

## THE INFLUENCE OF EU MEMBER COUNTRIES' ECONOMIC DEVELOPMENT ON THEIR CITIZENS' PRO-ENVIRONMENTAL ATTITUDES

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### **Abstract**

*The present paper aims to determine the influence of EU member countries' economic development on their citizens' pro-environmental attitudes using a path analysis. In this sense, we have used the results of the 2012 survey on the „Attitudes of Europeans towards building the single market for green products”, as well as the 2012 statistical information referring to EU member countries' economic development, provided by Eurostat. The results indicated which macroeconomic variables exert a significant influence on each pro-environmental attitudinal component. Future studies may consider using less macroeconomic variables in order to identify their influence on different pro-environmental attitudinal components.*

**Keywords:** *pro-environmental attitudes, economic development, EU member countries, path analysis, macroeconomic variables*

**JEL classification code:** *E03, O11, Q56*

### **I. INTRODUCTION**

As environmental pollution is one of the most important issues facing the world today, the level of concern for the natural environment has increased globally since the 1950s. Social research has focused on monitoring the development of public environmental awareness as well as on explaining individual as well as cross-national differences of public environmental concern. However, explaining the individual and crossnational differences is still a controversial issue in environmental research (Franzen & Meyer, 2010).

Standard economic reasoning suggests that the protection of the environment is not only a public good, but also a normal good, whose demand increases with income. Citizens in wealthier nations not only have a higher demand for a clean environment, but they also have less pressing economic problems and are therefore more willing and able to reduce their standard of living in order to devote more resources to global environmental protection while concern for local environmental problems is higher in poorer nations because of the more severe local environmental problems (Frazen, 2003). International comparisons play a central role in the explanation of environmental consciousness and attitudes. But only if relevant macrosocial conditions, that is, the objective level of environmental pollution, the socioeconomic level of development, and environmental policies, vary, is it possible to investigate their effects on individual attitudes and behaviors (Haller & Hadler, 2008).

European citizens are shown to undertake more environmentally-friendly actions if they are highly educated and well-informed about the environment (European Commission, 2011). Ott and Soretz (2014) distinguish two possible impacts of economic development on green attitudes: First, wealth is an important determinant of individual attitude towards the environment. Richer nations can spend more on environmental education, richer individuals are able to spend more for organic products. Therefore green attitude will strengthen with an increase in wealth. The second determinant we regard is pollution itself. As environmental quality decreases, individuals will be more concerned with environmental issues and hence care more about the environment.

Considering the discussion presented above, the purpose of the present article is to determine which macroeconomic variables exert a significant influence on each pro-environmental attitudinal component. Based

on the results of the 2012 survey on the “Attitudes of Europeans towards building the single market for green products”, as well as the 2012 statistical information referring to EU member countries’ economic development, we have studied the influence of macroeconomic variables, such as: the employment rate, tertiary educational attainment, GDP per capita, human development index value, unemployment rate, share of gross value added in services and share of employment in services, on European citizens’ pro-environmental attitudes. First, the paper presents a conceptual framework, followed by explanations regarding the method used for data analysis. The third section of the paper is dedicated to the results and the final section presents a series of conclusions.

## II. THEORETICAL FRAMEWORK

Environmental attitude is defined as a psychological tendency expressed by evaluating the natural environment with a certain degree of approval or disapproval (Milfont & Duckitt, 2010). According to Schultz et al. (2004), environmental attitude means the collection of beliefs, affect and behavioural intentions that a person has about activities related to the environment. Being a taught predisposition resulting from the values system, environmental attitude exerts an influence on the consumer’s response towards the environment (Rashid, 2009). The “pro-environmental” term (Shrum et al., 1995) indicates the concern for the physical environment (air, earth, water). The phrase “pro-environmental attitude” has been used by Bohlen et al. (1993) as a one-dimensional scale representing consumers’ concern over the quality of the environment and reflects the attitude towards environmental issues.

Ellen (1994) observed that a positive attitude towards the environment is a significant predictor of recycling, and other authors have confirmed that pro-environmental attitude is considered to be the most important predictor of consumers’ green consciousness (Bohlen et al., 1993; Rannikko, 1996; Schlegelmilch et al., 1996) or willingness to pay more for environmentally friendly products (Laroche et al., 2001).

Using data provided by the 1993 International Social Survey Programme (ISSP), Kimmelmeier et al. (2002) examined the relationship between economic factors, values, and environmental attitudes both at the societal level and the individual level. Results demonstrated that economic factors predicted proenvironmental attitudes at the societal level and less so at the individual level, but at neither level was the influence of economic factors mediated through postmaterialist values. Further, a society’s recent economic growth, but not current levels of economic development, predicted to what extent individuals’ proenvironmental views were linked to their personal economic resources. Kimmelmeier et al. (2002) conclude that economic factors do play an important role in the formation of some pro-environmental attitudes and behaviors, but not all. Also, many pro-environmental attitudes and behaviors are “not necessarily linked to or even the product of economic prosperity” (Kimmelmeier et al., 2002: p. 280).

Franzen and Meyer’s (2010) multilevel analysis of the International Social Survey Programme data found a positive cross-national association between affluence and environmental concern, net of environmental conditions and post material values. As a measure of affluence, Givens and Jorgenson (2011) used gross domestic product (GDP) per capita. A key finding of this study is the opposite effects of national levels of affluence and rates of economic growth on individual-level environmental values; GDP per capita is negatively correlated with levels of environmental concern, whereas GDP growth is positively associated with levels of environmental concern. Although higher rates of individual affluence are associated with higher rates of environmental concern, Givens and Jorgenson (2011) found, counter to Inglehart, that national-level affluence is associated with lower levels of environmental concern, in line with the results of Gelissen (2007) as well as some of the findings of Dunlap and Mertig (1997) and Dunlap and York (2008).

In Haller and Hadler’s (2008) study, attitudes and behavior are seen as a complex interplay between individual characteristics and natural-technical, economic, social, and political structures and institutions. The general socioeconomic development is important in various ways (Haller & Hadler, 2008). First, increasing wealth and education can imply a value change toward more post-materialist values and more pronounced environmental values. These considerations lead to the following hypotheses:

- concerning Level of Economic and Human Development: Growing wealth and better healthcare and education will have an impact on individual attitudes;
- concerning Education: Higher education leads to better knowledge about the environment; therefore, it may also lead to more environmentally friendly attitudes;
- concerning Environmental Knowledge: Better knowledge should lead to a better understanding of the connections between behavior and environmental strains. People who know the negative environmental effects of certain patterns of behavior should try to change them.

Second, problems such as unemployment, poverty, or security might be more relevant and outshine the environmental concerns (Haller & Hadler, 2008). Haller and Hadler (2008) postulated that employed persons

should be less concerned about the environment since they have less time to adapt their patterns of life. They also expect that people employed in the public sector will show more positive attitudes toward the environment since their work is concerned with public welfare.

Haller and Hadler (2008) used two indicators captured a country’s level of socioeconomic development: “the GNP” (gross national product) and “the HDI” (Human Development Index). They have found that nations with lower GDP and lower scores on the Human Development Index (HDI) have citizens with reduced levels of willingness to make sacrifices for the environment (Haller & Hadler, 2008). They have also outlined that a higher level of development increases the readiness to make sacrifices and that in postcommunist countries, willingness to cut back one’s lifestyle is particularly low.

Materialistic values have a different meaning in less developed countries (Hurst et al., 2013). Research on income and well-being has shown that higher levels of country-level income have a greater effect in increasing subjective well-being among poorer countries (Inglehart et al., 2008). It may be that the pursuit of additional wealth by individuals within these countries, perhaps spurred in part by personal materialistic values, may be positively related to important well-being factors, such as the satisfaction of basic psychological needs (Hurst et al., 2013). This, in turn, may have a consequent effect on environmental behavior and attitudes for individuals in these countries.

**III.METHODOLOGY**

In order to analyze the influence of macroeconomic variables on European citizens’ pro-environmental attitudes, we have considered two types of secondary data. First, we have studied the information included in the 2012 Flash Eurobarometer 367 “Attitudes of Europeans towards building the single market for green products” (European Commission, 2013). We have chosen this eurobarometer because it includes different items which reflect European citizens’ pro-environmental attitudes, that we considered relevant for our study. The research conducted in the 367 Flash Eurobarometer is based on a sample of 26.573 respondents (citizens from EU countries) and the results represent average values for the responses of respondents from each of the EU countries. Considering the varied themes presented in the eurobarometer, we have only extracted the items related to respondents’ pro-environmental attitudes. These items are represented by the respondents’ positive answers to different questions from the questionnaire. Initially, we have selected 18 items (attitudinal components) regarding respondents’ pro-environmental attitudes. In order to reduce the number of items, we performed a Principal Component Analysis and obtained 3 main components which were further on included in the model. Further analyses based on Structural Equation Modeling did not conduct to significant results (p was less than 0.05). In order to obtain an adequate model (with a p value above 0.05), we analysed each attitudinal component and repeatedly retested the model. The analyses we performed revealed that the best model (with the highest p value) includes 6 attitudinal components which we have further on used as endogenous variables (table 1).

**Table 1. Attitudinal components**

Items
Q1. I know a lot about the environmental impact of the products I buy and use.
Q2. I feel that using environmentally-friendly products is ‘the right thing to do’.
Q3. Buying environmentally-friendly products sets a good example.
Q4. I strongly agree that concerns about the environment are not exaggerated.
Q5. I would be willing to pay for products if I was confident that they were more environmentally friendly.
Q6. I often buy environmentally-friendly products.

Second, we have collected a series of macroeconomic indicators as independent variables from the 2012 statistical data provided by Eurostat:

- Tertiary Educational Attainment (TEA), measured in percents;
- Gross Domestic Product/ capita (GDP), measured in euro/ inhabitant;
- Human Development Index value (HDI), expressed with values between 0 and 1;
- Employment Rate (ER), measured in percents;
- Unemployment Rate (UR), measured in percents;
- Gross Value Added in Services (GVAS), measured in percents;
- Employment Rate in Services (ERS), measured in percents.

which we considered relevant for the economic development of EU 27’ countries.

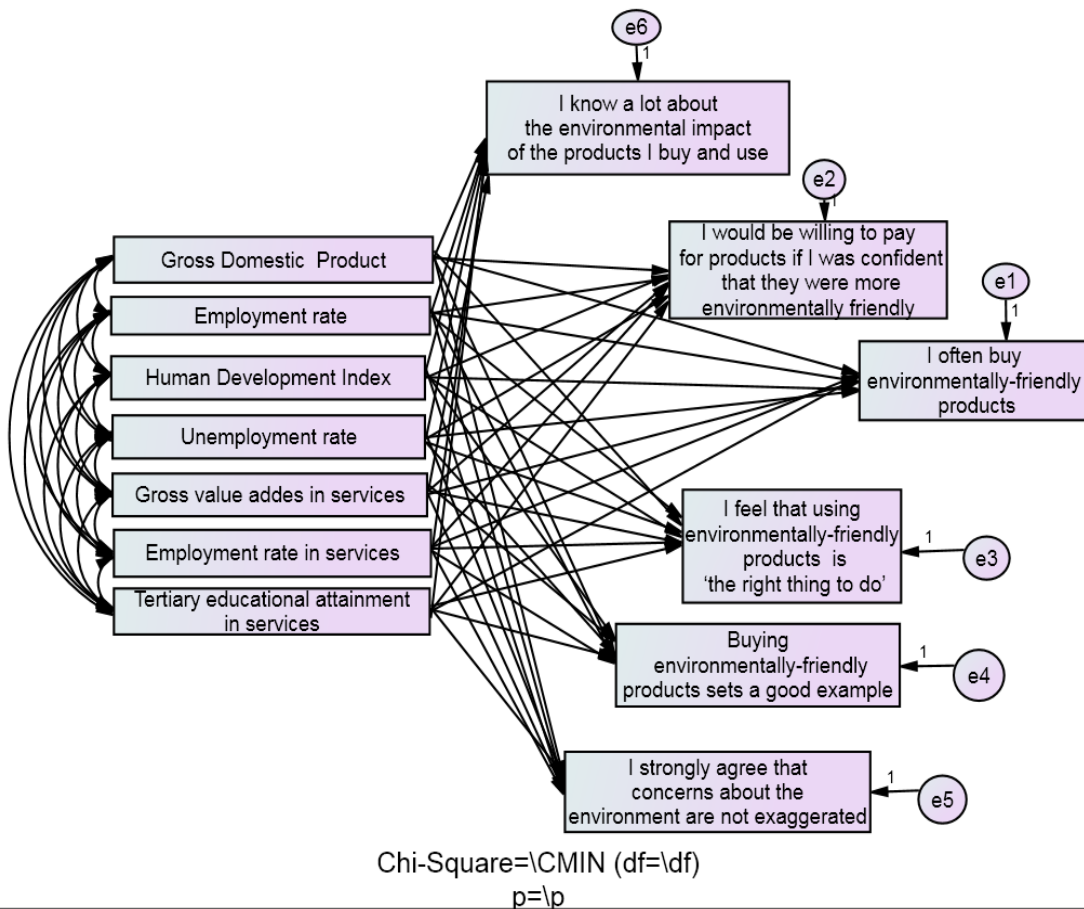
The conceptual model in Fig. 1 represents the framework for the hypotheses that this study tests. The

following will formulate the hypotheses tested in this study.

- H1: GDP has a significant influence on respondents' attitudes;
- H2: ER has a significant influence on respondents' attitudes;
- H3: HDI has a significant influence on respondents' attitudes;
- H4: UR has a significant influence on respondents' attitudes;
- H5: GVAS has a significant influence on respondents' attitudes;
- H6: ERS has a significant influence on respondents' attitudes;
- H7: TEA has a significant influence on respondents' attitudes;

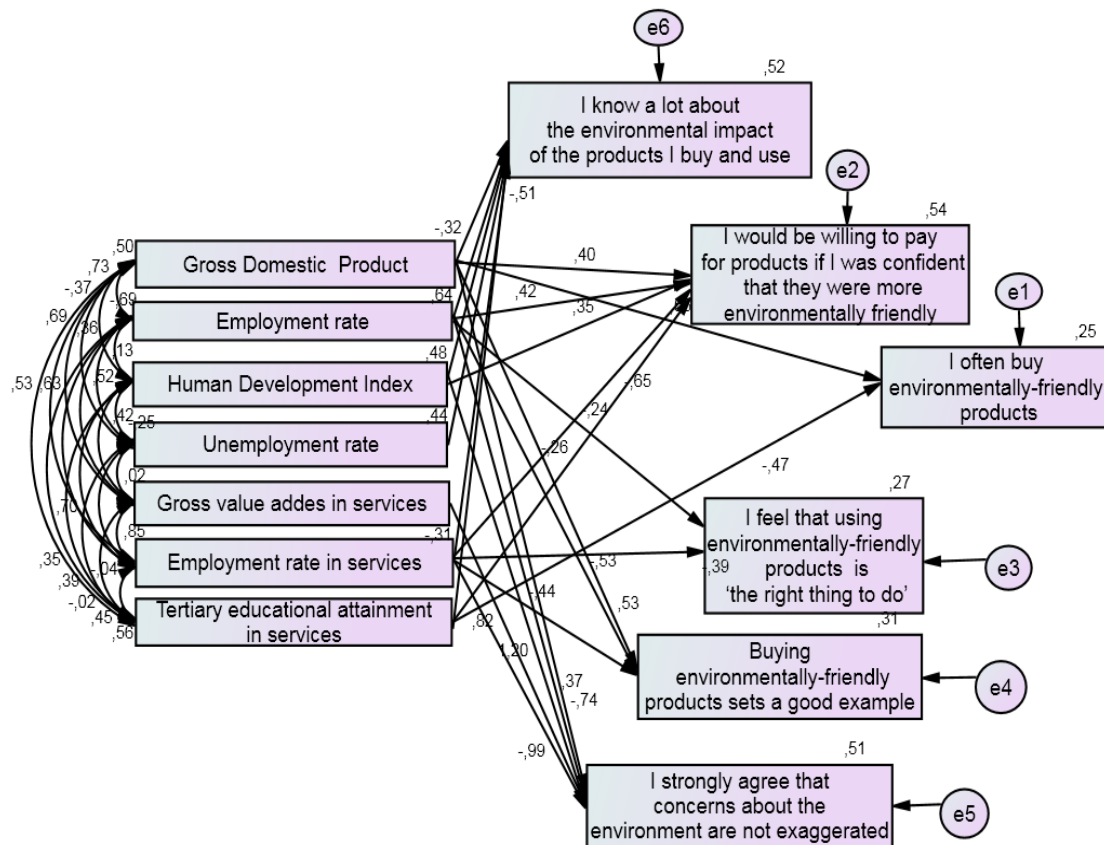
**IV.RESULTS**

In order to test the hypotheses above mentioned, a special type of structural equation modeling (SEM), Path Analysis, was used (figure 1). SEM is an advanced statistical procedure which examines the relationships between variables simultaneously. The only difference between SEM and path analysis is that in SEM we have both latent and observed variables; however, in the path analysis, only observed variables were used.



**Figure 1 - The conceptual model**

To account for the use of a specification search, a bootstrap was conducted using 500 samples. The results support the model as a good representation of the data (p=0.348). Table Y provides goodness of fit statistics of the path analysis. As can be seen in figure 1, macroeconomic variables are assumed to be the direct predictors of pro-environmental attitudes. AMOS 20 software was used for examining the relationships. After running the software, the analyses were done. The results are shown in figure 2.



Chi-Square=36,623 (df=34)  
p=,348

Figure 2 - The path model

To check whether the model fits the data adequately, goodness-of-fit indices were used. There are different indices used for fit of the model. In the present study, CMIN/DF, GFI, CFI and RMSEA were used (table 2). To have a fit model, P should be above 0.05; GFI and CFI should be above 0.95; and RMSEA should be less than .06 (Hu & Bentler, 1999). In the present study, P= 0.348, GFI= 0.829 (which is less than 0.95), CFI= 0.985, and RMSEA= 0.054. This shows that the proposed model fits the data adequately.

Table 2. Goodness of fit statistics for path analysis

<i>CMIN</i>						
Model	NPAR	CMIN	DF	P	CMIN/DF	
Default model	57	36.623	34	0.348	1.077	
Saturated model	91	0.000	0			
Independence model	13	257.100	78	0.000	3.296	
<i>Baseline comparisons</i>						
Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI	
Default model	0.858	0.673	0.988	0.966	0.985	
Saturated model	1.000		1.000		1.000	
Independence model	0.000	0.000	0.000	0.000	0.000	
<i>RMR, GFI</i>						
Model		RMR	GFI	AGFI	PGFI	
Default model		345.313	0.829	0.543	0.310	
Saturated model		0.000	1.000			
Independence model		15,979.284	0.405	0.306	0.347	
<i>RMSEA</i>						
Model		RMSEA	LO 90	HI 90	PCLOSE	
Default model		0.054	0.000	0.156	0.449	
Independence model		0.297	0.257	0.338	0.000	

As can be seen in the Regression Weights table (table 3), ER ( $\beta=0.908$ ,  $p=0.006$ ), HDI ( $\beta=103.295$ ,  $p=0.037$ ), TEA ( $\beta= -0.455$ ,  $p=0.005$ ) and UR ( $\beta=0.754$ ,  $p=0.044$ ) were significant predictors of Q1 (“I know a lot about the environmental impact of the products I buy and use”); GVAS ( $\beta=0.838$ ,  $p=0.017$ ), ERS ( $\beta= -0.820$ ,  $p=0.011$ ), ER ( $\beta=0.480$ ,  $p=0.035$ ) and GDP ( $\beta=0.000$ ,  $p=0.004$ ) were significant predictors of Q4 (“I strongly agree that concerns about the environment are not exaggerated”); ERS ( $\beta= -0.172$ ,  $p=0.048$ ), ER ( $\beta= -0.317$ ,  $p=0.005$ ) and GDP ( $\beta=0.000$ ,  $p=0.030$ ) were significant predictors of Q3 (“Buying environmentally-friendly products sets a good example”); ERS ( $\beta= -0.114$ ,  $p=0.029$ ) was a significant predictor of Q2 (“I feel that using environmentally-friendly products is ‘the right thing to do’”); ERS ( $\beta= -0.704$ ,  $p=0.002$ ) and ER ( $\beta=0.704$ ,  $p=0.010$ ) were significant predictors of Q5; GDP ( $\beta=0.000$ ,  $p=0.005$ ) and TEA ( $\beta= -0.362$ ,  $p=0.017$ ) were significant predictors of Q6 (“I often buy environmentally-friendly products”).

**Table 3. Regression Weights**

	Estimate	P		Estimate	P
Q1←GDP	0.000	0.188	Q3←ER	-0.317	0.005
Q1←ER	0.908	0.006	Q3←GDP	0.000	0.030
Q1←HDI	103.295	0.037	Q2←ER	-0.107	0.186
Q1←ERS	-0.279	0.176	Q2←ERS	-0.114	0.029
Q1←TEA	-0.455	0.005	Q5←HDI	88.809	0.119
Q1←UR	0.754	0.044	Q5←ERS	-0.704	0.002
Q4←GVAS	0.838	0.017	Q5←ER	0.704	0.010
Q4←ERS	-0.820	0.011	Q5←GDP	0.000	0.071
Q4←HDI	235.611	***	Q5←TEA	-0.273	0.128
Q4←ER	0.480	0.035	Q6←GDP	0.000	0.005
Q4←GDP	0.000	0.004	Q6←TEA	-0.362	0.017
Q3←ERS	-0.172	0.048			

The correlation path between the independent variables showed that, on one hand, HDI and ER, ER and GDP, HDI and GDP, HDI and GVAS, GDP and GVAS, HDI and ERS, GDP and ERS, ERS and TEA, GVAS and TEA, GDP and TEA are positively and significantly related to each other. On the other hand, ER and UR are negatively and significantly related to each other (table 4).

**Table 4. Covariances**

	Estimate	P
HDI <--> ER	0.127	0.019
ER <--> GDP	41513.278	0.022
HDI <--> GDP	394.805	0.003
HDI <--> UR	-0.052	0.212
ER <--> UR	-21.555	0.004
GDP <--> UR	-24902.881	0.080
UR <--> GVAS	0.741	0.923
HDI <--> GVAS	0.131	0.048
ER <--> GVAS	6.102	0.514
GDP <--> GVAS	65865.748	0.006
GVAS <--> ERS	62.452	***
UR <--> ERS	-1.963	0.836
HDI <--> ERS	0.268	0.004
ER <--> ERS	20.709	0.088
GDP <--> ERS	88457.723	0.004
ERS <--> TEA	51.437	0.013
GVAS <--> TEA	33.537	0.037
UR <--> TEA	-0.907	0.925
HDI <--> TEA	0.152	0.065
ER <--> TEA	20.693	0.094
GDP <--> TEA	69073.018	0.017

Findings indicated that the model had a good explanatory power. As can be seen in table 5, Squared Multiple Correlations for attitudinal components indicate that macroeconomic variables account for 53.6% of the variance of Q5 (“I would be willing to pay for products if I was confident that they were more environmentally friendly”), 52.2% of the variance of Q1 (“I know a lot about the environmental impact of the products I buy and use”) and 51.4% of the variance of Q4 (“I strongly agree that concerns about the environment are not exaggerated”).

**Table 5. Squared Multiple Correlations**

	Estimate
Q6	,254
Q1	,522
Q2	,274
Q3	,314
Q4	,514
Q5	,536

Also, macroeconomic variables account for only 31.4% of the variance of Q3 (“Buying environmentally-friendly products sets a good example”), 25.4% of the variance of Q6 (“I often buy environmentally-friendly products”) and 27.4% of the variance of Q2 (“I feel that using environmentally-friendly products is ‘the right thing to do’”).

**V.CONCLUSIONS**

The current study sought to provide a deeper understanding of the influence of macroeconomic variables on pro-environmental attitudes. The model was tested using Path Analysis, and there was strong support for the model. Specifically, the study results indicated that the proposed model had a satisfactory fit to the data.

It was assumed that the macroeconomic variables would affect all attitudinal components. The hypotheses formulated at the beginning of this research were confirmed only for one, two, three or four of the attitudinal components (items). Gross Domestic Product/ capita (GDP) was a significant predictor for items Q3 (“Buying environmentally-friendly products sets a good example”), Q4 (“I strongly agree that concerns about the environment are not exaggerated”) and Q6 (“I often buy environmentally-friendly products”), thus confirming H1. Employment Rate (ER) was a significant predictor for items Q1 (“I know a lot about the environmental impact of the products I buy and use”), Q3 (“Buying environmentally-friendly products sets a good example”), Q4 (“I strongly agree that concerns about the environment are not exaggerated”) and Q5 (“I would be willing to pay for products if I was confident that they were more environmentally friendly”), thus confirming H2. The Human Development Index value (HDI) and Unemployment Rate (UR) were significant predictors for item Q1 (“I know a lot about the environmental impact of the products I buy and use”), thus confirming H3 and H4. The Gross Value Added in Services (GVAS) was a significant predictor for Q4 (“I strongly agree that concerns about the environment are not exaggerated”), thus confirming H5. Employment Rate in services (ERS) was a significant predictor for items Q4 (“I strongly agree that concerns about the environment are not exaggerated”), Q3 (“Buying environmentally-friendly products sets a good example”), Q2 (“I feel that using environmentally-friendly products is ‘the right thing to do’”) and Q5 (“I would be willing to pay for products if I was confident that they were more environmentally friendly”), thus confirming H6. Tertiary Educational Attainment (TEA) was a significant predictor for items Q1 (“I know a lot about the environmental impact of the products I buy and use”) and Q6 (“I often buy environmentally-friendly products”), thus confirming H7. The final path diagram (figure 2) shows that macroeconomic variables affect the six attitudinal components.

Although the results of the present paper are valueable, it still presents a series of limitations. First, the study is limited by its exploratory character as it considered a high number of exogenous and endogenous variables to reflect the influence of EU countries’ economic development level on their citizens’ pro-environmental attitudes. Second, the sample size is quite reduced. Although the eurobarometer sample included 26.573 respondents, the results were presented as average values for each EU country, thus resulting 27 answers, corresponding to the number of countries included in the study. According to Stevens (2009), a good general rule for sample size is 15 cases per predictor in a standard ordinary least squares multiple regression analysis. Our study uses 7 predictors, which means that, in order for the sample to be considered relevant, it should be multiplied by 15 (15\*7=105 respondents/ countries). Third, the reduced sample size did not allow us to perform a comparative country analysis which could have outlined the existence of significant differences among them. Last, we only considered the EU countries’ economic development level in 2012 and did not take into consideration the rates of economic growth, as Givens and Jorgenson (2011) have.

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