Do Natural Disasters Disrupt Legal System Integrity?

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Introduction

- Climate change realities and projections weigh heavily not only on natural ecosystems and environment but also exacerbate threats to legal system integrity, governance, and democracy.

- Natural disasters and corruption have become a common phenomenon around the globe, hitting several economies and disturbing political stability.

- Brückner and Ciccone (2011) highlight the fundamental role of variation in environment induced events in shaping economic and political climate.

- Little existing research on whether climate change induced natural disaster affect a country's legal system integrity

Objectives

- Evaluate the impact of natural disasters on legal system integrity for developed, developing and transition economies from 1984 to 2006

Hypothesis

- Bruckner and Ciccone (2011): Negative economic shocks may give rise to a window of opportunity for citizens to contest power, leading to democratic improvement

- However, natural disasters may generate an incentive for officials to engage in corruption--misuse of disaster-relief funds, bribes for contract work, etc.

- Impact may be different for developed, developing, and transition economies

Contribution

- Introducing a new variable – legal integrity score—which has not be studied earlier in the context of natural disasters.

- Consider various types of disasters: droughts, floods, extreme temperature and storms while other studies have focused on a single type of disaster

- Expand the dataset by covering 147 countries and extending the time period to 33 years (1984-2016).

Data

Variable	N	Mean	SD
Legal integrity score (0 - 100)	4,416	70.76	17.80
Resource rent (% of GDP)	4,119	8.22	11.59
Log (net exports)#	4,851	6.96	10.37
Log (official development assistance)#	4,851	13.30	9.18
Population density (people per sq. km)	4,519	198.36	746.04
Log (total damages)#	4,851	3.10	5.38
Total no. of people affected (Flood)	4,851	673922	7921113
Total no. of people affected (Storm)	4,851	199850	2533299
Total no. of people affected (Drought)	4,851	413527	8124400

Note: # Inflation-adjusted to 2016 USD

Data Sources:
Legal system integrity – International country Risk Guide, Economic indicators – World Bank, Natural disasters – EMDAT database

Chart 1. Legal integrity score over a period of 1986-2016 for (a). Developed (b). Transition and (c). Developing economy

Methodology

Single equation estimation

$$plegal_{it} = \beta taf_{it}^{ND} + \alpha lctdm_{it} + \delta_{it}X_{it} + \lambda_{it}llagtdm_{it} + \gamma_t + \tau_i + \eta_{it}$$

Two systems of equation estimation

$$plegal_{it} = \beta taf_{it}^{ND} + \alpha lctdm + \delta_{it}X_{it} + \alpha_{it}lctdm + \gamma_t + \tau_i + \varphi_{it}$$

$$lctdm_{it} = \alpha_1 taf_{it}^{fl} + \alpha_2 taf_{it}^{st} + \alpha_3 taf_{it}^{dr} + \gamma_t + \tau_i + \varepsilon_{it}$$

- $plegal_{it}$: legal integrity score

- taf^{ND}: vector of total ppl affected by a disaster (ND) - flood, storm & drought

- $Lctdm$: log total damages

- $llagtdm$: log-lags of total damages for t-1 year

- X_{it}: vector of socio-economic variables including resource rents, population density measured in people per sq. km (popden), official development assistance (lcoda) and net exports (lcnex) measured in 2016 $.

- γ & τ: country and time fixed effects

Results

VARIABLES	IV: Full Sample Legal	SUR: Full Sample Damages	Legal	IV: Developed Legal	IV: Developing Legal	IV: Transition Legal
lctdm	0.006***		0.009***	0.005*	0.011***	-0.004
	(0.002)		(0.002)	(0.002)	(0.003)	(0.005)
resource	-0.018***		-0.018***	0.004	-0.012***	0.004
	(0.001)		(0.001)	(0.009)	(0.001)	(0.003)
lcnex	0.010***		0.010***	0.011***	0.013***	-0.006*
	(0.001)		(0.001)	(0.001)	(0.002)	(0.003)
lcoda	-0.062***		-0.062***	-0.022***	-0.032***	-0.004
	(0.001)		(0.001)	(0.002)	(0.003)	(0.004)
popden	0.000***		0.000***	0.000	0.000***	-0.001
	(0.000)		(0.000)	(0.000)	(0.000)	(0.001)
llagtdm1	0.008***		0.008***	0.017***	0.009***	-0.009**
	(0.002)		(0.002)	(0.003)	(0.003)	(0.004)
llagtdm2	0.006**		0.005**	0.001	-0.000	0.007*
	(0.002)		(0.002)	(0.003)	(0.003)	(0.004)
llagtdm3	-0.001		-0.000	0.000	-0.000	0.009**
	(0.002)		(0.002)	(0.003)	(0.003)	(0.005)
taf_fl		0.000**				
		(0.000)				
taf_st		0.000*				
		(0.000)				
taf_dr		0.000				
		(0.000)				
Constant	0.909***	-0.930	0.897***	1.009***	0.118	-0.025
	(0.031)	(0.857)	(0.031)	(0.034)	(0.076)	(0.104)
Observations	3,864	3,864	3,864	1,014	2,533	163
R-squared	0.479	0.454	0.479	0.211	0.177	0.130

Standard errors in parantheses, **p<0.01,**p<0.05, * p<0.1

Conclusion

- Our study may support notion by Bruckner and Ciccone (2011) that some disasters affect economy positively, by improving the institutions.

- Developed and developing countries indicate improvement in the integrity of the legal system after natural disasters

- Transition economies no sign of improvement due to natural disasters.

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