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Pro-Environmental Behaviour of EU Citizens:

Attitudes to Common Environmental Legislation and Standards

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ABSTRACT

This article examines the pro-environmental behaviour of EU citizens and the potential connection with their attitudes towards common environmental legislation and environmental standards. It analyses factors of the pro-environmental behaviour of EU citizens and their attitudes towards EU environmental legislation and helping non-EU countries improve their environmental standards. The article uses cross-sectional regression analysis based on Special Eurobarometer survey. Respondents show a mostly positive view of EU environmental protection legislation and standards enforcement. Respondents with pro-environmental behaviour in their daily life are significantly more in favour to common environmental legislation and standards. Women, managers, and those interested in political affairs are more positive as well.

KEYWORDS

Environmental Issues, Environmental Legislation, Environmental Policy, Environmental Standards, Environmentally friendly travelling, Pro-environmental Behaviour, Standardization

INTRODUCTION

Environmental problems come hand in hand with increased human activity. Population growth, increased production, technological development and economic growth are all related to the problem of environmental degradation. The rising number of environmentally oriented contributions proves the current importance of environmental issues (Kube et al., 2018; Mao et al., 2018; Wu et al., 2018). Many threats exist, but air and water pollution are globally regarded as the biggest environmental problems (Kube et al., 2018; Tagaris et al., 2015) or environmental factors (Fried et al., 2019).

Environmental protection and environmental policy tools are all limited – or supported – by the level of citizens' pro-environmental attitude. Environmental legislation and environmental standards can play an essential role in environmental protection. Public acceptance and support of common environmental rules as well as the introduction of environmental standards can have significant benefits. The main objective of the paper is to identify factors affecting pro-environmental behaviour and examine the potential consequences of pro-environmental behaviour on support of environmental regulations and standards. We also examine factors affecting attitude towards common EU legislation to protect the environment as well as respondents' views on the EU helping non-EU countries improve

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their environmental standards. In the next section we describe the theoretical background of our research. Following sections show the methodology and data as well as the most important results of our research. Finally, we make certain conclusions based on the obtained results.

BACKGROUND

Smith et al. (2017) and respondents of World Economic Forum (2013) surveys consider climate change the world's gravest environmental problem. Recognizing the seriousness of the environmental situation has led to environmental aspects being taken into account in the decision-making process and the idea of sustainable development being promoted on all governmental levels.

The United Nations Conference on the Human Environment, which took place in Stockholm in June 1972, was a crucial moment. It was attended by representatives of 113 countries; economists, politicians and other major actors recognized environmental pollution as a serious economic problem. Subsequently, a specific segment of economic policy, known as environmental policy, focused on environmental care with appropriate instruments collection, has been set apart. There are diverse approaches to classify environmental policy instruments.

According to Barbieri (2015), Clò et al. (2017), Liao (2018), Piciu and Trică (2012), Xepapadeas (2009), environmental regulation has two basic forms: command-and-control and market-based policy instruments. Command-and-control (regulatory or green regulation) instruments put pressure on polluters to change their behaviour by means of direct restrictions, commands, limitations or prescribed procedures that cannot be lawfully circumvented. If the polluters contravene them, they will be sanctioned. They have different degrees of commitment – laws, regulations, directives, standards (emission, technology and product standards), or agreements (Bergek et al., 2014; Liao, 2018; Singh et al., 2017).

Financial incentives that stimulate the polluter to choose the least costly alternative – to invest in a sustainable solution or to incur additional costs for pollution – are the key element of market-based (economic) instruments. Environmental taxes, environmental fees and charges, deposit-refund systems, tradable permits and subsidies are the most well-known economic instruments. (Bergek et al., 2014; Piciu & Trică, 2012; Xepapadeas, 2009)

In addition to the two types of regulatory instruments mentioned above, there is the third group of so-called voluntary instruments. The main purpose of voluntary instruments is to integrate environmental awareness and responsibility into decision-making processes of managing authorities. Voluntary instruments are, for instance, various environmental co-operation solutions, environmental education, (voluntary) environmental standards (such as ISO 14000), product environmental labelling, green public procurement (European Environmental Agency (EEA), 2016; Liao, 2018; Organization for Economic Cooperation and Development (OECD), 2019; Piciu & Trică, 2012).

In relation to solving environmental difficulties, it is possible to encounter another typology of tools, for example, single-source and multisource instruments (U. S. Congress, 1995), informational, cooperative, economic and regulatory policy instruments (Böcher, 2012), or push and pull policy instruments (Harring, 2018).

It is important to point out that the individual instruments do not appear separately in practice, but they constitute an optimal combination, a policy mix, that is effective in achieving environmental objectives (Schader et al., 2014).

The success rate of environmental policy, not only as a whole, but also of its instruments, has been the subject of numerous analyses. For example, Lan et al. (2017) focused on environmental regulation stringency and its impact on eco-industries. Their results have shown that a more stringent environmental regulation of both industrial SO_2 and wastewater emissions will not only contribute to the improvement of industrial environmental performance but will help eco-firms develop, too. Requate and Unold (2003) examined the environmental policy instruments incentive to invest in more environmentally friendly technologies. They have found that taxes provide stronger incentives

than permits, auctioned and free permits offer identical incentives, and standards may provide stronger incentives than permits. Liao (2018) assessed the stimulus capability of environmental policy instruments for environmental innovations. He concluded that market-based instruments and information-based instruments have significant positive effects on the three dimensions of enterprises' environmental innovation (eco-organization, eco-process and eco-product innovation), while the command-and-control instrument only has a significant positive effect on eco-organization innovation. As shown in the next chapter, attention is also paid to environmental standards.

Pro-Environmental Behaviour and its Determinants

Pro-environmental behaviour of citizens can be considered as one of the key elements affecting environmental problems in the country. Factors affecting pro-environmental behaviour have been therefore examined in several previous studies. This behaviour is often considered as heterogeneous, multidimensional and including both public and private sphere behaviours (Ertz et al., 2016). People are to some extent affected by their specific beliefs, role models as well as specific environmental policy tools.

According to De Leeuw (2015) the behaviour of parents and family is particularly important. Furthermore, individual differences in empathy can influence the eco-friendly beliefs people hold. Gifford and Nilsson (2014) classified factors affecting pro-environmental behaviour into personal and social factors. Personal factors include for example age, gender, education and knowledge. Social factors include religion, cultural variations, urban-rural difference, norms and social class. As mentioned, education and gender are two factors often stressed in previous studies. Meyer (2016) argues that higher education impacts pro-environmental behaviour and he believes that higher education institutions can play an important role in making societies more sustainable. The study also found that females and ethnic minorities engage in significantly higher levels of green behaviour including recycling and double-sided printing.

Significant differences can be seen among different cultures and countries. Punzo (2019), using a very similar dataset to ours, examined cross-country differences in environmental attitudes. Based on the results in Italy and the United Kingdom, perceived values are directly associated with pro-environmental behaviour, while in Germany and France, values provide less guidance for behaviour. Author argues that these differences can be to some extent explained by the heterogeneous cultural European identity.

Ertz et al. (2016) stress that policymakers are not able to influence objective contextual factors that consumers face but they can influence their perceptions and attitudes. Both environmental and monetary incentives can be to some extent effective tools. However, Steinhorst (2015) found that positive spill-over on climate-friendly intentions, beyond electricity saving, was found in the environmental framing condition but not for monetary tools. Based on the results of Vicente-Molina et al. (2018) elasticity values are generally higher for men, so men are likely to be more sensitive to programs that attempt to change their behaviour. They also found that women with science degrees and high attitude levels are more likely to act pro-environmentally.

Pro-environmental behaviour of citizens can also impact the adoption of environmental standards in the country. We can assume that people with more pro-environmental attitude can support pro-environmental regulation as well as introduction of new environmental standards in the country, especially when this attitude translates into actions in their everyday lives.

Environmental Standards

Environmental issues are also a topical issue in the field of standardization. Existing environmental standards are constantly evaluated, modified and supplemented by others to meet current environmental needs (Hormozi, 1997; Yuan et al., 2017).

Although their implementation is based on the voluntary decision of the subject (Jagu, 2015; Rainville, 2016; Urbaniec, 2014), sometimes environmental standards inspire legislators (Klintman,

2016). However, this may lead to misunderstanding environmental standards (and standards in general). In this paper, standards are considered as voluntary documents for which there are no legal obligations to comply (Hatto, 2010), and therefore belong to voluntary environmental policy instruments. It is worth noting that some authors such as Tuczek et al. (2018), Wirl and Noll (2007) identify them as voluntary standards. Environmental standards could be the basis of a regulation that specifies legally enforceable requirements, non-compliance with which may be subject to sanctions (Hatto, 2010) (i.e. it underlies the command-and-control environmental policy instruments). These standards could have the adjective 'regulatory' or 'mandatory' in the literature (Bergek et al., 2014; European Commission, 2016; Gouldson et al., 2014; Tuczek et al., 2018). This second way of using standards (referencing to standards in regulation) in the European Union (EU) is followed in the 'New Approach Directives' (European Committee for Electrotechnical Standardization (CENELEC), 2019).

Environmental standards, in addition to their primary purpose of improving or at least preserving the quality of the environment (Yuan et al., 2017), have further benefits as standards in general. They ensure the safety, reliability and good quality of products, processes and services, efficient production, cost reduction through competition, support regulation and promote innovation (Hatto, 2010; International Organization for Standardization (ISO), 2019a; Liao, 2018).

As a specific type of environmentally friendly standard, environmental standards can bring eco-industries a competitive advantage in the domestic market. The preference of consumers favouring products that are 'friendly' to the environment could be the reason. Moreover, the eco-producer can engage in export to meet the needs of such consumers in foreign markets (Levy & Dinopoulos, 2016). These views are followed by Okrepilov (2015) who talks about positive correlation between a company's environmental care and its profitability. He demonstrates the relationship between environmental protection and economic success with the example of Germany with thoroughly elaborated environmental legislation and a high level of economic development. Environmental standards (setting energy efficiency, emission limits or noise thresholds) are also applicable to green public procurement (European Commission, 2016; Rainville, 2016). If the public sector were exemplified for the private sector, it could support the success of the state's environmental policy. Saikawa and Urpelainen (2014) show an interesting finding that foreign direct investments can help promote international technology transfer from industrialized countries to developing ones. In doing so international environmental standards play a meaningful role. According to the authors, a foreign company will be able to bring their technology to a developing country if there is potential for success in the country's market. In this context, Levy and Dinoupolos (2016) mention three controversial theories about the effects of environmental standards:

- 'Race to the bottom' hypothesis – import competition from countries with low environmental standards puts pressure for less stringent environmental regulations in countries with high environmental standards,
- 'Gains from trade' – openness of economies encourages growth and innovation both of which could improve environmental quality,
- 'Pollution heaven' – countries with low environmental standards become the destination of multinational companies. These companies use pollution-intensive technologies, leading to greater global pollution.

Developing countries could therefore be an obstacle to achieving successful environmental care by using environmental standards. According to Aguilera-Caracula (2014), international environmental standards are a solution. Using environmental standards reduces the leeway for exploiting the differences in environmental regulation of individual countries (see the theory of 'pollution heaven'). In respect to the 'race to the bottom' hypothesis Prakash and Potoski (2006) explored conditions under which trade linkages can stimulate ISO 14001 (the most widely adopted voluntary environmental regulation) adoption, thereby countering environmental races to the bottom. They have ascertained

that trade linkages encourage ISO 14001 adoption if countries' major export markets have adopted this voluntary regulation.

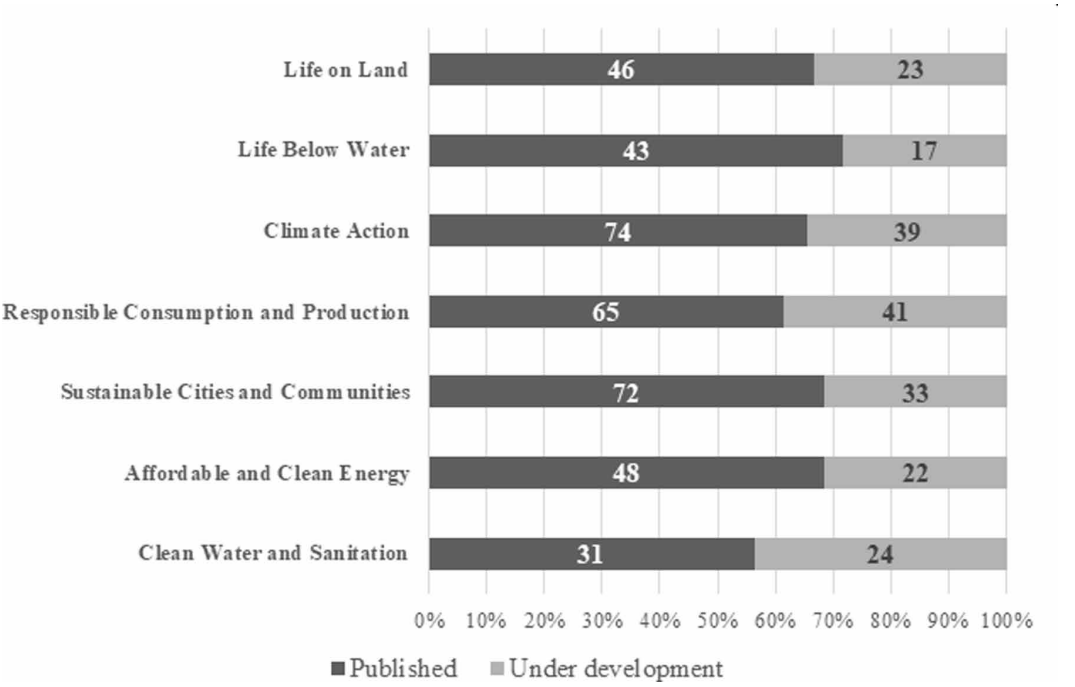
The well-known developers of international environmental standards are three sister organizations: the ISO, the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU). The ISO develops its standards in a wide variety of areas (including the environment) and even confronts its standards with the UN sustainable development goals (ISO, 2019b).

While it may be more difficult to show the connection of the IEC and the ITU to the environment, it does exist. The IEC promotes world trade and economic growth and encourages the development of products, systems and services that are safe, efficient and environmentally friendly (IEC, 2019). The ITU is promoting innovative ICT solutions to environmental questions and is developing green ICT standards to support a sustainable future (ITU, 2019) by raising awareness on Information and Communication Technologies' (ICTs) role in tackling environmental challenges including climate change. Between these three organization (the ISO, the IEC, the ITU), the ISO has the largest share of environmental standards.

Figure 1 shows the distribution of the number of ISO environmental standards in the selected seven environmental areas. There are 7 (out of 17) categories of ISO standards directly linked to the UN goals of sustainable development. The standards currently under development are also considered. It can be said that environment is indeed a dynamically developing area of standardization on an international level.

Extending environmental standards and their success in environmental care are under review in numerous papers. The authors most often concentrate on selected environmental areas of standardization (presented in Figure 1). Generally, these are the areas related to environmental problems whose solution is the most visible, such as air and water pollution. For instance, Orviska et al. (2019) focused on air, water, marine, agricultural, noise pollution and waste. Their results indicate that ISO environmental standards can be beneficial especially for reducing CO_2 emissions

Figure 1. Number of ISO standards related to the environment (ISO Standards classification by the UN Sustainable Development Goals) Note: It is abstracted from the parts of the standard. Each standard is counted only once, regardless of the number of its parts.



and for recycling activities. At the same time, many contributions are aimed at evaluation of ISO 14001 environmental efficacy (e. g. Arimura et al., 2016; Baek, 2018; Prakash & Potoski, 2014; Yin & Schmeidler, 2009; Zobel, 2018). For example, Baek (2018) has not confirmed a significant difference between environmental performance of ISO 14001 certified and non-certified facilities in Korea. Zobel (2018) has achieved similar results for business in Sweden. However, he points out that while there are many examples of ISO 14001succeeding, an ISO 14001-certification does not appear to be a guarantee of either superior environmental performance nor concrete environmental improvements. An example is a study by Prakash and Potoski (2014) who have found that ISO 14001 certifications reduce air (SO_2) emissions in countries with less stringent environmental regulations but have no effect on air emissions in countries with stringent environmental regulations.

Environmental Standards and the EU

Environmental initiatives did not have a global dimension from the beginning. The regional level, especially in Europe, due to the EU also has an important position in achieving environmental goals. The EU, or its predecessor European Economic Community (EEC), has been addressing environmental issues for nearly 50 years. So-called environmental action programs are the basis of the EU environmental policy (the first was issued in 1972, the current seventh program has been in force since 2014). However, the first legislative actions related to environmental care were launched in 1985. Later, the importance of the environment has grown from an EU perspective – it has become the EU's political objective (Maastricht Treaty) and then one of its absolute priorities (Amsterdam Treaty). Legislation linked to EU environmental policy is an inherent part of the Acquis Communautaire (Burnete & Choomta, 2015; European Commission, 2018).

The EU applies two basic types of environmental policy tools: command-and-control instruments e.g. in the form of regulations, directives, decisions, recommendations, economic instruments (environmental taxes, redesigned EU ETS etc.), and voluntary instruments such as eco-labelling, public green procurement and environmental standards (EEA, 2016).

Standardisation activities are carried out on behalf of the EU by three officially recognised standardizing sister organisations known as European Standards Organizations (ESOS): European Committee for Standardization (CEN), European Committee for Electrotechnical Standardization (CENELEC) and European Telecommunications Standards Institute (ETSI). European standards (including environmental) are developed by the institutions concerned, inter alia, in order to promote European regulation and legislation (ETSI, 2019), i.e. they can be the basis of the next regulation (above mentioned 'New Approach Directives').

ESOs are increasingly concerned about developing environmental standards. For example, CEN (2019) believes that all standards must take the environment into consideration. Environment is an interdisciplinary topic; therefore, all CEN sectors deal with environmental issues. Furthermore, ESOs cooperate with another two European partners providing a particular focus on environment within standardization: the 'European Environmental Citizens Organisation for Standardisation' (ECOS), and the 'European Association for the co-ordination of consumer representation in standardisation' also called the 'European consumer voice in standardisation' (ANEC). Their activities are reflected by the development of environmental standards includes hundreds of European environmental standards ('EN' category). CEN alone accounted for 733 published environmental standards. Table 1 shows how the CEN Technical Commission for the environment is involved in these numbers. Many of the CEN standards correspond also with ISO standards.

Because of the CENELEC (*Technical Committee TC 111X 'Environment'*) and ETSI (*ETSI Technical Committee – Environmental Engineering*) technical committees for the environment developed a much smaller number of EN standards, Table 2 shows a brief overview of them.

Considering the current environmental activities of the EU, it is very likely that the number of European environmental standards will continually increase. Understanding Europeans' attitudes towards specific environmental issues can therefore help in their development and implementation.

Table 1. Number of the CEN European environmental standards

Number	Name	Number of EN	Number of EN ISO in it
CEN Environmental Technical Committees			
CEN/TC 223	Soil improvers and growing media	16	
CEN/TC 230	Water analysis	157	105
CEN/TC 264	Air quality	58	13
CEN/TC 292	Characterization of waste	4	
CEN/TC 308	Characterization and management of sludges	12	2
CEN/TC 345	Characterization of soils	9	9
CEN/TC 351	Construction Products - Assessment of release of dangerous substances	3	
CEN/TC 366	Materials obtained from end-of-Life Tyres (ELT)	1	
CEN/TC 406	Mechanical Products - Ecodesign Methodology	0	
CEN/TC 444	Test methods for environmental characterization of solid matrices	78	39
Related committees			
CEN/TC 164	Water supply	209	
CEN/TC 165	Waste water engineering	39	
CEN/TC 183	Waste management	7	
CEN/TC 260	Fertilizers and liming materials	91	3
CEN/TC 335	Solid biofuels	24	23
CEN/TC 343	Solid recovered fuels	17	
CEN/TC 411	Bio-based products	8	
CEN/TC 454	Algae and algae products	0	
Total number of standards		**733**	**194**

Note: It is abstracted from the parts of the standard. Each standard is counted only once, regardless of the number of its parts.

METHODOLOGY AND DATA

Using data on environmental protection in the EU, we specifically aim our analysis to identify factors affecting pro-environmental behaviour and examine potential consequences of pro-environmental behaviour on the support of environmental regulations and standards. In order to achieve this goal, we use different methods. Firstly, we collect data from the Special Eurobarometer Survey 468 (European Commission, 2017). This survey was requested by European Commission and conducted by TNS Political and Social (Directorate-General for Communication Networks, Content and Technology). It was conducted between 23rd September and 2nd October 2017 and the sample consists of 27,881 EU citizens. Probability sampling method and multistage sample have been used. The sample was not representative with respect to the population of EU countries. The size of the sample was equal for almost all countries. However, the population weights can be applied on data. In our case we compare share indicators among countries in order to get a comparable basis. They were interviewed face-to-face at home and in their native language. We use linear regression as well as logit regression analysis in order to identify potential individual factors affecting their pro-environmental behaviour as

Table 2. Overview of the CENELEC and the ETSI European environmental standards

Number	Title
CENELEC	
EN 50419	Marking of electrical and electronic equipment
EN 50574	Collection, logistics & treatment requirements for end-of-life household appliances containing volatile fluorocarbons or volatile hydrocarbons
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN 50625	Collection, logistics & Treatment requirements for WEEE
EN 62321	Determination of certain substances in electrotechnical products
EN 62430	Environmentally conscious design for electrical and electronic products
EN 62474	Material declaration for products of and for the electrotechnical industry
EN 62542	Environmental standardization for electrical and electronic products and systems -
EN 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
ETSI	
ETSI EN 303 472	Environmental Engineering; Energy Efficiency measurement methodology and metrics for RAN equipment
ETSI EN 303 471	Environmental Engineering; Energy Efficiency measurement methodology and metrics for Network Function Virtualisation (NFV)
ETSI EN 303 470	Environmental Engineering; Energy Efficiency measurement methodology and metrics for servers
ETSI EN 303 423	Environmental Engineering; Electrical and electronic household and office equipment
ETSI EN 303 215	Environmental Engineering; Measurement methods and limits for power consumption in broadband telecommunication networks equipment
ETSI EN 302 099	Environmental Engineering; Powering of equipment in access network
ETSI EN 301 605	Environmental Engineering; Earthing and bonding of 400 VDC data and telecom (ICT) equipment
ETSI EN 301 575	Environmental Engineering; Measurement method for energy consumption of Customer Premises Equipment (CPE)
ETSI EN 301 169	Equipment practice; Engineering requirements for outdoor enclosures
ETSI EN 300 753	Environmental Engineering; Acoustic noise emitted by telecommunications equipment
ETSI EN 300 253	Environmental Engineering; Earthing and bonding of ICT equipment powered by -48 VDC in telecom and data centres
ETSI EN 300 132	Environmental Engineering; Power supply interface at the input to telecommunications and datacom (ICT) equipment
ETSI EN 300 119	Environmental Engineering; European telecommunication standard for equipment practice
ETSI EN 300 019	Environmental Engineering; Environmental conditions and environmental tests for telecommunications equipment

Note: It is abstracted from the parts of the standard. Each standard is counted only once, regardless of the number of its parts.

well as their attitudes to EU legislation on protecting environment and the role of the EU in improving environmental standards in non-EU countries.

All variables used in the regression analysis are described in more detail in Table 3.

We use factor analysis to determine one factor capturing pro-environmental behaviour to create a single variable for regressions. The results of factor analysis are shown in more detail in the analytical

Table 3. Variables derived from Eurobarometer survey used in regression analysis

Variable	Description
Pro-environmental behaviour (Factor)	This is the factor derived from factor analysis capturing the variability of 12 variables on pro-environmental behaviour
Political interest	Intensity of political interest of a respondent (political discussion)
Left-wing / Right-wing	Placing of the political view of a respondent on a left-right scale.
Opinion leadership	Answers to the question: When you hold a strong opinion, do you find yourself persuading your friends, relatives or fellow workers to share your views? (how often)
Gender	Gender of the respondent
Age	Current age of a respondent
Education age	Age of respondent when finishing education
Self-employed	Respondent is self-employed
Manual worker	Respondent is a manual worker
Management	Respondent is a manager
Rural/City	Respondent lives in a rural area or village/ Respondent lives in a town
Having a child	Respondent has at least one child (less than 10 years old)
Life satisfaction	Self-assessed satisfaction with life
Difficulties paying bills	Respondents who have difficulties paying their bills during last 12 month (often coded as 3, sometimes=2 and never= 1)

Source: Authors based on data retrieved from Special Eurobarometer 468 survey.

part of the paper. In the analysis we also examine factors correlated with pro-environmental behaviour of individuals. Based on previous research we can assume that there are personal and social factor affecting this behaviour (Gifford and Nilsson, 2014). Personal factors include for example age, gender, education and knowledge. Social factors include religion, cultural variations, urban-rural difference, norms and social class. Especially education and gender are two factors often considered as significant in previous studies (Meyer, 2016; Vicente-Molina et al., 2018).

We also include variables related to political preferences of the respondents as well as their interest in political issues and their intensity of opinion leadership. We assume that these variables could be correlated with environmentally friendly attitude and could play a role in developing this attitude. Finally, there are also the variables capturing individual well-being of a respondent by their life satisfaction and variables, taking into account the financial situation of a respondent. Some pro-environmental activities such as buying energy -saving durables or an electric car are highly dependent on financial situation.

We assume that the attitudes towards the environmental regulation and standards can be correlated with similar factors as pro-environmental behaviour. However, it is likely that some of them, such as financial situation and occupation, will not play a significant role here.

RESULTS

Factor Analysis of Pro-Environmental Behaviour

As mentioned in the methodological section of our paper we perform factor analysis which is applied based on 12 different variables related to pro-environmental behaviour in order to determine factors

capturing most of their variability. Table 4 shows that several factors were retrieved. However, we decided to take into account only the first one, because this factor is the only one with higher eigenvalue than 1. This is the most common approach used when determining the number of suitable factors. Hence, the first factor captures the major part of the variability from all twelve input variables used in factor analysis.

The factor can be labelled as "pro-environmental behaviour" of the respondents. This factor or more precisely factor scores assigned to all respondents are further used in a regression analysis as dependent variables or in some regressions as independent variables. Input variables into the factor analysis are shown in Table 5.

Links Between Pro-Environmental Behaviour and Attitudes to Environmental Regulation and Standards

Next, we try to identify potential links between pro-environmental behaviour and attitude to EU environmental legislation as well as help with environmental standards provided to non-EU countries. In this case we recode answers about the support for to these two issues to a binary scale. Those respondents who partially or fully agree with EU legislation for environmental protection have been recoded as one and all others as zero. The same has been performed with the variable capturing support for help with environmental standards. In the next phase we conduct Tetrachoric pair correlation in order to identify potential correlations between selected variables. Results of this analysis are shown in Table 6. All twelve variables capturing pro-environmental activities have positive correlation with both support of EU environmental regulation and help with environmental standards. The most positive correlation is evident in the case of using more environmentally friendly means of travelling as well as in the case of those reducing the amount of water.

In the final part of our analysis we focus our attention on these two mentioned questions as well as the pro-environmental behaviour of respondents.

Results of Regression Analysis

Results of questionnaire-based research can be affected by common method variance bias. Therefore, we decided to use Harman's single factor test in order to check for this potential problem. According to the results in Table 7, the first factor describes approximately 38% of variability. This value is significantly lower than 50%, which is mostly considered as the critical value. Hence, the results suggest that the problem of common method variance is not critical in our case.

We firstly examine potential socio-economic factors correlated with pro-environmental behaviour reflected by real life activities. This is in our case represented by the factor variable generated by factor analysis. The results of all regressions are shown in Table 8.

Table 4. Factors retrieved by regression analysis

	Eigenvalue	Proportion
Factor 1	1.5442	1.146
Factor 2	0.3923	0.291
Factor 3	0.1454	0.108
Factor 4	0.0897	0.067
Factor 5	0.0253	0.019
Factor 6	-0.0403	-0.030

Source: Authors based on data retrieved from Eurobarometer 468 survey.

Table 5. Variables captured in factor analysis (Factor 1)

In order to reduce problems with harmful emissions have you done any of the following in the last two years?	Factor 1	Uniqueness	KMO measure
1. You have frequently used public transport, bicycle, or chosen to walk instead of taking your car (**Environmentally friendly travelling**)	0.4113	0.8308	0.6426
2. You have replaced older energy-intensive equipment (hot water boiler, oven, dishwasher etc.) with newer options, with better energy efficiency rating (for instance products labelled A+++) (**Replaced energy-intensive equipment**)	0.3594	0.9426	0.7762
3. You have changed your home heating system form a high-emission system (e.g. coal, oil or wood-fired) to a lower-emission one (natural gas, solar, pellets, electricity) (**Low-emission heating**)	0.2396	0.9426	0.7683
4. You have bought a low emission-car (for example a hybrid car) (**Low-emission car**)	0.3594	0.8709	0.7345
5. You have bought an electric vehicle (**Electric vehicle**)	0.1252	0.9843	0.6973
Have you done any of the following in the past six months?			
1. Separate most of your waste for recycling **(Separate)**	0.3207	0.8972	0.8295
2. Cut down your energy consumption **(Less energy consumption)**	0.4729	0.7763	0.7689
3. Avoided single-use plastic goods other than plastic bags **4. (Avoid plastics)**	0.3672	0.8652	0.7929
5. Cut down your water consumption **(Less water)**	0.3021	0.9087	0.7628
6. Used a car less by avoiding unnecessary trips **(Less travel by car)**	0.4649	0.7838	0.7345
7. Bought products marked with an environmental label **(Enviro. label)**	0.4088	0.8329	0.8174
8. Avoided buying over-packaged products **(Avoid over-packed products)**	0.4604	0.7880	0.7818
Overall			0.7453

Source: Authors based on data retrieved from Eurobarometer 468 survey.

These results show that there appears to be several statistically significant variables with a potential effect on pro-environmental behaviour. Firstly, the political interest and respondents' political orientation seem to be correlated with their behaviour. Respondents more interested in political issues as well as those with left-wing political orientation are behaving more environmentally friendly. A similar situation is observed in the case of respondents with higher opinion leadership in their communities. However, in this case the significance of the variable should be taken with a grain of salt due to potential endogeneity. Respondents with a higher opinion leadership are also showing their good practices to others with pro-environmental behaviour. On the other hand, their strong environmental attitude and activities should be channelled to increased opinion leadership in community.

With respect to gender men are behaving less environmentally friendly according to our sample. The potential relationship between respondent's age and pro-environmental behaviour is in both cases non-linear, having an inverse U-shaped function. We also found that managers and city dwellers are in general behaving better with respect to environmental protection. On the other hand, financial problems seem to be negatively correlated with the level of pro-environmental behaviour.

Table 6. Results of tetrachoric pair correlation analysis

	EU legislation is necessary	EU should assist non-EU to improve environmental standards		EU legislation is necessary	EU should assist non-EU to improve environmental standards
EU should assist non-EU to improve environmental standards	0.605*** (0.009)		Environmentally friendly travelling	0.100*** (0.011)	0.120*** (0.011)
Separate	0.078*** (0.011)	0.078*** (0.011)	Replaced energy-intensive equipment	0.083*** (0.011)	0.127*** (0.012)
Less energy consumption	0.075*** (0.011)	0.110*** (0.012)	Low-emission heating	0.081*** (0.014)	0.059*** (0.014)
Avoid plastics	0.071*** (0.011)	0.132*** (0.012)	Low emission car	0.075*** (0.011)	0.102*** (0.019)
Less water	0.119*** (0.012)	0.108*** (0.012)	Electric vehicle	0.076*** (0.022)	0.087*** (0.022)
Less traveling by car	0.064*** (0.012)	0.101*** (0.012)			
Enviro. Labels	0.044*** (0.012)	0.159*** (0.013)			
Avoid over-packed products	0.065*** (0.012)	0.146*** (0.012)			

Note: Tetrachoric rho statistics are shown in the tables together with the level of significance (all correlation coefficients are significant at 1% level of significance). Standard errors are shown in parentheses).

Source: Authors based on data retrieved from Special Eurobarometer 468 survey.

Table 7. Results of test Harman's single factor test (Factor analysis of variables included in the regression models)

Variables included	Retained factors	% variance (Factor 1)	Eigenvalue (Factor 1)
17	10	0.381	1.248

Source: Authors based on data retrieved from Special Eurobarometer 468 survey.

The interpretation can be straight-forward, because some pro-environmental activities are financially demanding, e.g. buying new, more efficient appliances, such as acquisition of more energy efficient equipment or electric vehicle are of course money demanding. Finally, we also found that individual well-being captured by the level of respondents' satisfaction with life is also positively related to pro-environmental activities in daily life.

Further, we examine the factors correlated to the attitudes towards the necessity of EU environmental legislation and attitudes towards the EU helping non-EU countries with their environmental standards. As shown in Table 8 the results are to some extent similar to the previous regression. However, this time we also include pro-environmental behaviour as an independent variable. As expected, in both cases pro-environmental behaviour is significantly and positively correlated with attitudes towards the mentioned problems. Hence, those performing environmentally friendly activities are in general more in favour of EU environmental regulations as well as of the EU helping other countries with environmental standards. Political interest and left-wing political

Table 8. The results of ordered logistic regression for selected problems when selling online as dependent variables

	(1) Pro-environmental behaviour Factor (linear reg.)	(2) EU legislation is necessary (Ordered logit)	(3) The EU should assist non-EU to improve environmental standards (Ordered logit)
Pro-environmental behaviour		0.2972*** (15.00)	0.3533*** (17.80)
Political interest	0.1088*** (11.57)	0.1962*** (7.33)	0.2077*** (7.73)
Left-wing	0.0565*** (3.98)	0.169*** (4.42)	0.1364*** (3.56)
Right-wing	-0.0225 (-1.55)	-0.123*** (-2.99)	-0.0229 (-0.55)
Opinion leadership	0.0454*** (7.12)	0.058*** (3.30)	-0.0071 (-0.41)
Men	-0.1591*** (-15.44)	-0.0227*** (-4.51)	-0.0411 (-1.46)
Age	0.0186*** (9.38)	-0.0227*** (-4.16)	-0.005 (-0.84)
Age^2	-0.00019*** (-10.25)	0.0002*** (4.46)	0.0004 (0.79)
Education age	0.0313*** (15.38)	0.0103* (1.83)	0.012** (2.14)
Education age^2	-0.00028*** (-13.37)	-0.0009* (-1.66)	-0.0001* (-1.90)
Self-employed	0.045** (2.16)	0.0368 (0.66)	-0.042 (-0.78)
Manual worker	-0.015 (-1.08)	0.0503 (1.32)	-0.0257 (-0.67)
Management	0.0626*** (3.57)	0.119*** (2.60)	0.0828* (7.82)
Rural	-0.014 (-1.11)	-0.0287 (-0.85)	-0.0028 (-0.08)
City	0.0676*** (5.27)	0.0278 (0.81)	-0.0012 (-0.03)
Having a child	-0.0103 (-0.68)	-0.0244 (-0.60)	-0.0483 (-1.17)
Life satisfaction	0.092*** (10.47)		
Difficulties paying bills	-0.0647*** (-6.86)	-0.1277*** (-5.14)	-0.1131*** (-4.47)
Log pseudolikelihood		-20554.32	-20204.05
R2	0.20		
Wald X2		1293.12	1180.01
Observations	20512	19761	19779

Source: Authors based on the data from Special Eurobarometer 468.

Note: based on the data from Regressions done by linear regression, logit and ordered logit with standard errors corrected for heteroscedasticity. Variables are all defined in an appendix. (.) denotes t- statistics or z- statistics, */**/*** mean significance at the 10%/5%/1% levels of significance. EU countries fixed effects are included in all regressions.

orientation are again positively related to the mentioned issues. The same is true for managers and to some extent also those with higher education. Respondents with financial problems are mostly against EU legislation and helping other countries with environmental standards.

There are of course some limitations to our approach. First of all, the endogeneity and unobserved heterogeneity, may affect the results and therefore we interpret the results more as correlations than exact causalities. Secondly, the selection of control variables has been significantly limited by the availability of data. It could be also useful to control for several other variables such as intrinsic motivation of respondents. Despite considerable size and quality of our sample there are several limits especially respect to lack of representativeness for each EU country.

CONCLUSION

Environmental protection is currently one of the most-discussed issues in the world. In this paper we focused our attention particularly on pro-environmental behaviour, its factors and its relationship to attitudes to EU environmental legislation and environmental standards. The EU and its institutions currently have relatively broad competencies in regulating environmental protection in member countries. However, it has virtually no effect on non-EU countries. Based on secondary data from Special Eurobarometer survey we can say that respondents from EU countries have a mostly positive view of EU legislation and its role in protecting the environment in their countries. They are also in general in favour of the EU helping non-EU countries in the process of developing and improving national environmental standards. This can be a positive sign for the EU and its institutions to support common environmental standards in the EU as well as to help other countries with the improvement of their standards. These positive attitudes are especially evident for women, managers, respondents with a left-wing political orientation and those more interested in political affairs. These should be the subgroups which are supporting the EU environmental regulations and also environmental standards the most. Furthermore, pro-environmental behaviour in their daily life is positively correlated with their attitudes towards EU environmental regulations. This is especially true for using environmentally friendly means of transport and reducing water consumption. We also identify several factors affecting pro-environmental behaviour of the respondents. Again, it seems to be mostly related to their political views, age, gender and financial situation – respondents with financial problems behave less environmentally friendly.

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