Universiteit Utrecht

Research and Documentation Centre

European Survey Research Association,
General Conference, 17-21 July, 2023, Milan, Italy

A New Index of Political Inequality (IPI)

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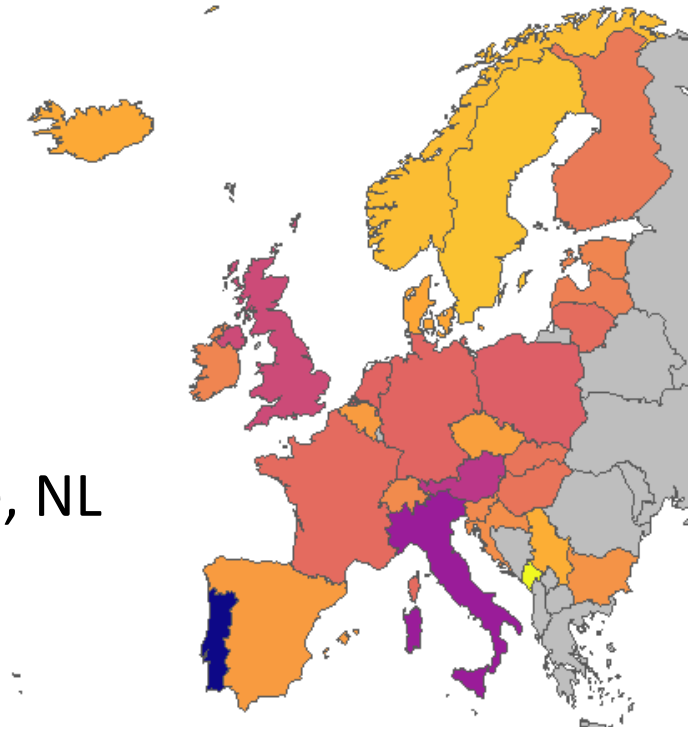
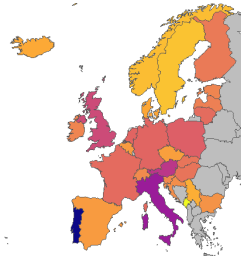
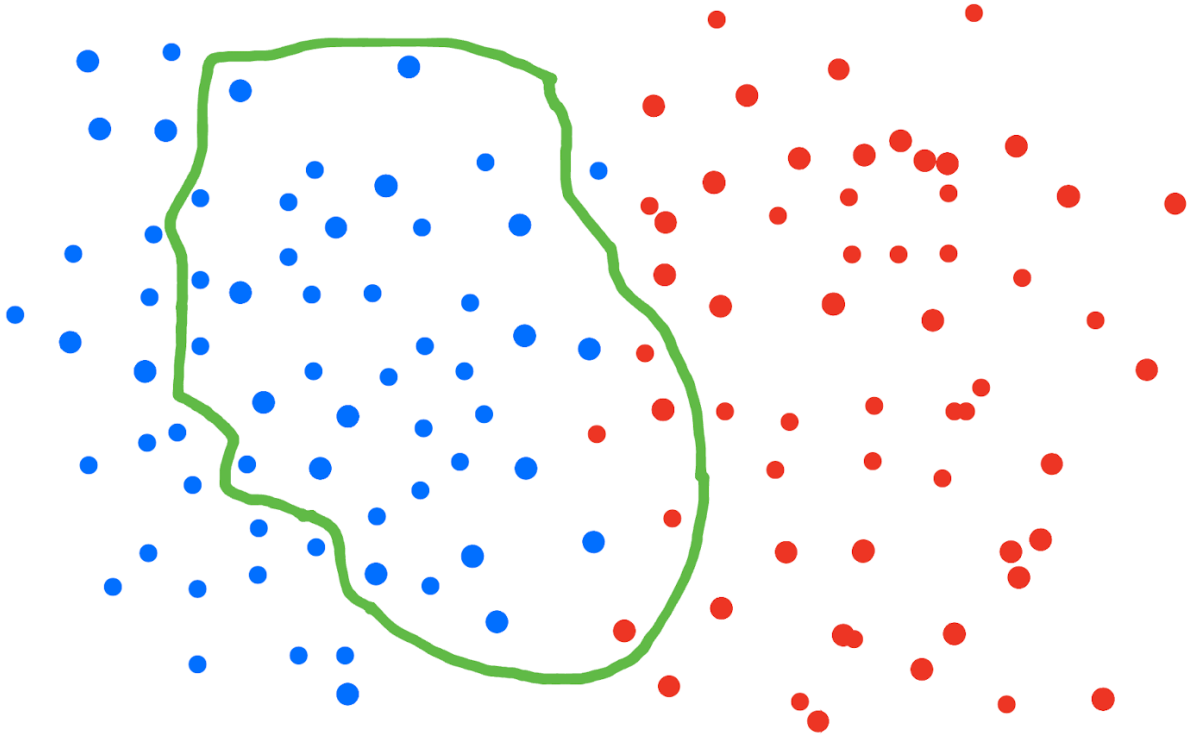




Social characteristics of people should not affect their political participation

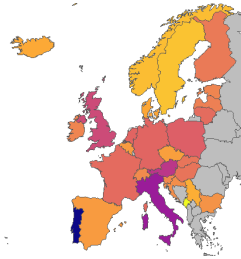
WHY NOT?



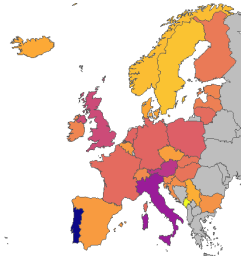
- The sample of “activists” is biased
- The sample does not represent the population
- The voices of some groups of people are underheard

Political inequality is the degree to which the voice of the people is biased by their social characteristics

Synonyms



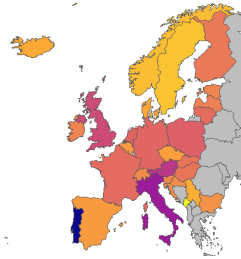
- Political inequality
- Political voice inequality
- Political participation inequality
- Political participation gap
- Inequality in political voice
- Underexpressed political voice



How to measure political inequality?

The statement	Statistical counterparts
Social characteristics of people	
should not affect	
their political participation,	
otherwise,	
political inequality exists and	
the stronger the influence, the higher inequality	

The statement	Statistical counterparts
Social characteristics of people	“Social” variables: age, sex, education, income, occupation, place of residence, migration background…
should not affect	**A numerical entity** that measures the effect / predictive power of a set of variables: $M = 0$
their political participation,	Voting, protesting, signing petitions, boycotting, etc.
otherwise,	If the measure ≠0
political inequality exists and	political inequality exists and
the stronger the influence, the higher inequality	the larger the *M*, the higher inequality

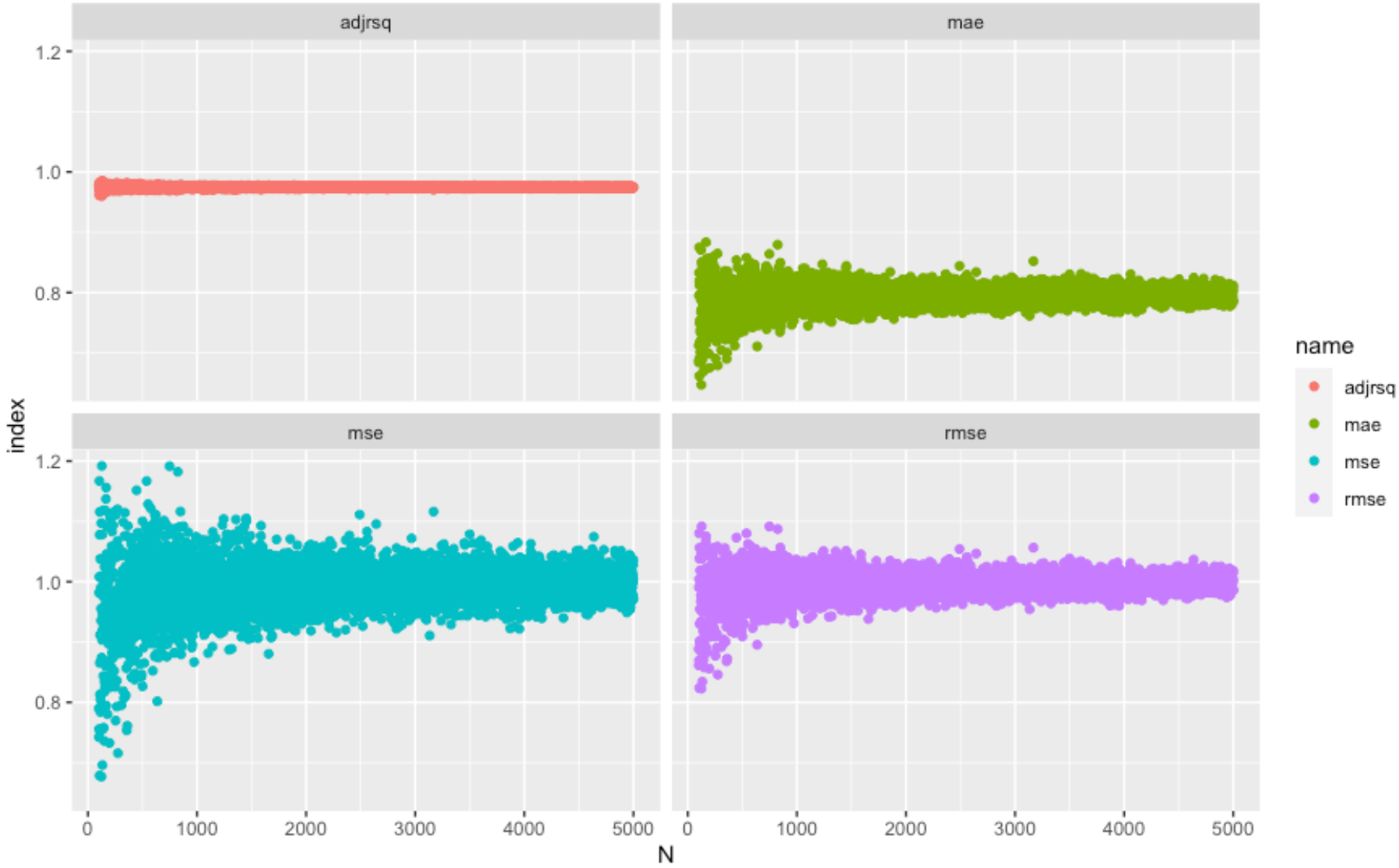


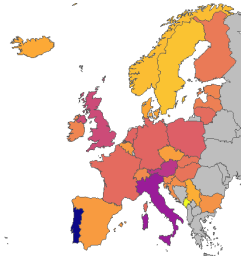
Which numerical entity to choose?

Measure	Range	Single number	Sample size dependent	# of vars dependent
β_x				
R^2				
Adjusted R^2				
MAE				
MSE				
RMSE				

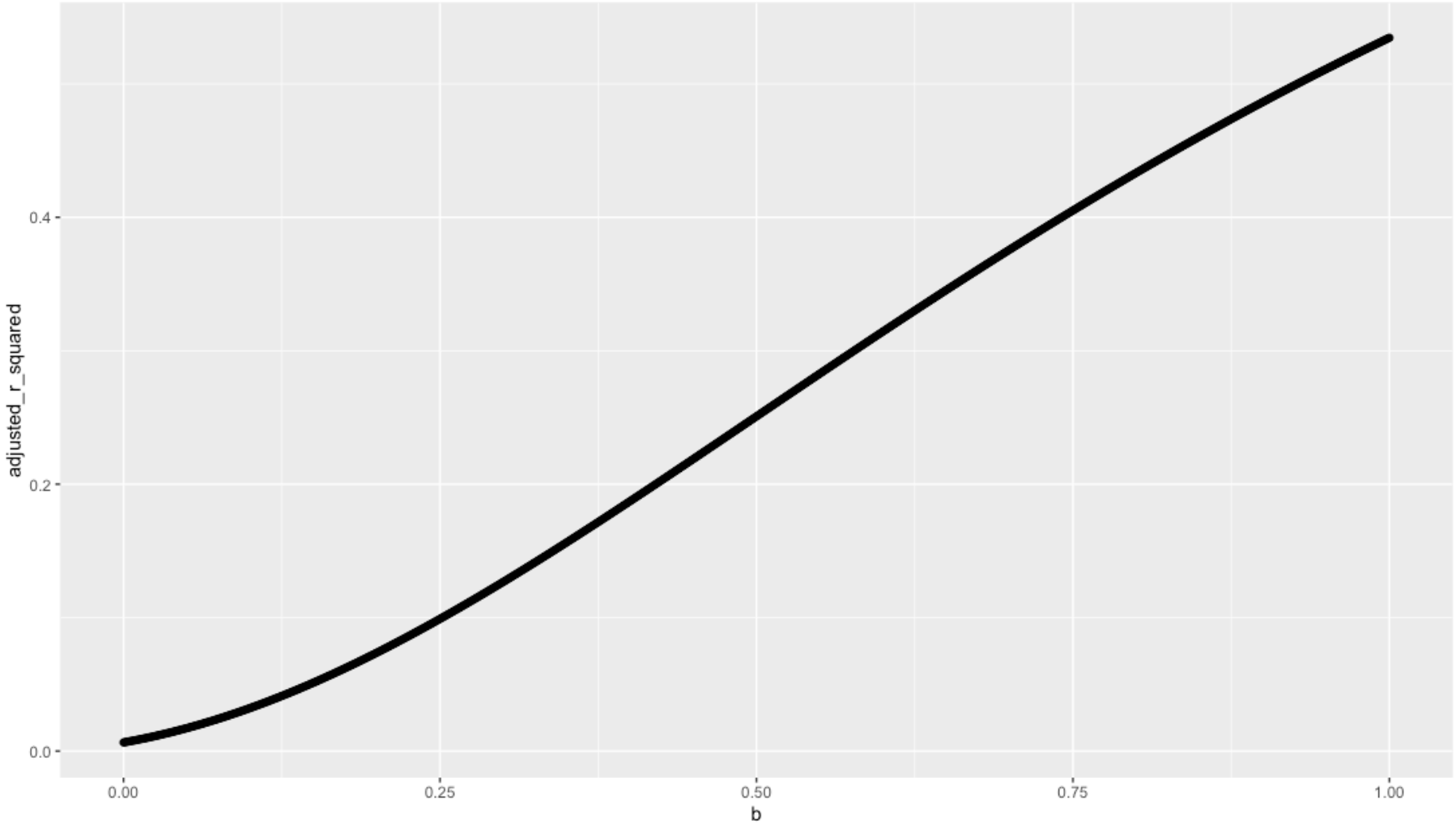
Measure	Range	Single number	Sample size dependent	# of vars dependent
β_x	+/- inf.	no	no	-
R^2	0 to 1	yes	no	yes
Adjusted R^2	**0 to 1***	**yes**	**no**	**no**
MAE	0 to inf.	yes	yes	yes
MSE	0 to inf.	yes	yes	yes
RMSE	0 to inf.	yes	yes	no

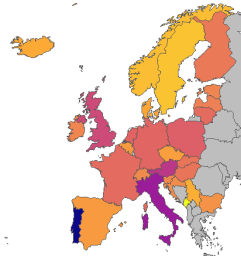
Robustness. Sample size should not affect the measure





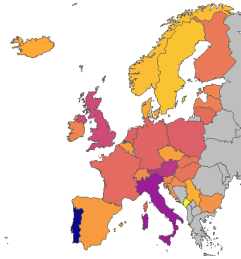
Properties:
R^2 reflects the strength of the effects (b-coefficients)





Creating the index

Data, Measurements, Methods



Data: ESS, CSES, ISSP, ANES, GSS, 1980-2022, 600 country-years (~400 - after cleaning),

N > 2 million respondents (~1 million - after cleaning)

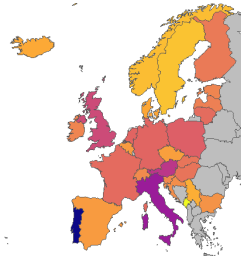
Political participation: voted (1/0)

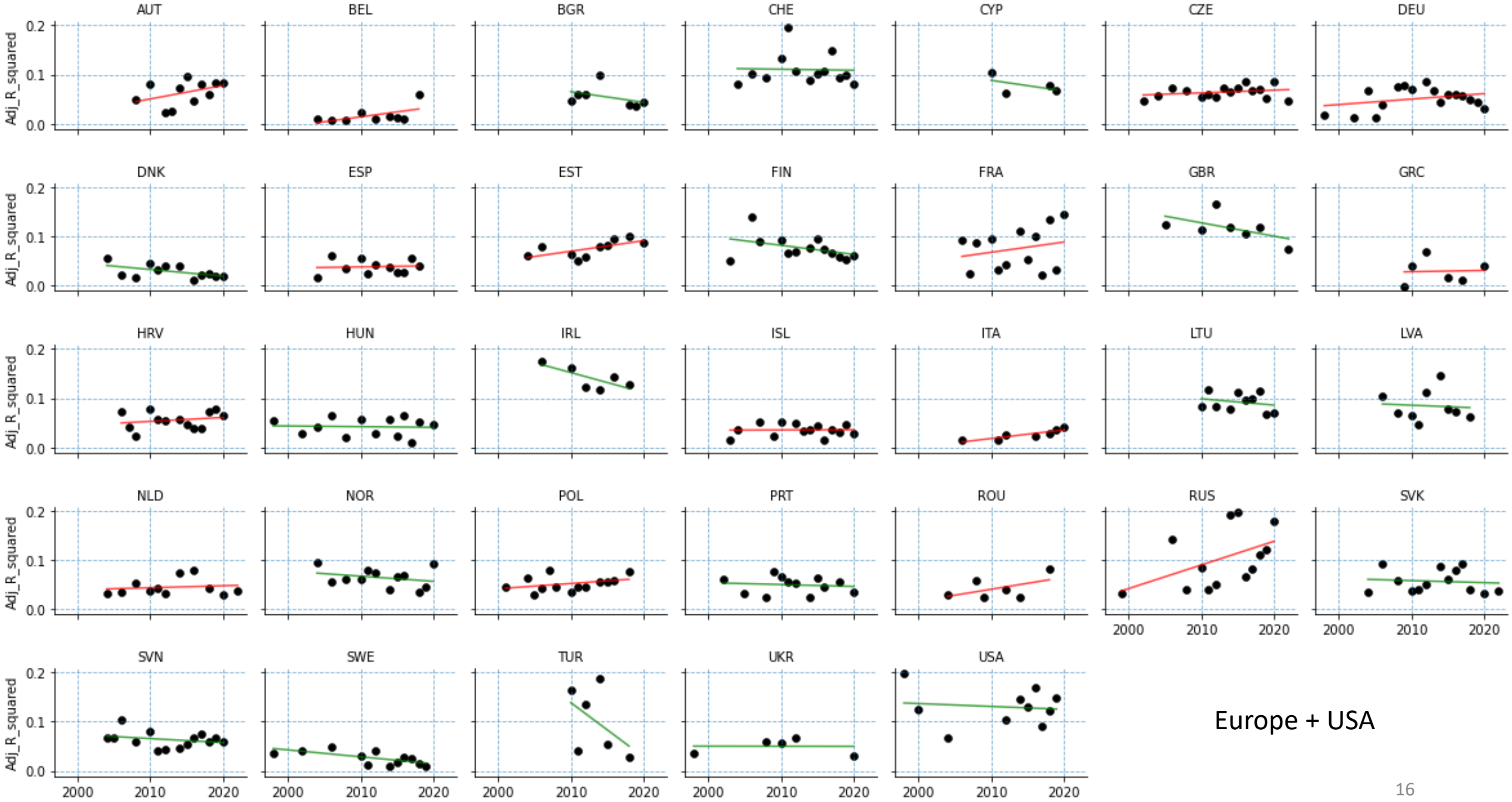
Social characteristics: age, female (1/0), higher education (1/0), religious (1/0), urban (1/0), married (1/0), employed (1/0)

Methods: OLS regression (LPM) of political participation on social characteristics on 400 country-years separately

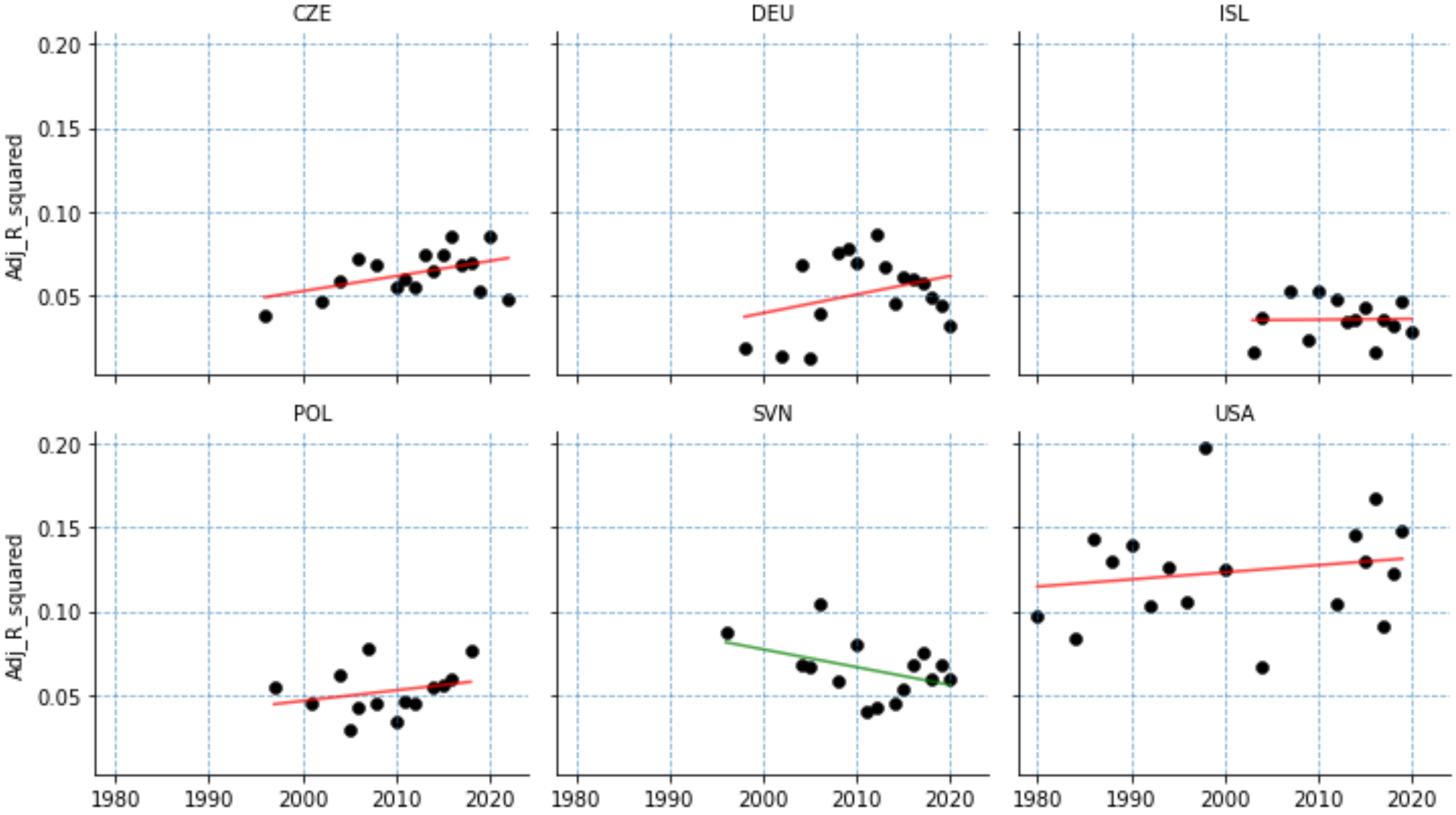
The index of inequality: adjusted r-squared for each 400 country-years

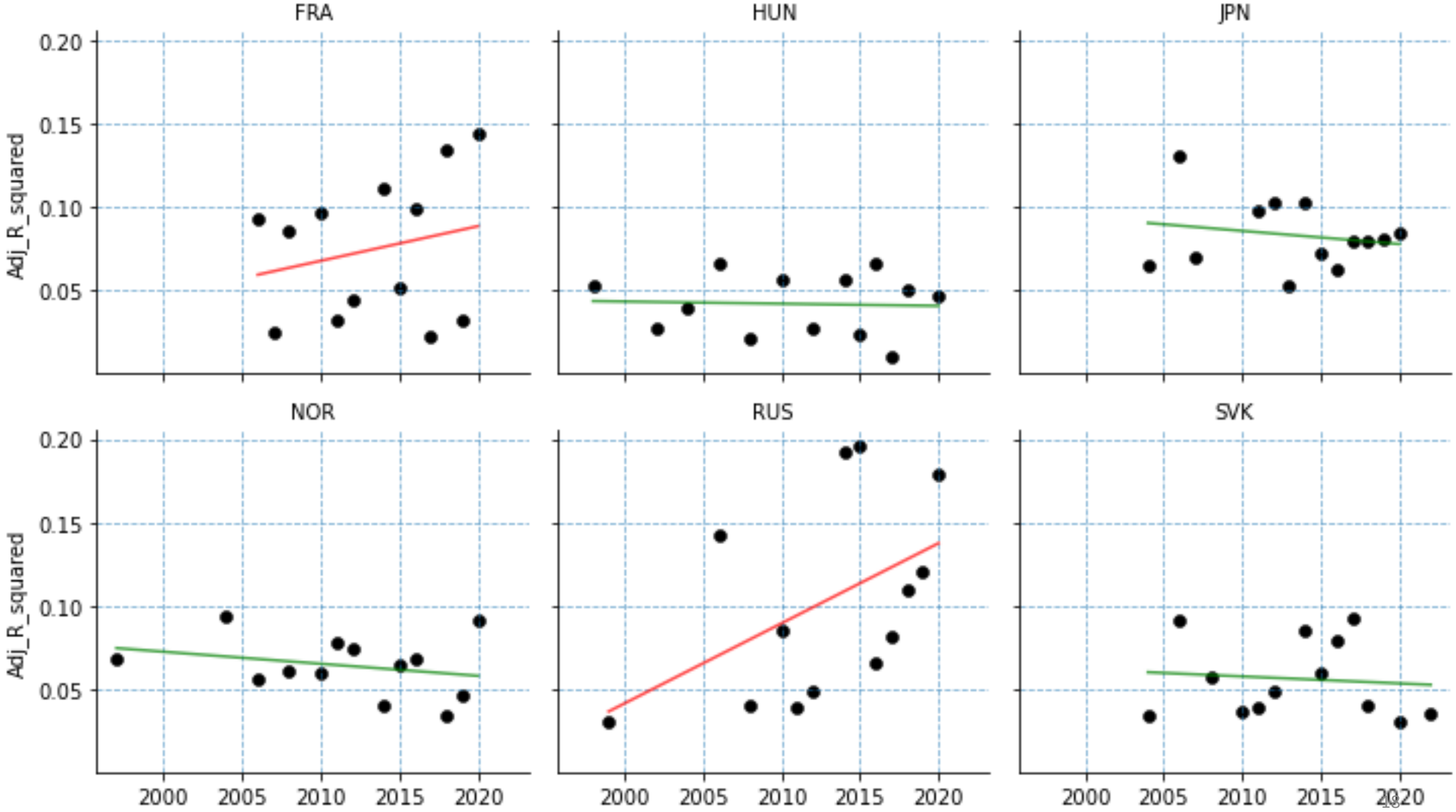
Results



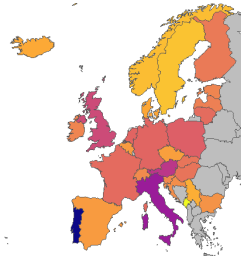

AUT
BEL
BGR
CHE
CYP
CZE
DEU
DNK
ESP
EST
FIN
FRA
GBR
GRC
HRV
HUN
IRL
ISL
ITA
LTU
LVA
NLD
NOR
POL
PRT
ROU
RUS
SVK
SVN
SWE
TUR
UKR
USA
Adj_R_squared
0.0
0.1
0.2
2000
2010
2020

Europe + USA


CZE
DEU
ISL
POL
SVN
USA
Adj_R_squared
0.20
0.15
0.10
0.05
1980
1990
2000
2010
2020


FRA
HUN
JPN
NOR
RUS
SVK
Adj_R_squared
0.20
0.15
0.10
0.05
2000
2005
2010
2015
2020

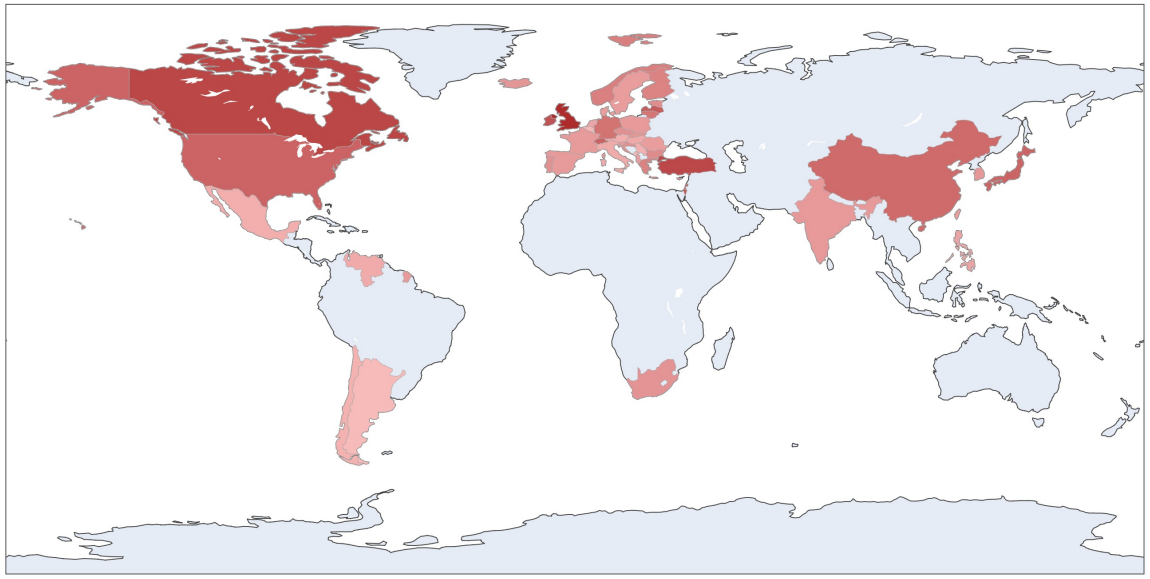
Within & between variability of the index

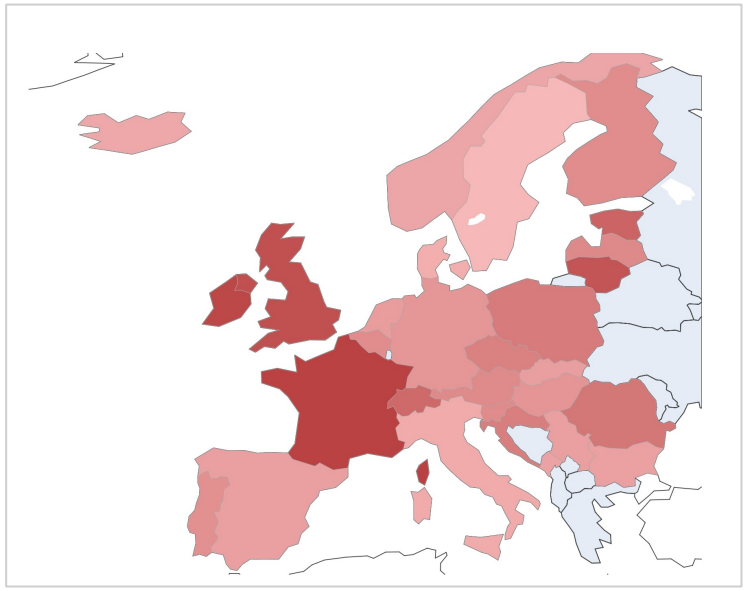


Variance	Within	Between
Country	0.0009	0.0013
Year	**0.0017**	0.0009

$N_{country\_years} = 588$

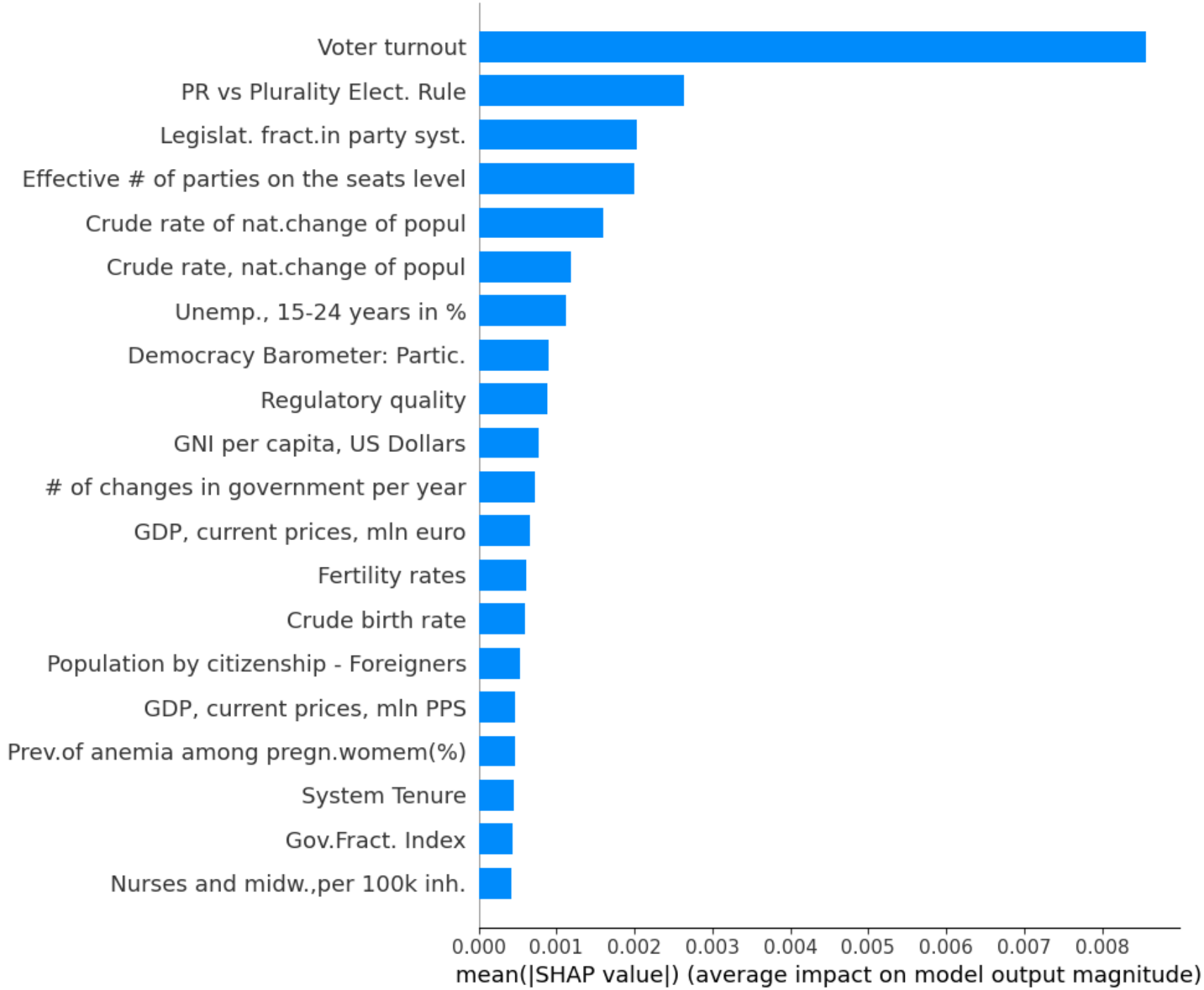
Interactive maps!

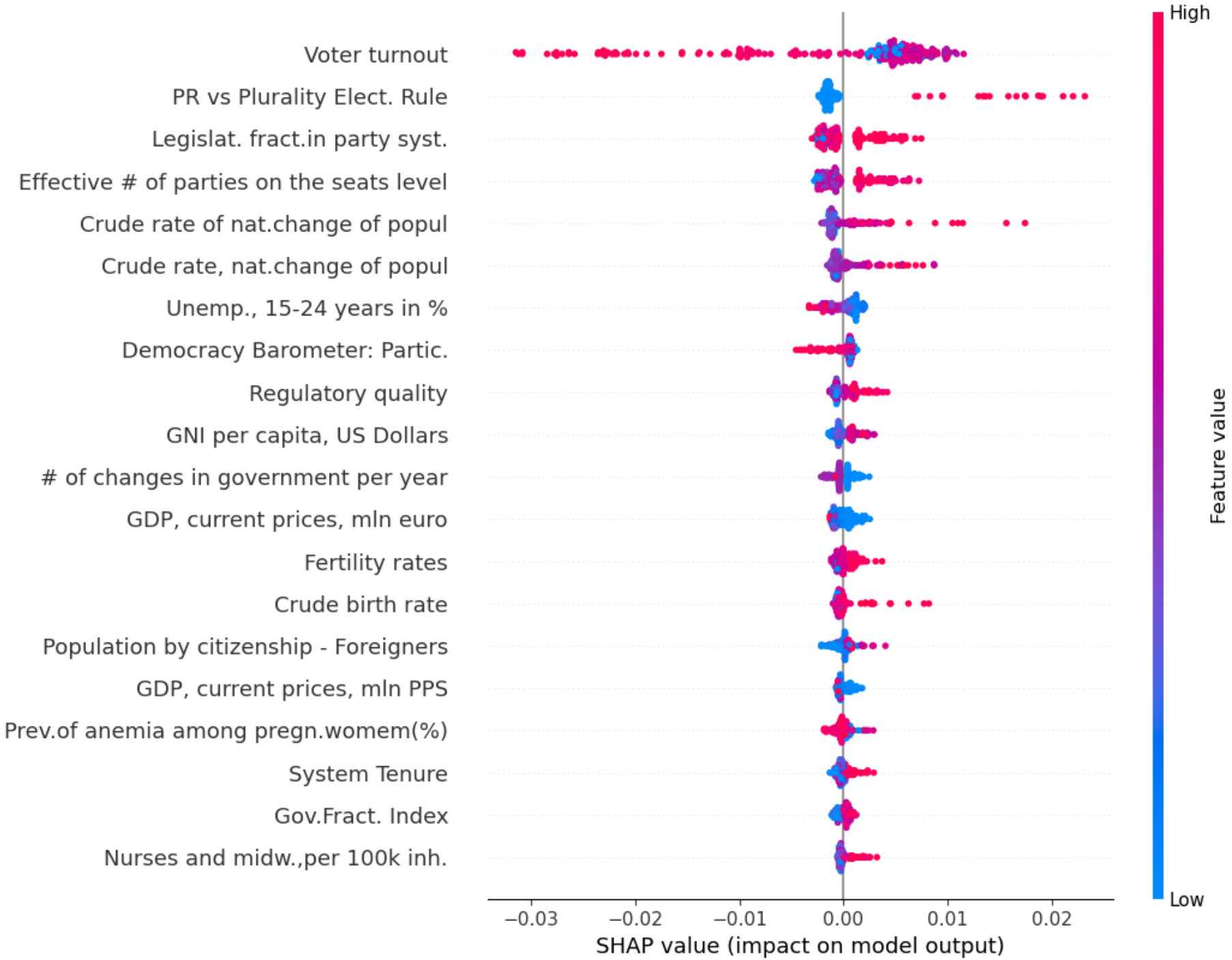




World:
https://www.vardanbarsegyan.com/publications/ipi_world_red_1.html

Europe:
https://www.vardanbarsegyan.com/publications/ipi_EU_red_1.html


Voter turnout
PR vs Plurality Elect. Rule
Legislat. fract.in party syst.
Effective # of parties on the seats level
Crude rate of nat.change of popul
Crude rate, nat.change of popul
Unemp., 15-24 years in %
Democracy Barometer: Partic.
Regulatory quality
GNI per capita, US Dollars
# of changes in government per year
GDP, current prices, mln euro
Fertility rates
Crude birth rate
Population by citizenship - Foreigners
GDP, current prices, mln PPS
Prev.of anemia among pregn.womem(%)
System Tenure
Gov.Fract. Index
Nurses and midw.,per 100k inh.
0.000
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
mean(|SHAP value|) (average impact on model output magnitude)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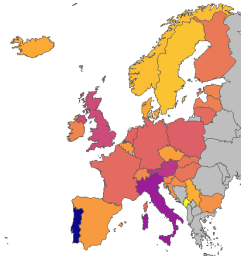
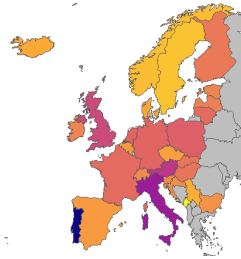
GDP, current prices, mln PPS
Prev.of anemia among pregn.womem(%)
System Tenure
Gov.Fract. Index
Nurses and midw.,per 100k inh.
−0.03
−0.02
−0.01
0.00
0.01
0.02
SHAP value (impact on model output)
High
Feature value
Low

To do



- Include 10,000 macro-indicators for machine learning
- Include other forms of political participation, separately / togethrs
- Test other model performance measures
- Add more data
- Compare with other political indexes

- Update the index yearly



Thank you for your attention!

Questions, comments?

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