate in detail what shapes individuals' environmental values in Spain. Another main advantage in this study is to work with several datasets collected at three different points in time, which allows us to observe trends over time and thus assess the robustness of our results.

A clear advantage of national studies in this field is the possibility to design country-level environmental initiatives. It also allows to go from a general perspective to a local one, assuming that regional information is available. Such an approach would allow, for example, to design optimal fiscal decentralization policies (Shapiro 1996)<sup>1</sup>.

A cross country and cultural comparison with a single item measure as the one used as dependent variable in this paper can pose some problems, as values are not free from cultural or institutional influences. Focusing on one country, Spain, and thus conducting a country case study helps to reduce such problems.

Before considering the findings in detail, Section II of the paper first introduces the way individuals' environmental attitudes are defined, provides information about the World Values Surveys and the European Values Survey, introduces the model, and presents our hypotheses. In Section III we present the empirical findings, and Section IV finishes with some concluding remarks.

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<sup>1</sup> It has been argued that if there is heterogeneity among jurisdictions, centralization is suboptimal (Peltzman and Tideman 1972, Oates and Schwab 1996). This is because strong differences in preferences among governments could lead to important efficiency losses for some jurisdictions (Burtraw and Porter 1991, Dinan et al. 1999).

## II. THEORETICAL APPROACH AND TESTABLE PREDICTIONS

### *1. Data*

The data used in the present study are taken from the World Values Survey (WVS, years 1990, 1995, 2000) and the 1999 European Values Survey (EVS)<sup>2</sup>. The World Values Survey is a worldwide investigation of socio-cultural and political change, based on representative national samples. It was first carried out in 1981-83, and subsequently in 1990-91, 1995-96 and 1999-2001. Data from these surveys are made publicly available for use by researchers interested in how views change with time. However, economists have just started to work with the WVS/EVS. To assess environmental attitudes of individuals in Spain we use the following question from these data sets throughout the whole paper:

*I would agree to an increase in taxes if the extra money were used to prevent environmental damage (0=strongly disagree, 3=strongly agree)*

Although we do not conduct a contingent valuation study (CV), the question offers the chance to investigate environmental preferences. However, the question is not free of problems. The statement is relatively vague. “Environmental damage” is not clearly specified. Different people may think of different kinds of environmental damages. The level of improvement and the degree of tax increase are not clarified either. So people are not aware of how much they have to pay<sup>3</sup>. The consequences of taxation are not mentioned either. No information is provided to which extent income tax, value added tax or other taxes are supposed to increase. Thus, it is not clear who will have the

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<sup>2</sup> A dummy variable has been included to differentiate between WVS and EVS.

<sup>3</sup> It has been shown that the preferences to protect the environment (regarding causes and consequences of environmental damages) depend on the level of information the questionnaire includes (Bulte et al. 2004).

highest tax burden. On the other hand, unspecified payment schemes will increase the variance, but may influence the willingness to contribute (Witzke and Urfei 2001). An unspecified statement still helps to measure preferences and values, and to reduce strategic behaviour via influencing the quantity or quality of environmental goods – people might intentionally indicate false willingness to contribute values in order to match their own preferences (Hidano et al. 2005). When neither specific goods nor quantitative values are used, the attributes of the environmental goods in questions do not have to be thoroughly explained to be sure that respondents understand and respond with the appropriate willingness to accept an increase in taxes <sup>4</sup>.

We take advantage of the scaled structure using ordered probit estimations rather than establishing a voting or referendum situation with a “yes or no” structure. This allows to consider also intermediate values between strong agreement and disagreement, and therefore to make full use of the data available. Our variable furthermore measures the marginal and not the total willingness to accept a tax increase. This implies that the change over time is also influenced by the change of governments’ environmental activities. Environmental improvements over time may reduce that willingness to be spent to prevent environmental damages, as might the current level of the tax burden. Nevertheless, only a limited number of papers investigate environmental preferences over time, controlling in a multivariate analysis for additional factors.

A critical aspect of surveys is the fact that studies can be biased if they do not cover a representative share of the population. A high response rate is therefore essential. We work with well-known data that cover many countries and have been conducted on a regular basis. These surveys pay especial attention to the

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<sup>4</sup> For a detailed discussion regarding possible survey biases see Carson and Mitchell (1995).

representativeness of the data set. Furthermore, the environmental question was only part of a larger survey, which may reduce environmental *framing biases*. We have the advantage to be able to control for many factors in a multivariate analysis, but also the disadvantage that only a limited number of environmental aspects can be investigated. However, in a specific environment survey the expressed environmental attitudes might be overstated if the respondent takes the interviewer to be an environmental activist and would feel guilty if stating a low willingness to accept an increase in taxes; such an upward bias should occur less in the database we use (Witzke and Urfei 2001).

Finally, it can also be discussed whether it is more adequate to use an index instead of a single question to measure environmental values. Many studies that examine environmental attitudes typically measure environmental values using a single item<sup>5</sup>. A single question has the advantage that problems associated with the construction of an index can be avoided. Furthermore, an index might be designed to fit best the theoretical argumentations. As we analyze one specific country, problems based on differences in the interpretation of the question or due to differences in the political institution, which may influence environmental values, do not appear. Working with more than one survey and thus considering different time periods allows to reduce biases due to a “time specific mood”.

## 2. *Model and Hypotheses*

In this section we introduce the model and develop the predicted influences of our independent variables. We will pool the available years using time dummy variables and investigate the development over time. Working with several datasets collected at

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<sup>5</sup> For a review see, e.g., Zelezny et al. (2000).

three different points in time allows to observe trends over time and to find robust results. So, the willingness to contribute for preventing environmental damage is specified as follows:

$$\begin{aligned} ENVAT_i = & \beta_0 + \beta_1 \cdot SOCIODEM_i + \beta_2 \cdot EDUC_i + \beta_3 IDEOLOG_i + \beta_4 \cdot ECONSIT_i \\ & + \beta_5 \cdot EMPLOY_i + \beta_6 \cdot SCAPITAL_i + \beta_7 \cdot IDENTIFIC_i + \beta_8 \cdot URBANI_i \\ & + \beta_9 \cdot REGION + \beta_{10} \cdot YEAR_t + \varepsilon_i \end{aligned}$$

$ENVAT_i$  measures an individual's attitudes towards preventing environmental damages. The independent variables considered are shown in *Table 1*; the set of variables included in the estimations is much broader than in several previous studies. Additionally, we provide the expected sign for each variable.

First of all, we consider a bundle of *socio-demographic and economic* variables, which have an important influence on preferences for environmental quality. Some factors commonly included in such studies are age<sup>6</sup> and gender (see, for example, Whitehead 1991, Cameron and Englin 1997, Blomquist and Whitehead 1998, Engel and Pötchske 1998, Witzke and Urfei 2001, Dupont 2004, Israel and Levinson 2004, Hidano et al. 2005).

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<sup>6</sup> An alternative specification related to age has been proposed by Popp (2001), in order to test the existence of weak and strong altruism towards future generations in the context of environmental issues. In his study, he included the individuals' life expectancy, calculated from their age and the life expectancy using the *Statistical Abstract of the United States*.



Table 1: Independent Variables

| INDEPENDENT VARIABLE                               | KIND OF VARIABLE | CATEGORIES  | EXPECTED SIGN |
|--|------------------|---|---------------|
| <b><u>Socio-Demographic Factors (SOCDEM)</u></b>   |                  |   |               |
| AGE  | Continuous       | ---   | -             |
| GENDER   | Dummy            | MALE (reference group)<br>FEMALE  | +             |
| MARITAL STATUS                                     | Dummy            | MARRIED; DIVORCED; SEPARATED;<br>WIDOWED; SINGLE (r.g.)   | +             |
| <b><u>Formal and Informal Education (EDUC)</u></b> |                  |   |               |
| EDUCATION  | Continuous       | ---   | +             |
| DISCUSSING POLITICS                                | Scaled           | 1 = <i>never</i> to 3 = <i>frequently</i>   | +             |
| INTEREST IN POLITICS                               | Scaled           | 1 = <i>not at all interested</i> to 4 = <i>very interested</i>  | +             |
| IMPORTANCE OF POLITICS                             | Scaled           | 1 = <i>not at all important</i> to 4 = <i>very important</i>  | +             |
| <b><u>Ideology (IDEOLG)</u></b>                    |                  |   |               |
| RIGHTIST POLITICAL ORIENTATION                     | Scaled           | 1 = <i>left</i> to 10 = <i>right</i>  | -             |
| <b><u>Economic Situation (ECONSIT)</u></b>         |                  |   |               |
| FINANCIAL SATISFACTION                             | Scaled           | 1 = <i>dissatisfied</i> to 10 = <i>satisfied</i>  | +             |
| ECONOMIC CLASS                                     | Dummy            | UPPER CLASS; UPPER MIDDLE CLASS;<br>LOWER MIDDLE CLASS;<br>WORKING/LOWEST CLASS (r.g.)  | +             |
| <b><u>Occupational status (EMPLOY)</u></b>         |                  |   |               |
| EMPLOYMENT STATUS                                  | Dummy            | FULL TIME EMPLOYED (r.g.); PART TIME<br>EMPLOYED; SELFEMPLOYED;<br>UNEMPLOYED; AT HOME; STUDENT;<br>RETIRED; OTHER                        | +/-           |
| <b><u>Social Capital (SCAPITAL)</u></b>            |                  |   |               |
| TRUST  | Scaled           | 0 = <i>can't be too careful</i> or<br>1 = <i>most people can be trusted</i>   | +             |
| MEMBERSHIP IN A VOLUNTARY ENV.<br>ORG.             | Dummy            | MEMBER VOLUNT.; NOT A MEMBER<br>(r.g.)  | +             |
| <b><u>Identification (IDENTIFIC)</u></b>           |                  |   |               |
| NATIONAL PRIDE                                     | Scaled           | 1 = <i>not at all proud</i> to 4 = <i>very proud</i>  | +             |
| PERCEIVED GEOGRAPHICAL GROUP                       | Dummy            | LOCALITY OR TOWN (r.g.); STATE OR<br>REGION; COUNTRY AS A WHOLE;<br>CONTINENT AS A WHOLE; WORLD AS A<br>WHOLE                             | +             |
| <b><u>Other Variables</u></b>                      |                  |   |               |
| SIZE OF TOWN (URBAN)                               | Dummy            | UNDER 2,000 (r.g.); 2,000-5,000; 5,000-<br>10,000; 10,000- 20,000; 20,000-50,000;<br>50,000-100,000; 100,000-500,000; 500,000<br>and MORE | +/-           |
| SPANISH REGION (REGION)                            | Dummy            | 17 SPANISH AUTONOMOUS REGIONS:<br>MADRID (r.g.)   | +/-           |
| TIME (YEAR)  | Dummy            | SPAIN 1990 (r.g.); SPAIN 1995; SPAIN<br>1999/2000   | +/-           |

Regarding AGE, we expect the number of individuals who are willing to contribute for additional environmental protection to fall with an increase of age, since older people will not live to enjoy the benefits of preserving resources for later years. There are two age effects, a *life cycle* or *aging effect* due to being at a certain stage of age and a *cohort effect* resulting from belonging to a specific generation. The cohort effect covers the

difference of attitudes between different age-cohorts due to generational differences in socialization, life experiences and economic conditions. People of a similar age have experienced similar historical and economic conditions and thus similar restrictions and possibilities. On the other hand, aging might have the effect that people become more cautious, more risk averse and more conservative, but also the reverse effect, as they expect a lower profit from preserving the environment (see Vlosky and Vlosky 1999). However, in our study we cannot differentiate between these effects.

GENDER is another specific variable. Experimental and empirical studies have shown gender differences in other aspects such as charitable giving, tax morale, bargaining or household decision making (Brown-Kruse and Hummels 1993, Nowell and Tinkler 1994, Andreoni and Vesterlund 2001, Eckel and Grossman 2001, Torgler 2005). It is often argued that traditional gender socialization, cultural norms, the women's roles as caregivers and nurturers, encouragements to be cooperative and feel compassion lead to a higher concern for the maintenance of life and environment. The "traditional" domain of working at home induces a greater likelihood to engage privately in behaviors aiming at the preservation of the environment (for an overview see Hunter et al. 2004). Women have a tendency to be more concerned with the environment than men. Zelezny et al. (2000) find strong evidence that environmentalism does not begin in adulthood, which contradicts the statement that gender differences arise due to motherhood and child protection. Regardless of age, women show more concern for the environment than men. However, literature reviews in the 80s report that the relationship between environmental attitudes and gender is meager and inconsistent (Van Liere and Dunlap 1980, Hines, Hungerford and Tomera 1986-1987, Mohai 1992). The meta-review of Zelezny et al. (2000) covering the years 1988 and 1998 reports that out of 13 studies, 9 found that women are significantly more

















































































