



Exploring Individual Preferences on Protecting Environment: A Binominal Logistic Regression

Esra Karapınar Kocağ^{1-a*}

¹Social Service and Counselling Department, Gümüşhane University Vocational School of Social Sciences, Gümüşhane, Türkiye

*Corresponding author

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ABSTRACT

Environmental degradation across the globe is a rising concern for every country amongst the public and policymakers. The relationship between economic growth and pollution in the natural environment is widely discussed in the relevant literature. Kuznets Curve which was originally proposed by Kuznets (1955) to represent a U shape relationship between income growth and income inequality and has later been used by researchers to examine the relationship between income growth and environmental pollution. Then, this approach is called Environmental Kuznets Curve (EKC) and it has been investigated by a large body of literature. While macro approaches are widely discussed, microeconomic approaches are scarce. In this context, this article aims to form an individual perspective on environmental preferences. Using individual priority for environmental protection rather than economic growth as an environmental indicator, individual factors affecting this choice were examined. Considering the limited studies in the literature, this study is one of the pioneering attempts to explain the environmental preferences of individuals using individual observations from more than a hundred countries for 1995-2020. The findings from the logistic regression approach show that there is no clear individual-level evidence to support the EKC hypothesis. However, it provides useful information for a better understanding of environmental choices that are crucial for a sustainable society. From a policy point of view, women's empowerment, education, and job opportunities might be suggested as useful tools in a society to achieve a sustainable future.

Key words: EKC, Environmental Preferences, World Values Survey, Logistic Estimation

JEL Codes: D91; Q5; C4

Çevreyi Korumaya Yönelik Bireysel Tercihleri Araştırma: Binomial Lojistik Regresyon

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Öz

Dünya genelinde çevresel bozulma, halk ve politika yapıcılar arasında her ülke için artan bir endişe kaynağıdır. Ekonomik büyüme ve doğal çevredeki bozulma arasındaki ilişki ilgili literatürde geniş bir şekilde tartışılmaktadır. Kuznets (1955) tarafından gelir artışı ve gelir eşitsizliği arasındaki U şeklinde bir ilişkiyi temsil etmesi için önerilen Kuznets Eğrisi, daha sonra araştırmacılar tarafından gelir artışı ve çevre kirliliği arasındaki ilişkiyi incelemek için de kullanılmıştır. Zamanla bu yaklaşım Çevresel Kuznets Eğrisi (EKC) olarak adlandırılıp geniş bir literatür tarafından incelenmiştir. EKC hipotezine yönelik makro yaklaşımlar büyük ölçüde tartışılırken, mikro ekonomik yaklaşımlar oldukça azdır. Bu makale, bu bağlamda, çevresel tercihler hakkında bireysel bir bakış açısı oluşturmayı amaçlamaktadır. Çevresel bir gösterge olarak ekonomik büyümeden ziyade çevrenin korunmasına yönelik bireysel önceliği kullanarak, bu tercihi etkileyen bireysel faktörler incelenmiştir. Literatürdeki sınırlı çalışmalar göz önünde bulundurulduğunda, bu çalışma, 1995-2020 dönemi için yüzden fazla ülkeden bireysel gözlemlerden yararlanması bakımından bireylerin çevresel tercihlerini açıklayan öncü girişimlerdir. Lojistik regresyon yaklaşımından elde edilen bulgular, EKC hipotezini destekleyecek bireysel düzeyde net bir kanıt olmadığını göstermektedir. Buna karşın elde edilen bulgular, sürdürülebilir bir toplum için çok önemli olan çevreci tercihlerin daha iyi anlaşılması için faydalı bilgiler sağlamaktadır. Politika önerileri kapsamında, kadınların güçlendirilmesinin, eğitimin ve iş fırsatlarının bir toplumda sürdürülebilir yeşil bir gelecek için yararlı araçlar olabileceği önerilebilir.

Anahtar Kelimeler: EKC, Çevresel Tercihler, Dünya Değerler Araştırması, Lojistik Tahmin

JEL Kodlar: D91; Q5; C4

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^aesrakkocaq@qumushane.edu.tr | ^b<https://orcid.org/0000-0002-2239-0519>

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Introduction

Environmental degradation across the globe is a rising concern for every country amongst the public and policymakers. Harmful human activities have given rise to air pollution, ocean acidification, soil erosion, habitat destruction, desertification, and other changes that make ecosystems more stressed, while demand for fresh water and arable land for agriculture is expected to increase in the future as the global population grows (ISO, 2022). According to the United Nations human population has grown more than tripled in size since 1950, more precisely, it reached almost 7.8 billion in 2020 and is projected to be over 8.5 billion in 2030 (UN DESA, 2022). This increasing number of human population highlights the importance of urgent measures to maintain that population's needs.

Even if new technologies have been adopted to help reduce energy use, for example, there still needs to be a significant change in the way of consumption, organisation, and production to maintain human wellbeing within the ecosystem. Individuals in this system are the most important actors as their action is responsible for this changing environment. Individuals within a society often face a choosing situation. They choose between self-individual interest in the short term and collective interest of the society where they live in the long term. Environmental decisions, in this respect, constitutes probably one most important choice made by individuals.

The relationship between economic growth and pollution in the natural environment is widely discussed in the literature. Kuznets Curve, which was originally proposed by Kuznets (1955) to represent a U shape relationship between income growth and income inequality, has later been used by researchers to examine the relationship between income growth and environmental pollution. Then, this approach is called Environmental Kuznets Curve (EKC) and it has been investigated by a large body of literature. However, individual-level studies that investigate preferences for the environment are rather scarce.

This paper, in this context, provides valuable insight on individual preferences on the environment. For this purpose, World Values Survey (WVS) time series dataset for the period 1981-2020 was utilised. A sample of 187,586 individual observations across 103 countries was used to examine the determinants of individuals' green choice through a survey question of "...Which of them comes closer to your own point of view? A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent."

The remainder of this paper is as follows. Section 2 discusses the estimation methodology that introduces sampling and variables first. Besides, the model to be used in the analysis is presented, and then empirical findings are given. Section 3 is the conclusion.

Literature Review

There exists a relatively wide literature on the relationship between economic growth and pollution. As one of them, Grossman and Krueger's (1991) study is the leading attempt to investigate the relationship between economic growth and air pollution, so the EKC hypothesis. The data set that was a project of the Global Environmental Monitoring System by a collaboration of the World Health Organization and United Nations Environment Programme was analysed for NAFTA countries. Findings reveal that environmental degradation decreases when it reaches a threshold through higher awareness of the public, more modern and cleaner technologies, and higher environmental standards with more powerful enforcement, even if it increases in the early stages of economic growth.

Although the EKC hypothesis has been tested by several studies for different country cases, it is hard to say there is a consensus on the findings of these studies. Narayan and Narayan (2010), as one example in the relevant literature, tested this hypothesis for 43 developing countries from the Middle East, South Asia, Latin America, East Asia, and Africa for the period of 1980–2004. Empirical evidence of this study shows that only Middle Eastern and South Asian panels were found to be consistent with the EKC hypothesis. There are also other country examples in the empirical literature such as India (Kanjilal and Ghosh, 2013), Malaysia (Saboori, Sulaiman and Mohd, 2012; Bekhet, Othman and Yasmin, 2020), Latin America, Africa and Asia for 66 countries (Bhattarai and Hammig, 2001), France (Iwata, Okada and Samreth, 2010), 14 Asian countries (Apergis and Ozturk, 2015), 25 European Union countries (Mazzanti and Zoboli, 2009) and Spain (Roca et al., 2001). Nevertheless, findings of the studies that investigate the existence of a U-shaped relationship between environmental indicators and economic growth as offered by the EKC hypothesis vary widely depending on the selected environmental indicator, country/country group, explanatory variables, time period, and econometric technique used in the analysis (Bhattarai and Hammig, 2001).

Microeconomic approaches toward the EKC hypothesis are not as largely discussed as macroeconomic ones. One reason for U shape EKC is individual demand for environmental quality with a higher level of income. Roca (2003) highlights the microeconomic basis of EKC that depends on preferences. The author criticises the approach that increased income will eventually help to reduce environmental degradation. More clearly, the individual preferences of rich people may not be environment-friendly because environmental costs are displaced into a far future or a far place. Hence, a higher level of income may not always translate into a lower level of consumer preferences that would lower the pressure on the environment which means assumptions of EKC may not hold.

As already mentioned, the measure of the environmental indicator varies across studies. An interesting individual-level indicator of the environment is offered by Lekakis and Kousis (2001). The authors use environmental actions per capita

rather than pollution indices and examine the relationship between these actions per capita and income per capita for three Southern European countries, Greece, Spain, and Portugal during 1974-1994. The findings of this study do not clearly support the EKC hypothesis. That is to say, there is no turning points as suggested by the hypothesis for these three countries. Apart from a few attempts, there are no extensive researches to explain individual factors on environmental preferences.

This paper, in this respect, steps back and tries to understand this individual demand side. Namely, unlike the macroeconomic approach of the studies that focused on environmental degradation and economic growth, this paper offers a micro-level approach questioning individual preferences toward environmental protection at the cost of economic growth. The environmental indicator is individual priority towards environmental protection rather than economic growth. Along with a standard set of socio-economic indicators including income as well, a wide range of individual characteristics are included in the model. This study is probably the first attempt that explains individual environmental preferences by a wide range of individual characteristics exploiting individual observations from more than a hundred countries.

Sampling and Variables

In this study version V2.0 of the World Values Survey (WVS) time series dataset for the period 1981-2020 was utilised. This dataset combines WVS survey waves that are Wave 1 (1981-1983), Wave 2 (1990-1992), Wave 3 (1995-1998), Wave 4 (2000-2004), Wave 5 (2005-2008), Wave 6 (2010-2014), and Wave 7 (2017-2020) (Inglehart, R., C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, 2014). This data set is not a panel data set in which there is continuity between samples over waves, however, it is a time series data file that shows the changes in the values across countries over time.

Originally, 106 countries with 432,482 individual observations are included in the data set. Not all countries are included in each wave. While there are data for some countries across waves, some of the countries have data

only in some particular waves. Besides, the dependent variable used in this empirical analysis did not exist in the first two waves. Therefore, these waves were dropped from the sample. Additionally, missing observations in the baseline specifications were also dropped. Eventually, this investigation ends up with a sample of 187,586 individual observations across 103 countries. The numbers of observations in each country are given in the appendix section.

For the dependent variable in this investigation, survey respondents were asked: "Which of them comes closer to your own point of view? A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.". The three options were 1. Protecting the environment; 2. Economic growth and creating jobs; and 3. Another answer. There were also missing variables, no answer, and don't know options. Thereby, a dichotomous dependent variable was generated that takes 1 if the respondent chose to protect the environment, and it takes 0 if the respondent chose economic growth and creating jobs. The rest of the observations apart from these two options were dropped.

The distribution of the green votes (i.e., protecting the environment) as percentage is shown in Figure 1. Darker green areas present a higher percentage of green votes against those for economic growth and creating jobs. Accordingly, the preferences of the sample in Andorra seem to be the most environmentalist as 86.28 percent of its sample chose protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. This is followed by El Salvador (85.66 percent), Dominican Republic (78.47 percent), Bolivia (74.82 percent), Puerto Rico (73.09 percent), and so on. In the lowest tale of answers, we see Israel as only 31.85 per cent of Israeli sample voted green. Countries such as Kuwait (32.21 percent), Ethiopia (33.71 percent), South Africa (33.74 percent), Pakistan (34.15 percent), and so on followed by this country.



Şekil 1. Yeşil oyların ülkelere göre dağılımı, yüzde
Figure 1. Distribution of green votes across countries, percentage

Source: Authors' calculation based on WVS data

Çizelge 1. Temel spesifikasyondaki değişkenlerin özet istatistikleri

Table 1. Summary statistics of the variables in the baseline specification

Variable		Obs	Mean	Std. Dev.	Min	Max
Protecting the environment should be given priority	Green 0	187586	(base)			
	1	187586	0.5602	0.4964	0	1
Gender, female	Female 0	187586	(base)			
	1	187586	0.4161	0.4929	0	1
Age categories	Agecat 15-24	187586	(base)			
	25-34	187586	0.4114	0.4921	0	1
	40-54	187586	0.3200	0.4665	0	1
	55-69	187586	0.1198	0.3247	0	1
	70 +	187586	0.0124	0.1105	0	1
Income categories	Incomecat Low income	187586	(base)			
	Mid income	187586	0.5844	0.4928	0	1
	High income	187586	0.1265	0.3324	0	1
Education categories	Education Lower	187586	(base)			
	Middle	187586	0.4536	0.4978	0	1
	Upper	187586	0.3199	0.4665	0	1
Employment status, unemployed	Unemployed 0	187586	(base)			
	1	187586	0.1440	0.3510	0	1

To construct independent variables, several survey questions were used as presented in Table 1. For baseline specifications, the standard set of socio-economic characteristics such as gender, age, income, education, and employment status are included. All of the explanatory variables used in the baseline specifications are categorical variables. The age variable is given in five age categories, starting from 15-24 to 70+. Although income categories in the survey were originally scaled in ten steps, the generation of three broader categories was preferred to have more observations in each category and to make the presentation simpler. Education also has three categories. Finally gender and unemployment status are dichotomous variables, taking 1 if female and/or unemployed.

Furthermore, the baseline specifications are extended by including several survey items step by step as listed in Table 2. These extended specifications include a wide range of explanatory variables that might influence individual environmental preferences such as family indicators (e.g., marital status, having children), religious and political orientation (e.g., being religious, left ideology), individual health and happiness, and individual feeling/reaction to protect the environment (e.g., membership of the environmental organization, confidence on the environmental protection movement).

In terms of weighting strategy, original country weights that are provided in the WVS dataset was used. This is chosen to compensate for small deviations from target figures in each country like age-gender distributions. [Further information on weighting the sample can be found at <https://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=WEIGHT&CMSID=WEIGHT>]

Binominal logistic estimation and findings

The empirical analysis in this paper aims to shed light on what kind of factors influence individual preferences on the environment. Standard socio-economic indicators including income level which was mostly focused on in the literature are presented as a baseline specification. Moreover, some additional individual indicators that are expected to explain these preferences are also involved in the further specifications. Thus, Equation 1 is estimated as follows:

$$e_{icy} = \beta_0 + \beta_1 X_{icy} + \epsilon_{icy} \quad (1)$$

where e is the binary outcome variable for individual i in country c in year y . X presents explanatory variables used in the analysis. The logit model is used to take into account the binary outcome variable which is defined as

$e_i = \{1$ if an individual responds "Protecting the environment should be given priority"

"0 if an individual responds "Economic growth and creating jobs should be the top priority"}

These kinds of models are estimated through maximum likelihood estimate which produces estimates of β most likely to be resulted in the observed values of e , given explanatory variables x . The likelihood function is individual probabilities for each outcome:

$$\ln L(\beta | x_i) = \sum_{i=1}^n [(1 - e_i) \cdot \ln[1 - \Lambda(x_i' \beta)] + e_i \cdot \ln \Lambda(x_i' \beta)] \quad (2)$$

where $\Lambda(x_i' \beta) = \frac{\exp(x_i' \beta)}{1 + \exp(x_i' \beta)}$

The exponential of the coefficients (i.e., odds ratio) measures the effect of one unit change in the explanatory variable on the likelihood of $e_i=1$ which provides an interpretation that is

$\frac{P}{1-P} = \exp(x_i'\beta)$. Nevertheless, marginal effects are more common in the interpretation of the coefficients. This is basically the impact the explanatory variables have on the probability of being in a given category, $e_i=1$. So, in this paper, marginal effects show the change in the probability of individuals having a specific environmental preference

when the independent variable increases by one unit. Weighted estimates are preferred to make the sample represent the national distribution. Table 3 presents the findings of the empirical investigation. First three columns of the table show baseline specifications. While the first specification does not include any interaction terms, the second specification includes age-income interaction, and the third one includes age-income, education-income, and age-education interactions.

Çizelge 2. Daha sonraki spesifikasyonlardaki değişkenlerin özet istatistikleri
Table 2. Summary statistics of the variables in the further specifications

	Variable	Obs	Mean	Std. Dev.	Min	Max
	Marital_status					
Marital status	Married	187586	(base)			
	Living together as married	187586	0.0759	0.2648	0	1
	Divorced	187586	0.0404	0.1968	0	1
	Separated	187586	0.0214	0.1446	0	1
	Widowed	187586	0.0270	0.1621	0	1
	Single/Never married	187586	0.2548	0.4358	0	1
	Children					
Having children	0	183026	(base)			
	1	183026	0.7011	0.4578	0	1
	Religious					
Being religious	0	179346	(base)			
	1	179346	0.6674	0.4711	0	1
	Left					
Political orientation, left	0	142135	(base)			
	1	142135	0.5381	0.4986	0	1
	Happiness					
Being happy	Very happy	187586	(base)			
	Quite happy	187586	0.5326	0.4989	0	1
	Not very happy	187586	0.1430	0.3501	0	1
	Not at all happy	187586	0.0248	0.1554	0	1
	Health					
Health status	Very good	187586	(base)			
	Good	187586	0.4561	0.4981	0	1
	Fair	187586	0.2407	0.4275	0	1
	Poor	187586	0.0415	0.1994	0	1
	Very poor	187586	0.0035	0.0589	0	1
	Membership					
Active/Inactive membership of environmental organization	Not a member	160262	(base)			
	Inactive member	160262	0.0874	0.2824	0	1
	Active member	160262	0.0464	0.2104	0	1
	Conf_env_mov					
Confidence: the environmental protection movement	A great deal	174374	(base)			
	Quite a lot	174374	0.4474	0.4972	0	1
	Not very much	174374	0.2903	0.4539	0	1
	None at all	174374	0.1075	0.3097	0	1
	Waves					
Survey waves	1994-1998	187586	(base)			
	1999-2004	187586	0.1301	0.3365	0	1
	2005-2009	187586	0.2126	0.4091	0	1
	2010-2014	187586	0.2555	0.4362	0	1
	2017-2020	187586	0.2450	0.4301	0	1

Tablo 3. Çevresel Tercihlerin Belirleyicileri, marjinal etkiler
Table 3. Determinants of Environmental Preferences, marginal effects

Variables	Baseline Specifications			Further Specifications	
	1	2	3	4	5
Female	0.013*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	0.012*** (0.003)	0.010*** (0.003)
Agecat:25-34	0.007* (0.004)	0.007* (0.004)	0.008* (0.004)	0.008 (0.005)	0.012** (0.006)
Agecat:40-54	-0.000 (0.004)	-0.001 (0.004)	0.000 (0.004)	0.001 (0.006)	0.007 (0.006)
Agecat:55-69	-0.005 (0.005)	-0.005 (0.005)	-0.004 (0.005)	-0.007 (0.007)	0.003 (0.007)
Agecat:70+	-0.022* (0.012)	-0.026** (0.012)	-0.043*** (0.014)	-0.040** (0.016)	-0.036** (0.018)
Incomecat: Mid inc.	-0.000 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.002 (0.004)	-0.008** (0.004)
Incomecat: High inc.	0.016*** (0.004)	0.015*** (0.004)	0.016*** (0.005)	0.020*** (0.006)	0.006 (0.006)
Education: Middle	0.018*** (0.004)	0.018*** (0.004)	0.018*** (0.004)	0.017*** (0.005)	0.019*** (0.005)
Education: Upper	0.079*** (0.004)	0.078*** (0.004)	0.080*** (0.004)	0.079*** (0.005)	0.080*** (0.005)
Unemployed	-0.022*** (0.004)	-0.022*** (0.004)	-0.022*** (0.004)	-0.024*** (0.005)	-0.029*** (0.005)
marital_status: Living together as married				-0.001 (0.006)	-0.001 (0.006)
marital_status: Divorced				0.002 (0.007)	0.005 (0.008)
marital_status: Separated				-0.012 (0.010)	-0.014 (0.011)
marital_status: Widowed				0.003 (0.009)	0.008 (0.010)
marital_status: Single/Never married				0.002 (0.005)	0.005 (0.006)
Children				-0.003 (0.005)	-0.005 (0.005)
Religious				0.015*** (0.003)	0.008** (0.004)
Left				0.040*** (0.003)	0.042*** (0.003)
Happiness: Quite happy					-0.009** (0.004)
Happiness: Not very happy					-0.040*** (0.006)
Happiness: Not at all happy					-0.034*** (0.012)
Health: Good					-0.009** (0.004)
Health: Fair					-0.002 (0.005)
Health: Poor					0.007 (0.009)
Health: Very poor					-0.011 (0.027)
Membership: Inactive member					0.030*** (0.005)
Membership: Active member					0.053*** (0.007)
Confidence: Quite a lot					-0.033*** (0.005)
Confidence: Not very much					-0.117*** (0.005)
Confidence: None at all					-0.161*** (0.007)
Constant	-0.136*** (0.042)	-0.155*** (0.047)	-0.149*** (0.056)	-0.356*** (0.072)	-0.117 (0.084)
Observations	187,586	187,586	187,586	133,926	110,518
Pseudo R-squared	0.0467	0.0467	0.0468	0.0502	0.0639
Wald Chi2	8710	8724	8741	6372	6760
Prob > Chi2	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Dependent variable is a binary variable that takes “1” if an individual responds “Protecting the environment should be given priority”, and “0” if an individual responds “Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent”. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

It is seen that the coefficient of gender, female, is statistically significant across specifications at 1 percent significance level. Being female, accordingly, increases the probability of reporting pro-environmental preference (i.e., protecting the environment should be given priority) by between 1.3 and 1 percentage points.

Age categories are also included in baseline specification to see if there exists any age effect on the pro-environmental preference. In the baseline specification 1, the marginal effect is higher for the oldest age group (i.e., age of 70+) and it is negative. More precisely, being in the age category of 70+ rather than in the reference group (i.e., 15-24 years) decreases the probability of reporting "Protecting the environment should be given priority" by 2.2 percentage points. However, being in the age category of 25-34 increases that probability by 0.7 percentage points. Nevertheless, these effects are only marginally significant. In column 2 where I interact age with income, the coefficient of the age category of 25-34 remains as it is in the first specification, while the effect in the oldest age cohort becomes larger and statistically more significant than in the first specification. Young people seem to have a higher level of pro-environmental preference when income level is considered together. Next, in the third column, education interaction with age and income are also included. This resulted in a slightly larger significant effect in the age category of 25-34, and an even larger and statistically more significant effect in the oldest cohorts. In the further 2 specifications, only in the last one there exists a significant age effect of the 25-34 cohort, that is being in the age category of 25-34 rather than the reference group of 15-24 increases the probability of reporting pro-environmental preference by 1.2 percentage point which is the highest level across specifications. However, being in the age category of 70+ rather than the reference group of 15-24 decreases the probability of reporting pro-environmental preference by 3.6 percentage points.

The next step is aimed to clarify if income has any effect on the pro-environmental preference of individuals. The only significant effect is observed in the first specification for the high-income group. So, being in the high-income group rather than low-income increases the probability of reporting protecting the environment should be given priority by 1.6 percentage points at a 1 percent significance level. However, this positive and significant relationship disappears in the final specification. The effect of being in the mid-income group is only significant in the final specification where being in this group rather than the low-income group is found to be negatively associated with pro-environmental preferences. Even though the effect of the mid-income group is negative while the effect of the high-income group is positive, there is no consistent statistically significant effect across specifications. Therefore, it can be said that the empirical findings of this paper do not clearly support the EKC hypothesis. Notwithstanding, unemployment status is consistently negatively related with pro-environmental preferences. Being unemployed decreases the probability of reporting pro-environmental

preference by between 2.2 and 2.9 percentage points at 1 percent significance level. This finding is expected that job creation and economic growth should be a priority instead of concerning environmental degradation for those who are looking for a job.

Education as the final baseline indicator of pro-environmental preferences is consistently positively related to this preference. This relationship is statistically significant across specifications. It should be noted that the effect of the upper level of education is much higher than lower categories. Having the upper level of education rather than a lower-level increases pro-environmental preferences by between 7.8 and 8 percentage points. Increased awareness through education seems to influence individuals' environmental preferences.

In the further specifications in columns 4 and 5, a variety of other variables are included. In terms of family-related effects, no significant effect of marital status and having children on pro-environmental preferences was found. Related to religiousness and left ideology, a positive and statistically significant relationship was found. Namely, being religious increases the probability of reporting pro-environmental preference by 1.5 percentage points, though it slightly decreased in magnitude and significance in the last specification. Having left ideology also increases that probability by 4 percentage points, and this effect gets even larger in the final specification.

In the final specification that is presented in column 5, additionally, personal happiness, health, environmental organisation membership, and confidence on in the environmental act were included. Regarding happiness, the coefficients are all negative and significant. Being quite happy rather than very happy decreases the probability of reporting pro-environmental preference by 0.9 percentage points. Coefficients are more negative when going into the least happy group, which means less happy individuals are less likely to report pro-environmental preference. For health categories, the only significant effect is found in the good health category. Having good health rather than very good health decreases the probability of reporting pro-environmental preference by 0.9 percentage points. This is similar to the effect on happiness, which is less healthy individuals are less likely to report pro-environmental preference.

Membership in an environmental organisation, on the other hand, increases the probability of reporting pro-environmental preferences, even though the membership is not an active one. Being an active member increases the probability by 5.3 percentage points, while it is 3 percentage points for inactive membership. Individual confidence in the environmental protection movement as a final indicator seems to have a negative significant effect on pro-environmental preferences, considering the reference category of a great deal of confidence. Therefore, when individuals feel not confident at all, they are less likely to report pro-environmental preference. For example, being not confident at all about the environmental protection movement decreases the probability of

reporting pro-environmental preference by 16.1 percentage points which is the highest level among the categories at 1 percent significance level.

Conclusions

This paper aims to shed light on individual preferences for the environment. More precisely, what factors influence given priority over environmental protection rather than economic growth or job creation. 187,586 individual observations across 103 countries were investigated in this respect which is one strength of the current paper. In the investigation of individual pro-environmental preferences, a wide range of explanatory variables were used along with baseline specifications that include a standard set of socio-economic variables.

Findings reveal that there is a significant gender effect that is consistent across specifications on this preference. There is a significant effect of age to explain pro-environmental preferences, in which the oldest group is less likely to report pro-environmental preference while the young population seems to have more pro-environmental attitudes. Income as the most investigated indicator in the literature was found to be positive and significant in the high-income group, while the mid-income group has a negative effect. Yet, these effects are not statistically significant across specifications. Therefore, it can be said that the empirical findings of this paper do not clearly support the EKC hypothesis as in line with Lekakis and Kousis (2001). However, the effect of education and unemployment status appear to be highly intuitive. Higher education seems to raise environmental awareness to prioritise environmental protection over economic growth at the cost of potential environmental degradation. Nevertheless, being unemployed as a major obstacle expectedly seem to postpone environmental concerns. Furthermore, it is worth noting that religiosity, political orientation, happiness, environmental organisation membership, and confidence in the environmental act are also important to explain this preference.

The empirical findings of this study provide very useful insights for a better understanding of individual pro-environmental preferences that is crucial for a sustainable society. From a policy point of view, it can be suggested that women's empowerment is likely to be a useful tool in a

society to achieve a sustainable greener future. Particularly in less developed and developing countries restrictive gender roles and norms might be a big obstacle to women's progress in this respect. Education, on the other hand, is a significant parameter that can alter protective attitudes toward the environment. Therefore, it should be given priority to achieve sustainable development goals. Besides, job concerns in society should be alleviated to get public support on that.

There are still a few limitations in this study worth mentioning. First, even if a wide range of countries across the world was evaluated, it could be useful to identify the preferences in particular regions/countries separately (e.g. developing countries). Second, gender roles might be examined deeper. What kind of roles and norms in countries are likely to restrict women and what should be done in particular countries to deal with challenging gender roles. Lastly, other survey questions such as voluntary work for the environment or willingness to give part of income for the environment, along with the survey question used in this paper as a dependent variable would also be useful to investigate.

Appendix

Çizelge 4. Örneklemdeki ülkeler ve gözlemler

Table 4: Countries and observations in the sample

Country	Frequency	Percent	Country	Frequency	Percent
South Africa	7,512	4.00	Andorra	1,460	0.78
China	5,578	2.97	Lebanon	1,455	0.78
United States of America	5,267	2.81	Norway	1,425	0.76
Türkiye	5,033	2.68	Jordan	1,414	0.75
Canada	4,601	2.45	Puerto Rico	1,309	0.70
Mexico	4,321	2.30	Haiti	1,305	0.70
Nigeria	4,321	2.30	Bosnia and Herzegovina	1,301	0.69
Russia	4,110	2.19	Guatemala	1,285	0.69
Colombia	3,868	2.06	Netherlands	1,214	0.65
Peru	3,717	1.98	Tunisia	1,210	0.65
India	3,712	1.98	Iraq	1,125	0.60
Egypt	3,659	1.95	Albania	1,109	0.59
Australia	3,476	1.85	Switzerland	1,108	0.59
Thailand	3,433	1.83	Bolivia	1,090	0.58
Brazil	3,314	1.77	Finland	1,063	0.57
South Korea	3,289	1.75	Libya	1,056	0.56
Indonesia	3,124	1.67	Slovenia	998	0.53
Iran	2,935	1.56	Myanmar	982	0.52
Ukraine	2,921	1.56	Macedonia	953	0.51
Zimbabwe	2,872	1.53	Poland	918	0.49
Taiwan ROC	2,857	1.52	Algeria	901	0.48
Chile	2,717	1.45	German Federal Republic	856	0.46
Germany	2,638	1.41	Bulgaria	819	0.44
Pakistan	2,634	1.40	Tajikistan	764	0.41
Malaysia	2,616	1.39	Uzbekistan	761	0.41
Philippines	2,606	1.39	Tanzania	713	0.38
Hong Kong SAR	2,542	1.36	Kuwait	711	0.38
Singapore	2,452	1.31	Qatar	690	0.37
Kyrgyzstan	2,435	1.30	Zambia	686	0.37
Serbia	2,312	1.23	Nicaragua	664	0.35
Romania	2,310	1.23	Trinidad and Tobago	660	0.35
Ghana	2,234	1.19	Saudi Arabia	620	0.33
Morocco	1,968	1.05	Greece	593	0.32
Spain	1,958	1.04	Latvia	581	0.31
Sweden	1,915	1.02	El Salvador	580	0.31
Japan	1,888	1.01	Venezuela	575	0.31
New Zealand	1,882	1.00	Macau SAR	573	0.31
Belarus	1,871	1.00	Montenegro	568	0.30
Vietnam	1,855	0.99	Hungary	533	0.28
Ethiopia	1,801	0.96	Burkina Faso	533	0.28
Azerbaijan	1,778	0.95	Slovakia	506	0.27
Kazakhstan	1,703	0.91	France	478	0.25
Cyprus	1,702	0.91	United Kingdom	475	0.25
Moldova	1,664	0.89	Palestine	457	0.24
Bangladesh	1,646	0.88	Czech Republic	447	0.24
Rwanda	1,597	0.85	Uganda	445	0.24
Ecuador	1,593	0.85	Mali	433	0.23
Uruguay	1,537	0.82	Yemen	430	0.23
Argentina	1,521	0.81	Lithuania	424	0.23
Armenia	1,518	0.81	Italy	348	0.19
Estonia	1,495	0.80	Dominican Republic	180	0.10
Georgia	1,494	0.80			

Extended Abstract

Environmental degradation across the globe is a rising concern for every country amongst the public and policymakers. The relationship between economic growth and pollution in the natural environment is widely discussed in the relevant literature. Kuznets Curve, which was originally proposed by Kuznets (1955) to represent a U shape relationship between income growth and income inequality, has later been used by researchers to examine the relationship between income growth and environmental pollution. Then, this approach is called Environmental Kuznets Curve (EKC) and it has been investigated by a large body of literature.

Although the EKC hypothesis has been tested by several studies for different country cases, it is hard to say there is a consensus on the findings of these studies. Besides, microeconomic approaches toward the EKC hypothesis are not as largely discussed as macroeconomic ones. This paper, in this respect, steps back and tries to understand this individual demand side. Namely, unlike the macroeconomic approach of the studies that focused on environmental degradation and economic growth, this paper offers a micro-level approach questioning individual preferences towards environmental protection at the cost of economic growth. The environmental indicator is individual priority toward environmental protection rather than economic growth. Along with a standard set of socio-economic indicators including income as well, a wide range of individual characteristics are included in the model. This study is probably the first attempt that explains individual environmental preferences by a wide range of individual characteristics exploiting individual observations from more than a hundred countries.

In this study version V2.0 of the World Values Survey (WVS) time series dataset for the period 1981-2020 was utilised. This dataset combines WVS survey waves that are Wave 1 (1981-1983), Wave 2 (1990-1992), Wave 3 (1995-1998), Wave 4 (2000-2004), Wave 5 (2005-2008), Wave 6 (2010-2014), and Wave 7 (2017-2020) (Inglehart, R., C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, 2014). This data set is not a panel data set in which there is continuity between samples over waves, however, it is a time series data file that shows the changes in the values across countries over time.

For the dependent variable in this investigation, survey respondents were asked: "Which of them comes closer to your own point of view? A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.". The three options were 1. Protecting the environment; 2. Economic growth and creating jobs; and 3. Another answer. There were also missing variables, no answer, and don't know options. Thereby, a dichotomous dependent variable was generated takes 1 if the respondent chose to protect the environment, and it takes 0 if the respondent chose economic growth and

creating jobs. The rest of the observations apart from these two options were dropped.

The empirical analysis in this paper aims to shed light on what kind of factors influence individual preferences on the environment. Standard socio-economic indicators including income level which was mostly focused on in the literature are presented as a baseline specification. Moreover, some additional individual indicators that are expected to explain these preferences are also involved in the further specifications. Thus, Equation 1 was estimated as follows:

$$e_{icy} = \beta_0 + \beta_1 X_{icy} + \varepsilon_{icy} \quad (1)$$

where e is a binary outcome variable for individual i in country c in year y . X presents explanatory variables used in the analysis. The logit model is used to take into account the binary outcome variable which is defined as

$e_i = \{1$ if an individual responds "Protecting the environment should be given priority"

"0 if an individual responds "Economic growth and creating jobs should be the top priority"

These kinds of models are estimated through maximum likelihood estimate which produces estimates of β most likely to be resulted in the observed values of e , given explanatory variables x . The likelihood function is individual probabilities for each outcome:

$$\ln L(\beta | x_i) = \sum_{i=1}^n [(1 - e_i) \cdot \ln[1 - \Lambda(x_i' \beta)] + e_i \cdot \ln \Lambda(x_i' \beta)] \quad (2)$$

$$\text{where } \Lambda(x_i' \beta) = \frac{\exp(x_i' \beta)}{1 + \exp(x_i' \beta)}$$

The exponential of the coefficients (i.e., odds ratio) measures the effect of one unit change in the explanatory variable on the likelihood of $e_i = 1$ which provides an interpretation that is

$\frac{P}{1-P} = \exp(x_i' \beta)$. Nevertheless, marginal effects are more common in the interpretation of the coefficients. This is basically the impact the explanatory variables have on the probability of being in a given category, $e_i = 1$. So, in this paper, marginal effects show the change in the probability of individuals having a specific environmental preference when the independent variable increases by one unit. Weighted estimates are preferred to make the sample represent the national distribution.

This paper aims to shed light on individual preferences for the environment. More precisely, what factors influence given priority over environmental protection rather than economic growth or job creation. 187,586 individual observations across 103 countries were investigated in this respect which is one strength of the current paper. In the investigation of individual pro-environmental preferences, a wide range of explanatory variables were used along with baseline specifications that include a standard set of socio-economic variables.

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