The Determinants of Individuals' Attitudes Towards Preventing Environmental Damage

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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)[1].

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.

[1] 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)[2]. 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[3]. 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

[2] A dummy variable has been included to differentiate between WVS and EVS.

[3] 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 [4].

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 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

[4] 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[5]. 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

[5] 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:

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

$ENVAT_i$ 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[6] 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).

[6] 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
Socio-Demographic Factors (SOCDEM)			
AGE	Continuous	---	-
GENDER	Dummy	MALE (reference group) FEMALE	+
MARITAL STATUS	Dummy	MARRIED; DIVORCED; SEPARATED; WIDOWED; SINGLE (r.g.)	+
Formal and Informal Education (EDUC)			
EDUCATION	Continuous	---	+
DISCUSSING POLITICS	Scaled	1 = *never* to 3 = *frequently*	+
INTEREST IN POLITICS	Scaled	1 = *not at all interested* to 4 = *very interested*	+
IMPORTANCE OF POLITICS	Scaled	1 = *not at all important* to 4 = *very important*	+
Idealogy (IDEOLG)			
RIGHTIST POLITICAL ORIENTATION	Scaled	1 = *left* to 10 = *right*	-
Economic Situation (ECONSIT)			
FINANCIAL SATISFACTION	Scaled	1 = *dissatisfied* to 10 = *satisfied*	+
ECONOMIC CLASS	Dummy	UPPER CLASS; UPPER MIDDLE CLASS; LOWER MIDDLE CLASS; WORKING/LOWEST CLASS (r.g.)	+
Occupational status (EMPLOY)			
EMPLOYMENT STATUS	Dummy	FULL TIME EMPLOYED (r.g.); PART TIME EMPLOYED; SELFEMPLOYED; UNEMPLOYED; AT HOME; STUDENT; RETIRED; OTHER	+/-
Social Capital (SCAPITAL)			
TRUST	Scaled	0 = *can't be too careful* or 1 = *most people can be trusted*	+
MEMBERSHIP IN A VOLUNTARY ENV. ORG.	Dummy	MEMBER VOLUNT.; NOT A MEMBER (r.g.)	+
Identification (IDENTIFIC)			
NATIONAL PRIDE	Scaled	1 = *not at all proud* to 4 = *very proud*	+
PERCEIVED GEOGRAPHICAL GROUP	Dummy	LOCALITY OR TOWN (r.g.); STATE OR REGION; COUNTRY AS A WHOLE; CONTINENT AS A WHOLE; WORLD AS A WHOLE	+
Other Variables			
SIZE OF TOWN (*URBANI*)	Dummy	UNDER 2,000 (r.g.); 2,000-5,000; 5,000-10,000; 10,000- 20,000; 20,000-50,000; 50,000-100,000; 100,000-500,000; 500,000 and MORE	+/-
SPANISH REGION (*REGION*)	Dummy	17 SPANISH AUTONOMOUS REGIONS: MADRID (r.g.)	+/-
TIME (*YEAR*)	Dummy	SPAIN 1990 (r.g.); SPAIN 1995; SPAIN 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

active in pro-environmental behaviors than men, 3 found no statistically significant difference between males and females and one study reports a greater participation of men. Davidson and Freudenburg (1996), Bord and O'Connor (1997), Berrens et al. (1997) and Zelezny et al. (2000), Hunter et al. (2004) found higher values for women, while Cameron and Englin (1997), Swallow et al. (1994) and Kealy et al. (1990) found the opposite result. Finally, Brown and Taylor (2000) did not find any gender difference.

It can also be criticized that studies relying on self-reports might be biased if women give more socially desirable responses in surveys. However, Zelezny and Yelverton (2000) report that social desirability is not related to gender. Furthermore, individuals' willingness to accept a tax increase could also be a function of risk attitudes, which was not possible to control for in this study. This would have allowed to gain better insights regarding the variables age, gender, or economic situation, as possible differences between women and men, or between different age groups could rather derive from different risk attitude functions. Controlling for risk aversion may lead to a stronger negative impact of age, as older people are supposed to be more risk averse than younger ones and may lead to a smaller difference between sexes, as according to some authors women are more concerned with the risk a poor environmental quality implies (Stern et al. 1993, Dupont 2004).

Additionally, MARITAL STATUS might influence environmental attitudes as well. Married people are more compliant or more concerned about environmental degradation than others, especially compared to singles, because they are more constrained by their social network and often strongly involved in the community (Tittle 1980). They furthermore might be more concerned with local environmental problems than singles as the "parent effect" makes them seek their children's future welfare (Dupont 2004).

The formal EDUCATION is a key variable. As a proxy for this variable we use the age at which individuals completed or will complete their full time education. In particular, the literature has shown that formal education[7] has a significant influence on environmental willingness to contribute (Whitehead 1991, Danielson et al. 1995, Blomquist and Whitehead 1998, Engel and Pötchske 1998, Popp 2001, Witzke and Urfei 2001, Israel and Levinson 2004, Veisten et al. 2004). In this respect, it is a general finding that higher levels of education lead to clear preferences for environmental protection.

On the other hand, also informal education matters (Whitehead, 1991, Blomquist and Whitehead 1998, Carlsson and Johansson-Stenman 2000, Hidano et al. 2005). Well-informed citizens who know about environmental problems might have stronger environmental attitudes, because they are better aware of the possible damage (Danielson et al. 1995). Thus, not only formal education should have an impact on the willingness to accept an increase in taxes. One possibility is to measure the individuals' political interest. We will use several proxies to check the robustness of the results (level of: DISCUSSING POLITICS[8], INTEREST IN POLITICS[9] and IMPORTANCE OF POLITICS[10]). On the other hand, it can be assumed that politically interested people are well-informed and have a high level of current knowledge about what is going on in politics and thus may also be aware of environmental issues and problems which are supposed to lead to a higher willingness to contribute. Compared to other determinants, the aspect of political interest has been widely neglected in the environmental literature.

[7] The formal education is usually specified by levels or degrees. It has been alternatively approached by means of the number of years (Blomquist and Whitehead 1998).

[8] Question: 'When you get together with your friends, would you say you discuss political matters frequently, occasionally or never?'.

[9] Question: 'How interested would you say you are in politics?'.

[10] Question: 'How important is politics in your life?'.

This brings us to a further factor connected to politics. The party individuals vote for (Engel and Pötchske 1998, Witzke and Urfei 2001) and their ideology are important aspects too. For example, voters who choose 'green' parties have strong preferences for environmental protection. It has been observed that left parties' voters show a higher sensitivity for environmental problems (Witzke and Urfei 2001). The latter finding can be explained by the higher preferences for economic growth 'right-wing' parties' voters have. This is a generally quite unexplored question that requires more attention. We use the degree of RIGHTIST POLITICAL ORIENTATION[11] as a proxy for ideology.

The economic situation of an individual is a significant aspect too. It can be argued that the protection of the environment or in our case the prevention of environmental damage is not only a public good, but also a normal good. Thus, demand may increase with income (Franzen 2003). Wealthier citizens may have a higher demand for a clean environment and less environmental damages. As a proxy for income[12] we use the individual perception of people's ECONOMIC CLASS. Investigating also environmental attitudes in different Spanish regions, we find it important to maximize the number of observations and thus to choose an alternative measure of income. Individuals with a higher income have less pressing economic problems and are therefore more willing and able to reduce their standard of living to spend more money on global environmental problems.

But the perception of pressure may depend on the financial satisfaction of an individual and not per se on the level of income. To consider this, we include the

[11] Question: 'In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking? Scale from 1 to 10'.

[12] In this paper, we include economic situation variables sequentially into the estimations, due to the relatively high number of missing values.

variable FINANCIAL SATISFACTION. Financial dissatisfaction might negatively influence the preference to pay more taxes in order to protect the environment. Such dissatisfaction can create a sense of distress, especially when taxes have to be paid and there is a discrepancy between the actual and the aspired financial situation. Thus, taxes might be perceived as a strong restriction, which increases the incentives not to contribute. As in one case the income variable is integrated in the equation, we can analyze the "stress" component of financial dissatisfaction.

Income has in general been considered in the literature (Whitehead 1991, Stevens et al. 1994, Blomquist and Whitehead 1998, Popp 2001, Witzke and Urfei 2001, Bulte et al. 2004, Dupont 2004, Israel and Levinson 2004, Veisten et al. 2004, Hidano et al. 2005). Usually, a positive relationship between income and environmental preference to contribute has been found. Sometimes, several income categories have been included in the estimations (Israel and Levinson 2004). This fact can be seen as a way to test the Kutznets´ hypothesis[13].

An additional variable that approaches and complements the economic situation of individuals is their occupational status (EMPLOYMENT STATUS). Witzke and Urfei (2001) found that some labour groups, such as persons engaged in the household or on maternity leave, had higher environmental preferences. Veisten et al. (2004) showed that unemployed people present, occasionally, lower preferences for environmental protection policies. However, the latter relationship sometimes is neither clear nor significant at all (Engel and Pötchske 1998, Witzke and Urfei 2001).

[13] The so-called Kutznets curve (Selden and Song 1994, Grossman and Krueger 1995) reflects the relationship between pollution and economic activity. That relationship usually is shown as a not linear function, by means of an inverted U-shaped curve. Even an inverted N-shaped curve has been proposed (Holtz-Eakin and Selden 1995, Cole et al. 1997).

An aspect which has been strongly neglected in the literature is social capital. This topic has been studied by many different disciplines. It has advanced to an important concept in social sciences, enforcing the interdisciplinary social discourse among researchers. The rapid growth of the social capital literature underlines a widespread unease with the standard explanations for the differential political and economic performances not only across nations but also across sub-national jurisdictions (see Ostrom and Ahn 2003, Schaltegger and Torgler 2005). According to Paldam (2000, p. 630), there are three families of social capital concepts: trust, cooperation and network. He points out that "most people build *trust* in and *networks* to others and come to *cooperate* with them" (p. 629). Trust and cooperation are closely related. Consequently, trust could be a crucial aspect in explaining also individuals' attitudes to contribute for environmental protection. In this respect, we have used two social capital proxies. First, we investigate the impact of generalized TRUST[14] and thus the belief to which extent most people can be trusted affects environmental attitudes. As an alternative measurement, the social capital literature uses membership in voluntary organizations. Additionally, it is useful to investigate the MEMBERSHIP IN A VOLUNTARY ENVIRONMENTAL ORGANIZATION as a variable. Some previous studies have used this variable (see, e.g., Whitehead 1991, Blomquist and Whitehead 1998, Carlsson and Johansson-Stenman 2000). It can be expected that individuals who participate actively in environmental institutions have stronger preferences for environmental protection, as one of the major aims in an environmental group is the provision of public environmental goods through voluntary contribution. However, the causality is not clear. There may be a potential *selection bias*. People with strong environmental preferences may choose to participate in a voluntary environmental

[14] Question: 'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?'.

organization. Such an argument would imply a reverse causality. To control for such a problem, we will use an instrumental approach in the empirical part to check the robustness of the results.

We also investigate the identification with the state, which may induce a higher cooperation among individuals and a higher preference to preserve a country's environmental conditions. NATIONAL PRIDE[15] can be used as a proxy for national identification. Tyler (2000) argues that in general pride influences people's behavior in groups, organizations and societies. It gives a basis for encouraging cooperative behavior. However, contrary to the trust variables, which have been thoroughly analyzed by *social capital* researchers, the variable pride has been completely neglected[16] in economics although it is a widespread phenomenon (Boulding 1992). We predict that a higher level of pride leads to stronger environmental attitudes.

Close to the concept of national identity are individuals' perceptions to which geographic groups they belong first of all. This is an unexplored issue, so we have considered the perceived GEOGRAPHIC GROUP[17]. It is difficult to obtain a clear prediction. Individuals who see themselves as citizens of the world as a whole may have relatively high environmental values, due the fact that in many cases environmental pollution produces high externalities at the world level. On the other hand, individuals strongly attached to the local area are less likely to act as free-riders and have a stronger willingness to reduce environmental damages at the local level and thus a higher willingness to accept higher taxes in order to preserve the environment[18]. As our

[15] Question: 'How proud are you to be …….? Scale from 1 to 4'.

[16] Torgler and Schneider (2005) find empirically a strong correlation between pride and tax morale.

[17] Question: To which of these geographical groups would you say you belong first of all?

[18] However, the willingness to pay higher taxes may dependent on the fiscal autonomy of the locality. A higher fiscal autonomy should enforce such an argument.

dependent variable does not give clear information about the environmental damage, both aspects can have an impact on individuals' environmental attitudes.

The literature has investigated factors such as the city/town size (Carlsson and Johansson-Stenman 2000, Israel and Levinson 2004), the rural/urban character of the place where a household is located[19] (Danielson et al. 1995, Veisten et al. 2004), or the proximity to the damaged area (Bulte et al. 2004). In line with these studies we use a proxy that measures different SIZES OF TOWNS as dummy variables. In general, the expected sign of the relationship is not clear. On the one hand, it can be argued that small towns are more "rural" which may lead to higher environmental values. But, on the other hand, medium and big cities are in general more active in implementing environmental polices, according Local Agenda 21 exigencies[20]. So, that fact could lead to higher preferences for environment protection.

Additionally, the survey provides the information in which Spanish region an individual lives. Thus, one of the main advantages in this study is the chance to control for regional differences. Witzke and Urfei (2001) point out that 'empirical knowledge about regional differences in demand for environmental goods is usually difficult to come by' (p. 213)[21]. Thus, regional dummies for all 17 SPANISH REGIONS called Autonomous Communities are built. Navarra and the Basque Country are defined as *foral regime communities* or *charter regions*, and the other 15 regions are defined as *common regime communities*. Although Navarra and the Basque Country have the highest financial autonomy among Spanish regions, the remaining communities have

[19] In this respect, Witzke and Urfei (2001) included the variable 'households in the building' as a proxy of the rural/urban character of the town/city.

[20] In this respect, Font and Subirats (2000) showed some big and medium size municipalities' experiences to implement Agenda 21 objectives in a local context.

[21] As an exception see also Cameron and Englin (1997).

obtained additional competences and financial instruments during the last years (Monasterio and Suárez-Pandiello 2005).

Finally, a TIME variable has been included. Franzen (2003, p. 297) argues that the general level of concern for the natural environment has globally increased in the last 50 years. This can also be observed by the rise in international environmental treaties, the number of national environmental ministries and the increase in international nongovernmental organizations. However, the preference to pay higher taxes in order to prevent environmental damage may be strongly connected to the environmental efforts made by the governments. If people are more satisfied with the environmental policy, they may believe that it is not necessary to pay additional taxes to reduce environmental damages. This may lead to a lower willingness to contribute.

After the Rio agreements in 1992 and the approval of the Agenda for the 21st century, the EU developed the V Environmental Program (1993-2000). In that document, several explicit strategies were designed, and members had to adapt their regulations to this Program's framework. In Spain, there was a concentration of initiatives and regulations in the second part of the 90s. During the period 1995-2000 institutions were created to improve the environment, and in special areas such as the reduction of certain emissions or the improvement of several environmental infrastructures, progresses are evident (OECD 2004). At the same time, from 1994 on, Spain began to receive European Structural Funds to finance environmental protection investments. Thus, strong improvements in the second half of the 90s may lead to a higher individual satisfaction with the environmental public policy and thus to a lower willingness to increase the contribution to prevent environmental damage.

Moreover, some specific factors made people more sensitive to solving environmental problems. A good example was one of the most severe drought periods

in Spain from 1992-1996. To cope with this drought, some rationing measures were put into practice, such as cuts in supply or reductions in water pressure. And, usually, the scarce quantity of water was aggravated by quality problems. This kind of environmental problems affects the population directly. They become aware of the necessity to intensify public environmental initiatives, which may have led to an increasing willingness to contribute for environmental protection in Spain, especially in the first half of the 90s.

Furthermore, as mentioned previously, individuals' environmental attitudes are also influenced by the current level of the tax burden. In Spain, an income tax reform in 1998 led to a reduction of the average tax rates by 2% from a static point of view and under a partial equilibrium context (Castañer et. al 2004). Moreover, the disposable income of all taxpayers became on average 2.6% higher.

IV. EMPIRICAL RESULTS

We will use an ordered probit model to analyze the ranking information of the scaled dependent variable. We also estimate weighted ordered probit models to correct the samples and thus to get a reflection of the national distribution. As we pool several years and data sets together we have integrated an additional weighting variable (*weighted var 1*). The original weight variable was multiplied by a constant to get an equal number of weighted observations (around 1500) for each survey *(weighted var 2)*. The data sets provide the weighting variables. To measure the quantitative effect of a variable on environmental values, the marginal effects are calculated, as the equation has a nonlinear form. The marginal effect indicates the change in the percentage of citizens (or the probability of) having a specific environmental level value, when the independent variable increases by one unit. For simplicity, in all estimations the

marginal effects are only presented for the highest value. Furthermore, “I don’t know” answers and missing values were omitted in all estimations.

This section reports two groups of estimation results. *Table 2* presents baseline estimation checking the robustness of the results working with or without weighting variables. Furthermore, to reduce possible causality problems, 2SLS estimations are presented. The primary objective in *Table 3* is to investigate the robustness of the informal education or better the impact of political interest on environmental values. To do so, several proxies are developed and tested sequentially. Furthermore, due to the relatively high number of missing values, proxies of the economic situation have also been included in *Table 3* sequentially.

In line with our prediction, we observe a negative correlation between age and environmental attitudes. In almost all estimations the coefficient is statistically significant. Female report a higher preference to contribute than men. The coefficient is statistically not significant in the non-weighted estimations, but significant in the first weighted estimations in *Table 2* and *3*. Estimation 2 indicates that being female rather than male increases the probability of a person to strongly agree to increase taxes to prevent environmental damage by 1.5 percentage points. Interestingly, the coefficient is not statistically significant anymore after controlling for the economic situations of the respondents.

A positive relationship between formal education and environmental attitudes can be observed. However, the coefficient loses its significance when the second weighting variable is used, 2SLS is run and the economic situation of the individuals is included. Informal education has a much stronger impact on individuals’ environmental attitudes. One of the key findings in this study is the fact that political interest is highly correlated with the preferences to contribute. An increase in the level of discussing

politics by one unit increases the share of subjects reporting the highest willingness to contribute between 2.5 and 2.9 percentage points. This result is confirmed when using two further proxies (INTEREST IN POLITICS and IMPORTANCE OF POLITICS), both cases yield marginal effects close the 2 percentage points. Thus, the paper shows that we have to go beyond formal education and include individuals' interest for current political matters. As mentioned in the theoretical part, this aspect has been neglected in previous studies. What about individuals' ideology? In line with our predictions, people with a rightist orientation are less willing to contribute and pay higher taxes to prevent environmental damages. This statement may not be affected by different environmental attitudes only, but also by a general rejection of tax increases. However, the marginal effects are relatively low. Furthermore, it should be noticed that the ideology variable has many missing values, which makes it impossible to include the variable simultaneously in all the regressions.

There are no statistically significant differences among the marital variables and the employment situation. On the other hand, we find evidence that the economic situation matters, as mentioned previously. Due to the relatively high number of missing values these variables have been sequentially included in the last two estimations. The results indicate that a higher financial satisfaction leads to a higher preference to contribute (see Estimation 9). This result remains robust after controlling for individuals' perception of their economic class status, although in both estimations, the marginal effects are not very high. Interestingly, *upper middle class* people show the highest level of environmental preferences, with marginal effects of 3.5 percentage points, followed by the *lower middle class* (3.3 percentage points) and the *upper class* (0.5 percentage, with a coefficient that is not statistically significant). Thus, there is a

non-linear relationship between economic class and environmental attitudes. That fact can be seen as a confirmation of Kuznet's hypothesis at the individual level.

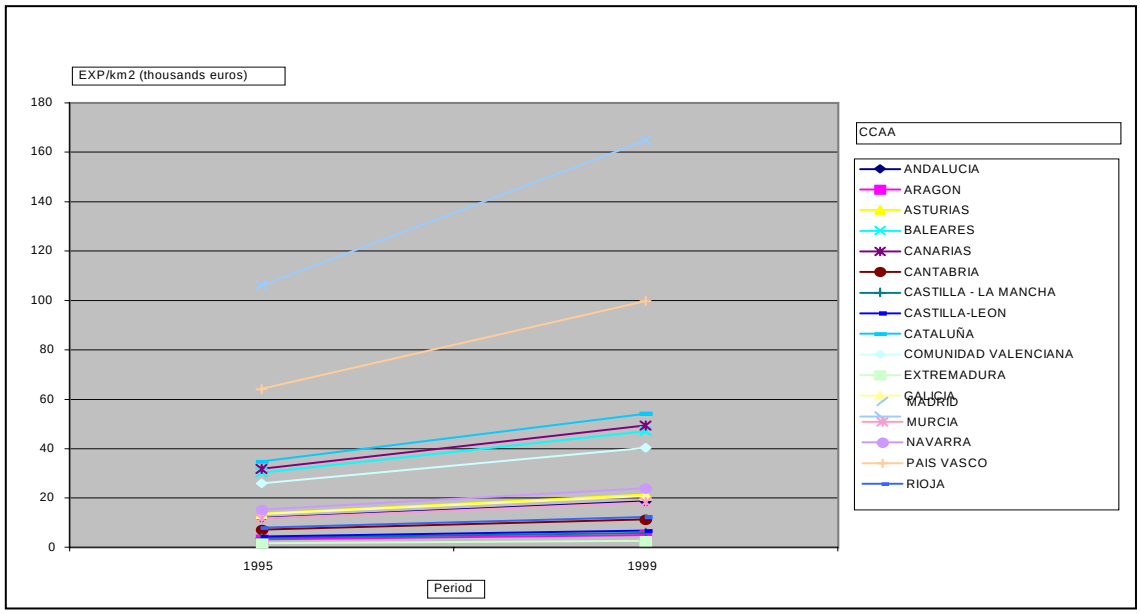
Tables 2 and *3* also show that social capital matters. Trusting others leads to a higher preference for environmental protection. An increase in the trust scale by one unit raises the share of people reporting the highest preference between 3.1 and 3.6 percentage points. Not surprisingly being a member of a voluntary environmental organization leads to a higher willingness to accept a tax increase, the probability of stating the highest values increasing by more than 7.3 percentage points and showing thus the highest marginal effects. This might, however, be due to people with high values choose to participate in a voluntary environmental organization. As the causality is not clear due to a *selection bias*, we apply an instrumental variable technique. A suitable instrument must be contemporaneously uncorrelated with the error term but must be highly correlated with a membership in a voluntary environmental organization. In our case, we use the dummy variable NOT A MEMBER OF A VOLUNTARY ORGANIZATION as an instrumental variable, which covers all possible voluntary organizations and not only environmental ones. The variable is not correlated with the error term (r=-0.03) and highly correlated with being a member of a voluntary environmental organization (r=-0.30). The 2SLS estimations are presented in the equations 4 and 5 using the two available weighting variables. The equations indicate that the results are consistent with the ordered probit estimations. Therefore we decided to continue with ordered probit estimations to take into account the ranking information of the dependent variable.

A higher level of national pride is also correlated with a higher preferences towards environmental protection, although the coefficient loses its significance in the last three estimations in *Table 3*. However, the lack of significance may be driven by a

significantly lower number of observations. The GEOGRAPHIC GROUP variable shows that people in the reference group (*locality or town*) have the lowest preference to contribute (all coefficients have a positive sign). On the other hand, the group *world as a whole* shows the strongest difference to the reference group and the highest preference for environmental protection, being statistically significant in almost all estimations with marginal effects between 2.6 and 3.8 percentage points. The factor TOWN SIZE shows some interesting implications. People living in a town with less than 2'000 inhabitants have the lowest value. The highest preference can be found in the town size 50'000-100'000. On the other hand, individuals living in a town with 500'000 and more inhabitants show lower values, closer to those from towns with 5-10'000 inhabitants. The relationship is not entirely linear. The high level of environmental attitudes in town sizes of 50'000-100'000 may be due to their not being big enough to induce a strong free-riding mentality in the anonymous city, but big enough to be able to implement strong and active environmental programs.

Figure 1

Environmental Protection Expenditures 1995-1999



Source: INE (2004).

Strong regional differences between Spanish regions are found. To detect a possible reason for this we calculate the environmental protection expenditures per km^2 for the years 1995 and 1999[22] (INE 2004). Those values are shown in *Figure 1*.

All in all, regions with negative coefficients in the estimations have relatively higher levels of environmental protection expenditures per km^2 (except the Cantabria Region). In this case, the argument can be similar to the time-factor explanation. The higher the expenditures, the higher citizens' satisfaction with public policies in matters of environmental protection, which leads to a decrease in the preference to pay higher taxes for that "public good". The regional income level can be an additional argument to explain the negative coefficients of some Autonomous Communities (CCAA). Communities like Baleares, Comunidad Valenciana or Cataluña are characterized by high GDP per capita levels. This might reflect a trade-off between economic activity and preferences for protecting the environment.

Finally, we take a look at the development over time. The results are largely in line with our expectations. We find a strong increase of the willingness to contribute between 1990 and 1995, a period with new environmental programs launched after the Rio agreement and the development of the V EU Environmental Program. On the other hand, between 1995 and 1999/2000 a very strong decrease is observable. The attitudes towards environmental protection by means of higher taxes in 1999/2000 is statistically significantly lower than in 1990, with marginal effects between 2.5 and 3.2 percentage points. Possible reasons for the decay in the second half of the 90s are the improvements of the environmental infrastructure and institutions as well as the

[22] The Ceuta and Melilla Region has been excluded from the graph because it is an outlier. Only information about 1995 and 1999 is available.

financial support from the European Structural Funds to support investments in environmental protection.

In general, if people perceive the environmental damages more closely, they will be willing to pay more money in order to improve the quality of the environment. As discussed in Section II, a good example for this was one of the most severe drought periods in the first half of the nineties (1992-1996). Additionally, the tax burden has not increased between 1995 and 1999/2000. Thus, the development of the tax burden is not a valid argument to explain the decrease of environmental attitudes.

Furthermore, the situation at the end of the 90s does not allow to speak of a real "green" tax reform in Spain. Although having good administrative conditions to implement environmental taxation, the Spanish fiscal system has not included taxes on emissions, and sometimes, environmental taxes are poorly designed and rather used to get additional revenues than to really handle existing environmental problems (Gago and Labandeira 1999). Thus, environmental taxes are not significantly higher in 1999/2000 compared to the other years in the analysis.

Table 2: Determinants of the preferences for environmental protection in Spain

ORDERED PROBIT		*unweighted ordered probit* *Coeff.*	*z-Stat.*	*Marg. Effects*	*weighted var 1 ordered probit* *Coeff.*	*z-Stat.*	*Marg. Effects*	*weighted var2 ordered probit* *Coeff.*	*z-Stat.*	*Marg. Effects*	*weighted var 1 2SLS* *Coeff.*	*t-Stat.*	*weighted var2 2SLS* *Coeff.*	*z-Stat.*
INDEPENDENT V.		*1*			*2*			*3*			*4*		*5*	
Socio-Demographic Factors														
AGE		-0.003**	-2.08	-0.001	-0.003*	-1.92	-0.001	-0.003*	-1.75	-0.001	-0.002**	-2.02	-0.002*	-1.74
GENDER	MALE (r.g.)													
	FEMALE	0.049	1.30	0.010	0.085**	2.12	0.017	0.070	1.62	0.015	0.075**	2.39	0.068**	2.01
MARITAL STATUS	MARRIED	0.009	0.21	0.002	-0.005	-0.10	-0.001	0.003	0.07	0.001	0.015	0.42	0.026	0.65
	DIVORCED	-0.135	-0.80	-0.026	-0.172	-0.93	-0.030	-0.141	-0.74	-0.027	-0.156	-1.12	-0.117	-0.81
	SEPARATED	0.066	0.54	0.014	0.017	0.14	0.003	0.005	0.03	0.001	0.051	0.56	0.047	0.44
	WIDOWED	-0.091	-1.11	-0.018	-0.111	-1.28	-0.021	-0.122	-1.34	-0.024	-0.067	-0.99	-0.073	-1.04
	SINGLE (r.g.)													
Formal and Informal Education														
EDUCATION		0.007**	1.99	0.002	0.007*	1.88	0.001	0.006	1.41	0.001	0.003	0.96	0.002	0.69
DISCUSSING POLITICS		0.123***	4.88	0.025	0.146***	5.36	0.029	0.132***	4.36	0.028	0.099***	4.71	0.089***	3.89
Occupational Status														
EMPLOYMENT STATUS	FULL TIME EMPLOYED (r.g.)													
	PART TIME EMPLOYED	-0.027	-0.36	-0.005	-0.078	-0.98	-0.015	-0.018	-0.21	-0.004	-0.111*	-1.74	-0.072	-1.04
	SELFEMPLOYED	0.026	0.43	0.005	0.017	0.25	0.003	0.014	0.19	0.003	0.001	0.03	-0.007	-0.13
	UNEMPLOYED	-0.019	-0.32	-0.004	-0.075	-1.18	-0.014	-0.053	-0.78	-0.011	-0.068	-1.35	-0.059	-1.09
	AT HOME	-0.001	-0.02	0.000	-0.034	-0.62	-0.007	-0.069	-1.18	-0.014	-0.039	-0.91	-0.075	-1.63
	STUDENT	0.090	1.31	0.019	0.063	0.84	0.013	0.009	0.11	0.002	0.055	0.95	0.022	0.35
	RETIRED	-0.023	-0.37	-0.005	-0.040	-0.62	-0.008	-0.066	-0.93	-0.014	-0.031	-0.63	-0.059	-1.09
	OTHER	-0.028	-0.16	-0.006	-0.058	-0.31	-0.011	0.014	0.07	0.003	-0.056	-0.39	-0.012	-0.08
Social Capital														

TRUST		0.147***	4.69	0.031	0.156***	4.64	0.031	0.142***	3.90	0.031	0.115***	4.43	0.100***	3.61
ENVIRON. ORGAN.	MEMBER VOLUNT.	0.338***	3.66	0.083	0.338***	3.56	0.079	0.317***	2.98	0.078	1.125***	3.97	0.977***	3.46
	NOT A MEMBER (r.g.)													
Identification														
NATIONAL PRIDE		0.044**	2.01	0.009	0.046**	1.98	0.009	0.055**	2.18	0.012	0.046**	2.51	0.051**	2.57
GEOGRAPHIC GROUP	LOCALITY OR TOWN (r.g.)													
	STATE OR REGION	0.056	1.35	0.012	0.078*	1.78	0.016	0.075	1.63	0.016	0.061*	1.79	0.058	1.64
	COUNTRY AS A WHOLE	0.059	1.53	0.012	0.063	1.55	0.013	0.027	0.61	0.006	0.051	1.60	0.024	0.68
	CONTINENT AS A WHOLE	0.078	0.99	0.017	0.112	1.30	0.023	0.118	1.24	0.027	0.086	1.32	0.088	1.25
	WORLD AS A WHOLE	0.126*	1.89	0.028	0.129*	1.82	0.027	0.168**	2.04	0.038	0.091*	1.67	0.106*	1.72
Other variables														
SIZE OF TOWN	UNDER 2,000 (r.g.)													
	2,000 - 5,000	0.166**	2.23	0.037	0.104	1.27	0.021	0.112	1.30	0.025	0.063	0.99	0.059	0.88
	5,000 - 10,000	0.120*	1.73	0.026	0.102	1.31	0.021	0.154*	1.83	0.035	0.053	0.87	0.079	1.20
	10,000 - 20,000	0.153**	2.18	0.034	0.128*	1.68	0.027	0.220***	2.74	0.051	0.078	1.32	0.137**	2.24
	20,000 - 50,000	0.107	1.63	0.023	0.171**	2.34	0.036	0.170**	2.14	0.038	0.111*	1.96	0.102*	1.68
	50,000 - 100,000	0.299***	3.90	0.071	0.258***	3.17	0.057	0.301***	3.43	0.073	0.171***	2.72	0.195***	2.89
	100,000 - 500,000	0.178***	2.97	0.038	0.206***	3.13	0.043	0.248***	3.52	0.056	0.137***	2.67	0.158***	2.91
	500,000 and MORE	0.096	1.46	0.020	0.152**	2.13	0.032	0.206***	2.68	0.047	0.089	1.60	0.118**	1.98
SPANISH REGION	ANDALUCIA	-0.129**	-2.06	-0.025	-0.126*	-1.91	-0.024	-0.098	-1.26	-0.020	-0.105**	-2.07	-0.072	-1.22
	ARAGON	0.191*	1.94	0.043	0.153	1.30	0.033	0.170	1.46	0.039	0.101	1.12	0.138	1.57
	ASTURIAS	0.156	1.46	0.035	0.179	1.57	0.039	0.184	1.52	0.043	0.136	1.57	0.154*	1.67
	BALEARES	-0.290***	-2.64	-0.050	-0.256**	-2.06	-0.043	-0.384***	-2.65	-0.065	-0.207**	-2.18	-0.288***	-2.69
	CATALUNA	-0.257***	-4.19	-0.048	-0.332***	-5.22	-0.057	-0.172**	-2.36	-0.034	-0.248***	-5.06	-0.107*	-1.91
	CANARIAS	-0.167*	-1.69	-0.031	-0.169	-1.56	-0.030	-0.008	-0.07	-0.002	-0.163*	-1.93	-0.028	-0.31
	CANTABRIA	-0.337***	-2.66	-0.057	-0.260*	-1.87	-0.044	-0.146	-0.94	-0.028	-0.183*	-1.70	-0.085	-0.73
	CASTILLA-LEON	0.296***	3.94	0.070	0.228***	2.90	0.050	0.275***	3.02	0.066	0.154	2.61	0.192***	2.85
	CASTILLA-LA MANCHA	-0.225**	-2.56	-0.041	-0.184*	-1.83	-0.033	-0.022	-0.18	-0.005	-0.157**	-2.04	-0.028	-0.32
	EXTREMADURA	0.238**	2.12	0.055	0.183	1.62	0.040	0.364***	2.93	0.092	0.111	1.33	0.238***	2.68
	GALICIA	-0.237***	-2.94	-0.043	-0.278***	-3.29	-0.047	-0.097	-0.97	-0.020	-0.213***	-3.31	-0.066	-0.88
	RIOJA	0.069	0.57	0.015	0.004	0.03	0.001	0.093	0.53	0.021	-0.024	-0.23	0.032	0.23

	MADRID (r.g.)													
	MURCIA	0.119	1.11	0.026	0.175	1.51	0.038	0.164	1.14	0.038	0.147	1.62	0.143	1.23
	NAVARRA	-0.041	-0.34	-0.008	-0.140	-1.08	-0.025	-0.078	-0.57	-0.016	-0.094	-0.95	-0.029	-0.28
	PAIS VASCO	-0.067	-0.76	-0.013	-0.019	-0.21	-0.004	0.018	0.18	0.004	-0.008	-0.12	0.035	0.45
	COMUNIDAD VALENCIANA	-0.165**	-2.39	-0.031	-0.247***	-3.29	-0.043	-0.156*	-1.93	-0.031	-0.212***	-3.58	-0.138**	-2.17
TIME	SPAIN 90 (r.g.)													
	SPAIN 95	0.258***	5.84	0.058	0.261***	5.60	0.055	0.249***	5.32	0.054	0.140***	3.42	0.140***	3.53
	SPAIN 1999/2000	-0.138***	-3.16	-0.028	-0.150***	-3.29	-0.029	-0.159***	-3.40	-0.032	-0.106***	-3.04	-0.112***	-3.14
(Pseudo) R2		0.031			0.037			0.035			0.053		0.046	
Number of observations		5226			5226			5226			5226		5226	
Prob > chi2		0.000			0.000			0.000			0.000		0.000	

Dependent variable: environmental morality on a four point scale. *,** and *** denote significance at the 10%, 5% and 1% level. Marginal effect = highest environmental value score (3). Instrument in the 2SLS for MEMBER VOLUNTARY ENVIRONMENTAL ORGANIZATION: NOT A MEMBER OF A VOLUNTARY ORGANIZATION. Data Spain 1999/2000 covers the European Values Survey (EVS) 1999 and the World Values Survey (WVS) data 2000. A dummy variable has been added in the estimations to differentiate between EVS and WVS.

Table 3: Further Factors that Shape Individuals' preferences for environmental protection in Spain

		weighted var 1 ordered probit			*weighted var 1 ordered probit*			*weighted var 1 ordered probit*			*weighted var 1 ordered probit*			*weighted var 1 ordered probit*		
		Coeff.	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*
INDEPENDENT V.		*6*			*7*			*8*			*9*			*10*		
Demographic Factors																
AGE		-0.003*	-1.96	-0.001	-0.003**	-2.00	-0.001	-0.002	-0.91	-3E-004	-0.003**	-2.05	-0.001	-0.003*	-1.78	-0.001
GENDER	MALE (r.g.)															
	FEMALE	0.082**	2.06	0.016	0.078*	1.96	0.015	0.101**	2.23	0.021	0.059	1.32	0.013	0.063	1.37	0.014
MARITAL STATUS	MARRIED	0.006	0.13	0.001	0.010	0.22	0.002	-0.008	-0.16	-0.002	-0.007	-0.13	-0.001	-0.032	-0.60	-0.007
	DIVORCED	-0.145	-0.80	-0.026	-0.118	-0.65	-0.022	-0.226	-1.09	-0.041	-0.208	-0.95	-0.040	-0.217	-0.98	-0.041
	SEPARATED	0.016	0.13	0.003	0.009	0.08	0.002	0.100	0.74	0.022	-0.043	-0.35	-0.009	-0.069	-0.54	-0.014
	WIDOWED	-0.102	-1.18	-0.019	-0.097	-1.11	-0.018	-0.153	-1.48	-0.029	-0.116	-1.23	-0.023	-0.120	-1.24	-0.024
	SINGLE (r.g.)															
Formal and informal education																
EDUCATION		0.008*	1.94	0.001	0.007*	1.91	0.001	0.008**	1.79	0.002	0.004	0.96	0.001	0.001	0.31	0.0003
DISCUSSING POLITICS								0.131***	4.26	0.027	0.135***	4.47	0.029	0.134***	4.31	0.029
INTEREST IN POLITICS		0.097***	5.18	0.019												
IMPORTANCE OF POLITICS					0.098***	5.08	0.019									
Idealogy																
RIGHT POLITICAL ORIENTATION								-0.030***	-2.94	-0.006						
Economic Situation																
ECONOMIC SITUACION	UPPER CLASS													0.045	0.43	0.010
	UPPER MIDDLE CLASS													0.153***	2.67	0.035
	LOWER MIDDLE CLASS													0.148***	3.25	0.033
	WORKING/LOWEST CLASS (r.g.)															
FINANCIAL SATISFACTION											0.027***	2.69	0.006	0.025**	2.33	0.005
Occupational Status																

EMPLOYMENT STATUS	FULL TIME EMPLOYED (r.g.)															
	PART TIME EMPLOYED	-0.080	-1.01	-0.015	-0.071	-0.90	-0.013	-0.100	-1.09	-0.019	-0.085	-0.97	-0.017	-0.095	-1.06	-0.019
	SELFEMPLOYED	0.023	0.35	0.005	0.028	0.43	0.006	0.018	0.25	0.004	-0.002	-0.03	0.000	0.001	0.02	0.000
	UNEMPLOYED	-0.052	-0.82	-0.010	-0.055	-0.86	-0.011	-0.065	-0.90	-0.013	-0.034	-0.47	-0.007	-0.003	-0.05	-0.001
	AT HOME	-0.041	-0.75	-0.008	-0.042	-0.77	-0.008	0.007	0.11	0.001	-0.043	-0.70	-0.009	-0.029	-0.46	-0.006
	STUDENT	0.056	0.75	0.011	0.059	0.79	0.012	0.066	0.78	0.014	0.000	0.00	0.000	0.021	0.24	0.005
	RETIRED	-0.044	-0.68	-0.008	-0.051	-0.78	-0.010	-0.039	-0.53	-0.008	-0.027	-0.37	-0.006	-0.024	-0.32	-0.005
	OTHER	-0.077	-0.41	-0.014	-0.076	-0.40	-0.014	-0.032	-0.14	-0.006	-0.295	-0.40	-0.053	-0.319	-0.43	-0.057
Social Capital																
TRUST		0.155***	4.61	0.031	0.155***	4.61	0.031	0.166***	4.46	0.035	0.164***	4.35	0.036	0.162***	4.20	0.036
ENVIRON. ORGAN.	MEMBER VOLUNT.	0.322***	3.30	0.075	0.317***	3.24	0.073	0.423***	4.25	0.106	0.340***	3.17	0.086	0.292***	2.66	0.072
	NOT A MEMBER (r.g.)															
Identification																
NATIONAL PRIDE		0.047**	2.04	0.009	0.047**	2.02	0.009	0.040	1.52	0.008	0.011	0.42	0.002	0.007	0.25	0.001
GEOGRAPHIC GROUP	LOCALITY OR TOWN (r.g.)															
	STATE OR REGION	0.074*	1.69	0.015	0.067	1.52	0.013	0.059	1.15	0.012	0.044	0.90	0.010	0.046	0.91	0.010
	COUNTRY AS A WHOLE	0.060	1.46	0.012	0.052	1.28	0.010	0.051	1.11	0.011	0.035	0.75	0.008	0.072	1.50	0.016
	CONTINENT AS A WHOLE	0.121	1.39	0.025	0.123	1.42	0.026	0.106	1.20	0.023	0.043	0.50	0.009	0.032	0.35	0.007
	WORLD AS A WHOLE	0.131*	1.87	0.027	0.125*	1.79	0.026	0.121	1.53	0.026	0.155*	1.84	0.036	0.165*	1.93	0.038
Other variables																
SIZE OF TOWN	UNDER 2,000 (reference group)															
	2,000 - 5,000	0.113	1.39	0.023	0.105	1.29	0.022	0.037	0.38	0.008	0.071	0.82	0.016	0.069	0.78	0.015
	5,000 - 10,000	0.116	1.50	0.024	0.110	1.43	0.023	0.014	0.15	0.003	0.169**	2.05	0.039	0.155*	1.82	0.036
	10,000 - 20,000	0.142*	1.88	0.030	0.144*	1.90	0.030	0.056	0.63	0.012	0.167**	2.07	0.038	0.169**	2.05	0.039
	20,000 - 50,000	0.168**	2.33	0.035	0.165**	2.29	0.035	0.108	1.22	0.023	0.179**	2.27	0.042	0.180**	2.21	0.042

	50,000 - 100,000	0.256***	3.16	0.057	0.258***	3.19	0.057	0.209**	2.14	0.047	0.303***	3.49	0.074	0.262***	2.92	0.063
	100,000 - 500,000	0.215***	3.31	0.045	0.215***	3.31	0.045	0.114	1.44	0.024	0.279***	4.02	0.065	0.263***	3.64	0.061
	500,000 and MORE	0.149**	2.11	0.031	0.157**	2.22	0.033	0.090	1.07	0.019	0.184***	2.38	0.042	0.182**	2.27	0.042
SPANISH	Andalucia	-0.131**	-1.98	-0.024	-0.133**	-2.01	-0.025	-0.153**	-2.07	-0.029	-0.118	-1.53	-0.024	-0.102	-1.28	-0.021
REGION	Aragon	0.179	1.50	0.039	0.153	1.29	0.033	0.225	1.62	0.052	0.278*	1.93	0.068	0.313**	2.19	0.078
	Asturias	0.169	1.50	0.036	0.161	1.43	0.034	0.096	0.78	0.021	0.216	1.64	0.052	0.270**	2.00	0.066
	Baleares	-0.250**	-2.06	-0.042	-0.252**	-2.06	-0.043	-0.183	-1.32	-0.034	-0.280**	-2.21	-0.051	-0.246*	-1.89	-0.046
	Cataluna	-0.335***	-5.25	-0.057	-0.333***	-5.22	-0.057	-0.403***	-5.62	-0.070	-0.202***	-2.76	-0.040	-0.196***	-2.60	-0.039
	Canarias	-0.179*	-1.66	-0.032	-0.172	-1.60	-0.031	-0.144	-1.15	-0.027	-0.136	-1.06	-0.027	-0.078	-0.60	-0.016
	Cantabria	-0.233*	-1.69	-0.040	-0.230*	-1.67	-0.039	-0.090	-0.49	-0.017	-0.155	-1.06	-0.031	-0.128	-0.85	-0.026
	Castilla-Leon	0.212***	2.70	0.046	0.218***	2.77	0.047	0.169*	1.87	0.037	0.197**	2.25	0.046	0.214**	2.40	0.050
	Castilla-La Mancha	-0.217**	-2.12	-0.038	-0.215**	-2.09	-0.037	-0.173	-1.57	-0.032	-0.097	-0.83	-0.020	-0.107	-0.89	-0.022
	Extremadura	0.180	1.58	0.039	0.176	1.56	0.038	0.198	1.50	0.045	0.336***	2.83	0.085	0.357***	2.99	0.091
	Galicia	-0.287***	-3.40	-0.048	-0.282***	-3.34	-0.048	-0.256***	-2.78	-0.046	-0.068	-0.68	-0.014	-0.032	-0.31	-0.007
	Rioja	-0.005	-0.04	-0.001	-0.023	-0.17	-0.005	-0.071	-0.44	-0.014	-0.032	-0.21	-0.007	0.0013	0.01	0.0003
	Madrid (r.g.)															
	Murcia	0.130	1.14	0.027	0.138	1.22	0.029	0.172	1.29	0.039	0.272*	1.93	0.067	0.240	1.64	0.058
	Navarra	-0.152	-1.18	-0.027	-0.139	-1.06	-0.025	-0.154	-1.02	-0.029	-0.085	-0.65	-0.017	-0.065	-0.49	-0.014
	Pais Vasco	-0.030	-0.33	-0.006	-0.030	-0.34	-0.006	-0.048	-0.46	-0.010	-0.030	-0.29	-0.006	-0.010	-0.09	-0.002
	Comunidad Valenciana	-0.251***	-3.33	-0.043	-0.251***	-3.33	-0.044	-0.283***	-3.43	-0.051	-0.284***	-3.31	-0.053	-0.268***	-3.04	-0.051
TIME	SPAIN 1990 (r.g)															
	SPAIN 1995	0.261***	5.61	0.056	0.249***	5.32	0.053	0.259***	4.78	0.058	0.257***	5.47	0.058	0.303***	5.80	0.069
	SPAIN 1999/2000	-0.149***	-3.29	-0.029	-0.158***	-3.47	-0.031	-0.154***	-3.02	-0.032	-0.149***	-3.27	-0.031	-0.117**	-2.36	-0.025
(Pseudo) R2		0.037			0.037			0.035			0.035			0.037		
Number of observations		5232			5213			4033			4284			4086		
Prob > chi2		0.000			0.000			0.000			0.000			0.000		

Dependent variable: environmental morality on a four point scale. *,** and *** denote significance at the 10%, 5% and 1% level. Marginal effect = highest environmental value score (3). A dummy variable has been added in the estimations to differentiate between EVS and WVS. Equation 9 and 10 covers only World Values Survey data. The used proxies on the economic situation were not available in the EVS 1999 data set.

The results obtained can help to design environmental policies in Spain. The most effective degree of decentralization to achieve specific environmental objectives remains a controversial topic. On the one hand side, regional differences are a significant argument to justify a decentralization process in this context. In fact, Spanish regions have obtained more environmental competences in the last few years. However, for some environmental policies in the European Union we observe the trend towards centralization[23]. In this respect, it could be adequate to propose some kind of mixed policy, in order not to induce welfare losses in some Spanish regions, and thus to take into account regional differences. A decentralized policy in the Spanish regions, which takes into account European objectives, could be a possible strategy.

IV. CONCLUSIONS

Since the 1970s, the number of studies investigating environmental preferences has been growing. However, we still lack papers analyzing a country and its regions or its development over time. Furthermore, it is a promising line to search empirically for factors neglected in previous studies. This paper aims therefore at reducing such shortcomings. To assess individuals' environmental attitudes in Spain and its different regions over time we use data sets provided by the *World Values Surveys* (WVS) and the *European Values Surveys* (EVS) covering the years 1990 (WVS), 1995 (WVS) and 1999/2000 (WVS and EVS). Regional dummy variables have been added to check for

[23] For example, in the water resources field, the European Framework D2000/60/EC established a common guide for members to improve water quality and quantity aspects. The basic objective of the European regulation is to improve water quality and to achieve a rational use of water resources, in order to reduce pressure on those resources. The European Union is enforcing country members to apply this framework in the next few years. The Spanish central government will have to adapt its regulation to the European Framework.

possible cross-regional variations. The results indeed indicate that there are differences between regions. Furthermore, we find big differences between the first half (strong increase of the environmental attitudes) and the second half of the 90s (strong decrease). A possible reason for regional differences and the development over time is a higher satisfaction with the environmental policy, which may lead to the belief that paying additional taxes is not necessary to reduce environmental damages.

Compared to many previous studies, we present in this paper a richer set of independent variables to better isolate the impact of a specific variable on individuals' environmental attitudes. The results obtained from commonly used variables such as age, gender, formal education, and income are in line with the tendencies reported in the literature. This paper as a novelty shows the relevance of further variables neglected beforehand, such as political interest and social capital. These variables have a strong impact on the environmental attitudes. All three proxies for political interest have a statistically significant positive impact on individuals' attitude to pay higher taxes, with high marginal effects. The rapid growth of the social capital literature inspired our efforts to check the importance of these variables on the environmental attitudes. Generalized trust, which can be seen as one of the key variables of societies' social capital has also a strong impact on the environmental preferences. Not surprisingly, being in a member of a voluntary environmental organization has also a positive impact on environmental attitudes. As the causality is not clear, an instrumental approach has been chosen. We find robust and consistent results.

All in all, investigating citizens' environmental preferences underlines the importance of investigating a rich set of theories to fully understand what influences their willingness to contribute to the environmental protection. Understanding what shapes environmental attitudes still remains a fruitful field for further research.

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(lxv) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications” organised by Fondazione Eni Enrico Mattei and sponsored by the EU, Milan, September 25-27, 2003
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(lxviii) This paper was presented at the ENGIME Workshop on “Governance and Policies in Multicultural Cities”, Rome, June 5-6, 2003
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(lxxvii) This paper was presented at the Workshop on Infectious Diseases: Ecological and Economic Approaches held in Trieste on 13-15 April 2005 and organised by the Ecological and Environmental Economics - EEE Programme, a joint three-year programme of ICTP - The Abdus Salam International Centre for Theoretical Physics, FEEM - Fondazione Eni Enrico Mattei, and The Beijer International Institute of Ecological Economics.

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