Documenting State Presence along Transnational Border Crossings

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- Key questions:
  - Are borders as permeable as studies of globalization suggest?
  - What are the motivations for physical investments states make at their international border crossings?

- Purposes of this project:
  - To explore the relationships between physical investments at borders and state/social anxieties and ideologies

- Findings (very tentative):
  - state 'presence' at border crossings vary significantly over space and time.
  - Evidence of sensitivity to economic and maybe even perceived cultural threats reflected in the built environment at border crossings

Step 1: Locate Border Crossings

(major highways that intersect international political boundaries)
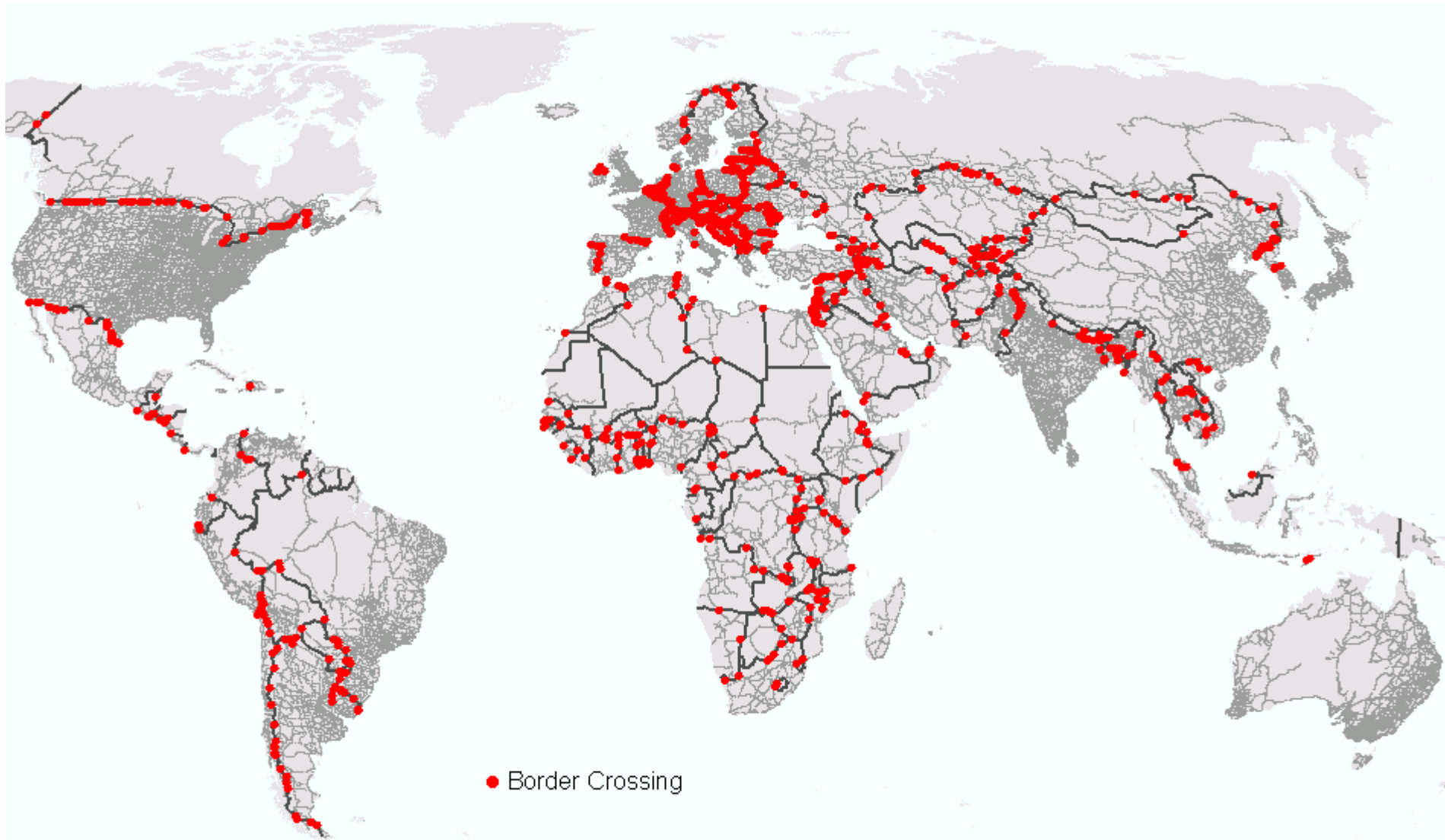
● Border Crossing

Step 2: Evidence of "state presence" at border crossings

- Are images available on google earth?
- Is there really a border crossing? Confirm.
- Zoom in on the road/border intersection. Code for the following:
  - Gates/barriers (and covered gates)
  - Multiple lanes
  - Split lanes (suggesting inspection areas)
  - Official buildings (and multiple buildings)
- How hard is this? A closer look at "official buildings"…

Instructions for official buildings

- **Official Building?**

  - Code 1 if there is one or more *official* looking buildings at or near the border. Official looking buildings *tend to be*:
    - at or near the border (proximity; nearer the border than residential or commercial structures.);
    - symmetrical on each side of the road;
    - located on road loops that swing out from and then rejoin the main road;
    - near to inspection areas; near to gates/barriers.
    - one of a kind or one of a cluster of a kind around an inspection center/vehicle holding or parking area.
    - Linked/near to the gates or barriers
  - *Guideline:* (override this if there are other reasons to code as official buildings): Code 1 if proximity plus at least one other characteristic hold; otherwise code 0.
  - *Recommendation:* Look at street shots if available. Consider parking lots configurations; trucks lined up near buildings (but watch but for gas stations.)

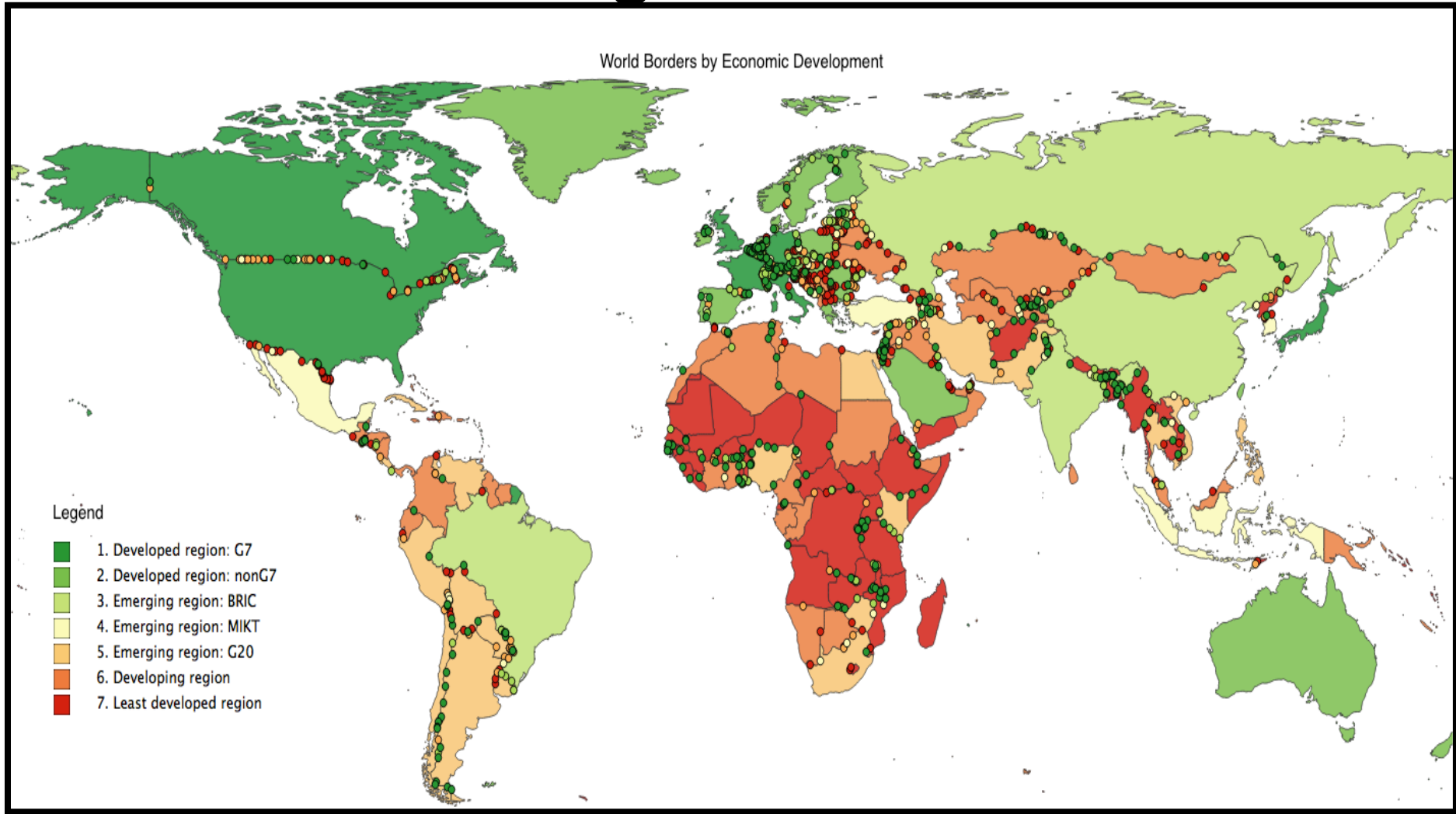- **Building Confidence: 1 low, 2 med, 3 high**
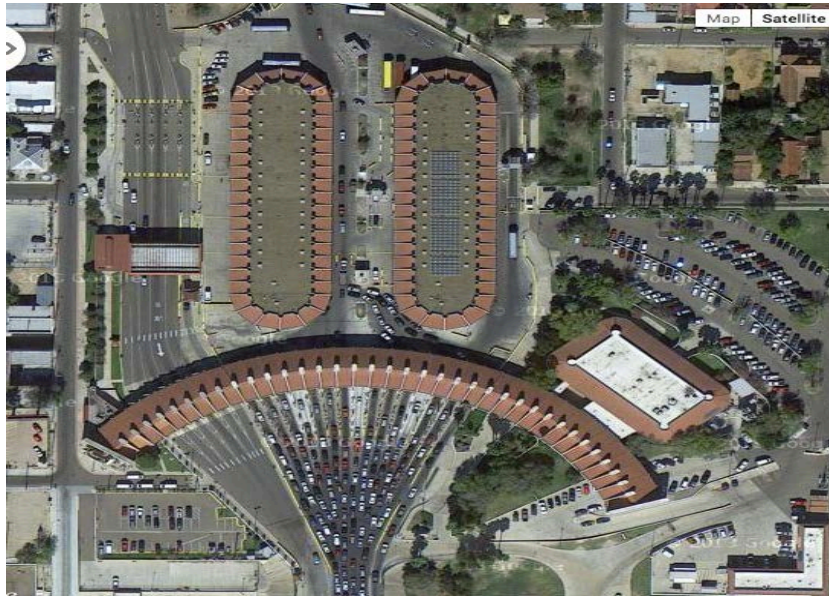
Latitude: 27.354159, Longitude:-99.45647 (US-Mexico border): Example of "thick" state presence

Latitude: 10.977346, Longitude: 0.514248 (Burkina Faso-Togo border): example of no state presence

Border Crossings and State Presence

World Borders by Economic Development

Legend

1. Developed region: G7
2. Developed region: nonG7
3. Emerging region: BRIC
4. Emerging region: MIKT
5. Emerging region: G20
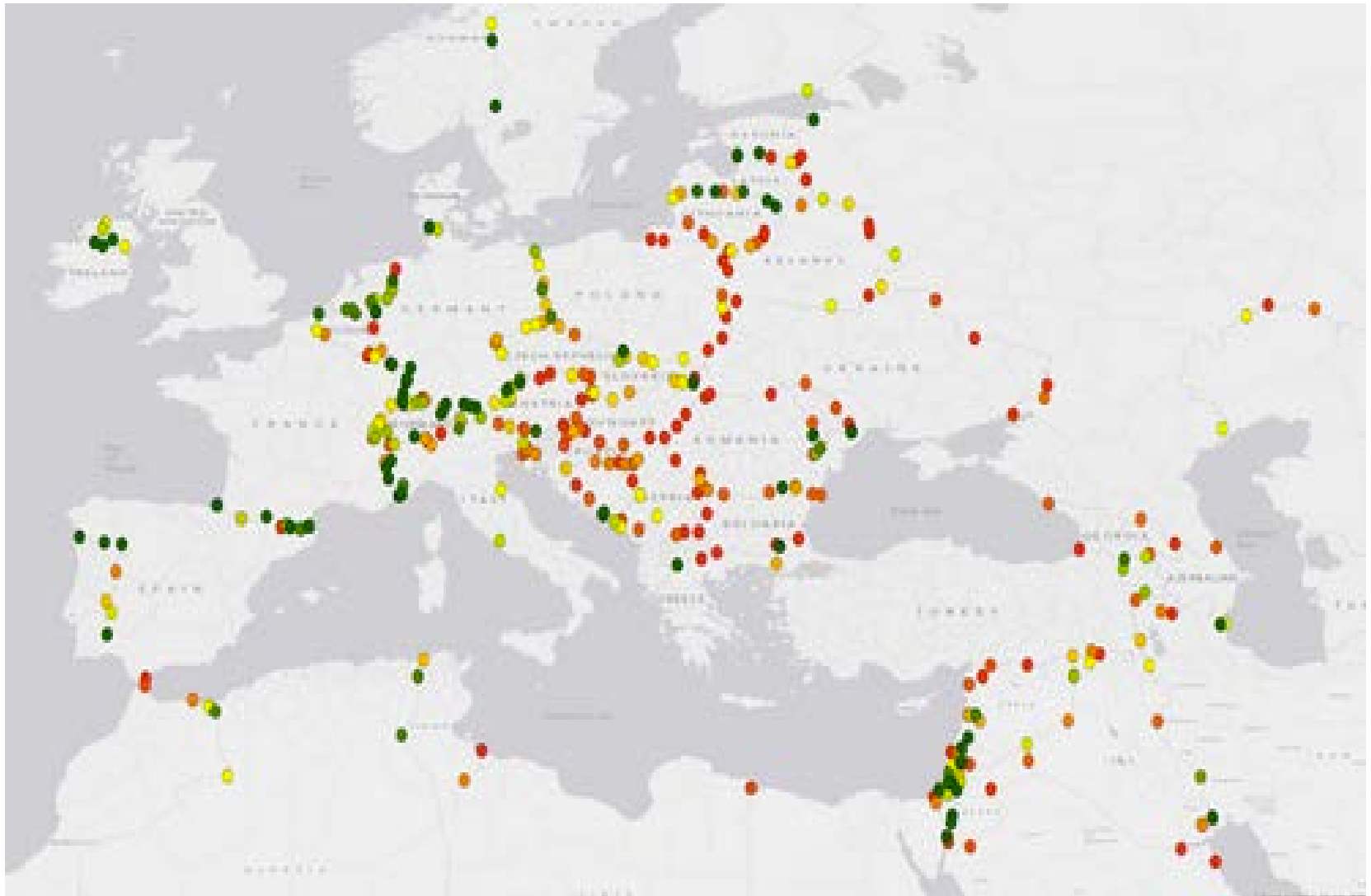6. Developing region
7. Least developed region

*N=0 ▬▬▬▬▬▬▬ N=12

*N = For each border crossing, N represents the accumulated value of 12 measurable binary variables (0 for Yes, 1 for No) indicating higher state presence as N increases.
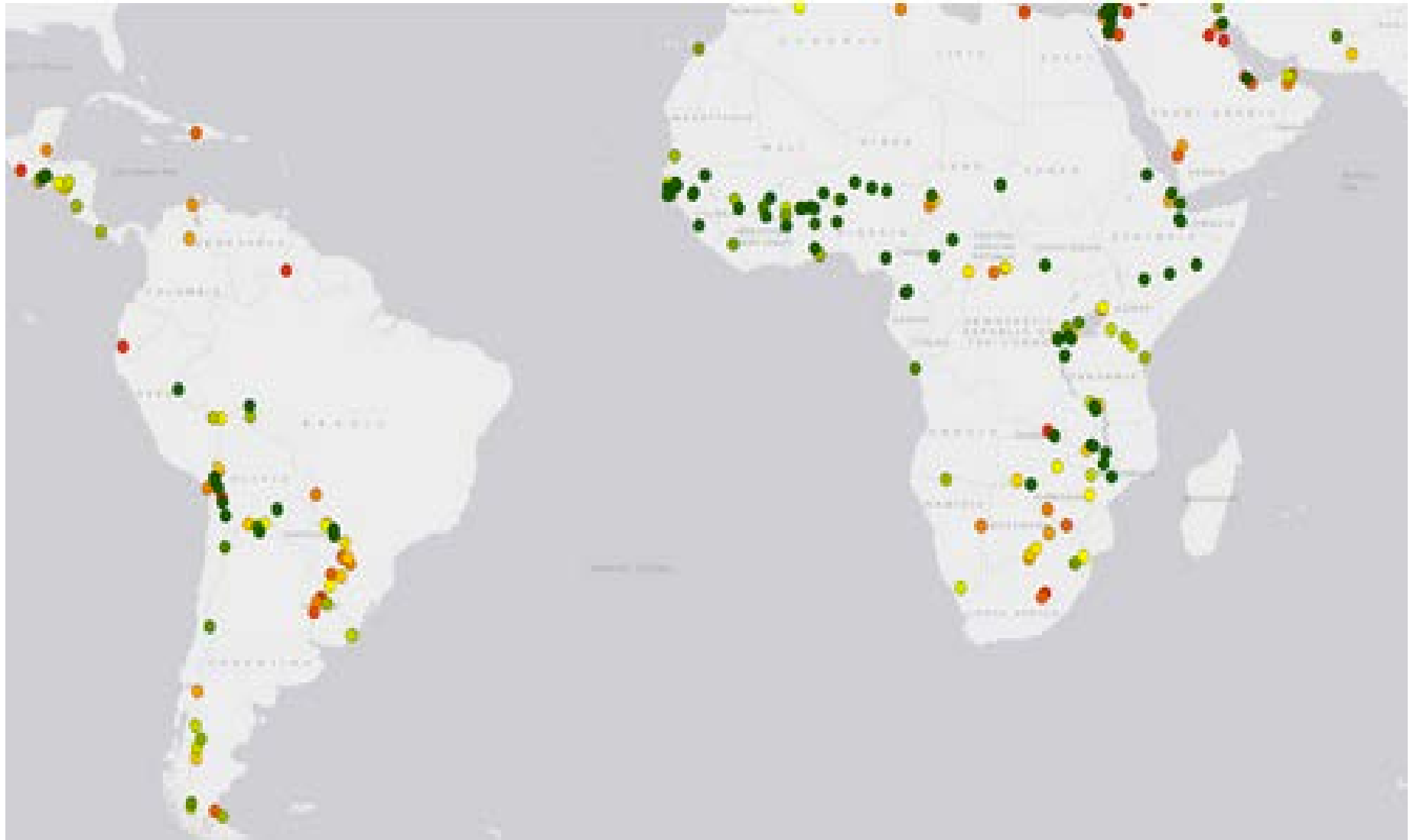
North America

Europe

Southern Hemisphere

Do the data make any sense?
Preliminary Analysis

- **States mimic one another** at the borders. Gates and official buildings on one side predict gates on the other.

- **The rich build to block out the poor**. The wealthier a state and the poorer its neighbor, the thicker its official border presence.

- **Homogeneous states guard their borders.** Ethnically, religiously and linguistically heterogeneous states have thinner official border presence.

- **Democracies are less likely to block** their borders. Autocracies have a much thicker official border presence.

Do the data make any sense?

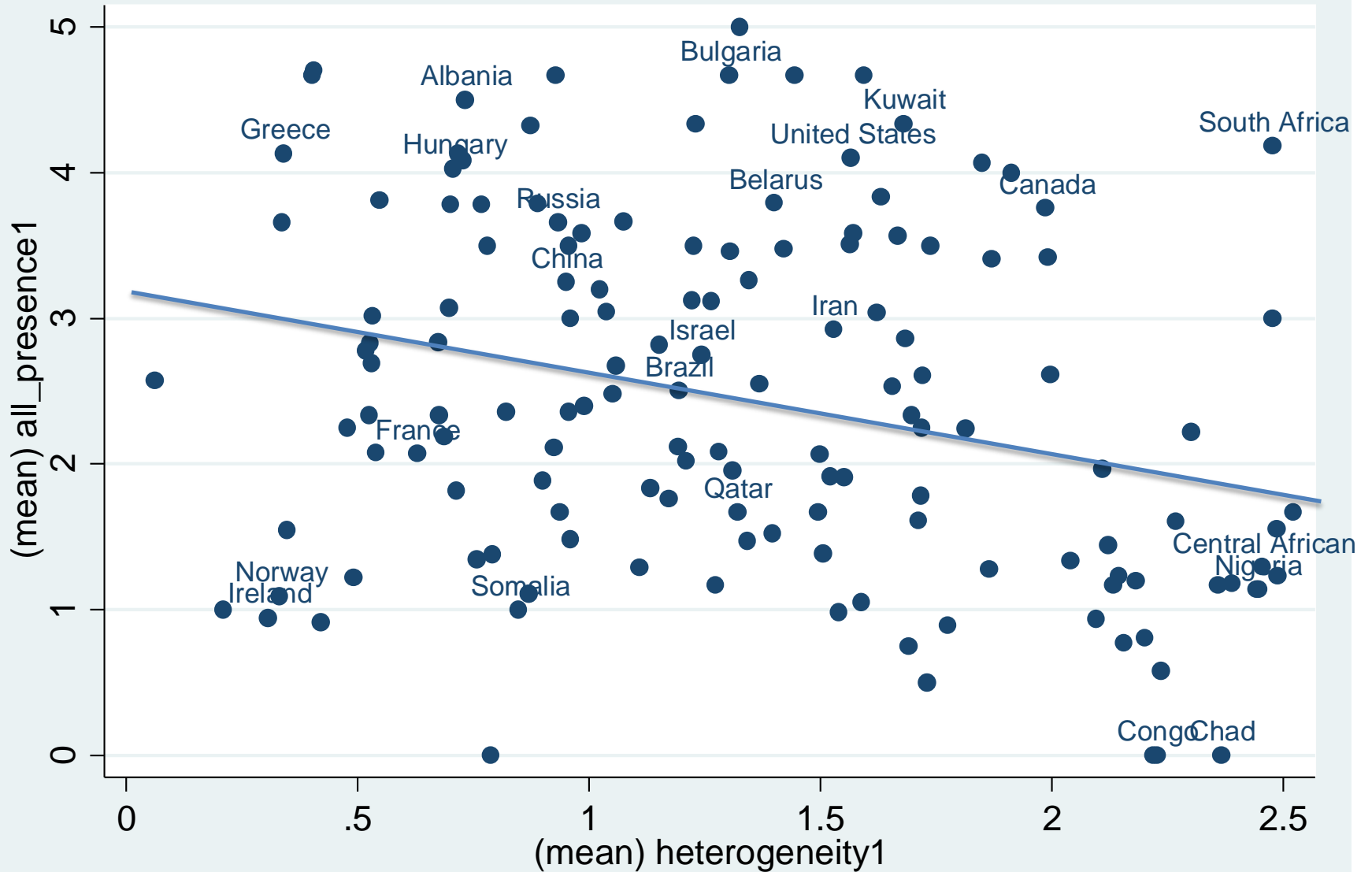| VARIABLES	(1) gates	(2) official buildings	(3) official presence
Bordering state has gate(s)	0.80***		
	(0.03)		
Bordering states has official building(s)		0.77***	
		(0.04)	
Bordering state's total official presence			0.82***
			(0.03)
Logged GDP per capita, state 1 (ego)	0.07***	0.03	0.11***
	(0.02)	(0.02)	(0.04)
Logged GDP per capita, state 2 (partner)	-0.05***	-0.02	-0.08***
	(0.02)	(0.02)	(0.04)
Ethnic, religious and linguistic heterogeneity state 1	-0.08*	-0.08**	-0.12**
	(0.04)	(0.03)	(0.08)
Polity score, state 1	-0.009**	-0.003	-0.016**
	(0.0037)	(0.003)	(0.006)
Civil war, state 2	0.011	0.00130	0.022
	(0.0192)	(0.0121)	(0.031)
Constant	0.15	0.303*	0.49
	(0.19)	(0.154)	(0.366)
Observations	407	407	407
R-squared	0.71	0.67	0.75

OLS; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1 (unit of analysis: border pairs (average of crossings)

Border Presence and GDP/Capita
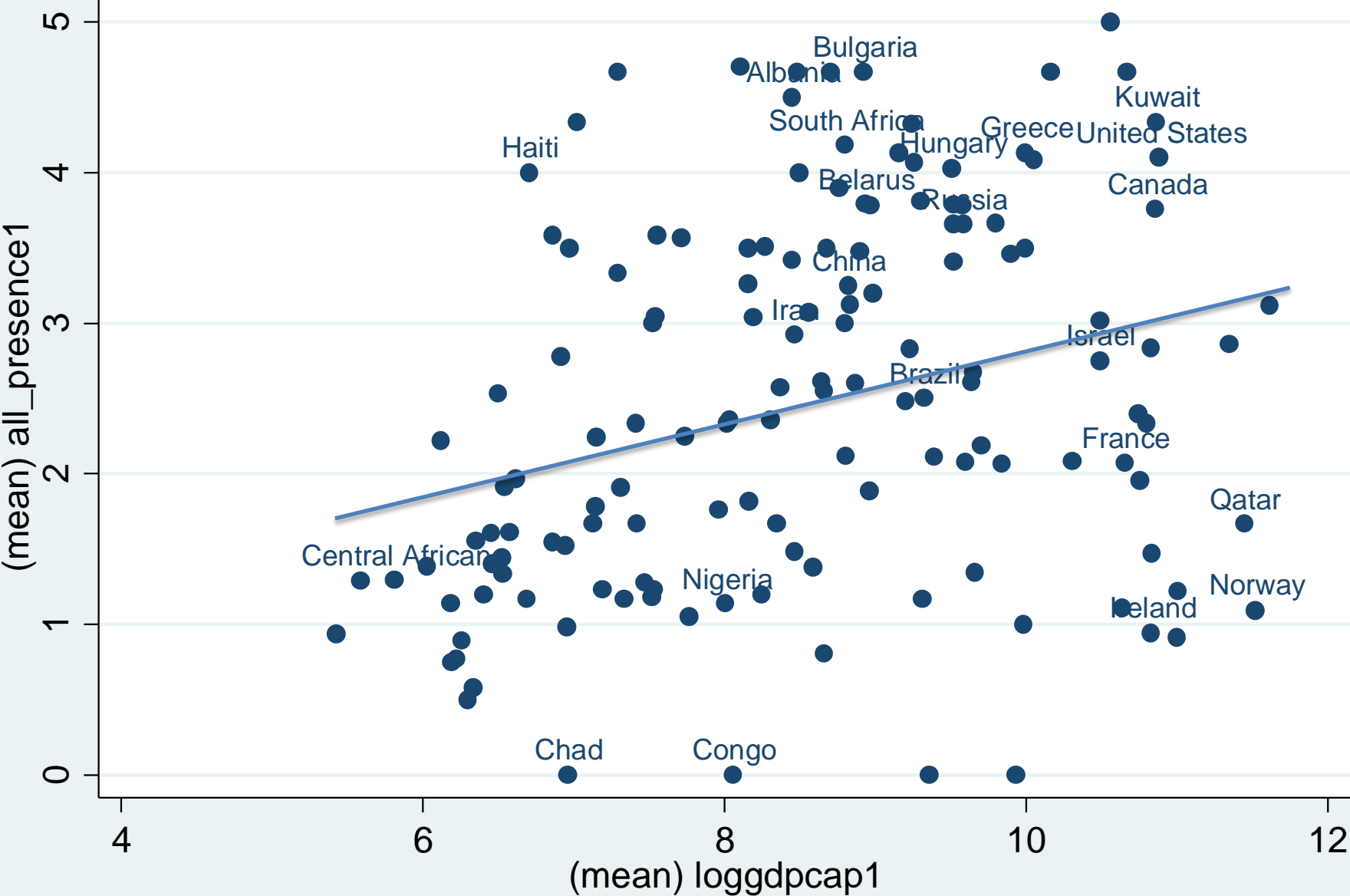
Border Presence and Cultural Homogeneity

Scatter plot of (mean) all_presence1 (y-axis, 0 to 5) versus (mean) heterogeneity1 (x-axis, 0 to 2.5) with a downward-sloping fitted line. Labeled countries include: Greece, Albania, Bulgaria, Kuwait, South Africa, Hungary, United States, Canada, Russia, Belarus, China, Iran, Israel, Brazil, France, Qatar, Somalia, Norway, Ireland, Central African, Nigeria, Congo, Chad.

Border Presence between Neighbors
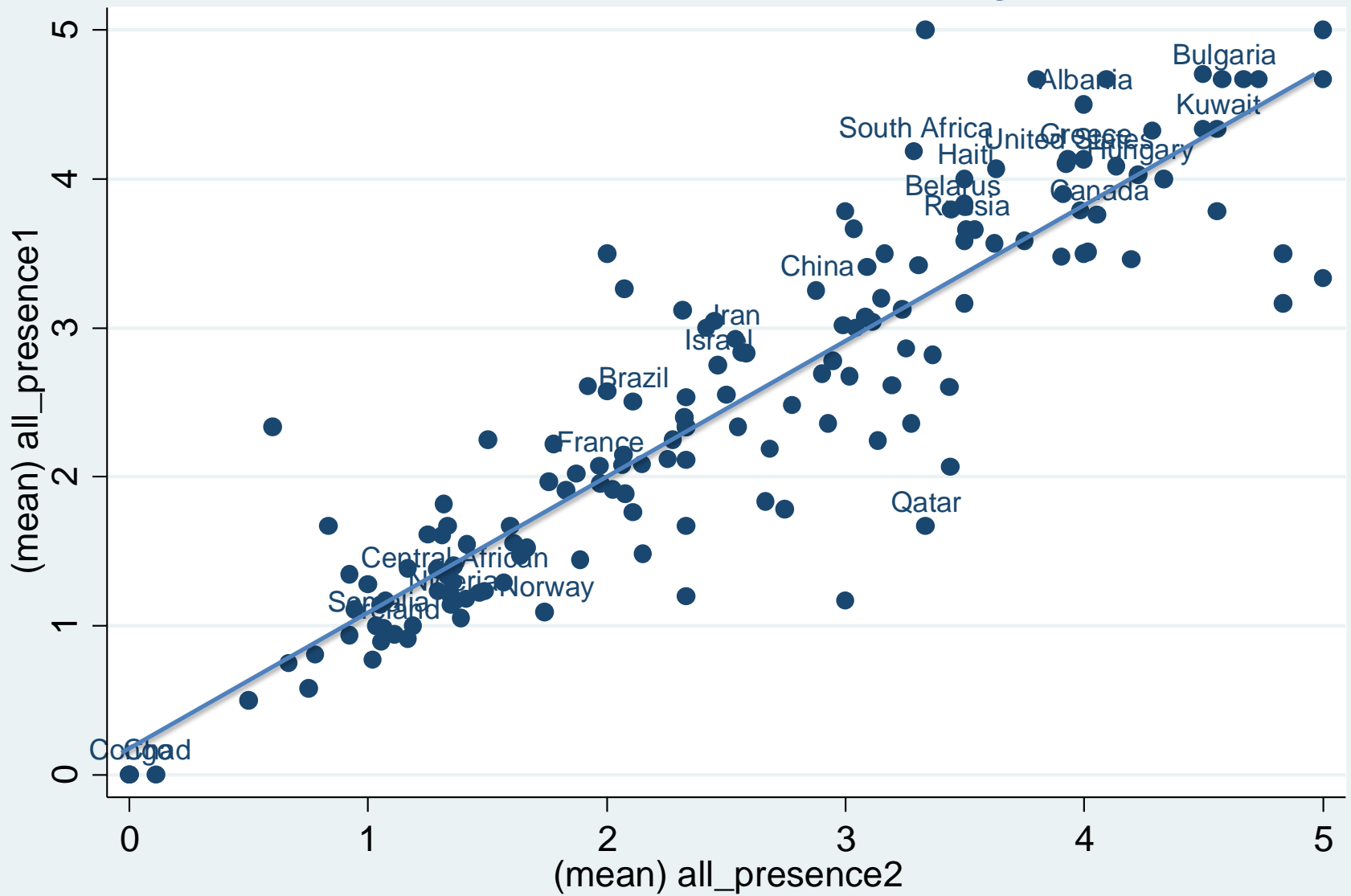
Into the Future: Time Series Project

- In process: a database that documents change at the border over time.

- Google Earth stores images as far back as 1980, though image quality is only adequate since about 2000.

- Time series data will allow investigation of the dynamics of change at the border:
  - what events or conditions prompt states to heighten their border presence?
  - **Does globalization stimulate *thicker* borders?**

U.S –Mexico Border
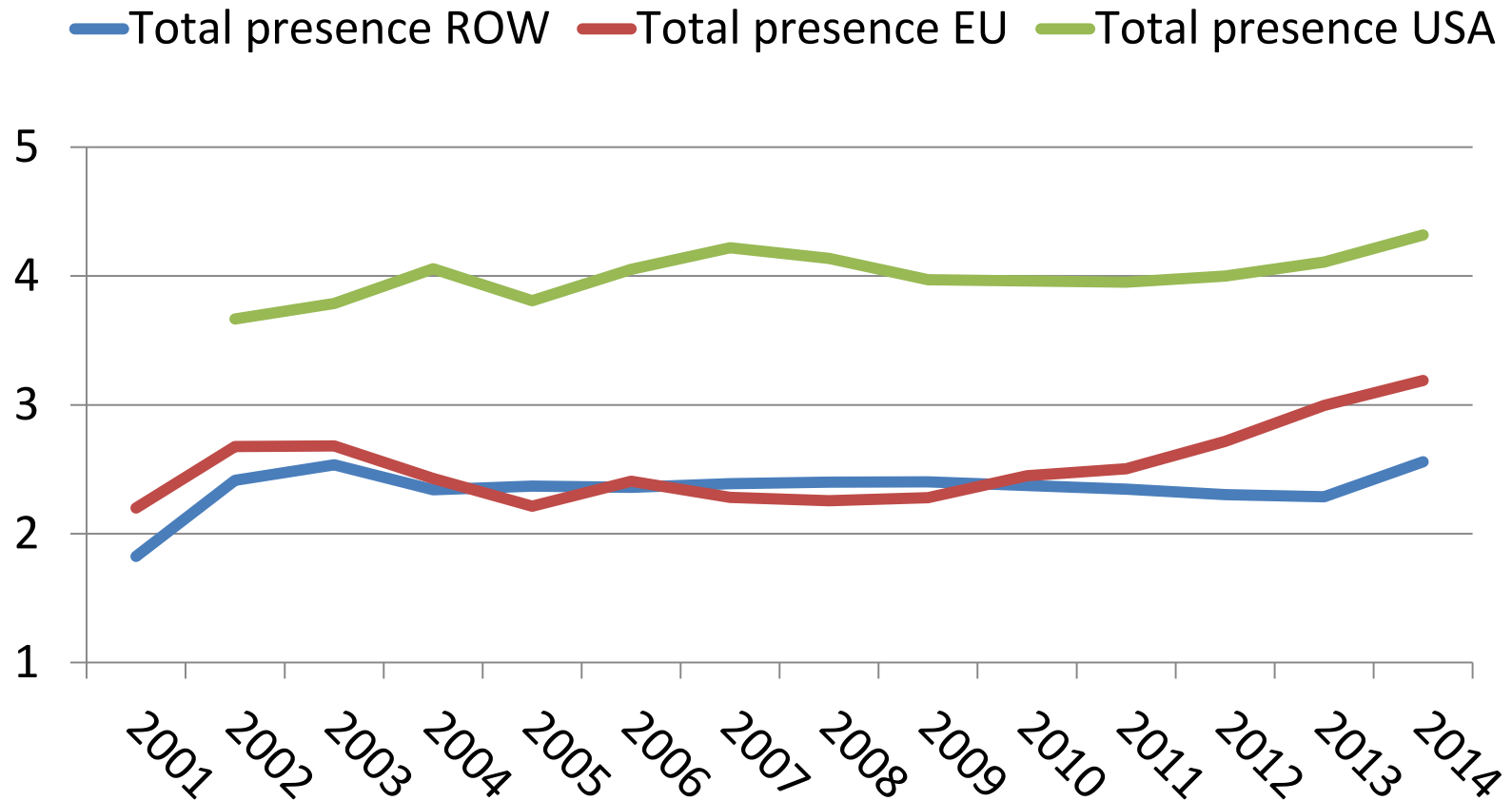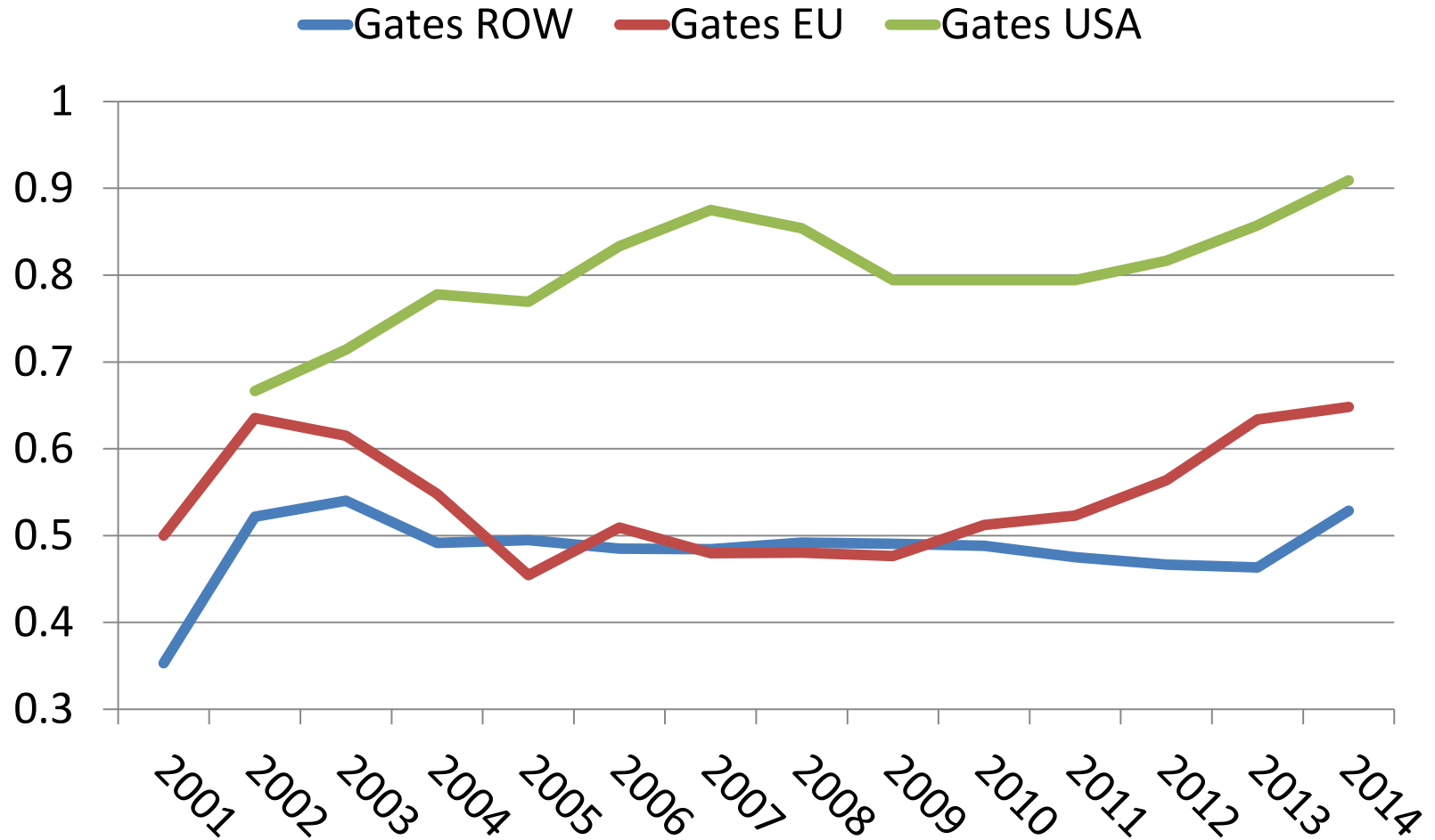# (27.5965, -95.53569)

1995

2002

2010

2015

"Official Border Presence"
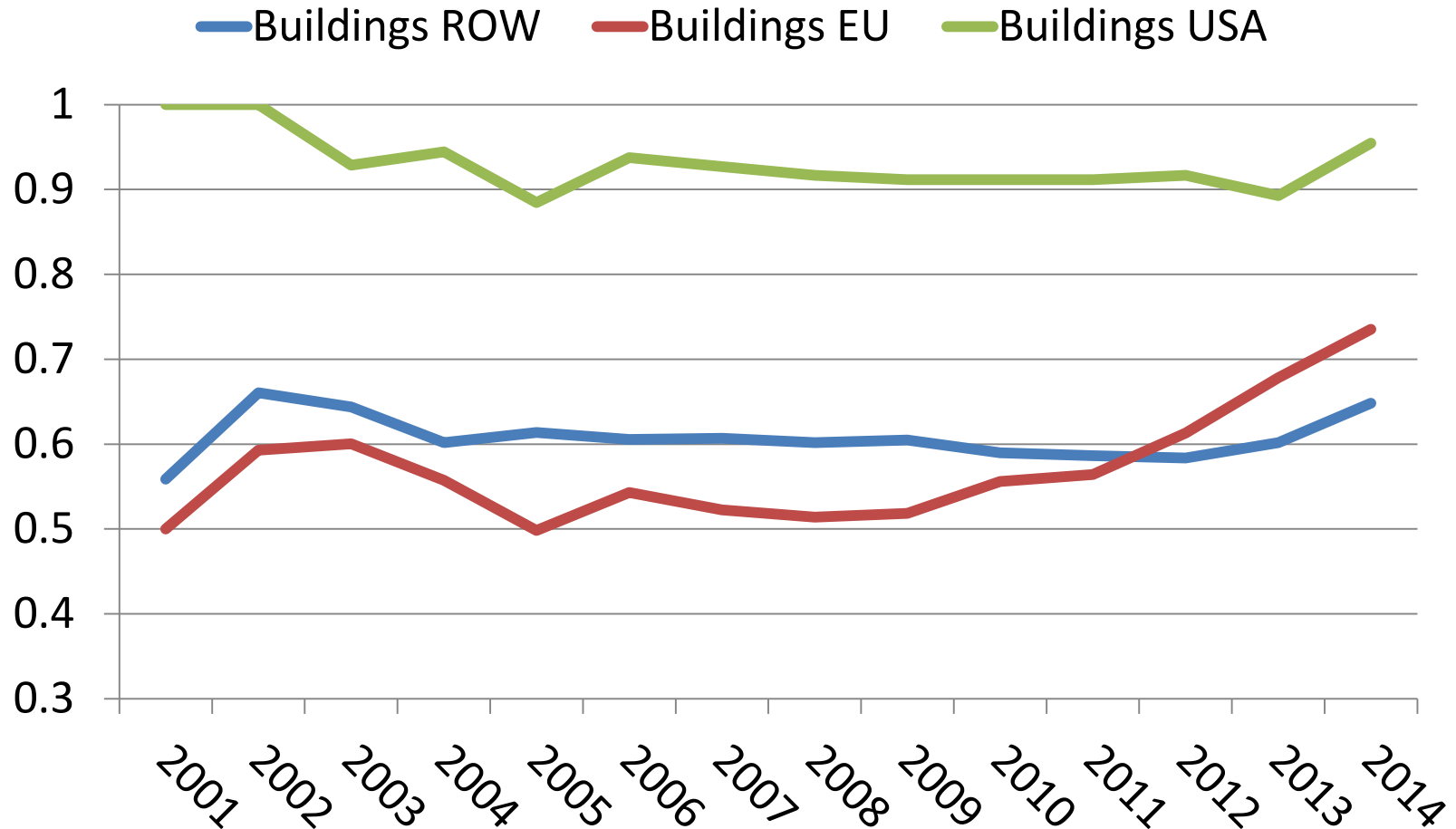# Evidence from the built environment

Likelihood of observing a gate:

Likelihood of observing official buildings:

Likelihood of observing inspection lanes:
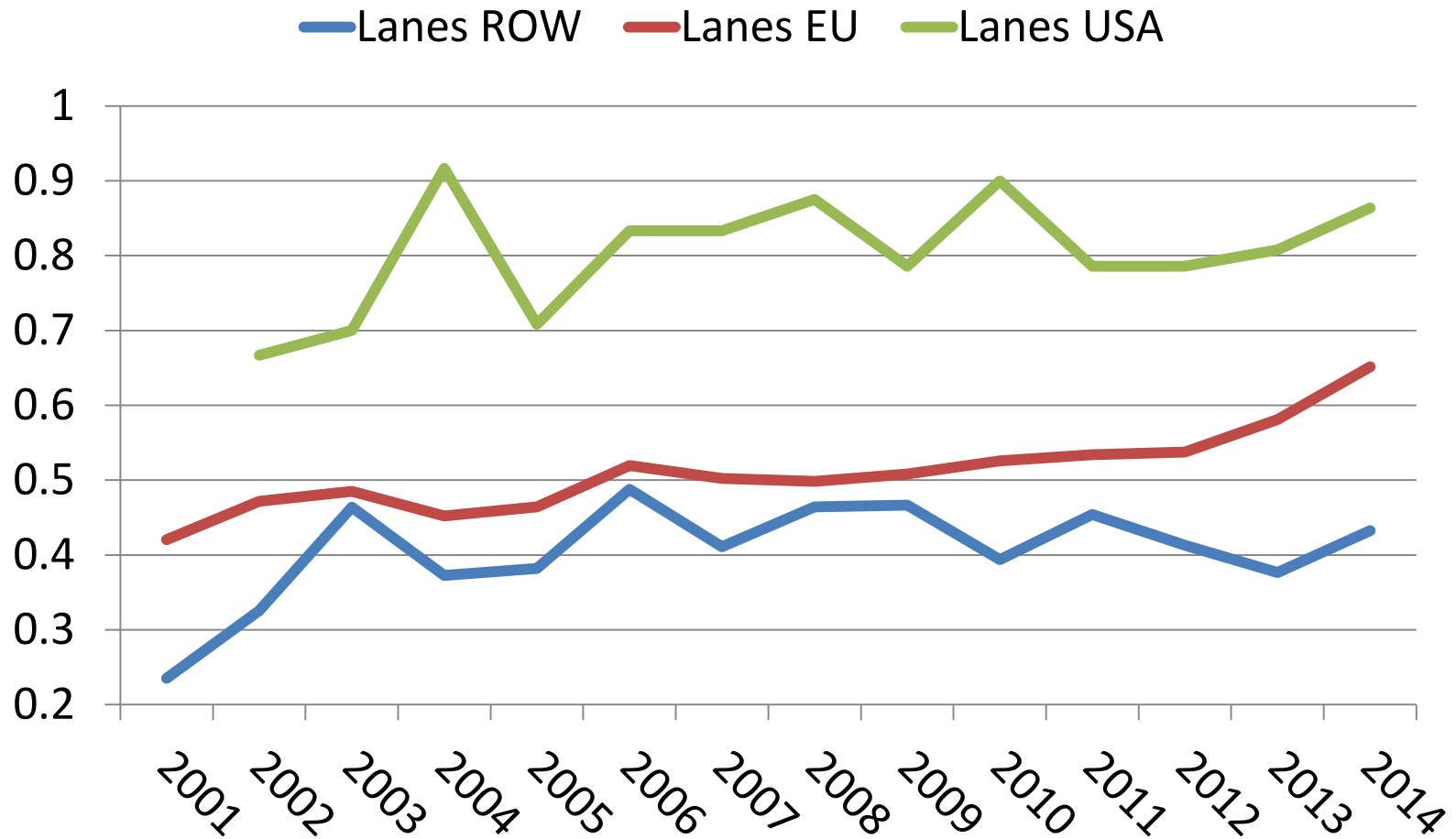
Adding geographic information

- Completed:
  - Distance to nearest city > 500,000
  - Distance to nearest country capital
  - Elevation
- In progress:
  - Slope within 5km
  - Population within 5km
  - Lights at night within 5km
  - Ruggedness

Elevations at each crossing

Elevation in meters
- < 100
- 101 - 200
- 201 - 1,000
- 1,001 - 3,000
- > 3,000
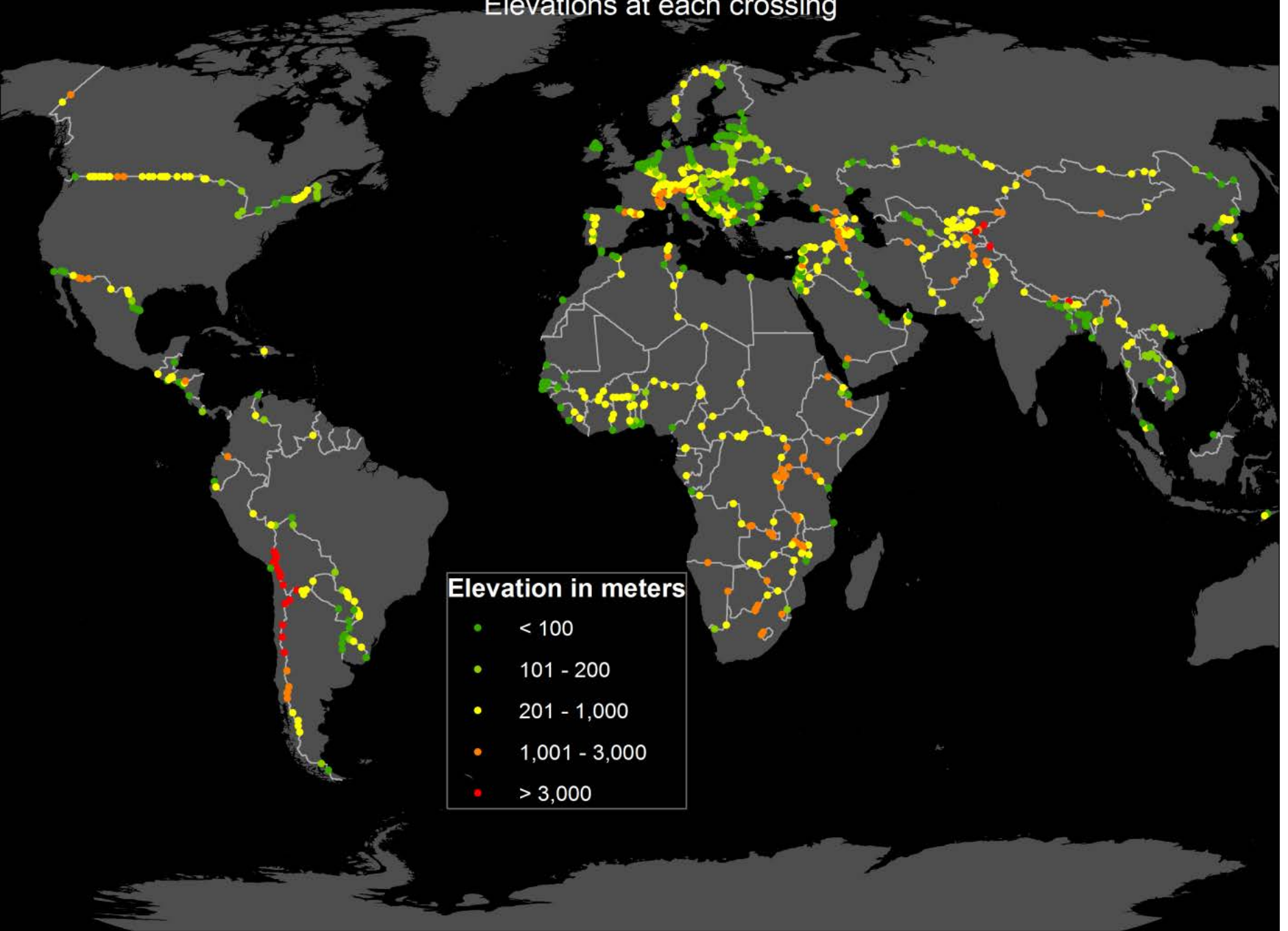
Distance from crossings to the nearest Major City

Kilometers

- < 200
- 201 - 500
- 501 - 1,000
- > 1,000
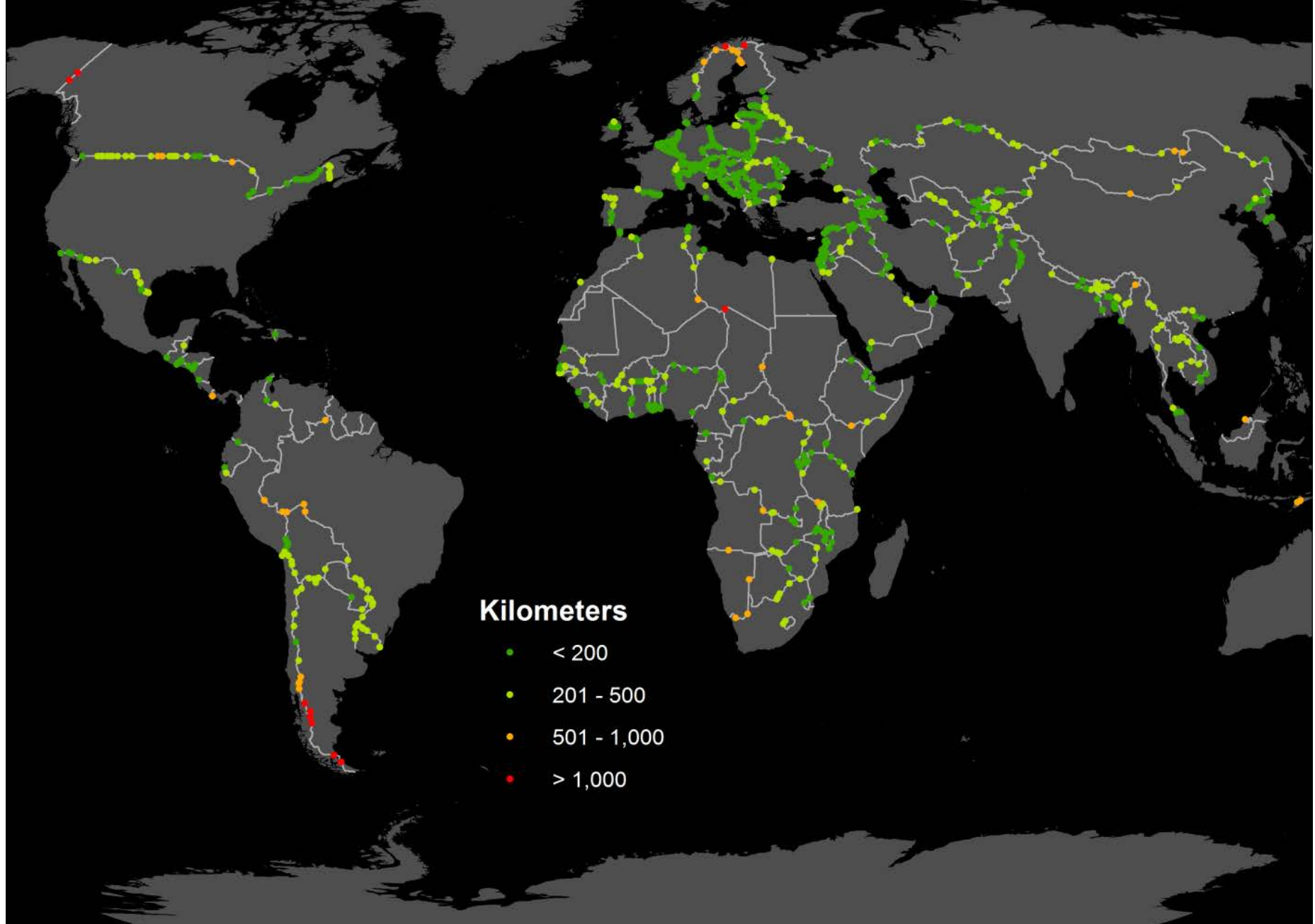
Distance from crossings to the nearest Capital City

Kilometers

- ● < 200
- ● 201 - 500
- ● 501 - 1,000
- ● > 1,000
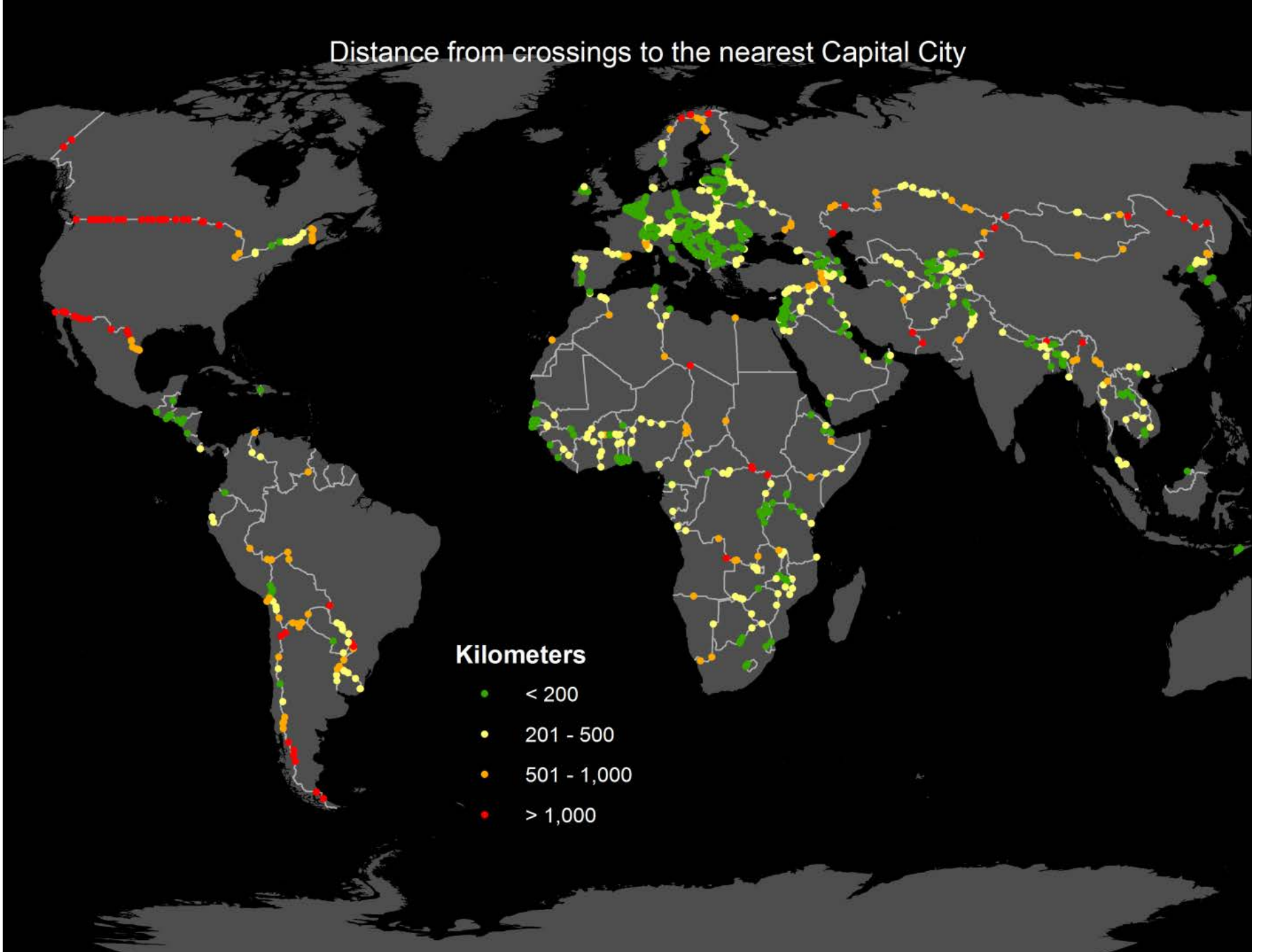
Possible directions

- Border environments and globalization: "disappearing" or "thickening"?

- Borders as anxiety: as response to multiple threats
  - Economic; traditional security; ontological security

- Borders, corruption and rents

- Beyond the built environment: technology and surveillance at the border

end

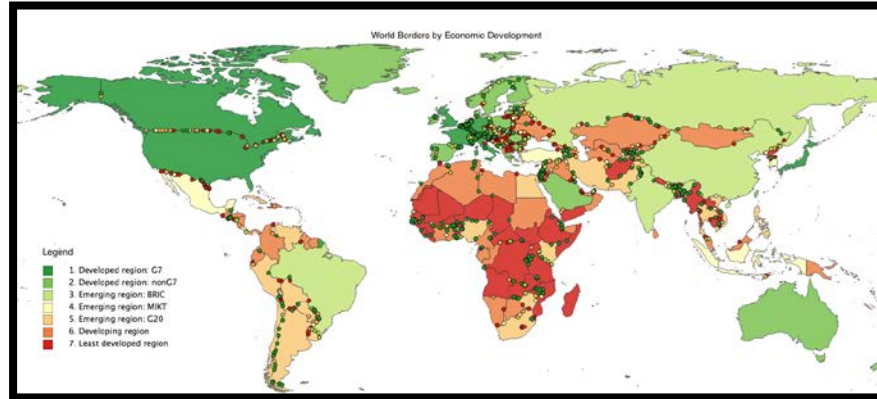# Documenting State Presence along Transnational Border Crossings

Harvard Institute of Quantitative Social Science | Undergraduate Research Scholars Program

Lead Researchers: Beth Simmons and Jeff Blossom   **Graduate Assistant:** Shelley Liu
Assistant Researchers: Nick Rossenblum, Dina Perez, Ed Magema, Hanel Bavejal

Motivation

Are borders as permeable as studies of globalization suggest? We can learn a great deal about state motivations and identities by watching the physical investments they make at their international borders. Using global satellite imagery, our team is creating the first ever dataset documenting "state presence" along major highways that connect neighboring states. We are finding that state presence along borders vary significantly over space and time. Efforts of the state physically to regulate exit and entry within its territory expresses economic and security concerns, cultural anxieties, and political ideologies.   Our database can also be used for the study of licit and illicit transnational flows, law enforcement, and border conflict.

World Borders by Economic Development

Legend
1. Developed region: G7
2. Developed region: nonG7
3. Emerging region: BRIC
4. Emerging region: MIKT
5. Emerging region: G20
6. Developing region
7. Least developed region

*N=0   N=12

*N = For each border crossing, N represents the accumulated value of 12 measurable binary variables (0 for Yes, 1 for No) indicating higher state presence as N increases.

Methods

We inspected images from Google/Bing. For each border crossing, we document whether or not there is: a gate and/or a barricade on the road, a covered gate and/or a barricade on the road, multiple lanes for vehicles, and presence of single or multiple governmental buildings. We also collected screenshots of each border crossing.

Latitude: 27.354159, Longitude:-99.45647 (US-Mexico border): Example of "thick" state presence

Latitude: 10.977346, Longitude: 0.514248 (Burkina Faso-Togo border): example of no state presence

Explaining a state's official border presence

VARIABLES	(1) gates	(2) official buildings	(3) official presence
Bordering state has gate(s)	0.83*** (0.03)		
Bordering states has official building(s)		0.81*** (0.03)	
Bordering state's total official presence			0.86*** (0.03)
Logged GDP per capita, state 1 (ego)	0.09*** (0.02)	0.05*** (0.02)	0.15*** (0.04)
Logged GDP per capita, state 2 (partner)	-0.07*** (0.02)	-0.04** (0.02)	-0.12*** (0.03)
Ethnic, religious and linguistic heterogeneity state 1	-0.07* (0.04)	-0.07** (0.03)	-0.16** (0.08)
Polity score, state 1	-0.00778** (0.00339)	-0.00297 (0.00240)	-0.0116* (0.00597)
Civil war, state 2	0.0101 (0.0192)	0.00130 (0.0121)	0.00687 (0.0315)
Constant	0.0939 (0.183)	0.235 (0.144)	0.348 (0.338)
Observations	421	421	421
R-squared	0.754	0.718	0.800

OLS; Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
(unit of analysis: border pairs (average of crossings)

Preliminary Analysis

A preliminary analysis of the data collected to date suggests we are capturing and coding important border characteristics, and not just gathering 'noise.' To the left are the results of regressions that test some basic relationships that should hold if the data are actually reflecting real expressions of state sovereignty at border crossings.

Findings:
States mimic one another at the borders. Gates and official buildings on one side predict gates on the other.

The rich build to block out the poor. The wealthier a state and the poorer its neighbor, the thicker its official border presence.

Homogeneous states guard their borders. Ethnically, religiously and linguistically heterogeneous states have thinner official border presence.

Democracies are less likely to block their borders. Autocracies have a much thicker official border presence.

Into the Future: Time Series Project

To date two or more students have coded both sides of 1,066 border crossings using the most recent imagery available. Our next step is to develop a database that documents change at the border over time. Google Earth stores images as far back as 1980, though image quality is only adequate since about 1990. Time series data will allow investigation of the dynamics of change at the border: what events or conditions prompt states to heighten their border presence? The US-Mexico border (27.596992°, -99.535692) near San Antonio, Texas illustrates border build up that show build up during a period of intense liberalization between these two states. **Does globalization stimulate *thicker* borders?**

U.S –Mexico Border (27.5965, -95.53569)

1995

2002

2010

2015