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Political-Economic Correlates of Environmental Policy

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Political-economic Correlates of Environmental Policy

by

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May 15, 2020

Abstract

Does globalization lead to environmental degradation? What is the role of democracy for environmental performance and do left-wing governments really care more about the environment? Using a comprehensive measure of environmental performance, we test these three hypotheses for a panel of 134 countries for the period 2007-2016. Our findings show that globalization leads to better environmental performances. Interestingly, this result is predominantly driven by social, not by economic or political globalization. Although we find evidence that left-wing governments perform better than right-wing governments, it is centrist governments that have the highest environmental performance. The political system, i.e. democracy, turns out insignificant in all specifications.

Key words: Environment, Globalization, Political Orientation, Democracy, Environmental performance index, KOF globalization index

JEL codes: F64, O13, Q5, Q56

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1. Introduction

Three theories on the determinants of environmental policy have gained considerable currency. The ecological dumping and the pollution haven hypothesis (PHH) posits that globalization leads to increased pollution levels through the erosion of environmental standards. In order to attract foreign direct investment and to gain a competitive edge, environmental standards are kept low, which increases pollution and harms the environment (e.g., Rauscher 1994, Ulph 1996, Umanskaya and Barbier 2008). According to the PHH, firms in countries with high environmental standards have incentives to shift their production to countries with low environmental regulations. The empirical evidence regarding this hypothesis is mixed. Brunnermeier and Levinson (2004), Levinson and Taylor (2008), Hanna (2010), and Grether et al. (2012) find evidence in its favor, whereas Eskeland and Harrison (2003) find no effect of production being shifted towards countries with lower environmental standards. For a recent literature review on the impact of globalization on the environment see Cherniwchan et al. (2017).

The 'clean democracy hypothesis' posits that environmental concerns carry a larger weight in democracies as civil liberties, such as freedom of speech and of association, and a free press create larger awareness of environmental concerns and allow a better organization of environmental interests. Legal and electoral accountability ensures that incumbents care about citizens' demands for better environmental quality and implement more restrictive regulations – thus democracies should be cleaner (e.g., Payne 1995, Li and Reuveny 2006). Empirical evidence is mixed with supporting evidence provided e.g. by Li and Reuveny (2006), Bernauer and Koubi (2009), and You et al. (2015) and contradicting evidence by Midlarsky (1998) and Gassebner et al. (2011). Kammerlander and Schulze (2020) find no evidence for democracies being cleaner.

The third theory maintains that left-wing parties impose stricter environmental policies because they are less reluctant to impose costs on entrepreneurs and because their supporters, the working class, are more vulnerable to environmental hazards as they can afford health care and protection against environmental hazards less. King and Borchard (1994) and Neumayer (2003, 2004) provide supporting evidence for this hypothesis.

We shed light on all three theories by using a comprehensive measure of environmental quality, the *Environmental Performance Index* (EPI), jointly developed by the Yale Center for Environmental Law and Policy, the Center for International Earth Science Information Network at Columbia University, and the World Economic Forum. The EPI aggregates indicators on multiple dimensions of environmental quality, such as environmental health risks, air quality, water and sanitation, water resources,

agriculture, fisheries and forests, and biodiversity, and is thus a much more comprehensive measure than the single pollution measures frequently used in the analyses of the above theories.[1]

Our results are surprising – we find no support for the clean democracy hypothesis, it is the centrist parties that have the highest EPI scores, not the left, and globalization is good for the environment. The positive impact of globalization is driven by social globalization. Interestingly, economic and political globalization do not play a role.

2. Data and Empirical Approach

Our dependent variable is the **Environmental Performance Index**, a comprehensive measure of environmental quality, which is divided with equal weight into the environmental health sub-index, consisting of indicators for environmental risk exposure (weight 1/3), air quality (1/3), and water and sanitation (1/3), and the ecosystem vitality sub-index, consisting of indicators for water resources (25%), agriculture (10%), fisheries (5%), forests (10%), biodiversity and habitat (25%), and climate and energy (25%). The EPI ranges from zero (worst) to 100 (best value); it covers with its 20 indicators a multitude of dimensions of environmental quality and makes performance comparable across countries (Hsu et al. 2016). Therefore, it provides a more comprehensive picture than data on pollution emissions, which are often used only very selectively. The EPI has undergone several methodological changes, but the data team has provided a backcast of the EPI2016 for the period 2007-2016, which we are using.[2]

Political orientation: The Database of Political Institutions hosted by the Inter-American Development Bank[3] contains a variable denoting the political orientation of the largest government party (Cruz et al. 2018). We create the dummy variables LEFT and CENTER from this database. As robustness check we also use the orientation of the party of the country's chief executive.

Democracy: We use three measures of democracy, the polity2 score of the POLITY IV project and, following Epstein et al. (2006), dummy variables derived from this: DEMOCRACY (polity2 score >6), PARTIAL DEMOCRACY (scores >0, but <7) and AUTOCRACY (scores ≤ 0). We also use alternative cut-off values as suggested by the Center for Systemic Peace (2018), see below.

[1] Often, only one or two theories are tested, which raises concerns about omitted variable biases.
[2] For methodological changes from 2016 to 2018 cf. https://epi.envirocenter.yale.edu/epi-report-2018/chapter-2-methodology/90-changes-2016-epi, data are available from YELP (2016).
[3] https://mydata.iadb.org/Reform-Modernization-of-the-State/Database-of-Political-Institutions-2015/ngy5-9h9d

Globalization: We capture the degree of globalization by the updated KOF Globalization Index, which ranges from 0 (autarky) to 100 (globalized), and measures of multiple dimensions of globalization (Gygli et al. 2019). Globalization may improve access to modern, cleaner technology, it may increase FDI, which often adheres to the strictest environmental standards (one-fits-all technology), and it may also transmit information and environmental awareness, which may lead to stricter environmental policies.

Other control variables: We control for GDP per capita and its squared term to capture possible Environmental Kuznets Curve (EKC) effects (cf. Grossman and Krueger 1995, Cole 2004). It is calculated as chained PPP (2011) in 1,000 US$ taken from the Penn World Tables 9.1. We include factor endowment variables – capital-labor ratio and the human capital index – both taken from PWT9.1. The idea is that capital-abundant countries specialize in capital-intensive production, which may be pollution-intensive (Copeland and Taylor 2003). Higher human capital endowments may lead to cleaner production and more awareness of environmental issues. Lastly, we control for total population (in logs) and the percentage of population living in urban areas to capture economies of scale effects in the provision of public goods and infrastructure. Our data cover the period 2007-2016 and 134 countries. Table 1 provides descriptive statistics, Table A1 in the appendix shows a list of countries in the sample.

Table 1: Descriptive statistics

VARIABLES	(1) Obs	(2) Mean	(3) S.D.	(4) Min	(5) Max
Environ. Performance Index	1,327	67.83	14.98	34.36	91.05
Democracy	1,327	0.543	0.498	0	1
Partial Democracy	1,327	0.197	0.398	0	1
Population in Mio.	1,327	50.86	162.5	0.480	1,379
Human capital index	1,327	2.522	0.699	1.136	3.809
Capital-labor ratio	1,327	159.6	155.3	2.941	669.6
GDP p.c.	1,327	18.17	20.28	0.591	153.5
GDP p.c. squared	1,327	741.1	1,804	0.349	23,549
Urbanization (% of pop.)	1,327	58.53	22.29	9.864	100
Globalization Index	1,327	64.98	14.27	32.81	91.31
Economic Globalization	1,327	58.76	16.55	26.61	95.29
Social Globalization.	1,327	62.14	18.29	18.48	92.27
Political Globalization	1,327	73.96	15.06	35.84	98.59
Left-wing Government	1,327	0.306	0.461	0	1
Centrist Government	1,327	0.0625	0.242	0	1

We use the following regression model

$$EPI_{i,t} = \alpha + \beta G_{i,t} + \delta D_{i,t} + \gamma PO_{i,t} + \theta X_{i,t} + \mu_t \, (+ \mu_i) + \varepsilon_{i,t}$$

where $EPI_{i,t}$ is the environmental performance index of country *i* at time *t*, *G* denotes the globalization index, $D_{i,t}$ is our democracy measure, $PO_{i,t}$ the measure for the government's political orientation, $X_{i,t}$ are the other control variables, μ_t denotes a full set of time FE and μ_i a set of country FE. As many features of the political and economic system may move only slowly over time, we use a pooled OLS model with time FE and in addition a model with country and time FE. Standard errors are clustered at the country level.

3. Results

Contradicting the environmental dumping hypothesis, globalization is positively associated with environmental performance (Table 2). In all specifications the coefficient for the globalization index is positive and statistically significant. A one standard deviation increase in globalization is associated with an approximate 37% of a standard deviation increase in environmental performance (models 1-4). This is a sizeable effect and contradicts the notion that globalization may lead to a race to the bottom in environmental standards.[4] We further investigate the impact of globalization on environmental performance by breaking down the globalization index into its three main components: economic, social and political globalization (model 5). Interestingly, social globalization, measuring interpersonal, informational and cultural aspects of globalization, drives this result – economic and political globalization are insignificant and both point estimates are substantially smaller compared to social globalization. This suggests that the transfer of information and awareness across borders and cultural proximity is important for domestic environmental policy formation.

We find no support for the 'clean democracy' hypothesis. All coefficients of DEMOCRACY and PARTIAL DEMOCRACY are insignificant in all specifications. Thus, democracies as such are not found to be cleaner than autocracies. This corroborates earlier findings by Gassebner et al. (2011) and Kammerlander and Schulze (2020).

We do find support for the notion that left-wing governments obtain higher EPI scores than right-wing governments (reference category). A left-wing government has a 2 points higher EPI score on average, which is about 12% of a standard deviation. Yet, the effect is much stronger for centrist governments – they have a 3.5 points higher EPI score (22 percent of a standard deviation).

Human capital-abundant economies have higher EPI scores, either because of a cleaner production structure or because politically relevant environmental awareness is higher. More capital-intensive countries have higher EPI scores. Other things being equal, countries with larger populations and higher GDP per capita are linked to lower EPI scores, but we find no support for an Environmental Kuznets Curve. The negative marginal effect of higher GDP per capita diminishes in absolute terms, but the turning point is outside the support of the GDP per capita (model 5). Higher urbanization is correlated with higher EPI performance.

[4] For favorable effects of globalization on other areas cf. Potrafke (2015).

Table 2: Results

VARIABLES	(1)	(2)	(3)	(4)
Globalization Index	0.391***	0.395***	0.386***	
	(0.091)	(0.079)	(0.089)	
Democracy	0.544		-0.0274	-0.960
	(1.528)		(1.530)	(1.435)
Partial Democracy	-0.923		-1.121	-1.524
	(1.327)		(1.276)	(1.245)
Left-wing Gov.		1.974**	1.927**	1.799**
		(0.843)	(0.860)	(0.818)
Centr. Gov.		3.440***	3.457***	3.254***
		(1.139)	(1.156)	(1.123)
Economic Glob.				-0.0365
				(0.046)
Social Glob.				0.489***
				(0.104)
Political Glob.				0.0752
				(0.051)
GDP p.c.	-0.199*	-0.196*	-0.193*	-0.305***
	(0.117)	(0.109)	(0.113)	(0.108)
GDP p.c. squared	0.000359	0.000308	0.000285	0.00117*
	(0.001)	(0.001)	(0.001)	(0.001)
Capital-labor ratio	0.0154*	0.0163**	0.0158**	0.0171**
	(0.008)	(0.008)	(0.008)	(0.007)
Human capital index	10.13***	10.14***	10.20***	7.512***
	(1.376)	(1.346)	(1.340)	(1.573)
Urbanization (% of pop.)	0.125***	0.124***	0.123***	0.0826***
	(0.032)	(0.032)	(0.032)	(0.031)
Log(Population)	-0.556*	-0.623**	-0.603**	-0.242
	(0.296)	(0.281)	(0.284)	(0.419)
Observations	1,327	1,327	1,327	1,327
R-squared	0.866	0.871	0.872	0.886
Year FE	Yes	Yes	Yes	Yes
Country FE	No	No	No	No

We test the robustness of our results in several dimensions, using our model 3 as baseline. First, we use alternative cut-offs for democracy (polity2 scores 6-10) and autocracy (-6 - -10) with the group in between named anocracy as suggested by the authors of PolityIV (Center for Systemic Peace 2018). Second, we do not classify countries as democratic, partially democratic and autocratic, but rather use the raw polity2 score.

Table 3: Fixed Effects and Robustness Checks I

VARIABLES	(1) Baseline	(2) Alternative Cut-offs	(3) Polity2	(4) Corruption	(5) Oil	(6) FE	(7) FE
Globalization Index	0.386***	0.408***	0.414***	0.383***	0.368***	0.0755**	
	(0.089)	(0.090)	(0.091)	(0.089)	(0.089)	(0.034)	
Democracy	-0.0274	-0.923		-0.0844	-0.359	-0.198	-0.233
	(1.530)	(1.708)		(1.595)	(1.548)	(0.400)	(0.400)
Partial Democracy	-1.121	-0.932		-1.133	-1.419	-0.0340	-0.0639
	(1.276)	(1.550)		(1.282)	(1.288)	(0.265)	(0.266)
Left-wing Gov	1.927**	1.963**	2.039**	1.904**	1.900**	0.0734	0.0805
	(0.860)	(0.861)	(0.854)	(0.861)	(0.841)	(0.155)	(0.154)
Centr. gov.	3.457***	3.532***	3.586***	3.486***	3.082***	0.200	0.183
	(1.156)	(1.149)	(1.148)	(1.173)	(1.163)	(0.243)	(0.239)
Polity2			-0.0571				
			(0.103)				
Corruption				-0.453			
				(2.267)			
Country produces Oil					-1.727		
					(1.148)		
Economic Glob.							0.0258
							(0.018)
Social Glob.							0.0546*
							(0.031)
Political Glob.							0.00812
							(0.022)
Observations	1,327	1,327	1,327	1,327	1,327	1,327	1,327
R-squared	0.872	0.871	0.871	0.872	0.874	0.996	0.996
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	Yes	Yes

Third, we include the Political Corruption Index taken from the V-Dem database (McMann et al. 2016) as corruption may compromise a government's ability to effectively implement environmental regulations. Fourth, we include a dummy variable for oil producing countries to test for the possibility that this might alter the environmental performance and at the same time be related to other variables of interest, such as the globalization index. None of these changes affects our three central results – democracy is uncorrelated to environmental performance, left governments have a better environmental performance but centrist governments even more so, and globalization increases environmental performance.

Lastly, we run fixed effects regressions. Coefficients keep their signs, but lose their significance, which is not surprising given the short time span of a decade (dictated by data availability). Only globalization remains significantly positive; the breakdown into its subcomponents shows again that social globalization matters most for environmental performance.

In Table 4 we use the six measures from the World Governance Indicators (Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption) instead of democracy testing whether characteristics typically associated with democracy are correlated with environmental performance. None of them improves EPI scores.

The results confirm the findings from the baseline: the environmental performance of democratic countries is not better compared to the performance of other countries. Neither if we use the pure polity scores nor if we apply alternative cut-offs do we find any significant coefficient. None of the six measures from the World Governance Indicators significantly improves the environmental performance. We conclude that our findings are not due to the choice of our measure but that democracies as such do not have a better environmental performance. Presidential systems have no other EPI scores than parliamentary systems. We also use the party of the country's CEO (not the largest government party) as an alternative measure for political orientation; the findings from the baseline are again confirmed. If the party of the national leaders is centrist or leftist, the countries' environmental performance is significantly better compared to right-wing parties. Again, centrist governments have higher EPI scores than left-wing governments.

Table 4: Robustness checks II

VARIABLES	(1) Baseline	(2)	(3)	(4)	(5)	(6)	(7)	(8) Presidential	(9) Alternative Left/Center
Globalization Index	0.386***	0.424***	0.384***	0.419***	0.439***	0.479***	0.452***	0.391***	0.387***
	(0.089)	(0.084)	(0.089)	(0.078)	(0.105)	(0.089)	(0.096)	(0.094)	(0.090)
Democracy	-0.0274							0.812	0.150
	(1.530)							(1.631)	(1.522)
Partial Democracy	-1.121							-0.296	-1.051
	(1.276)							(1.384)	(1.286)
Left-wing Gov	1.927**	2.043**	1.960**	2.265***	1.955**	2.061**	2.177**	1.832**	1.721*
	(0.860)	(0.844)	(0.839)	(0.834)	(0.845)	(0.845)	(0.857)	(0.896)	(0.889)
Centr. gov.	3.457***	3.338***	3.446***	3.407***	3.432***	3.351***	3.657***	4.534***	3.311***
	(1.156)	(1.110)	(1.146)	(1.126)	(1.124)	(1.073)	(1.109)	(0.910)	(0.921)
CorrControl		-0.775							
		(0.747)							
GovEff			0.257						
			(0.956)						
PolStab				-0.898					
				(0.671)					
RegQual					-0.763				
					(1.087)				
RuleofLaw						-1.834*			
						(0.929)			
Voice							-0.973		
							(0.746)		
Presidential System								0.788	
								(1.217)	
Observations	1,327	1,327	1,327	1,327	1,327	1,327	1,327	1,212	1,327
R-squared	0.872	0.871	0.871	0.872	0.871	0.874	0.872	0.870	0.871
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No	No	No	No

4. Conclusion

We have analyzed the political and economic correlates of domestic environmental performance. We find that globalization, social globalization in particular, is associated with better environmental performance. This suggests that the exchange of information and the spill-over of (environmental) awareness matter more for environmental performance than the exchange of goods and the

integration of financial and capital markets. We find no evidence in favor of the 'clean democracy' hypothesis nor can we support the Environmental Kuznets Curve hypothesis. All results suggest that democracy as such is not a determinant of environmental protection, but that political orientation matters, yet in a surprising way: left-wing governments pursue stricter environmental protection than right-wing governments, but centrist governments outshine both.

We find some support for the notion that left-wing governments pursue stricter environmental protection than right-wing governments. Yet, centrist governments have the best environmental performance.

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Appendix

Table A1: List of countries included in our sample

Albania	Egypt	Lithuania	Senegal
Algeria	El Salvador	Luxembourg	Sierra Leone
Angola	Estonia	Madagascar	Singapore
Argentina	Ethiopia	Malawi	Slovakia
Armenia	Fiji	Malaysia	Slovenia
Australia	Finland	Mali	South Africa
Austria	France	Mauritania	South Korea
Bahrain	Gabon	Mauritius	Spain
Bangladesh	Gambia	Mexico	SriLanka
Belgium	Germany	Moldova	Sudan
Benin	Ghana	Mongolia	Swaziland
Bolivia	Greece	Morocco	Sweden
Botswana	Guatemala	Mozambique	Switzerland
Brazil	Haiti	Myanmar	Syria
Bulgaria	Honduras	Namibia	Tajikistan
Burkina Faso	Hungary	Nepal	Tanzania
Burundi	India	Netherlands	Thailand
Cambodia	Indonesia	New Zealand	Togo
Cameroon	Iran	Nicaragua	Trinidad & Tobago
Canada	Iraq	Niger	Tunisia
Central African Republic	Ireland	Nigeria	Turkey
Chile	Israel	Norway	Uganda
China	Italy	Pakistan	Ukraine
Colombia	Jamaica	Panama	United Arab Emirates
Republic of the Congo	Japan	Paraguay	United Kingdom
Congo (DRC)	Jordan	Peru	United States
Costa Rica	Kazakhstan	Philippines	Uruguay
Cote d'Ivoire	Kenya	Poland	Venezuela
Croatia	Kuwait	Portugal	Vietnam
Cyprus	Kyrgyzstan	Qatar	Yemen
Czech Republic	Laos	Romania	Zambia
Denmark	Latvia	Russia	Zimbabwe
Dominican Republic	Lesotho	Rwanda	
Ecuador	Liberia	Saudi Arabia	