



## Analysis

# What are political leaders' environmental intentions? The impact of social identification processes and macro-economic conditions



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## ABSTRACT

Evidence of continued environmental degradation has led to a questioning of the traditional vision of unlimited economic growth in favour of sustainable development. Although several explicit environmental strategies were designed at the supranational level, the pursuit of environmental sustainability remains an aim driven by political concerns at the country level. This study aims to investigate the role of both “internal” (cognitive and motivational factors) and “external” (social forces and macro-economic conditions) contexts in influencing the propensity of political leaders regarding environmental matters. The findings indicate that cognitive and motivational factors tend to shape the environmental intentions of political leaders, whereas the “external” context does not have a significant impact. Our results suggest that the political leaders' propensity for addressing environmental matters is largely affected by the desire of leaders to establish or confirm an individual *status* (through political processes) or to conform to group norms. However, younger political leaders demonstrate a higher environmental propensity than do older leaders.

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## 1. Introduction

Attention to environmental matters has increased considerably in the last twenty years, especially in the most industrialized countries. Evidence of continued environmental degradation has led to a questioning of the traditional vision of unlimited economic growth in favour of sustainable development (Shi, 2003, 2004; York et al., 2003; Scricciu, 2007). However, the European Union (EU), which plays a key role in promoting sustainable development at the member state level (and internationally), has recently noted that “much of our environment is protected by a body of European legislation. But the implementation of these policies remains problematic” (EU, 2014: 4). Therefore, although several explicit environmental strategies were designed at the supranational level, the pursuit of environmental sustainability is still driven by political concerns at the country level (Levine et al., 2015; Bradshaw et al., 2010). Within the international literature that investigates environmental awareness, several empirical studies have focused on the determinants of citizens' environmental attitudes (e.g., Torgler and Garcia-Valinas, 2007; Torgler et al., 2008). However, there is a lack of papers addressing the factors affecting environmental intentions of political leaders, even though they are instrumental players in the promotion or opposition of environmental policies. The purpose of the present study is to fill the gap in the existing literature. As stated by

Levine et al. (2015), human goals and behaviours are affected by the surrounding context, both “internal” (cognitive and motivational factors) and “external” (socio-economic context). The aim of this paper is to investigate, through a quantitative analysis, the role of both “internal” and “external” contexts in influencing the propensity of political leaders for addressing environmental issues.

To measure the level of environmental propensity of political leaders, we conduct a content analysis on the political leaders' narrative discourses addressing environmental topics within political programs<sup>1</sup> for the national elections of 2006, 2008 and 2013. Discourses are important in politics because they reflect the politicians' intentions regarding specific topics (Krippendorff, 1989; Dryzek, 1997; Schmidt, 2008). The analysis is carried out with reference to Italy. Italy is one of the most industrialized countries in the EU, second only to Germany. Unlike Germany, however, Italy has been characterized by greater uncertainty following the global financial crisis. Italy is a suitable setting for our study because it enables us to explore whether and to what extent the factors relating to the surrounding context (both internal and external) tend to influence the environmental intentions of political leaders within an industrialized country and to ascertain the macro-economic effects of a severe economic crisis. In addition, conducting a national study allows the analysis to move from a general perspective of

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<sup>1</sup> In electoral programs, the main concerns and intentions of political leaders (and their political parties) are formally disclosed with regard to economic, social and environmental matters.

environmental strategies designed at the EU level to a local perspective (Torgler and Garcia-Valinas, 2007), gaining understanding of political propensity for environmental matters (and related potential determinants) at the country level. The analysis begins in 2006, the year when Italian political leaders (and relating coalitions) began to be obliged to register their programs at the Ministry of Internal Affairs.

The results indicate that cognitive and motivational factors (“internal” context) have a strong impact in affecting the political leaders' propensity for addressing environmental matters, whereas macro-economic conditions and social forces such as community (“external” factors) appear to not influence this propensity significantly. Moreover, younger political leaders (up to 39 years old) seem to be more prone than older leaders to address environmental matters.

The remainder of this paper is structured as follows: Section 2 provides the theoretical framework and the hypotheses development. Section 3 describes the data and research methodology. The results are presented and discussed in Section 4, and the study's conclusions are presented in Section 5.

## 2. Theoretical Framework and Hypotheses Development

Different from the neoclassical model of *Homo economicus*, where a human actor is assumed to be a mere self-regarding agent who makes isolated decisions independently of the socio-economic context, studies of human cognition and behavioural economics indicate that human attitudes and behaviours are context-sensitive. Individuals' concerns and goals are shaped by cognitive and motivational factors (internal context), as well as by the social and economic factors (external context) in which the individuals develop and operate (Tajfel, 1981; Buck, 1985; Haidt, 2001, 2006; Eccles and Wigfield, 2002; Venkatachalam, 2008; Manner and Gowdy, 2010; Levine et al., 2015). Within the ecological economics and policy literature, recent studies argue the need for greater environmental concern by political actors for more effective pro-environmental policies (Venkatachalam, 2008; Manner and Gowdy, 2010). The propensity of political leaders toward environmental issues may primarily depend on their social identification. According to the social identity theory (SIT), a social identity is an individual's knowledge that he belongs to a social category or group (Tajfel, 1974; Hogg and Abrams, 1988). Through a cognitive process of self-categorization, individuals categorize themselves as members of a group that they perceive to have similar beliefs, values, affective reactions, behavioural norms and other properties that are judged as relevant in the self-categorization process (Hogg et al., 1995). This process produces an accentuation of the perceived differences between the self and out-group members, implying an intergroup social comparison. Owing to the social comparison process, an underlying need for positive distinctiveness (motivational factors) leads individuals toward concerns, goals and behaviours that allow them to positively differentiate their own group when compared to other groups (Wilder, 1986; Turner et al., 1987). Within a political landscape, political leaders identify with groups having similar beliefs, values, concerns and behavioural norms. These groups are organized in the form of political parties with political leaders who share an identity with the members of the group they lead. Motivated by a need to enhance the positive distinctiveness of the group they lead (Hogg and Abrams, 1990; Luhtanen and Crocker, 1992; Abrams and Hogg, 1999), political leaders will commit to improving or emphasizing the relevant properties characterizing their own group. According to McCright and Dunlap (2010, 2011), welfare is the relevant quality characterizing the left-wing parties, and environmentalism may be viewed as an additional political instrument to improve the welfare of future generations. On the contrary, right-wing parties are primarily concerned with profit margins and economic growth, and consider environmental issues to be potential costs or constraints that might impair these priorities. Thus, when accentuating the positive properties of their own group, we expect that political leaders of left-wing parties will tend to manifest more propensities for environmental issues as part of a general vision of harmonious development

through the reconciliation of welfare preservation and economic priorities. In order to demonstrate the crucial role of political ideology (belief and values) as the best predictor of politicians' environmental intentions, several studies argue and show that left-wing politicians express greater attitude toward environmental issues than their counterparts, especially in developed capitalist countries (O'Connor et al., 2002; Neumayer, 2004; Leiserowitz, 2006; Dietz et al., 2007; Dunlap and McCright, 2008; Leiserowitz et al., 2010; McCright and Dunlap, 2011; Nawrotzki, 2012).

Based on the above arguments, we thus test the following hypothesis:

**H<sub>1</sub>.** *Within a developed capitalist country, political leaders of left-wing political parties tend to manifest a greater propensity than their counterparties toward environmental matters.*

As outlined by Brewer (1991), an individual's social identification process with a group is the result of a compromise between the conflicting needs for the individual's uniqueness and their assimilation into a social category. To increase the power and notoriety of similar groups over dissimilar groups, this compromise can also be pursued at the intergroup level through the formation of coalitions or alliances between similar groups. In this sense, Brown (2000a, 2000b) - applying the Brewer's “Optimal Distinctiveness Theory” (1991) to explain the phenomenon of intergroup attitudes and attraction - states that groups seek to establish positive relationships with other groups “to avoid feeling stigmatised, but simultaneously need to retain enough distinctiveness,” thereby favouring the optimal mix of distinctive and common attributes (Brown, 2000a, pp. 758).

According to Brown's (2000a, 2000b) arguments within a political landscape, the political leader of a party will be motivated to form alliances with relatively similar groups having some distinctive attributes acknowledged by a part of electors to gain more power and notoriety in terms of electoral consensus (motivational factors). Once the alliance is formed, the leader of a coalition will tend to refashion the political identity opportunistically (Taylor, 1994). Within the Italian political context, over the period examined some political leaders formed alliances with the most popular green parties, i.e., the green parties with an electoral consensus in previous political elections. Based on the aforementioned arguments, it is expected that political leaders of these coalitions will tend to manifest greater environmental intentions.

The following hypothesis is thus proposed and tested:

**H<sub>2</sub>.** *Political leaders of coalitions including popular green parties will show a greater propensity to address environmental issues.*

Based on both the social identity theory and the optimal distinctiveness theory used with our first two hypotheses, the following Fig. 1 highlights the assumed inverse relationship between the self-uniqueness of leaders (self-identity) and the consensus opportunity. As the leaders tend to pursue a compromise between their own self-uniqueness and the assimilation in one or more groups, they will achieve a broader consensus by exploiting the positive distinctiveness of the groups.

Although the propensity toward addressing environmental issues is shaped by an individual's cognitive and motivational factors (internal context), the influence of the external socio-economic context cannot be excluded (Shi, 2004; Esty and Porter, 2005). As stated by Levine et al. “virtually anything a person perceives or experiences at a given time can have an influence on his or her thinking [...] and, ultimately, on his or her choice of action” (Levine et al., 2015, pp. 29). In particular, the external context may act as a constraint or catalyst for human intentions (Matutinović, 2012). In accordance with community psychologists, social forces such as community contribute to shaping an individual's socio-environmental propensity and behaviour (Sarason, 1974; Bachrach and Zautra, 1985; Chavis and Newbrough, 1986; Perkins and Taylor, 1996; Prezza and Costantini, 1998). Specifically, if an individual has played an active role in a community he will tend to develop greater sensitivity to the pressing matters of the community.

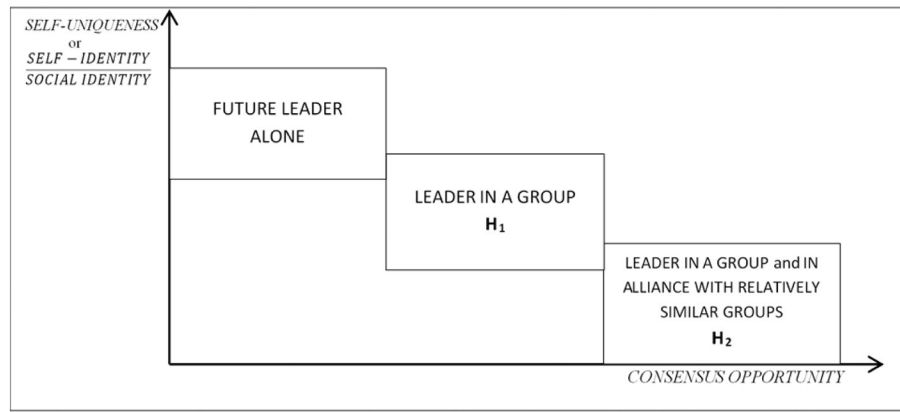


Fig. 1. Social identification processes and consensus opportunity.

It is more likely that his future attitudes will be affected by that experience and sensitivity because past problems influence future choices (Levine and Perkins, 1987; Chavis and Wandersman, 1990; Jason et al., 2015). The previous concrete involvement of political leaders in decision-making processes may therefore stimulate their concerns for the pressing issues that emerge during political mandate. In the last decade, the environmental issue in Italy has been a highly contested problem that has led to tensions and social events both locally and nationally. Those who played a political role in those years probably acquired a greater awareness of environmental issues. Thus, we expect leaders with previous political experiences with pressing environmental matters to express a higher propensity to address environmental issues. The following hypothesis is therefore tested:

**H<sub>3</sub>.** Political leaders with previous political experience with pressing environmental matters will tend to manifest a greater propensity for addressing environmental issues.

Another important external factor concerns the macro-economic conditions of a country. For several Western countries (including Italy), the long-lasting global financial crisis has led to a severe recession with negative effects on national wealth (GDP), debt and employment rates (Urhammer and Røpke, 2013). Within the political landscape, this crisis has deepened the division between political actors who perceive environmental action as detrimental to growth (Tienhaara, 2010; Geels, 2013) and those who perceive environmental issues as key to overcoming the crisis in favour of sustainable growth (OECD, 2011; UNEP, 2011; Jackson, 2009; NEF, 2010). During crisis periods, environmental matters are often considered as additional costs that can deeply undermine the firms' competitiveness, especially in comparison with firms that are located in geographic areas with a lack of environmental regulation (Oberthür and Pallemarts, 2011; Wurzel and Connelly, 2011). As outlined by Geels, "the green growth discourse in Western countries is hindered by cheap Chinese competition, which caused over-capacity, tumbling prices, and bankruptcy or job reductions for many Western wind and solar companies. The industrial shake-out and job losses led politicians to criticize the use of Western government subsidies (for renewable energy) to stimulate Chinese industries" (Geels, 2013, pp. 83). Furthermore, in many European countries (Italy, Spain, Germany and UK), austerity measures have caused even further reductions to green stimulus packages such as public grants, cheap loans and investments. Following the period of developed country downturns, the ambitious objective of "green recovery" policies has become more politically controversial (Geels, 2013).

Esty and Porter (2005) prove a strong relationship between the economic growth of a country and strong pro-environmental actions. According to the environmental Kuznets curve, the country's environmental degradation is an inverted U-shaped function of the level of national economic growth, the latter measured as income per capita

(Grossman and Krueger, 1993; Selden and Song, 1994). Therefore, only beyond a certain level of income per capita an increasing environmental concern emerges. Under the environmental Kuznets curve perspective, it is thus expected that during a period of strong economic and financial crisis with decreasing levels of GDP, politicians will mainly be concerned with economic growth rather than environmental matters. Based on the above arguments, we expected that a decline in macro-economic conditions would negatively influence political propensity for environmental matters. Our fourth and last hypothesis is therefore formulated and tested as follows:

**H<sub>4</sub>.** A decline in the macro-economic conditions of a country negatively affects the propensity of political leaders to address environmental issues.

### 3. Research Methodology

This section explains the methodological approach used by the study. The first subsection describes the data source and how the sample was drawn. The second subsection focuses on the technique used to build our dependent variable. The third subsection reports on the empirical model used and provides a brief explanation of the independent variables and the related measures employed.

#### 3.1. Sample Selection and Data Source

To perform our analysis, all the programs of the Italian parties that participated in the national elections of 2006, 2008 and 2013 were examined. We carried out the analysis at national level as required by the Italian Constitution (article 117): "the State has exclusive legislative powers on protection of the environment, the ecosystem and cultural heritage." We began data collection in 2006, the year in which the requirement for political parties to register their programs with the Ministry of the Interior began. Since then, a new electoral system has been introduced through law no. 270 (December 21, 2005). The new law introduced a "corrected" proportional system that assigns a reward for office (majority reward) to the political party or coalition with the highest number of votes. Furthermore, the electoral law provides a different cut-off point in both chambers of parliament (the House and the Senate). Each party or list must obtain at least 4% of national votes to obtain seats in the House, while coalitions must obtain at least 10%. In the Senate, each party or list must obtain at least 8% of votes while coalitions must obtain at least 20%. Additionally, the lists associated with a coalition that has reached the established threshold will only participate in the distribution of seats if they have >3% of the votes.

In Italy, the legislative period lasts 5 years. However, during the examined period, Italy had an extra shorter legislative period in 2006 (15th Legislature of the Italian Republic), which lasted 732 days. This period lasted from April 28, 2006 to April 28, 2008, and occurred due to the

“no confidence” vote received by the Romano Prodi government. The (unbalanced) final data panel was composed of 59 programs in 2006, 66 programs in 2008 and 47 programs in 2013, for a total of 172 programs studied.

### 3.2. Dependent Variable

The dependent variable in this study is the political leaders' propensity for addressing environmental matters. We used a content analysis approach to measure this propensity. Content analysis is a research methodology used in the social sciences “for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorff, 2013, pp. 34). The assumption is that the frequency of phrases about a certain topic reflects its importance in every communication. Within political contexts, content analyses were used to shed light on the intentions of candidates for political offices toward specific issues (Krippendorff, 1989). Content analysis also allows for the mapping of policy preferences manifested by candidates in their political programs (Budge et al., 2001). Content analysis differs from data normally used in qualitative research, its advantage being that researchers have no control over producing the data because, as opposed to, for example, interviews, “most content analyses start with data that are not intended to be analyzed to answer specific research questions. They are meant to be read, interpreted and understood by people other than the analysts” (Krippendorff, 2013, pp. 36). We applied the content analysis to political programs presented and registered by political leaders with the Ministry of the Interior for the national elections of 2006, 2008, and 2013. The assessment of the environmental intent of political leaders through content analysis involves different phases (Krippendorff, 2013): (1) development of an analytical construct for analysing the environmental issues; (2) definition of recording units; (3) coding; and finally, (4) assessment of the level of reliability attained. The development of an analytical construct is important for content analysis because it clarifies “the rules of inference that guide the analyst,” thereby making “the context portable to other content analyses or similar contexts” (Krippendorff, 2013, pp. 40). Accordingly, we chose a consistent framework provided by the EU to analyze environmental issues. The EU provides eleven basic environmental classes/categories, each of which is divided into sub-categories (items). The basic categories are: tackling climate change, general regulations, sustainable development, waste management, air pollution, water protection and management, protection of nature and biodiversity, soil protection, noise pollution, the environment, cooperation with third countries, and civil protection. For our study, we eliminated two categories (general regulations and civil protection) that are not directly correlated with the analysis. Therefore, the final environmental framework for the content analysis consists of nine separate categories that include several items (sub-categories) as indicated by the EU (Appendix). According to Krippendorff (2013: pp. 84) “content analysts must justify their methods of unitizing, and to do so, they must show that the information they need for their analysis is represented in the collection of units, not in the relationship between the units, which unitizing discards”. As a unit of analysis, we preferred sentences to individual words because “Individual words have no meaning to provide a sound basis for coding social and environmental disclosures without a sentence or sentences for context” (Milne and Adler, 1999, pp. 243). Following the Budge et al. (2001) approach, each sentence of the political program was coded with a score of 1 if it embraces one of the environmental items included in the Environmental Framework (and reported in the Appendix A) as a policy goal, and 0 otherwise. For example, to the following sentence a score of zero was assigned because it reveals only a general reference to the environment, lacking a minimum of clear environmental proposal: “To return to growth are necessary a great mobilization of all Italians and a profound change that can hold together the economic, social and environmental quality.” On the contrary, the following sentence was coded with a score of 1 because containing a policy goal about the environmental item discussed: “Our proposal provides for the reduction of total consumption of fossil fuels (in the mix of

fossil fuels we favour the use of natural gas less polluting) and a decrease in greenhouse gas emissions.” Inferences are then drawn from the occurrence of such sentences in the analyzed text (Budge et al., 2001).

In particular, an overall environmental index was assigned to each political leader in relation to the total score reached. The overall index measures the political leaders' propensity for addressing environmental matters: the higher the index, the greater the stated intention to address environmental issues. Finally, to ensure the reliability of the content analysis, we performed an inter-coder reliability test using the Krippendorff's *alpha* agreement for coding (Krippendorff, 2013). In particular, two coders (one research assistant and one of the two authors) calculated the scores by conducting a content analysis on the political programs. A preliminary check was performed on ten political programs after the research assistant was trained by the authors. Finally, a degree of agreement above the minimum limit of acceptance of 70% was found (Milne and Adler, 1999).

### 3.3. The Model

To perform our empirical analysis, we estimated the following equation:

$$EI = \alpha + \beta_1 L + \beta_2 C + \beta_3 GR + \beta_4 NAL + \beta_5 CWG + \beta_6 PPE + \beta_7 \Delta GDP + \beta_8 \Delta DEB + \beta_9 AGE + \beta_{10} G + \beta_{11} DS + \epsilon \quad (1)$$

where the dependent variable (*EI*) is the overall environmental index measuring the political leaders' propensity for addressing environmental matters. To test our first hypothesis (*H1*), we considered the political ideology underpinning the parties of the political leaders. We distinguished between left (*L*), right (*R*), centre (*C*), green (*GR*) and non-aligned political parties<sup>2</sup> (*NAL*). We coded these variables as dummies. To verify our second hypothesis (*H2*), we considered a dichotomous variable (*CWG*) that takes value of 1 if the coalition includes a popular green party (i.e., green party that had success in the previous elections), and 0 otherwise. Our third hypothesis (*H3*) was tested by employing the variable related to the previous political experience of the political leaders (*PPE*), which is measured by a dummy variable with a value of 1 if the political leader had already been either a mayor, provincial or regional councillor, Parliament member or Prime Minister during a period of pressing environmental matters, or 0 otherwise. To verify our fourth hypothesis (*H4*), we considered the three main macro-economic variables that are universally recognized as measures of health trends of a country:  $\Delta GDP$ ,  $\Delta EMP$  and  $\Delta DEB$ .  $\Delta GDP$  is the gross domestic product growth rate between the election year examined and the previous election year.  $\Delta EMP$  is the national employment growth rate between the election year examined and the previous election year.  $\Delta DEB$  is the national debt growth rate between the election year examined and the previous election year. Because of the perfect collinearity between  $\Delta GDP$  and  $\Delta EMP$ ,<sup>3</sup> we eliminated the variable  $\Delta EMP$  from the regression. Finally, we complete the analysis by controlling for the demographic variables of age (*AGE*) and gender (*G*), and for the party size. The first two control variables are commonly recognized as affecting individuals' environmental attitudes (Torgler and Garcia-Valinas, 2007; Torgler et al., 2008; Mzoughi, 2011). *AGE* is the age of the political leader. We distinguished two classes of age by applying a dummy variable: up to 39 years old<sup>4</sup> (inclusive) (dummy = 1) and over 39 years old

<sup>2</sup> “Non-aligned” parties do not follow any traditional political ideology; instead, they identify with a category of possible electors (such as pensioners) or civic lists that are not linked to any political ideology.

<sup>3</sup> The Pearson correlation found between  $\Delta EMP$  and  $\Delta GDP$  is 0.884, *p-value* < 0.00001, whereas the Pearson correlation between  $\Delta EMP$  and  $\Delta DEB$  is  $-0.5055$ , *p-value* < 0.00001. Instead, there is no significant correlation between  $\Delta GDP$  and  $\Delta DEB$  ( $\rho_{\Delta GDP, \Delta DEB} = -0.044$ , *p-value* = 0.5688). We thus kept the variables  $\Delta GDP$  and  $\Delta DEB$  in the regression.

<sup>4</sup> 39 years old is the chosen cut off for young vs. old politicians according to that identified by both Italian National Institute of Statistics (ISTAT) and European Institute of Statistics (EUROSTAT).

**Table 1**  
Dependent and Independent Variables.

Symbol	Variable	Measurement
<i>EI</i>	Overall environmental index (Dependent Variable)	It was built by applying the content analysis to political programs. The overall index measures the political leaders' propensity for addressing environmental matters: the higher the index, the greater the stated intention to address environmental issues.
<i>L</i>	Leftwing political party	Dummy variable
<i>R</i>	Rightwing political party	Dummy variable
<i>C</i>	Centre-wing political party	Dummy variable
<i>GR</i>	Green political parties	Dummy variable
<i>NAL</i>	Non-aligned political parties	Dummy variable
<i>CWG</i>	Coalition with a popular green party	Dummy variable
<i>PPE</i>	Previous political experience of the political leader during "environmental turbulence"	Dummy variable
$\Delta GDP$	Gross domestic product	Growth rate between the election year examined and the previous election year
$\Delta DEB$	National debt	Growth rate between the election year examined and the previous election year
$\Delta EMP$	National employment	Growth rate between the election year examined and the previous election year
<i>AGE</i>	Age of the political leader.	Dummy variable
<i>G</i>	Political leader's gender.	Dummy variable
<i>DS</i>	Party's size in the House of Deputies	Percentage of votes obtained in the House of Deputies
<i>SS</i>	Party's size in the Senate	Percentage of votes obtained in the Senate

**Table 2**  
Descriptive statistics.

	<i>EI</i>	<i>L</i>	<i>R</i>	<i>C</i>	<i>GR</i>	<i>NAL</i>	<i>CWG</i>	<i>PPE</i>	$\Delta GDP$
Mean	5.098837	0.267442	0.377907	0.168605	0.017442	0.168605	0.040698	0.587209	0.053910
Median	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.005041
Maximum	81.00000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.210522
Minimum	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.074064
Std. Dev.	10.10162	0.443917	0.486280	0.375496	0.131293	0.375496	0.198166	0.493773	0.117838
Observations	172	172	172	172	172	172	172	172	172
	$\Delta DEB$	$\Delta EMP$	<i>AGE</i>	<i>G</i>	<i>DS</i>	<i>SS</i>			
Mean	0.143525	0.011437	0.127907	0.889535	0.017423	0.017430			
Median	0.167127	0.018140	0.000000	1.000000	0.000000	0.000000			
Maximum	0.238382	0.046574	1.000000	1.000000	0.498100	0.502200			
Minimum	0.054877	-0.042085	0.000000	0.000000	0.000000	0.000000			
Std. Dev.	0.075488	0.035081	0.334961	0.314384	0.078620	0.079203			
Observations	172	172	172	172	172	172			

(dummy = 0). *G* is the political leader's gender. This is a dummy variable that is equal to 1 if male and 0 if female. Finally, to measure the party size we considered both the percentage of votes achieved by the party in the House of Deputies (*DS*) and the percentage of votes obtained by the party in the Senate (*SS*). Owing to the extremely high collinearity between these two measures of size, we eliminated the variable with the higher VIF (i.e., *SS* with a VIF = 803.141) from the regression.

Because the dependent variable (*EI*) takes only non-negative integer values, the Poisson regression model may represent the natural starting point for our analysis. Nevertheless, observed counts may exhibit substantial overdispersion, casting doubts on the unit variance-to-mean ratio implied by the Poisson model. Such an overdispersion may be explained in several ways (see e.g., Winkelmann, 2008): unobserved heterogeneity, missing covariates or correlation among repeated measurements. Clearly, even if the Poisson regression can be recognized as an important tool to analyze the effects of covariates on count data, a pooled approach may not be suitable for longitudinal data, in which repeated measurements on the same sample unit could be correlated. A generalized estimating equations (GEE) approach allows us to take into account the longitudinal structure of the data by introducing a working correlation matrix in the model. It is well-known (Sutradhar, 2003) that the GEE approach (using a robust sandwich estimator) leads to consistent parameter and standard error estimates, even if the working correlation matrix is incorrectly specified. If the working correlation matrix is correctly specified, GEE models will give more efficient estimates of the parameters. In this respect, we considered a completely unstructured working

correlation matrix, to increase the flexibility of the model in recovering the correlation in the data. However, more parsimonious assumptions can be made, leading to similar results.

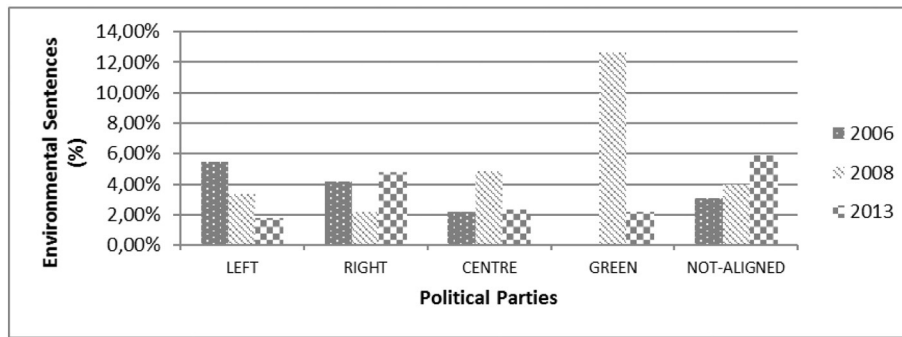
Table 1 reports the description and measurement of each variable employed in our model, as follows:

#### 4. Results

This Section shows and discusses the results of our quantitative analysis. A brief qualitative analysis is carried out to illustrate the environmental intentions and preferences of political leaders over the period examined and in comparison with the attitudes of Italian citizens toward environmental issues.

##### 4.1. Descriptive Statistics

Table 2 shows the main descriptive statistics referring to our sample. The data confirms what often emerges from Italian political debates – that is, the excessive predominance of male (88.95%) and older political leaders. On average, only 13% of political leaders are younger than 39 years old during the period analyzed. Finally, more than half of the leaders (58.72%) had previous political experience with a territorial community. The analysis reveals a significant percentage for right, left, and non-aligned parties (37.79%; 26.74%, 16.86% and 16.86%, respectively) among parties that participated in the national elections during the years examined. Moreover, the



Graph A. Percentage of sentences in political programs devoted to environmental issues.

coalitions with the most popular green parties represent 4.07%, whereas the green parties not included in any coalitions represent, on average, approximately 1.74%.

From Table 2 it also emerges that, on average, political leaders do not devote many sentences to environmental topics, although there is wide variation among the different electoral programs that range from a minimum of zero (no mention of environmental items) to a maximum of 81 sentences. As shown by the following Graph A, the environmental issues addressed by the political leaders over the period examined tend to take up only a small part of their electoral programs, with the only exception being the green parties in 2008 (12.66%).<sup>5</sup>

The low environmental intentions of political leaders over the period examined appear to contrast with the environmental sentiment of the Italian citizens that emerged through three Eurobarometer Surveys.<sup>6</sup> On average (with a stable trend), 95% of Italian citizens interviewed considered environmental issues to be very and fairly important. Moreover, 54% (tendentially stable over time) felt the progress of a country should be evaluated based equally on social, environmental and economic criteria. Concerning the relative importance that political leaders tend to attach to the environmental issues analyzed over the period, Table 3 shows greater environmental concern by political leaders is devoted to tackling climate change.<sup>7</sup>

This topic represents, on average, 47% of environmental programs and over 50% in 2008 and 2013, respectively. The second topic that receives the most attention from political leaders is waste management. This topic was especially popular in Italy in the years examined. Several central and southern municipalities had serious problems with waste disposal due to the lack of adequate plants and the high costs of transporting waste to plants in northern Italy and central-northern Europe. The topic of soil protection had a significant but decreasing incidence, representing, on average, 14% of the environmental issues addressed in electoral programs and a drop from 17.7% in 2006 to 10.4% in 2013. Following these first three categories with two-figure average values are three others: the protection of nature and biodiversity, sustainable development and water protection and management. These categories represent approximately one-fifth of the environmental topics discussed in electoral programs. It is interesting to observe that the percentage of interest of political leaders in sustainable

development and water protection and management is decreasing. Interest seems to have completely disappeared for the last three categories: air pollution, cooperation with third countries and noise pollution. A comparison of the data from Table 3 with the following Graph B on the main environmental concerns manifested by Italian citizens reveals a misalignment between citizens and their political leaders.

Specifically, political leaders tend to attach greater importance to the climate change issue, paying little attention to water and air pollution. However, the Italian citizens' concern for these two environmental issues is notably high.<sup>8</sup>

#### 4.2. Multiple Regression

Table 4 shows the results of the multiple regression (1) used to test our four hypotheses.

Our first hypothesis (H1) is empirically supported. We find a positive and significant relationship between the left-wing parties (L) and political leaders' propensity for addressing environmental issues ( $\beta_1 > 0$ ;  $p$ -value  $< 0.05$ ). The results also show a positive coefficient with regard to non-aligned political parties (NAL), but its value is lower and only slightly statistically significant (at the 10% level). Obviously, leaders of green parties (GR) show a positive and significant propensity to address environmental issues ( $\beta_3 > 0$ ;  $p$ -value  $< 0.001$ ). The findings also provide empirical support to our second hypothesis. Indeed, the coefficient of the CGW variable is positive and statistically significant ( $\beta_5 > 0$ ;  $p$ -value  $< 0.05$ ). This latter result gives empirical support within a political landscape to Brown's (2000a, 2000b) arguments about social identification processes at the intergroup levels. Political leaders of parties who formed an alliance with the most popular green parties (i.e., green parties that have achieved an electoral consensus in previous elections) tend to show greater environmental intentions. Our third hypothesis was not supported. We found that a political leader's previous political experience with pressing environmental matters does not significantly influence their propensity for addressing environmental issues. Furthermore, counter to the assumption of the environmental Kuznets curve, the decline in the macro-economic conditions of a country, as measured by decreasing GDP and increasing national debt, does not seem to affect the environmental intentions of political leaders significantly. Therefore, our fourth hypothesis does not have empirical support. Taken together, our results highlight the prevalence of internal factors (cognitive and motivational) related to the social identification processes over external factors in influencing the propensity of political leaders to address environmental issues. However, it is interesting to notice that younger

<sup>5</sup> The percentage of sentences in an electoral program devoted to environmental issues is measured as the ratio between the number of sentences that embrace the environmental topics and the totality of sentences making up the program.

<sup>6</sup> The Eurobarometer surveys on the environmental attitudes of European citizens were published in (2008) (for the survey conducted in 2007), (2011) and (2014).

<sup>7</sup> Following the Budge et al. (2001) approach, through the content analysis of electoral programs, we mapped for the environmental preferences of political leaders. The relative importance of each environmental category is measured as the ratio between the number of sentences in an electoral program devoted to that category and the total sentences contained in the program for all nine environmental categories.

<sup>8</sup> In the last Eurobarometer report (2014) the climate change issue was omitted from the question relating to the list of the environmental concerns.

**Table 3**  
The relative importance of environmental category for political leaders.

Category	2006	2008	2013	Mean
Air pollution	1.61%	0.00%	0.50%	0.70%
Environment: cooperation with third countries	0.97%	0.00%	0.00%	0.32%
Noise pollution	0.65%	0.27%	0.00%	0.31%
Protection of nature and biodiversity	12.58%	6.03%	5.45%	8.02%
Soil protection	17.74%	14.25%	10.40%	14.13%
Sustainable development	9.03%	6.85%	7.92%	7.93%
Tackling climate change	31.29%	53.97%	55.94%	47.07%
Waste management	17.10%	13.70%	16.34%	15.71%
Water protection and management	9.03%	4.93%	3.47%	5.81%
All categories	100%	100%	100%	100%

political leaders (up to 39 years old) appear more environmental concerned than older leaders ( $\beta_{10} > 0$ ;  $p$ -value  $< 0.005$ ), confirming the increased awareness of younger people of the urgency of environmental concerns (Torgler et al., 2008).

## 5. Conclusions, Policy Implications and Future Research

The aim of sustainable development is driven by political concern for environmental matters (Shi, 2004; Bradshaw et al., 2010; Levine et al., 2015). Different from the neoclassical model of *Homo economicus*, studies of cognition and behavioural economics highlight that human actors' goals and behaviours are affected by cognitive and motivational factors (internal context), as well as the external socio-economic context (Venkatachalam, 2008; Manner and Gowdy, 2010; Levine et al., 2015). To the best of our knowledge, this paper presents the first quantitative investigation of whether and to what extent environmental intentions of political leaders are influenced by “internal” and “external” contexts. The results are controlled for party size and demographic factors relating to age and gender, commonly considered influential in individuals' environmental propensity (Torgler and Garcia-Valinas, 2007; Torgler et al., 2008; Mzoughi, 2011). Our findings show that the environmental propensity of political leaders tends to be shaped by cognitive and motivational factors connected to social identification processes. Indeed, “external” context does not significantly impact the environmental intentions of political leaders. Our results suggest that political leaders' propensity for addressing environmental matters is largely affected by their desire to establish or confirm an individual *status* (through political processes) or to conform to group norms. However, younger political leaders demonstrate a greater propensity for addressing environmental issues.

**Table 4**  
Factors influencing environmental intentions of political leaders.

GEE population-averaged model - Poisson regression			
Robust standard errors			
Variable	Coefficient	z-Statistic	Prob.
Const	−0.1761605	−0.30	0.764
L	0.7659747	2.04	0.041**
C	0.4630396	1.06	0.291
GR	1.248697	3.49	0.000***
NAL	0.7332945	1.81	0.070*
CWG	1.33218	2.41	0.016**
PPE	0.2624564	0.96	0.338
$\Delta GDP$	0.239929	0.25	0.806
$\Delta DEB$	−0.387172	−0.26	0.799
AGE	0.8785592	2.48	0.013**
G	0.9431517	2.12	0.034**
DS	1.369428	0.93	0.354
Wald Chi2(11)	62.72		
Prob > Chi2	0.0000		
Max VIF	2.379		
Number of observations	172		
Error correlation	Unstructured		

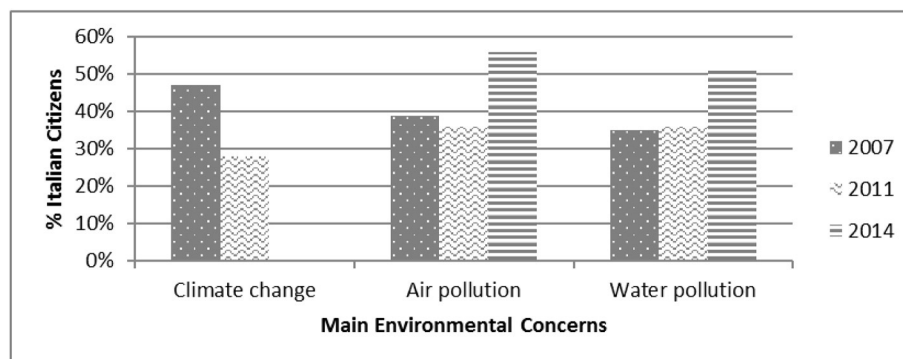
\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.

These results have several interesting policy implications. The environmental propensity of leaders should not be connected to a mere desire to establish or confirm an individual *status* through political processes or to conform to group norms. To overcome mere opportunistic or ideological behaviours, environmental awareness among future leaders should be increased. In addition to shorter-term policies, such as strengthening environmental legislation and related controls, it may also be helpful to introduce forward-looking policies, such as mandatory environmental education to form an effective culture of sustainable development. To ensure more alignment of shared future pro-environmental behaviours, these policies should be approved at an international level through a wide implementation of a binding common legislation in various countries.

Although this paper explored empirically for the first time the influence of internal and external factors on the propensity of political leaders toward environmental concerns, we are aware that the analysis can be further deepened. Two aspects of additional in-depth analysis are particularly relevant. First, the analysis could be carried out with reference to the other countries. Moreover, further analytical approaches may be applied to the issue, such as a quantitative mapping approach inspired by digital methods (Venturini et al., 2014, 2015).



**Graph B.** Main environmental concerns for Italian citizens. Source: Eurobarometer (295, 365 and 416).

## Appendix A. Environmental Framework<sup>9</sup>

1. Tackling climate change	5. Water protection and management
1.a Political context	5.a Specific uses of water
1.b Kyoto Protocol	5.b Marine pollution
1.c Reduction in greenhouse gas emissions	5.c Regional waters
1.d Energy	5. d Discharges of substances
1.e Transport	6. Protection of nature and biodiversity
1.f Industry	6.a Biodiversity
1.g Agriculture	6.b Fauna and flora
2. Sustainable development	6.c Forests
2.a Sustainable development strategies	6.d Genetically modified organisms
2.b Integration of environmental policy	7. Soil protection
3. Waste management	7.a Management of specific soil types
3.a Waste from specific activities	7.b Discharges of substances
3.b Radioactive waste	7.c Activities leading to specific risks
3.c Hazardous waste	8. Noise pollution
3.d Re-cycling and prevention	8.a Sources of noise pollution
4. Air pollution	8.b Management of noise pollution
4.a Air quality	9. Environment: Cooperation with third countries
4.b Atmospheric pollution	9.a Enlargement
4.c Transport	9.b Cooperation with other countries
4.d Industry	9.c International conventions

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<sup>9</sup> The framework was built according to the EU categorization. The basic environmental classes and the relating items (sub-categories) as identified by the EU are available online at: [http://europa.eu/legislation\\_summaries/environment/index\\_it.htm](http://europa.eu/legislation_summaries/environment/index_it.htm).



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