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RELEVANT DETERMINANTS OF THE POLITICAL PARTIES' ENVIRONMENTAL PREFERENCE

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Abstract

An instrument that political parties use to inform the electorate with regard to their policy preference (including preference towards the environment) is the electoral manifest. This paper analyses some important drivers that push political parties towards adopting pro-environmental attitudes by analysing the content included in their electoral manifestos (using the Comparative Manifesto Dataset). As explanatory factors we consider various socio-economic, ideological and international related variables, but our main focus is on environmental related determinants. We proceed as such because the paper aims to test the validity of 'the ecological approach' given that the current literature overlooks this issue or doesn't succeed in providing strong evidence of its existence. Our dataset covers 49 countries worldwide and a total of 190 national electoral years, occurring between 2000 and 2015. The resulting evidence, which might confirm the validity of 'the ecological approach', is rather weak, but there is nonetheless strong evidence to prove the existence of an opportunistic behaviour of the political parties (confirming the validity of the 'opportunistic political cycle').

Keywords: environmental preference; environmental performance; ecological approach; political ideology; opportunistic political cycle

JEL classification: Q58, Q50, D72

1. INTRODUCTION

Electoral manifestos are important channels of communication that political parties use to inform the electorate with regard to their policy preference, including preference towards the environment. Through a party programme, a political party "can explain how it differentiates itself from others and show its political ambition, basic values, and mission for its country in every aspect of the society (…)" (Schrey, 2013, p. 3) of either political, economic, social or environmental nature. But what drives political parties towards adopting a more or less environmental attitude is still unclear in some regards (especially when looking into environmental determinants which refer to a branch of literature entitled the 'ecological approach').

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In this context, the aim of the paper is to test the validity of 'the ecological approach' with regard to the influence of environmental related determinants on the political parties' pro-environmental attitudes (as expressed in their electoral manifestos). A total of six hypotheses were formulated and were tested by using a dataset that covers general elections held in 49 countries worldwide between 2000 and 2015, over a cumulated number of 190 electoral rounds.

The outcomes of the analysis revealed the influence that socio-economic, ideological and international related determinants have on the environmental preference of political parties. Nonetheless, this is not fresh news, as the existing literature also confirms the presence of these influence factors. A novelty with regard to this set of determinants is the designing and usage of an indicator for measuring 'power dispersion', which is not only statistically significant, but clearly shows that the more divided the power between parties is (within a country's parliament), the higher the environmental preference of political parties is. The interesting insights of this paper consist in the fact that, although the resulting evidence which might prove the validity of 'the ecological approach' is rather weak, there is nonetheless strong evidence which might indicate an opportunistic behaviour of the political parties (proving therefore the validity of the 'opportunistic political cycle').

The remaining of the paper is structured as follows: Section 2 presents the concept of National Environmental Performance (definitions, measurements and how it is tackled by political parties), Section 3 analysis the environmental preference of political parties and looks into some of the pressure factors influencing it (with a special focus on the 'ecological approach'), Section 4 presents the empirical analysis highlighting key hypotheses, data selection and methodology as well as the correlation and regressions analyses and Section 5 concludes and proposes future developments of the study.

2. NATIONAL ENVIRONMENTAL PERFORMANCE

2.1 Definitions

Environmental performance is a concept that encompasses "the control of pollution and stewardship of natural resources" (Daniel Esty and Porter, 2002, p. 78). In other words, a country's environmental performance is given by its ability to "produce environmental public goods" (Duit, 2005). Measuring a country's environmental performance level is a growing preoccupation in both advanced as well as developing economies. An important development was registered also with regard to the scientific literature on the topic. According to Daniel Esty and Porter, in 2002, the volume of statistical centred research with regard to the influencing factors of national environmental performance across countries was very rare, with the existing ones focusing mainly on anecdotal evidence and case studies (Daniel Esty and Porter, 2002, p. 78). In 2005, the same authors restated that "little rigorous analysis has been done to identify the factors that determine whether environmental efforts succeed" (Daniel Esty and Porter, 2005, p. 391). Almost ten years later, the literature has grown significantly but still leaves uncovered ground in some regards.

As stated by Fiorino (2011), the existing literature with regard to national environmental performance can be divided in two important strands, where the focus is either on *policy outputs* or on *policy outcomes*. Within the first branch of the literature (which concentrates on *policy outputs*), researches usually:

a) focus solely on indicators of policy outputs, such as the number of environmental policies adopted (C. Knill *et al.*, 2010), number of institutions created, international agreements reached (Recchia, 2002) or commitments made;

b) employ a combination of policy outputs, such as the creation of a national council for sustainable development, measures of the availability of environmental information, a country's membership in international environmental organizations, in addition to participation in agreements (Gates *et al.*, 2002; Gleditsch *et al.*, 2002);

c) make us of a mix between environmental commitment and various factors of policy outcomes (Bättig and Bernauer, 2009).

As for the branch of the literature that focuses on *policy outcomes*, this is more common among researches and it usually zooms in on a country's levels of air and water pollution (absolute values, changes in time etc.). The pollutants usually employed in these analyses are: nitrogen oxides, sulphur dioxide, particulate matter, carbon monoxide, carbon dioxide, biological oxygen demand, chemical oxygen demand and metals (Fiorino, 2011). The most consecrated works on the topic include the ones of L. Scruggs (2003), Esty and Porter (2002, 2005), D. Esty *et al.* (2008), Neumayer (2003), Emerson *et al.* (2010), Hsu et al. (2016; 2014) and others.

2.2 Measuring Environmental Performance

Since the United Nations' Conference on Environment and Development in 1992 (Rio de Janeiro), when the world leaders raised "red flags about the seriousness of the problems seen in today's world" (Costica Mihai *et al.*, 2016, p. 110) and drew attention on the need for developing common sustainability indicators (including environmental indicators), many organizations and scholars worldwide engaged in designing 'batteries of indicators' to gauge, as much possible, a nation's environmental performance level. These existing indicators are usually classified into areas such as biodiversity, water, energy, transport or agriculture (Gallego-Álvarez *et al.*, 2014). Some of the most known composite indicators used to measure a country's EP level are (Apostoaie and Maxim, 2016): the Ecological Footprint and Biocapacity initially developed by Rees and Wackernagel (1996); the Composite Index of Environmental Performance developed by García-Sánchez *et al.* (2015); the Living Planet Index developed by the World Wide Fund for Nature; the Environmental Vulnerability Index developed by the South Pacific Applied Geoscience Commission; the Environmental Degradation Index proposed by Jha and Murthy (2003); the Renewability and Energy Sustainability Index (Gallego-Álvarez *et al.*, 2014).

In this study, we make use of the Environmental Performance Index (EPI) – derived from the earlier Environmental Sustainability Index (ESI). This is a composite indicator developed by D. Esty *et al.* (2008), who form part of a group of environmental experts at Yale University and Columbia University. EPI was chosen for this research given its ability to best capture the 'environmental sustainability' concept (rather than its specific components).

2.3 National environmental performance addressed by political parties

Environmental degradation (in the form of environmental pollution or mismanagement of natural resources) is a geographically unbounded phenomenon that requires the involvement of micro- as well as macro-economic level entities. Nonetheless, the society most often looks towards state bodies for solutions to improve the level of environmental

performance (i.e., quality of the environment). It is thus a nation's responsibility the proper designing and management of tailored environmental policies, not only for the protection of its citizens, but also for the safety of and moral duty towards its neighbours (Apostoaie, 2016). This is even more important if we were to consider the fact that, in spite of the Kyoto Protocol ending without a successor agreement in place, global leaders still fail to take decisive action on the issue of climate change (Costică Mihai *et al.*, 2016).

In spite of their evolution and scale, environmental policies remain the state's concern and responsibility on the long run. The flawless implementation of specific environmental policies (at global, regional and local level) will be determined mainly by national policies and their commitment, institutions, as well as administrative and technical capacity (Dryzek *et al.*, 2002; Meadowcroft, 2005; Sommerer and Lim, 2016).

One cannot argue that environmental politics is currently growing in importance, although having its humble beginnings almost half a century ago (in the 1960s). Fiorino (2011) identified two important waves of development in this regard: a) in the 1st wave, 'pioneer' western democracies established national programs as a response to the existing environmental problems (Weidner, 2002); Sweden or the USA are among the first states which created the appropriate institutions, enacted laws and developed the necessary administrative and technical capacity; b) within the 2nd wave, many developing and transitional economies responded with appropriate political measures to the signals offered by the World Commission on Environment and Development meeting (in 1983) and the Rio Earth Summit (in 1992).

Whilst there is no doubt that contemporary politics has taken in the issue of environmental protection (although not very easily), electoral politics remain dominated by traditional materialist issues, such as the state of the economy, taxation, public order and welfare policy (Carter, 2007). In fact, some consider environmental policy as a secondary policy issue, along with gun control, foreign aid or trade policy, potentially affected by the voting behaviour of 'single issue voters' (List and Sturm, 2006). These kinds of background policies will always be overshadowed by 'frontline' policy issues such as the level of government spending or the degree of income and wealth redistribution.

The rise of environmentalism in politics has taken the form of 'green parties' who are currently a familiar feature of the political landscape. Carter (2007) places the first green parties in Tasmania and New Zealand in 1972, while in Europe the Swiss elected the first green to a national assembly in 1979. In time, most of the already existing parties have gradually adopted a more positive attitude towards environmental protection (either in the form of a greener rhetoric in some cases or by developing progressive environmental programmes in most of the cases).

3. ENVIRONMENTAL PREFERENCES OF POLITICAL PARTIES

3.1 Political orientation and preferences towards environmentalism

As highlighted above, improving the quality of the environment (in other words, attaining a higher level of national environmental performance) is perhaps achieved more efficiently through public policies. This, in turn, puts pressure on all the members of the political spectrum making them accountable towards the citizens for the implemented environmental policies and the level of environmental performance. Driven by the accountability towards their voters, political candidates (as future policy makers) will try to

please the electorate and offer them the requested information about environmental quality. For this reason, an essential feature of established democracies is the *election period*. It is then when the electorate has the opportunity to "reward the incumbent politician with re-election or to replace him with a challenger" (List and Sturm, 2006, p. 1249). This is a "pivotal period since parties' commitment to platforms determines policy outcomes and political institutions aggregate citizens' preferences diversity" (Michallet *et al.*, 2015, p. 1).

Nonetheless, the election period is just a specific point in time and only one of the three-steps characterizing the political game of a democratic system. It is preceded by the campaign period and followed by the policy making and implementation phase. During the campaign period, political parties have the opportunity to reveal their ideological orientation via electoral platforms or party programs (Grossman and Helpman, 2005). The main advantages that bring the party's political program in the forefront of the political game are revealed by Michallet *et al.* (2015, p. 4): it offers information shortcuts (Franzmann and Kaiser, 2006), it selects and aggregates the citizens' preferences in coherent policy packages (H. D. Klingemann *et al.*, 1994), and election propaganda (Ray, 2007). But maybe one of the most striking features of these electoral manifestos consists in the fact that they inform the voters with regard to the policy preference of the party, including preference towards the environment. Through a party programme, a political party "can explain how it differentiates itself from others and show its political ambition, basic values, and mission for its country in every aspect of society (political, economic, social…)" (Schrey, 2013, p. 3).

The ideological orientation of a political party and the preference towards specific policies is supposed to derive from the needs of the citizens. This means that the public opinion has the power and means to shape the policies in a democratic country (Burstein, 2003) via political parties (Spoon and Klüver, 2014) in accordance with their preferences. Environmental protection makes no exception; the citizens' preference for a certain level of environmental quality is supposed to be expressed via interactions with political parties. There is an existing literature which provides evidence that when building their electoral manifestos, parties modify their positions in response of public opinion (Adams *et al.*, 2004) and of voters' opinion expressed in past election (Spoon and Klüver, 2014). As a response to the citizens' preference, political parties construct their electoral manifestos (around an ideological core) which are then rewarded or punished through the voting procedure.

As discussed in the earlier section (2.3), environmentalism has only gradually entered in the parties' political agendas. If other emerging issues, such as gender or race, have been addressed easily and without too much effort by political parties – appropriating them via their own policies to address the abovementioned problems – this was not the case of environmentalism. Displaying a certain level of preference towards protection the environment posed distinctive problems for established parties because "the technocentric-ecocentric divide cuts across the left-right cleavage that underpins most party systems. Established parties, both left and right, share a technocentric commitment to maximising economic growth and are often linked closely to producer interests. […] Despite their obvious differences, these producer interests are broadly united in supporting expansionary economic policies and opposing environmental interests" (Carter, 2007, p. 128).

An existing literature already exists with regard to the relationship between a party's ideological position and its pro-environmental attitude. The research is confined either to single country studies (e.g., R. E. Dunlap *et al.*, 2001; Dietz *et al.*, 1998), to studies of a very limited number of countries (Hayes, 2001) or to studies that focus on bigger samples of countries (Neumayer, 2003; and 2004; L. A. Scruggs, 1999; Michallet *et al.*, 2015). The

common ground is that political parties on the left of the political spectrum are more likely to embrace pro-environmental positions than their right-wing counterparts (Neumayer, 2003, p. 167). But is political ideology the single factor that determines a party's pro-environmental preference? The next sections will offer clear responses.

3.2 The ecological approach

"Environmental policy did not emerge as an abstract idea but was the response to deteriorating environmental surroundings often threatening human health" (C. Knill *et al.*, 2010, p. 308). For this reason, we ask ourselves: is the environmental status of a country influencing politics? Are political parties becoming more pro-environment as the process of environmental degradation is more pronounced?

We presume that as environmental degradation appears, this will raise the attention of the public consciousness, especially within the current context of the knowledge society. This, in turn, will signal the political parties to take action and present a viewpoint within their electoral manifestos. Not presenting an environmental pro-position would have a significant cost for parties as it should reduce votes and increase the probability of electoral defeat (Michallet *et al.*, 2015). In other words, it is expected that the low levels of environmental quality will increase the sensitivity of voters towards environmental issues which, in turn, is expected to – considering that there is a political market for environmental issues (Garmann, 2014) – produce a shift towards environmentalism in parties' political programs (if parties were to meet the electorate's demand). This situation was named by Michallet *et al.* (2015) the "ecological approach". They stated that "political parties offer environmental policy in response to a global consensus on objective environmental conditions" (Michallet *et al.*, 2015, p. 9). This approach is built upon the New Environmental Paradigm (NEP) proposed by Riley E. Dunlap and van Liere (1978); according to this theory rather than wealth, the main determinant of individual's environmental concern would be a common and objective perception of environmental degradation – see Knight and Messer (2012) for further analyses. The NEP is an alternative to the dominant social paradigm (DSP).

This approach is somewhat similar to the "ecological problem pressure" studied by C. Knill *et al.* (2010) – and later on by Christoph Knill *et al.* (2014) – where the authors reflected on the impact that environmental conditions have on the adoption of 'green' policies. The authors have concluded that there are "no indication that environmental problem pressure, as measured here, results in a higher number of enacted environmental policies" (C. Knill *et al.*, 2010, p. 328).

In view of the existing environmental problems, we should therefore expect an increase in the political party's preference towards the environment (regardless of the political parties represented in government).

Unfortunately, the majority of the existing studies fail to provide evidence of the "ecological approach" existence. After testing this approach, Michallet et al. find that "objective ecological degradation as well as variables that should reflect subjective feelings of this degradation does not seem to be clearly correlated with parties supply of environmentalism" (2015, p. 3); a finding in line with the results of C. Knill *et al.* (2010) who could not confirm the existence of a connection between ecological degradation and the number of environmental policies.

3.3 Other pressure factors affecting a political party's environmental preference

Some other important theories suggest that other variables of economic, socio-demographic, international and ideological nature tend to shape the preference towards the environment of political parties.

With regard to the economic approach, the existing literature is abundant. Core elements of this line of thought are the post-materialist values theory (Inglehart, 1990; Kemmelmeier *et al.*, 2002) and the prosperity hypothesis (Franzen and Meyer, 2010) which consider 'income', or more generally 'wealth', the main determinant of environmental concern. Education, race, gender, age, ethnicity, religiousness, occupation and other socio-demographic factors also seem to have an impact on the pro-environmental attitude of parties (as well as individuals) – see the work of Klineberg *et al.* (1998). And as stated by Rogers "socioeconomic inequality is now understood to be integrally linked to environmental degradation, climate change, and blocking of pathways to sustainability" (Rogers, 2014, p. 933).

The existing literature fails also in providing strong evidence of a clear relation between the party's inclination towards international trade and its pro-environmental attitude. While some authors find that a party's environmental preference and its inclination towards promoting trade policies is negatively correlated (Bechtel *et al.*, 2012), there are works that suggest a positive relationship between the two dimensions in the sense that trade boosts technological progress and through that the development of green technologies (Copeland and Taylor, 2003).

Another important determinant factor for a party's pro-environmental attitude derives from its ideological inclination. After examining whether government ideology and fragmentation have influenced the process of CO2-emission reductions in 19 OECD countries within 1992-2008, Garmann (2014) finds that right-wing governments are associated with emission reduction to a smaller extent than center and left-wing governments. Moreover, it seems like emissions are higher the more parties are in a government. Neumayer (2004) used data from 25 countries over the period 1945-1998 and found that left-wing parties as well as individuals are more pro-environmental than their right-wing counterparts.

4. EMPIRICAL ANALYSIS

4.1 Hypotheses

As already mentioned in Introduction, the paper seeks to identify some important drivers that push political parties towards adopting pro-environmental attitudes. The current literature offers some insights into possible determinant variables (of economic, socio-demographic, international or ideological nature) but the main focus of this paper is on environmental factors. To provide an answer to the paper's main question (is 'the ecological approach' accurate?) the following key hypotheses have been formulated:

H1: Low values of environmental quality variables are associated with a higher environmental preference of political parties

Through H1 we intend to test whether the deteriorating environmental surroundings (expressed through variables that reflect the quality of air, water and sanitation) have a 'signalling effect' in the sense that they determine political parties to express an increasing preference towards protecting the environment (by including environmentally related policy proposals in their electoral manifestos).

H2: Higher values of environmental performance related variables is associated with a higher environmental preference of political parties

H2 is in fact an alternative of the H1 through which we intend to test whether political parties are opportunistic in nature in the sense that these parties are aiming to increase their number of voters at 'any price' by seizing any opportunity, whenever such opportunities arise (in our case, in the form of enhanced levels of environmental performance, which may or not depend on policy making). This hypothesis insinuates that political parties react more or are more sensible (in the form of policy proposals expressed in electoral campaigns) to improvements in the quality of the environment than to the deterioration of this. For some insights on the topic of 'opportunistic political cycles' see Percic *et al.* (2014).

Aside from the key hypotheses, the paper also enables us to test the following hypotheses to see whether the research results confirm the existing theories (regarding the existence of other pressure factors affecting a political party's environmental preference) and if they are in line with the current literature:

H3: Higher values of socio-economic variables (improvements in welfare, wellbeing, inflation, unemployment, and in the share of services) is associated with a higher environmental preference of political parties

H4a: The more right-wing (left-wing) oriented political parties are, the less (higher) their preference towards protecting the environment is

H4b: The more divided the power between parties is (within a country's parliament), the higher environmental preference of political parties

H5: The more states affiliated to OECD/EU are, the higher the environmental preference of political parties is

H6: Socio-economic, ideological, international and environmental related variables have a higher combined impact on the environmental preference of political parties

4.2 Data selection and description

To better grasp a political party's 'environmental preference' we turn to the Comparative Manifesto Project (CMP) database, one of the most comprehensive cross-national dataset for observation of parties' political platforms (Volkens *et al.*, 2016). One variable considered in this dataset accounts for percentage of sentences devoted by each party to topics that are explicitly related to 'environmental protection'; this will be the dependent variable in our analysis: *Environmental Preference of Political Parties (E3P)*. As stated by C. Knill *et al.* (2010, p. 311), "the more parties formulate 'quasisentences' in their election manifestos that belong to the 'environmental protection' category, the more they are assumed to be in favour of pro-environmental legislative proposals". For a detailed analysis on the CMP and insights into the methodological approach consult the work of H.-D. Klingemann *et al.* (2006). Nevertheless, Mikhaylov *et al.* (2012, p. 90) advise us to be cautious when dealing with CMP data because the coding process of the dataset is "highly prone to misclassification and stochastic coding errors" and "some categories in the CMP scheme are much more susceptible to coding error than others".

As explanatory factors the study employs various variables that belong to the socio-economic, international and ideological dimensions (as specified in the current literature), with special attention to the environmental determinants (to test 'the ecological approach'). Within this last dimension we consider two important categories of variables: one that refers to data describing the process of environmental degradation – similar variables were used in

the works of Michallet *et al.* (2015), Christoph Knill *et al.* (2014) and Garmann (2014) –, and one category that describes the level of environmental performance as provided by EPI and its composing indicators (these measure the country's proximity to meeting internationally established targets or, in the absence of agreed targets, how nations compare to one another); see sections 2.1 and 2.2. A higher number of environmental components have been considered due to the exploratory nature of this study. Jointly, these indicators cover more or less the entire ecosystem: air, water, soil, fauna and flora. In other studies, EPI and its components are used as explanatory variables instead, as in the works of Gallego-Álvarez *et al.* (2014) or Apostoaie and Maxim (2016).

The data was extracted mainly from the CMP (Volkens *et al.*, 2016), the World Data Bank – WDB (World Bank, 2016) and the Quality of Government Standard Dataset – QGSD (Teorell *et al.*, 2016). A list with the codes, definitions and data sources of the dependent and explanatory variables is provided in Table no. 1. One other aspect worth mentioning is the fact that, while the dependent variable reports values in year *t*, most of the explanatory variables refer to data from *t-1*; this approach was considered to account for changes in the electoral manifestos that was determined by information in the recently closed year.

Table no. 1 – Description of variables and data sources

Variable	**Definitions and data sources**	
Socio-economic variables (SE)		Data source: WDB
GDP	Logarithmic values of GDP per capita, reflecting the level of welfare	
ANS	Adjusted Net Savings – it accounts for the individuals' wellbeing and reflects the effects of the environmental component – see Percic and Apostoaie (2016)	
IND	Industry, value added (% of GDP)	
SERV	Services, value added (% of GDP)	
INF	Inflation, consumer prices (annual %)	
UNEM	Unemployment, total (% of total labor force)	
Ideological variables (ID)		Data source: CMD
Ri-Le	Right-left position of the political party	
PD	'power' dispersion within the parliament's political parties and is calculated as: $1-\Sigma S_i^2$, where S stands for the share of votes received by each political party (*i*)	
International variables (IT)		Data source: CMD
EU	dummy variable: has a value of 1 if a country is an EU member and 0, if otherwise	
OECD	dummy variable: has a value of 1 if a country is an OECD member and 0, if otherwise	
Environmental related variables (ENV)		
- *environmental degradation variables*		Data source: WDB
co2	CO^2 emissions (metric tons per capita)	
fwater	renewable internal freshwater resources (cubic meters per capita) – logarithms	
ghg	total greenhouse gas emissions (kt of CO^2 equivalent per capita) – logarithms	
pm25	PM2.5 air pollution, mean annual exposure (micrograms per meter^3)	
sanit	improved sanitation facilities (% of population with access)	
wateracc	improved water source (% of population with access)	
- *environmental performance variables*		Data source: QGSD
EPI	Environmental Performance Index	
EH	Environmental Health (and the below specified sub-indicators 'eh-')	
EV	Ecosystem Vitality (and the below specified sub-indicators 'ev-')	
eh – air	air quality – calculated from household air quality, air pollution as average exposure to pm25 and its exceedance	
eh – water	water and sanitation (considers access to drinking water and to sanitation)	
eh – pm25	air pollution as average exposure to PM25	

Variable	Definitions and data sources
eh – pest	pesticide regulation (whether countries have signed the Stockholm Convention)
ev – subs	agricultural subsidies expressed in price of their product in the domestic market less its price at the border, expressed as a percentage of the border price
ev – co2	trend in CO^2 emissions per KWH
ev – agr	agriculture factor (from agricultural subsidies and pesticide regulation)
ev – bh	biodiversity and habitat component calculated from terrestrial protected areas, marine protected areas and critical habitat protection
ev – clim	climate and energy component calculated from trend in carbon intensity, change of trend in carbon intensity and trend in CO^2 emissions per kwh
ev – forest	forest cover component which is computed as forest loss - forest gain in > 50% tree cover, as compared to 2000 levels
ev – water	wastewater treatment component which is the level weighted by connection to wastewater treatment rate

The dataset refers to general elections held in 49 countries worldwide between 2000 and 2015. Figure no. 1 reports 49 cassettes with the countries, electoral years as well as number of parties participating in the elections (in each year), which were considered in the study (a cumulated number of 190 electoral rounds and around 1249 party-level observations).

Armenia 2003 (6) 2007 (5) 2012 (6)	Germany 2002 (5) 2005 (5) 2009 (5) 2013 (7)	Norway 2001 (7) 2005 (7) 2009 (7)
Australia 2001 (4) 2004 (4) 2007 (4) 2010 (5) 2013 (8)	Hungary 2002 (6) 2006 (6) 2010 (6) 2014 (6)	Poland 2001 (7) 2005 (7) 2007 (5) 2011 (6)
Austria 2002 (5) 2006 (5) 2008 (6)	Iceland 2003 (5) 2007 (5) 2009 (5) 2013 (6)	Portugal 2002 (7) 2005 (7) 2009 (6) 2011 (6)
Azerbaijan 2000 (5)	Ireland 2002 (6) 2007 (6) 2011 (7)	Romania 2000 (5) 2004 (4) 2008 (4) 2012 (4)
Belgium 2003 (10) 2007 (13) 2010 (11)	Italy 2001 (14) 2006 (16) 2008 (5) 2013 (13)	Russia 2003 (7) 2007 (4) 2011 (4)
Bosnia Herzegovina 2000 (8) 2002 (6) 2010 (8) 2014 (8)	Japan 2000 (7) 2003 (8) 2005 (6) 2009 (8) 2012 (10)	Slovakia 2002 (8) 2006 (6) 2010 (8) 2012 (7)
Bulgaria 2001 (4) 2005 (8) 2009 (6) 2013 (4)	Latvia 2002 (7) 2006 (7) 2010 (5)	Slovenia 2000 (8) 2004 (7) 2008 (8) 2011 (10)
Canada 2000 (5) 2004 (4) 2006 (4) 2008 (5) 2011 (5)	Lithuania 2000 (8) 2004 (6) 2008 (7) 2012 (8)	South Africa 2004 (3) 2009 (4) 2014 (5)
Croatia 2000 (8) 2003 (9) 2007 (7) 2011 (7)	Luxembourg 2004 (5) 2009 (6) 2013 (6)	South Korea 2000 (4) 2004 (5) 2008 (4) 2012 (4)
Cyprus 2001 (4) 2006 (6) 2011 (6)	Macedonia 2002 (7) 2006 (10) 2008 (7) 2011 (10) 2014 (6)	Spain 2000 (11) 2004 (12) 2008 (11) 2011 (13)
Czech Republic 2002 (5) 2006 (5) 2010 (7) 2013 (8)	Mexico 2000 (3) 2003 (6) 2006 (5) 2009 (10) 2012 (9)	Sweden 2002 (7) 2006 (7) 2010 (8)
Denmark 2001 (8) 2005 (9) 2007 (8) 2011 (8)	Moldova 2001 (3) 2005 (3) 2009 (5) 2010 (4) 2014 (5)	Switzerland 2003 (10) 2007 (11) 2011 (11)
Estonia 2003 (6) 2007 (6) 2011 (6) 2015 (6)	Montenegro 2001 (6) 2002 (6) 2006 (6) 2009 (4) 2012 (5)	Turkey 2002 (2) 2007 (4) 2011 (4) 2015 (8)
Finland 2003 (8) 2007 (8) 2011 (8)	Netherlands 2002 (10) 2003 (9) 2006 (10) 2010 (10) 2012 (11)	Ukraine 2002 (6) 2006 (5) 2007 (6)
France 2002 (6) 2007 (6) 2012 (10)	New Zealand 2002 (7) 2005 (6) 2008 (7) 2011 (8)	UK 2001 (8) 2005 (3) 2010 (3) 2015 (11)
Georgia 2003 (6) 2004 (3) 2008 (5) 2012 (2)		USA 2000 (2) 2004 (2) 2008 (2) 2012 (2)
Greece 2000 (4) 2004 (4) 2007 (5) 2009 (5) 2012 (15) 2015 (17)		Serbia 2000 (3) 2003 (6) 2007 (6) 2008 (5) 2012 (8) 2014 (8)

Note: () refers to the number of political parties which participated in the general elections in a year

Figure no. 1 – Dataset contents with regard to countries, election years and parties

With regard to the empirical approach, this study employs one that is similar to the works of de Simone and Sapio (2013) and Michallet *et al.* (2015). Basically, we perform correlations and regression analysis using a dataset which is treated as a pooled cross-section. This approach is applied because data could not be organized as a panel without disregarding a large number of party-level observations. The data was extracted mainly from the CMD (Volkens *et al.*, 2016), the World Data Bank – WDB (World Bank, 2016) and the Quality of Government Standard Dataset – QGSD (Teorell *et al.*, 2016). It was afterwards processed using the EViews software and the recommendations in the User Guide of the program (QMS, 2010).

The econometric models are generated by employing multiple ordinary-least- squares (OLS) regression analyses with standard errors (at party-level and in different phases) and follow the formula specified in Equation (1):

$$E3P_{i,j}^{t} = \alpha + \beta_1 \times SE_j^{t-1} + \beta_2 \times ID_{i,j}^{t} + \beta_3 \times IT_j^{t-1} + \beta_4 \times ENV_j^{t-1} + \varepsilon_{i,j} \quad (1)$$

where: *i* is the cross-section unit (party), *t* is the electoral year (2000-2015), *j* is the country, E3P is the dependent variable (environmental preference of political parties), SE, ID, IT and ENV represent the explanatory variables (pertaining to the socio-economic, ideological, international and environmental dimension), β represent the coefficient values, α is the constant and ε is the error term that captures unobserved variables that change over party and country and tend to affect E3P.

In order to generate the best possible models from all existing combinations of the 30 predictor variables, the *Backwards* method was used, as described by Field (2009). This type of stepwise regression starts by including all relevant predictors in an initial model after which the ones that do not meet the significance threshold for the *t-test* are successively removed and the model is computed again. The process is halted when all predictors have been eliminated or a suitable model has been identified. Moreover, special attention was given to eliminating variables (from the same category, e.g. air) that were found to be strongly correlated or theoretically overlapping.

4.3 Correlation analysis

A view on the descriptive statistics of the data (containing minimum, maximum, mean and standard deviation) – for reasons of space, the tables have not been included in this manuscript but can be provided on request – showed us that there is a wide dispersion among the dependent and explanatory variables. On average, around 4.76% of the political parties' proposals during electoral campaigns are dedicated to environmental protection, with a minimum value of 0% (196 observations have this value, when taking into account the entire period and all the countries included in the study) and a maximum of about 62% (of a party in the Netherlands in 2006 and 2010, and shortly followed a political party in Mexico, in 2012). The next step in verifying if there is a relation between the political party's preference towards the environment and the battery of elected determinants is to perform a correlation analysis. Table no. 2 reports on the *Pearson* correlation coefficients and the associated level of significance.

Table no 2 – Correlations between E3P and the explanatory variables

	socio-economic						**ideological**		**international**	
	ans	*gdp*	*ind*	*infl*	*serv*	*unemp*	*pc*	*rile*	*EU*	*OECD*
Pearson	0.23	0.27	*0.02*	-0.13	0.08	-0.21	-0.08	-0.19	0.09	0.23
Sign.	0.00	0.00	*0.43*	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	environmental degradation related variables									
	co2		*fwater*		*ghg*		*pm25*		*sanit*	*wateracc*
Pearson	0.10		0.10		*-0.03*		-0.14		*0.04*	0.11
Sign.	0.00		0.00		*0.25*		0.00		*0.14*	0.00
	environmental performance related variables									
	EPI	*EH*	*EV*	*EH*				*EV*		
				air	*water*	*pm25*	*pest*	*subs*	*co2*	*agr*	*bh*	*clim*	*forest*	*water*
Pearson	0.15	0.12	0.08	0.16	0.11	0.08	0.10	*0.04*	0.11	0.07	0.16	0.07	*-0.04*	0.15
Sign.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.19*	0.00	0.01	0.00	0.02	*0.16*	0.00

Note: values on rows are for the Pearson correlation coefficients and the associated level of significance

As seen in the Table no. 2, most of the predictors are correlated with the dependant variable (E3P); with some exceptions (variables and values in italics), all the explanatory variables have correlation coefficients that are statistically significant at levels between 0.00-0.10. More importantly, the directions of the correlations' coefficients fit the generally accepted theories (e.g. direct relationship between E3P and GDP, ANS and the importance of services in an economy and inverse relationship with variables such as inflation, unemployment or RiLe). The strength of the relationships for the statistically significant coefficients varies, in absolute values, between small (.04-0.10), to medium (.11-.19) and strong (.20-.27). Unfortunately, there is no consistency between the variables of each of the four dimensions with regard to strength of the correlations. Nonetheless, the strongest relations with E3P are with GDP and OECD, which is clearly in line with the existing theory. More than that, the high value of the correlation with the ANS (a variable not yet included in similar analyses) confirms the ability of this variable to incorporate the sustainability principles.

4.4 Regression analysis

After applying the methodological approach specified in section 4.2, the following six models resulted (see Table no. 3): model 1 accounts for the socio-economic determinants; model 2 refer to the ideological dimension and international status of a country; models 3 to 5 focus on the environmental explanatory variables (including, gradually, EPI, then its two components EV and EH, and afterwards the sub-indicators); finally, model 6 integrates all the variables as specified in eq. (1).

The results offered by Model 1 are in line with the existing theory; similar results were obtained by Michallet *et al.* (2015). It is clear that the GDP has a strong influence on the environmental preference of a political party, in a direct way (confirming the prosperity and the post-materialism hypotheses). The remaining of ANS in the model reinforces this observation. Moreover, when a country deals with high inflation or unemployment, it is clear that political parties focus their agenda in this direction, and less towards environmental protection. Thus we have strong evidence to support hypothesis H3.

Table no. 3 – OLS models for determinants of party's environmental preference

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	SE[1]	*ID*[1]*+IT*[1]		*ENV*[1]		*unified*[2]
Constant	-3.114 (-1.438)	4.692*** (9.329)	7.884*** (11.948)	0.792 (0.979)	-5.069*** (-4.403)	-2.393 (-1.049)
GDP per capita	1.912*** (4.086)					1.016* (1.664)
ANS	0.103*** (3.587)					0.073** (2.499)
inflation	-0.060* (-1.667)					
unemploy-ment	-0.071** (-2.378)					-0.071** (-2.420)
political concentration		-7.716*** (-5.139)				-5.297*** (-3.422)
RiLe		-0.060*** (-6.871)				-0.058*** (-6.698)
OECD		3.056*** (8.346)				1.250** (2.200)
PM25 (#env. degrad.)			-0.200*** (-4.907)			
CO2 (#env. degrad.)						-0.116** (-2.245)
EH: Environment Health				0.029*** (4.169)		
EV: Ecosistem Vitality				0.030*** (3.073)		
ehair (#air)					0.044*** (5.955)	0.016** (2.124)
Evclimate (#air)					0.023*** (2.307)	
Evbh (#biodiversity)					0.024*** (3.270)	0.015** (2.149)
Evag (#soil)					0.037*** (4.288)	0.035*** (4.004)
ewater (#water)					0.021*** (3.213)	
R^2	**.092**	**.101**	**.019**	**.020**	**.071**	**.144**
F-stat.	30.75	45.67	24.07	13.11	18.59	20.51
Prob.	.000	.000	.000	.000	.000	.000
D.-W.	1.884	1.801	1.744	1.753	1.841	1.889

*Notes: D.-W. = Durbin-Watson stat; *, ** and *** significant at the 10%, 5% and 1% level*
[1] SE, ID, IT and ENV refer to the socio-economic, ideological, international and environmental dimension;
[2] represents the unified model including all the dimensions

Model 2 contributes to the existing evidence in the literature with regard to the relationship between a party's ideological position and its pro-environmental attitude (e.g., R. E. Dunlap *et al.*, 2001; Dietz *et al.*, 1998; Neumayer, 2003 and 2004) – supporting hypothesis H4a. The novel aspect of this model is the inclusion of the proposed indicator for measuring 'power dispersion', which is not only statistically significant, but clearly shows

that, the more divided the power between parties is (within a country's parliament), the higher environmental preference of political parties is – supporting hypothesis H4b. Also, although the model cannot confirm the existence of a relationship between E3P and the EU status, there is clear evidence that parties in the OECD area do pay greater attention to environmental related topics in order to attract the attention of the electorate – partially confirming hypothesis H5.

In the next phase, a model was built by including all the variables related to the environmental dimension: the 6 variables referring to environmental degradation and the 11 sub-indicators of environmental performance. After applying the *Backwards* technique specified in section 4.2, all the variables referring to environmental degradation were eliminated leaving us with Model 5.

Nonetheless, we wanted to test whether an actual model can be generated by using only the six variables of environmental degradation; after eliminating the variables that were not statistically significant we turned out with model 3. Although not included in the table, a new model was generated using only EPI in the analysis as explanatory variable. The result confirmed that there is an influence from this part towards the environmental preference of parties. We then proceeded to using the two main components of EPI (EV and EH) as explanatory variables. Both variables have proven to be statistically significant and have an influence on E3P, resulting in Model 4. Therefore, the following deductions can be made:

a) the outcomes of Model 3 revealed that it is possible to confirm the "ecological approach" if we were to use the 'PM25' indicator as a proxy for environmental degradation. Nonetheless, the fact that just only one variable from six was found to be relevant for the model could make the results debatable. Similar weak results were obtained by Michallet *et al.* (2015) when using CO^2 and SO^2 (in logarithmic values) as explanatory variables; they had insufficient data to confirm the "ecological approach". Also C. Knill *et al.* (2010) was not able to provide support for the "ecological problem pressure" when using the energy per capita as an environmental variable. A possible explanation for founding the 'PM25' indicator to be relevant for the model (as compared to the usage of CO^2 and SO^2) could derive from the fact that, in the recent years, the media has often approached the subject of air pollution with fine particulate matter 2.5, thus making the public more aware and at times panicked; political parties became more aware of the subject and of the peoples' worries and reacted by treating the subject more in their manifestos. Therefore, there is some evidence to support hypothesis H1, but this is debatable.

b) the outcomes of models 4 and 5 show that a country's environmental performance with regard to air, water, soil as well as biodiversity and habitat has an important influence on E3P. These results offer strong evidence that political parties are 'opportunistic' by nature and seize any chance (in our case, in the form of enhanced levels of environmental performance) to 'embellish' their electoral manifestos in order to attract more votes, especially from the 'single issue voters' (List and Sturm, 2006). Thus, there is strong evidence to support hypothesis H2.

An interesting aspect that clearly catches one's attention is the low values of R^2 in all the six models (although they are all statistically significant for the .01 level). Neumayer (2004, p. 172) found similar results in this regard and mentions that the low values of R^2 are typical for environmental related studies. R. E. Dunlap *et al.* (2001, p. 44) also state that "socio-political variables have seldom explained more than ten per cent of the variance in a wide range of measures of environmental concern", statement also made by Jones and Dunlap (1992). McCright *et al.* (2016, p. 348) also find that in most of the social science research which

connect the environmental concern with socio-demographic variables, "the adjusted R^2 values across the models are relatively small". Bearing this in mind, we cannot neglect however that by including in a generalized model all the independent variables, we obtain the biggest explanatory power, thus confirming hypothesis H6 (with some reservations).

5. CONCLUSIONS

The aim of this paper was to test the validity of 'the ecological approach' with regard to the influence of environmental related determinants on the political parties' pro-environmental attitudes (expressed in their electoral manifestos). The reason for such an endeavour relies in the fact that the current literature overlooks this issue or doesn't succeed in providing strong evidence of its existence. Two key hypotheses were formulated around environmental related variables while four additional hypotheses were launched to verify the existence of other pressure factors affecting a political party's environmental preference. These hypotheses were tested by using a dataset which covers general elections held in 49 countries worldwide between 2000 and 2015, over a cumulated number of 190 electoral rounds.

The first battery of results revealed that the socio-economic dimension has a clear and significant influence on the pro-environmental attitude of political parties. When there are concerns referring to welfare of the society, wellbeing of the individuals, inflation or unemployment, political parties build their electoral manifestos around topics or solutions that focus on solving these issues, neglecting in the process environmental related matters (up until disregarding them totally). While it is rather intuitive, we cannot overlook that this is not a political approach in line with the sustainability principles. Despite this, the results are in line with existing literature. More important than this set of determinants seem to be the party's ideological position, the institutional framework and the international context of the country which influence significantly the political parties' environmental preference. Interesting results were also found with regard to the environmental dimension. It is possible to confirm the "ecological approach" if we were to use the 'PM25' indicator as a proxy for environmental degradation, an indicator which was overlooked by the existing literature (its relevance in this analysis, when compared to CO^2 or SO^2, is probably due to its media coverage); the questionable nature of this outcome is nonetheless in line with the findings of other authors. But by far the most interesting results of the study seem to point out that the pro-environmental attitude of a political party is more sensible to variables referring to environmental performance. Such outcomes could imply that political parties are 'opportunistic' by nature and seize any chance (in our case, in the form of enhanced levels of environmental performance) to 'embellish' their electoral manifestos in order to attract more votes.

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