A study of Democracy Backsliding in the Perspective of COVID-19 using econometrics and machine learning approaches

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1. Introduction

World governments are using the global COVID-19 pandemic to pursue their opportunistic goals, corruption and power strengthening. This issue poses a serious threat to the stability of democracy [1][2]. The goal of the research is to investigate the consequences of the COVID-19 pandemic for the quality of democracy, depending on institutional circumstances in a country. Therefore we state the question: What is the relevance of the law and the current state of democracy for susceptibility to democracy backsliding in the face of the COVID-19? We use a novel global dataset [3] covering the period of the first wave of the pandemic and apply various econometric and machine learning tools to analyse our research problem.

2. Literature review

Studies on democratization [4] suggest the following determinants of the democracy distortion [direction of the impact]:
• Rule of law [-]
• Current state of democracy [-]
• Economic development and economic stability [-]
• Education level [-]
• Trade flow and policy [-]
• Natural resources [+]
• Linguistic, religious and ethnical fractionalization [+/-]
• Economic inequality [+]
• Population density [+]

3. Materials

Data specification: cross-sectional
Geographic scope: 146 countries
Variables (type, time, source):
• Pandemic data (endogenous, 03-07-2020, V-Dem Institute)
• Pandemic Demographic Violations and Disinformation Index (pandem_dis), Pandemic Backsliding Index (panback)
• Democratization data (exogenous, 2019, V-Dem Institute):
  - Rule of law index (rule), Electoral democracy index (polityarchy), Education level index (education), Politico-geographic regions dummy (region_geo)
• Economic & Demographic data (exogenous, 2019, WB & OECD):
  - Gini Index (gini), GDP pc (gdp_pc), Trade GDP (trade_gdp), Inflation rate (inflation), Oil sale (oil), Minerals sale (mineral), Population Density (density), Income group dummy (income_group)
• Fractionalization data (exogenous, 2018, Alesina Fractionalization Dataset):
  - Ethnic (ethnic_frac), Linguistic (ling_frac) and Religious fractionalization (relig_frac)

4. Methods & brief EDA

General formula: democracy_backsliding = \alpha + \beta_0 \times rule_i + \beta_1 \times polityarchy_i + \gamma \times X_i + \epsilon

Models:
• Ordinary Least Squares (OLS) Regression – baseline modeling approach
• Two-Stage Least Squares (2SLS) Regression – to handle interrelationships between variables
• CatBoost – to handle highly non-linear interactions between variables (also categorical ones)

5. Results

Econometric models:

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>panback</td>
<td>0.091**</td>
<td>-0.216**</td>
<td>variable not included</td>
<td>0.145**</td>
<td>-0.154***</td>
<td>-0.033</td>
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<tr>
<td>pandem_dis</td>
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<td>0.119**</td>
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<tr>
<td>pandem_poly</td>
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<td>-0.068***</td>
<td>-0.04*</td>
<td>-0.071***</td>
<td>-0.04*</td>
<td>-0.067***</td>
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<tr>
<td>ling_poly</td>
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<td>0.006**</td>
<td>0.004</td>
<td>0.006*</td>
<td>0.003</td>
<td>0.006**</td>
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<tr>
<td>region_geo_FE</td>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>income_group_FE</td>
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<td>yes</td>
<td>yes</td>
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<td>yes</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.136</td>
<td>0.047</td>
<td>-0.066</td>
<td>-0.114</td>
<td>-0.170</td>
<td>0.033</td>
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<tr>
<td>Adjusted R²</td>
<td>0.218</td>
<td>0.313</td>
<td>0.216</td>
<td>0.281</td>
<td>0.218</td>
<td>0.318</td>
</tr>
</tbody>
</table>

Note: *p<0.1; **p<0.05; ***p<0.01; '+' positive impact, '-' negative impact, '0' no impact

Econometric models (OLS Models with robust cov matrix) 2SLS Models

Machine Learning models:

6. Conclusions

Our results suggest that the rule of law and high level of the initial state of democracy may prevent from democracy backsliding during extraordinary negative shocks. As a result we provide a value-added to the strand of literature on the outcome of the COVID-19 and determinants of democracy and democratization.

7. References

https://tinyurl.com/2020ulinpl