**The marginal impact of environmental NGOs in different types of democratic systems – Online appendix**

We changed a variety of specifications and estimated the empirical models again in order to assess the robustness of our main findings[[1]](#footnote-1). First, some of the control variables that are closely related to democratic regimes and their institutions may undercut the significance and size of our key explanatory variables. As shown in the main paper (as well as in the estimations below when using alternative ENGO data), however, including or excluding these control variables does not affect the principal results (see also Clarke, 2005). We also implemented all models with *ENGO Leverage (ln)* lagged by one year. Once again the results did not change significantly. Moreover, the structure of discrete duration data is essentially identical to data with a binary dependent variable in a time-series cross-section format (Beck *et al.*, 1998). Therefore, we estimated all models again using a Cox duration setup. Again, this did not change our core findings.

Second, due to our theoretical framework, we are primarily interested in the impact of ENGOs on the likelihood of environmental treaty ratification contingent on the form of government and the type of electoral rule. However, we established this framework via the link of ‘the effective number of parties’ (Laakso and Taagepera, 1979). Therefore, alternative empirical estimation strategies, compared to those used for the main paper, could focus on the interaction between *ENGO Leverage (ln)* and a measure for the effective number of parties. Using the data sources we point to in the main paper, we implemented such an alternative estimation. Our main results remain unchanged in this setup, however, despite the fact that the corresponding analyses are based on 23 OECD democracies only: the impact of ENGOs remains higher in parliamentary systems with proportional representation rule (or those countries with a higher effective number of parties); conversely, the impact of ENGOs on the likelihood of treaty ratification remains smaller in presidential systems with plurality rule (or those countries with a lower effective number of parties).

Third, as discussed in the main paper, the data for *ENGO Leverage (ln)* (Bernauer *et al.*, 2013) stem from the International Union for Conservation of Nature (IUCN). While this organization has a broad coverage of ENGOs and its network extends to most countries (181 states in total) in the world, the IUCN is an umbrella organization where membership is not mandatory. Thus, there is a certain degree of self-selection involved and our variable *ENGO Leverage (ln)* may omit some ENGOs. To address this potential shortcoming, we used an alternative information source on ENGOs that has been used in other research on the subject: the World Environment Encyclopedia and Directory (Europa Publications, 1994, 1997, 2001). We took the data from Fredriksson *et al.* (2005) and Binder and Neumayer (2005), which we merged into an ENGO sample that covers the period 1977-2000. A detailed discussion of these data from the World Environment Encyclopedia and Directory (Europa Publications, 1994, 1997, 2001) – including strengths and weaknesses – can be found in the cited publications, and we refer the interested reader to these studies. Furthermore, note that some years are not covered by these data (i.e. 1989-1992; 1994-1995; 1997-1999) and we impute these missing data linearly.

As discussed in Fredriksson *et al.* (2005: 355), it seems that the Directory’s data are more comprehensive than the IUCN data we employ in the main paper. For the year 2000, for instance, the highest values in the sample are 190 (United Kingdom) and 250 (United States). The number of environmental interest groups equals zero in seven countries, e.g. Comoros, Malawi, and Oman. Among the developing countries, 24 out of 82 countries have at least ten active environmental groups. The highest value in the sample according to the IUCN data (across all years) is the United States with 82 ENGOs in 1989, while there are only 46 ENGOs registered in the United States in the year 2000 according to the IUCN (Bernauer *et al.*, 2013).

That said, the pair-wise correlation between the ENGO variable used in the main paper and the variable constructed with information from the World Environment Encyclopedia and Directory (Europa Publications, 1994, 1997, 2001) is in fact very high: we obtain a Pearson’s *r* of 0.7622 (p=0.0000). The question remains, however, whether our results remain robust when employing the alternative data source. We estimated Model 2 (i.e. the full model) of the main paper with the ENGO data from the World Environment Encyclopedia and Directory (Europa Publications, 1994, 1997, 2001). The table below summarizes our findings.

As can be seen in this table, the change in the operationalization of the ENGO item does not influence the effects of the control variables. Recall, however, that the constitutive terms of the three-way interaction cannot be interpreted directly (Braumoeller, 2004; Brambor *et al.*, 2006). Hence, we graphically plot the substantive quantities of interest for the full model above in Appendix Figure 1. As shown in this figure, our results remain robust to the extent that the effect of the ENGO item is noticeably stronger in parliamentary systems with proportional representation rule than in presidential democracies with plurality voting. Against this background, we conclude that the ENGO variable used for the estimations in the main paper may have some shortcomings, but the pair-wise correlations and the robustness of our findings when using an alternative data source suggest that it is a reliable proxy indeed.

Appendix Table 1. Results from logistic regression models – Alternative ENGO data

|  |  |
| --- | --- |
|   | Appendix Model 1 |
| ENGO Leverage (ln) – Directory Data |  0.56 |
|  |  (0.09)\*\*\* |
| Presidential System Dummy |  0.39 |
|  |  (0.48) |
| ENGO\*Presidential |  –0.28 |
|  |  (0.16)\* |
| Plurality Voting Dummy |  0.76 |
|  |  (0.45)\* |
| ENGO\*Plurality |  –0.37 |
|  |  (0.13)\*\*\* |
| Presidential\*Plurality |  1.37 |
|  |  (0.71)\* |
| ENGO\*Presidential\*Plurality |  –0.26 |
|  |  (0.20) |
| IO Membership |  0.03 |
|  |  (0.00)\*\*\* |
| Trade Intensity |  –0.92 |
|  |  (0.11)\*\*\* |
| Number of Countries Ratified |  –0.02 |
|  |  (0.00)\*\*\* |
| Percent of Income Group Ratified |  0.04 |
|  |  (0.00)\*\*\* |
| Percent of Region Group Ratified |  0.07 |
|  |  (0.00)\*\*\* |
| GDP per capita |  3.92 |
|  |  (1.28)\*\*\* |
| GDP per capita2 |  –0.19 |
|  |  (0.07)\*\* |
| SO2 per capita |  0.04 |
|  |  (0.06) |
| GDP |  –0.44 |
|  |  (0.09)\*\*\* |
| Ratification Years Variable |  –0.51 |
|  |  (0.05)\*\*\* |
| Spline 1 |  0.00 |
|  |  (0.00) |
| Spline 2 |  –0.01 |
|  |  (0.00)\*\*\* |
| Spline 3 |  0.00 |
|  |  (0.00)\*\*\* |
| Constant |  –30.48 |
|  |  (4.94)\*\*\* |
| Observations | 45,634 |
| Log Pseudolikelihood | –3,596.75 |
| Wald  | 2,055.87\*\*\* |

Standard errors clustered on country-treaty pair in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1% (two–tailed).



**Appendix Figure 1** The impact of ENGO leverage – Conditional on democratic system and electoral rule.

*Note*: The graph pertains to full model estimations from above. The dashed lines indicate 90% confidence intervals.

**References for the appendix**

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1. All robustness checks can be replicated with the replication files. [↑](#footnote-ref-1)