

The Built Environment: State Presence at Border Crossings in the Modern World

[Note: pages 19-24 are best viewed in color]

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Please note: This is a first draft based on partially collected and coded data. Discussion about what might be most interesting to pursue will be useful. All comments and suggestions are welcome. Please do not quote or circulate further without the author's permission.

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“Mr. Gorbachev, tear down this wall!”

Ronald Reagan, June 12, 1987, Berlin

“I would build a great wall, and nobody builds walls better than me, believe me, and I’ll build them very inexpensively. I will build a great, great wall on our southern border. And I will have Mexico pay for that wall. Mark my words.”

Donald Trump, presidential announcement speech, June 16, 2015, New York City

Border politics have become a salient component of high international politics. Territorial jurisdiction – the exclusive right of a state to decide who and what enters their political space, on what terms, and under what rules – has long been considered one of the key aspects of sovereign statehood. States have fought bloody battles to establish their authority over space; even today, territorial conflicts are often cited as one of the most important causes of war between states.

Do international political borders matter in the modern world, and if so, in what ways? The nuclear revolution was widely recognized to have de-territorialized national security, as territorial expanse was no longer a necessary asset in the logic of deterrence. The globalization literature suggests that political boundaries between states matter less and less, especially as states have liberalized their markets for goods and services.

And yet, political boundaries between states have apparently not faded away – far from it. If the most iconic image of the advent of the post-Cold War era was the breach of the Berlin Wall as East German guards looked on, then one of the starkest set of images of the early twenty-first is the United States’ walled sections of its southern border; Israel’s security fence along the Palestinian territories, and new barriers to prevent unwanted refugee flows across Europe, from the Hungarian/Serbian border to a new security fence around the tunnel entrance in Calais. Indeed one of the most ironic findings in the age of globalization is that states have started to erect walls at an accelerated rate (Hassner and Wittenberg 2015, Carter and Poast 2015, Élisabeth 2016). Wall-building along international borders is a mainstay of international politics (Vallet and David 2012, 111). The politics of barrier-building has recently been dubbed “teichopolitics” by political geographers Stephane Rosière and Reece Jones (2012).

What are the politics, the economics, and the psychologies of (in)security that explain states’ and their polities’ concerns with their national borders? Full answers to these questions are years away. Traditional international relations research has focused on conflict episodes (border disputes, wars and skirmishes), their resolution (settlement, treaties, demarcation) and border regulation (trade and immigration rules). These are all relevant lenses through which to analyze border politics. But a potentially new perspective can be had from a somewhat different angle: we can learn something about the broad patterns of national anxieties around the world by examining the built environment on the ground at crucial spaces along states’ international

borders. The built environment at the border represents governments' efforts to address rational concerns as well as symbolic self-presentation to their neighbors and their own people. Moreover, it represents a physical capacity to filter goods, services and people – the “wanted” from the “unwanted” – and thus is an expression of the authority of the state to preserve its jurisdictional sovereignty. While it is useful to ask whether the state's effort to control its borders is effective, it is first important to describe the broader border regime. Of course only a part of that regime is expressed in the built environment, but that environment represents symbols and investments that complement laws and other efforts states make to project security from the outside world.

This paper describes the first-ever effort to develop a global satellite generated database of the world's major border crossings to understand how states and societies attempt to filter and project symbols along the edges their (legally) sovereign jurisdictions. I focus on the built environment at border crossings because these spaces are, to some extent, expressions of governance strategies at ground based points of entry and exit. Examining border crossings – the intersection of a major highway with an international political borders – is an opportunity to better understand how a state and its society want to interact with their neighbors and parry multifarious threats. As such, these spaces reflect anxieties as well as aspirations about how to relate with the rest of the world.

This paper, which is large descriptive, is structured as follows. The first section discusses the phenomenon of border crossings and their built environments conceptually. The second section introduces new data gleaned from global satellite imagery that for the first time allows us to view most states of the world through their major points of entry and exit on the ground. The data consist of imagery at the exact point where a major highway crosses an international border separating two or more states. Some of these border crossings clearly reflect an effort to filter the persons, goods and services that enter; others reflect little desire or perhaps minimal capacity to regulate exit and entry on the ground. The third section explores this new data through the lens of national anxieties, aspirations, and capacities. It will show that filtering at the borders is largely the prerogative of the rich, who express even greater tendencies to build-to-filter when they are bordered by a relatively poor country. This section also demonstrates that economic differentials are not the only stimulus to fortifying border crossings; cultural anxieties may also be at play. Political ideologies are expressed at border crossings as well. Even as states create infrastructural connections with their neighbors, repressive governance is reflected in the built environment. There is also some evidence that states are starting to concentrate more rather than less of their efforts at their border crossings over time. This finding reflects the irony of globalization: as more goods and services cross the borders, the desire to filter gets ever greater – a claim we can see in hints of the “thickening” of the official border presence over time.

The final section interprets what has been going on globally at states' land-based gateways to the outside world. States cannot make their borders total impenetrable. Study after study shows walls are breached by motivated persons who travel miles to find weak spots where their neighbor has not been able or willing to filter. Airports and seaports are also points of entry and exit that this project does not yet address. The point is not whether political boundaries have become impenetrable and a people have achieved utter control over what and who enters, when, why and how. Rather, the data in this project are a new way to look at the tensions between nations that are important enough to justify resources to build, to man, and to maintain a physical

state presence at the border. The point is not to measure permeability, but rather to infer the motives and meanings states and societies give to their encounters with their neighbors and the rest of the world.

I. Sovereignty, Borders and Crossing: The Meaning of the Built Environment in Border Regions

Globalization and the image of a borderless world

In the 1990s, globalization was heralded as a process by which political borders between states would gradually lose their meaning. From an economic point of view, market integration seemed to trump governmental efforts to control the movement of goods and especially capital into and out of political jurisdictions. To visionary business strategists, integrating markets contributed to a “borderless world” (Ohmae 1990) that rendered state authority much less relevant than in the past. Increasingly, the nation-state was losing its ‘gate-keeper’ role to regional authorities, soft privately negotiated rules, and transnational socioeconomic exchange networks (Blatter 2001). The unification of the European market, the founding of North American Free Trade Area (NAFTA), and other regional trade agreements contributed to the sense that state boundaries were less relevant than in the past.

On the geopolitical front, the end of the Cold War marked the “downgrading of the wall as a political institution” (Vallet and David 2012, 113). Ideas and information move easier than ever before. Cyber threats are said to have “de-bordered” national security in new ways (Goodman and Portnoy 2009). All of these trends suggested new ways to look at human contact, and the idea of a networked world displacing a territorialized and politically bordered one has gained significant attention (Castells 2000). Neil Brenner sums it up well when he wrote in 1999 that the “wide-ranging effort to transcend state-centric epistemologies [w]as the unifying theme of contemporary globalization research” (Brenner 1999, 40).

Today such a view is recognized as ironic, if not a little naïve. While globalization is still associated with a sense that borders don’t matter, at least not in traditional ways, international borders are increasingly recognized as contradictory and controversial (Diener 2012, 15). Even the vocabulary for describing global trends is changing. Descriptions of the world as “borderless” have peaked and are on a marked decline (Figure 1). The world remains replete with borders, and international political boundaries are among the most revered (Diener 2012, Diener and Hagen 2009). States borders are perhaps among of the best globally recognized and institutionalized of any in human social relations (O’Dowd 2010). Borders decisively affect trade patterns and costs (McCallum 1995). Border studies have enjoyed a renaissance (Newman 2006). Even the internet has not “debordered” the world to quite the extent that early proponents predicted (Goldsmith and Wu 2006).

Why study state presence at the border?

The trend in critical geography has been to “decenter” the state in the study of international borders (see for example Bauder 2011), but my research takes the opposite tack. While there are as many potentially interesting borders in the world as there are social and political categories – gender, religion, municipal, regional, familial, partisan and ethnic borders,

all of which are of intense interest to scholars of international studies – the central concern of this project is how nation *states* have sought to express their sovereignty at the limits of their formal territorial jurisdiction. What states do (or do *not* do) at and near their international borders informs a range of conversations about how various boundaries collide, intersect and reinforce one another.

International relations scholars readily accept the importance of state borders, and have for decades researched border conflicts, settlements, demarcation, and territorial division. The international relations literature, rooted in realism, tends strongly to characterize territorial issues as involving diametrically opposed, zero-sum state interests (Mitchell and Hensel 2007). These scholars emphasize that states are more likely to fight over territory than any other issue (Vasquez and Henahan 2001); some research has also shown that settled borders have pacific effects (Owsiak 2012) and by some accounts even facilitate democratic development (Gibler 2007).¹ Indeed, the “settledness” of many international borders is taken by some as evidence of their legitimacy (Hurd 1999).

One important research stream focuses on institutions such as treaties (Schultz 2013), settlement procedures such as arbitration (Mitchell and Hensel 2007, Allee and Huth 2006) and focal points reflected in customary norms such as *uti possedetis* for peaceful border relations (Huth, Croco, and Appel 2011). For example, Carter and Goemans (2011) show that international borders based on previous administrative boundaries are less contested and less prone to violence. Settled borders in turn reduce uncertainty for economic agents and create opportunities for international economic cooperation between states (Simmons 2005). As this literature suggests, we know a reasonable amount about the global distribution of territorial disputes, and their settlement, escalation, and consequences.

Yet, traditional security conceptions with an emphasis on interstate war, military confrontation, and treaty-based peace accords misses much of what is actually going on along state boundaries. Peter Andreas argues persuasively that traditional security concerns are no longer the major focus of security activities at many states’ borders: “...there is a widening gap,” he claims, “between the traditional realist conception of security and borders and what many states are actually doing in the realm of security and border defenses. ...Transnational law evaders rather than interstate military invaders increasingly drive state border security priorities. Geopolitics is alive and well, but is increasingly based on policing matters” (Andreas 2003, 82).

We know relatively little, however, about the nature of *state presence* at international borders around the globe. Most international borders are neither contested nor militarized, and yet states typically (though they do not always) attempt to establish their authority at the edges of their territorial reach. The border is the region at which the State is likely to first encounter non-citizens, foreign goods, and various instances of foreign threat (perceived and/or real). The border is also typically perceived domestically as the edge of the envelope of national security; it is the place where citizens seek the comforting symbols of the security of coming – or being – home. Borders are “signs of the eminent domain of that state” (Wilson and Donnan 1998, 9).

¹ These conclusions are contested. See for example Atzili (2006) who argues that fixed borders among socio-politically weak states have sparked civil war and international conflict in some parts of the world.

Many states naturally express their authority in border regions by creating both symbols and architecture that reflect their authority. They do this by altering the landscape with infrastructure, building barriers, erecting monuments, planting flags and sheltering an administrative apparatus (Andrijasevic and Walters 2010). In short, “...at borders...the powers of the state are monumentally inscribed” (Wilson and Donnan 1998, 8). Placing state assets and symbols at or near the formal political border might be an effort to sustain, in Jordan Branch’s words, “homogenization of territorial authority” as “authoritative structure of politics” (Branch 2011).

There is tremendous variation, at least anecdotally, in states’ posture toward their formal borders. Much of this variation is likely historically specific. One of the first tasks that modern states have historically undertaken is the problem of extending their authority over territory.² Borders are therefore closely linked to the broader project of state formation and building. Gavrilis (2008) analyzes border regimes – strategies states use at their borders – as closely linked to state building strategies, arguing that the consequences for institutions and practices at the border will differ depending on a state’s preference for centralization versus decentralization; for political command versus market forces. Gavrilis looks at border regimes as expressions of state formation strategies taken in their early years of independence.

Some states have recently invested significant resources in and around their borders, while other leave their political borders quite porous, as in the case of the internal borders of the EU. Some states make minimal displays of their presence at the legal international boundary line, but attempt to filter the foreign from the domestic deeper into their territory. In Europe (Lebuhn 2013) and the United States (Varsanyi et al. 2012) for example, cities and private citizens participate in the regulation of migration far from formal international borders. Some states (often the same ones) “export” their borders by enforcing immigration and customs rules extraterritorially or at sea (Klein 2014, Bauböck 2015). How states inhabit and structure their borders is a politically interesting question, because these regions “are always domains of contested power in which local, national and international groups negotiate relations of subordination and control” (Wilson and Donnan 1998, 10). In border regions, we are likely to witness active strategies of state sovereignty by controlling or at least expressing the symbols of control over a geographical area (Vollaard 2009). In some cases, this is done peacefully and with tolerance, while in other cases border areas are “troublesome zones of tension and antagonism” (Diener 2012, 82).

Border *crossings* are especially interesting political, economic and geographic phenomena. These are the spaces in which states tend to expend the most effort to facilitate *and* to block exit and entry. In this project, a border crossing is operationalized as the area around the intersection of a major highway with an international border.³ On the one hand, such spaces are by definition, intention and design highly connective.⁴ On the other hand, crossing from one formal jurisdiction to another crosses a notional line over which states want to exert control. In other words, border crossings are likely to display a range of contradictory state impulses: to

² Interestingly, most new (or newly territorialized) sovereign states have attempted to control challenges to their territorial sovereignty, including cultural challenges such as nomadism, which some states see both as materially and ideationally conflict (MacKay et al. 2014).

³ Future research will examine airports and seaports as border crossings.

⁴ Transportation research suggests that cross-border infrastructure tends to be undersupplied, however. See Rietveld (2012).

connect and integrate with a neighbor (as represented by a major infrastructural commitment, i.e., the road itself); to *filter* this relationship with infrastructure for inspection, law enforcement, immigration control and customs collection; and to display symbols of sovereign authority of the state through various displays of state officialdom. Brenda Chalfin's description of the built environment of the Ghanaian border at Aflao is apt: "At the border, where the state seeks to inscribe its authority in terms that are fixed, functional, and well-ordered, architecture serves as a highly efficient means for the display of state capacity" (Chalfin 2010, 70).

How do states express their political strategies at such crossings? If, as Stuart Elden argues, "territory...can be understood as a political technology: it comprises techniques for measuring land and controlling terrain, and measure and control – the technical and the legal – must be thought alongside the economic and strategic" (Elden 2010, abstract; 811) then we need to examine border crossings as places where such technologies are most likely to be implemented. I assume that states' broadest concern is to establish the authority necessary to maintain political control and legitimacy in the border region and nationally. In general terms, they need to develop an infrastructure that permits connectedness while allowing for filtering. Some – perhaps most – of this infrastructure can be considered symbolic in that it probably does not fully accomplish its stated policy purpose. As Wendy Brown (2010) and many others have noted, border walls don't keep out unwanted people or activities. Nevertheless, the capacities and symbols in which states invest at their borders suggests their concerns and possibly those of their polity as well.

State purposes at the border: security, economics, identity and rent seeking

There are potentially many reasons for a beefed up state presence along the border and at border crossings in particular. One obvious one is national or local security from violent foreign threats. Control over territory was the historical way that states gained sovereign authority, and territory has long been considered a power resource by realist thinkers. If territory (and population, resources and defensible borders) are worth fighting for, surely they are also worth defending. International borders have had important security dimensions in civil wars as well. Neighbor's border regions have been used by rebel groups as bases of attack in civil conflicts, in effect using a neighbor's sovereignty as a shield (Checkel 2013). As Donaldson suggests, civil unrest in neighboring states may well explain at least some of the tendency for states to fortify their borders, even though the territory itself is not in dispute (Donaldson 2013, 190).

Security concerns might display distinctive patterns of state presence at border crossings, from observable military structures, to vehicles and hardware. It might be expressed in the use of walls, fences and barricades. It might be possible to infer a security presence by the historical context: disputed borders or violent region might elicit a greater state presence at the border.

States also control their borders for economic reasons. Most of the time governments both want their economies to benefit from transactions across borders (border crossings by definition are created where highways connect countries), but they would also like to collect rents and regulate market activity according to their preferences. Governments have created a welter of rules for international economic transactions precisely because of concerns about the impact of cheap goods and low paid labor on domestic producers and workers. They have also done so to collect taxes and other rents. Crossing borders incurs real economic costs to traders,

although they do not wipe out the gains associated with ease or preference to engage in trade within ethnic groups (Aker et al. 2013)

Of course states can make all the rules they want, but many are hard to enforce if people have incentives to violate them. There must be a way to *filter* economic transactions at the border in order to benefit politically important domestic groups. Visas need to be checked; vehicles need to be searched; customs need to be collected. These are all ways to insert sovereign policies into markets. Chalfin's description of the Ghanaian border reminds us that the laws passed and structures erected and manned for these purposes are imperfect at their task – all they sometimes perform is a “normalizing” function, “imposing a rudimentary order with only limited sanction on those entering the country via Aflao” (Chalfin 2010, 72). But the effort to filter is clearly expressed in the built environment.

Economic motives suggest distinct patterns of state presence at border crossings. If there is no market or if there is no desire on the part of a government to alter market patterns, there is no reason for a border presence to act as economic filter. Official border presence is only “needed” when a market exists and when a state has a motive to alter it or collect rents from it. In the former case, the state may want to reduce, regulate or even stop a market relationship (e.g., to benefit domestic producers or workers from competition). In the latter case a government want to profit from it (customs, rents, corruption). *Economic filtering* call for inspection stations, fences, and buildings on the border to reflect state preferences for growth, rents, and regulation.

A third reason states might maintain a salient border presence is cultural: to maintain a clear national identity. Goemans (2006) argues that territorial designations are convenient ways for identities to form that address problems of collective action. The reinforcement of national identities can aggravate security problems, however, since the division or loss of areas identified as homelands can raise the risk of violent conflict (Shelef 2016, Toft 2003). National identities almost always have a territorial (sometimes ethnic) basis (Smith 1991). If one anxiety is the maintenance of a national identity through ethnic filtering, then we might expect culturally homogeneous nations to develop a more ambitious state presence at border crossings than do cultural diverse ones.

Why not just look at policies to explore states' and societies anxieties and purposes? There are two reasons why policies are not sufficient. First, policies alone do not provide security, filter flows or display identities in a publicly observable way. Immigration rules and tariff schedules are not self-enforcing. State border presence suggests *some* capacity to secure and filter, however imperfectly. Secondly, it is informative to study the built environment because policy alone is cheap talk. Immigration rules, trade laws – essentially rules about who and what can enter a sovereign territory – are easy to pass, to change and to ignore. The built environment – poured concrete, buildings, fences, barriers, barbed wire, gates and surveillance capacity – are a crucial supplemental indicator of a state's commitment to control. These structures constitute a costly signal to foreigners and citizens alike that a government is serious about profiting from or regulating “globalization.” They also provide physical (even if symbolic) evidence of the State's effort to secure its people whether from military or cultural “threats.”

The built environment around borders therefore summarizes the political purpose of the State. George Gavrillis (2008) views international borders as institutions “all the way down,” but it is critical to recognize that such institutions usually lead to and sometimes require a built

environment to support them. We can find the imprint of these forces, quite literally, on the ground. For a number of reasons (resource constraints are one) they are not a perfect indication, but they are a useful medium-term clue of a state's orientation toward globalization in general and its neighbors in particular.

II. Data: Collecting Information on the Built Environment at the Borders

So let's have a look at these interesting geopolitical spaces. In order to do so, a first of its kind dataset is in the process of being developed of every point on the globe where an interstate border and major road intersect. The first step was to locate and verify each instance, world-wide, in which a major highway crosses an international political boundary between states. We used satellite images available in the USGS Global GIS database to create a worldwide dataset of major highways connecting each pair of contiguous countries.⁵ We then overlaid this database over a political map of the world to isolate the intersection of each highway with an international border. A first-pass result of this procedures yielded well over a thousand border crossings throughout world (Figure 2).

[Figure 2 about here]

These crossings generally reflect places where motorized vehicle can cross the border. Typically, they have at least one clear paved lane each way. We are unable at this point to capture every dirt lane or trail head on earth that might lead across an international border. Obviously we are unable with this data to document underground tunneling, off shore transportation routes, train tracks or air traffic with this method. We also do not collect data for every mile of an international border. But our purpose is not to document every conceivable way in which persons or contraband might move from one jurisdiction to another. Rather, it is to characterize efforts of governments to display a border presence, beginning with physical infrastructure on land. I have chosen to begin with roads because they are natural conduits for connecting geographic spaces on land, and are generally designed to facilitate relatively low-cost movement between states.

The visual corpus from which Figure 2 is derived is massive, but limited in important ways. Satellite images are generated in response to commercial or governmental demand. As a result, some parts of the world have far clearer and more updated images than do others. European and North American borders are clear and frequent. Satellite images of remote parts of the world are a low priority for paying customers and therefore are rarer, and often of poorer quality. We also found a few border regions where images were obviously intentionally blacked out. While this may be of political interest, we were not able to use these border crossings in the analysis below. Finally it should be noted that to date we have collected a cross-section of images. Time series collection is ongoing, but the problem of differential availability around the world is greatly amplified. The cross sectional analysis of border crossings below is largely based on images produced between 2012 and 2015.

⁵ Data are based on aerial photography and geological surveys taken in January of 1997 by the United States National Imagery and Mapping Agency. Documentation and definitions at http://www.agiweb.org/pubs/globalgis/metadata_qr/roads_qk_ref.html.

How varied are border crossings around the world? Using the rough latitude/longitude coordinates generated by the overlay exercise, human coders using google maps located each initial point and applied ocular inspection. In the vast majority of cases, they were able to confirm the transection of an international border by a highway. Because the visual coordinate rarely matched exactly with the initial estimate, each human investigator adjusted the coordinates of the intersection manually to reflect visual realities on the ground. In a few instances, the original coordinates could not be confirmed, e.g., no satellite imagery was available, or was so obscured as to be unhelpful; imagery revealed no border crossing in the area, or in some instances revealed a road that approached the border but made a sharp turn away without crossing (as in Figure 3a). Such instances are retained in the dataset, but are not analyzed as border crossings for the purposes below. Once every coordinate could be confirmed as a border crossing, it was made precise to six decimal places. This process reduced the usable dataset to just under a thousand confirmed crossings, which represents the most precise world-wide set of border crossings on land in existence.

For each border crossing, visual inspections were made to characterize the built environment on each side of the international border, distinguishing the territory of State A (e.g., the United States) and State B (e.g., Mexico), which allows us to record asymmetries in the built environment on each side of the border.. Conceptually, we are looking for evidence of a capacity to filter persons, goods and services, and threats at the border crossing. Such a capacity implies that the state would post personnel at or near the border. While there are many border crossings that are supplemented by border cams and other forms of electronic surveillance, posting personnel at the international border crossing is suggestive of a moderately strong state priority to distinguish the “wanted” from the “unwanted.” Thus, the presence of *official looking buildings*⁶ at or near the border is our first indicator of a built environment to facilitate filtering.

Specific kinds of infrastructural investments assist in the ability to filter transactions and mobility at the border. In particular, is there any evidence of a state capacity to slow, stop, and/or inspect vehicular traffic crossing from State A to State B? First, we looked for evidence of *barriers or gates* at or in very close proximity to the roadway that could be used to control traffic.⁷ Next, we looked for evidence of a *capacity to inspect* incoming vehicular traffic. One

⁶ Coders were instructed as follows: For each year an image of a crossing exists, 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 lot configurations; trucks lined up near buildings (but watch out for gas stations.)

⁷ Coders were instructed as follows: For each year an image of a crossing exists, code 1=yes; 0=no. Leave blank if there is no image and/or no border crossing for a specific year. Instructions:

- Code as 1 anything that looks like a gate or barrier that crosses the main road that itself crosses the international border. Do not code barriers that are located off the main road (e.g., around a facility away from the road).

of the best physical indicators of inspection capacity is the existence of turnout areas or *split lanes*, where traffic can be routed for detailed inspections.⁸ Such lanes are typically easy to spot in satellite imagery, and highly suggestive of efforts to regulate entry for certain kinds of persons and goods.

Despite quite explicit instructions, intercoder reliability is an important issue. I am aware of few if any studies that have attempted to develop global data about physical infrastructure at such a localized level as this one, so there are few examples of best practices. Nonetheless, basic precautions were taken. Every border crossing was examined by at least two coders. Most were coded by three independent coders, and a few by as many as five. When two initial coders disagreed, a third was added. Numerous discussion sessions were held to reduce the instructions' ambiguity and establish a set of common decision rules (see footnotes above). Finally, every coder was instructed to indicate how certain they were about each specific coding (unsure, moderately sure, very sure). In short, since we cannot eliminate the possibility that coders might disagree about what they see at the border crossing, we had multiple coders, increasingly precise instructions, and, in the end, recorded coder uncertainty.

III. Describing the World's Border Crossings

Variance by State:

States have widely varying desires and/or capacities to display filtering infrastructures at border crossings. Figure 3 depicts two extreme (and easy to code) examples. The United States has invested tremendously in a capacity to filter activities at many of its border crossings with Mexico. Multiple lanes, inspection stations, barriers, and buildings are all arrayed in such a way as to improve the chances of control across this political space. Remote parts of Africa provide a stark contrast, as shown by a remote border crossing between Burkina Faso and Togo.

[Figure 3 about here]

While these are two extreme cases of thick and thin presence at international border crossings, the data suggest variation with strong patterns world-wide. Figure 4 provides a sweeping look. For every crossing, scores on the three main indicators of filtering capacity at the border (official buildings, gates/barriers, and inspections lanes) are aggregated and mapped. I created a continuous scale from red (high filtering capacity) to yellow (moderate capacity) to

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- Include partial structures that appear designed to slow, divert, or stop traffic (barrels, cement barricades).
 - Code as 1 only those structures that you find in the vicinity of the border crossing.

Recommendation: Use ground level photography where available to help determine whether you are looking at a gate/barricade.

⁸ Coders were given the following Instructions:

- Code 1 if lanes proliferate or split at or very near the border; if you see auxiliary lanes loop to the side to inspection areas and then rejoin the road; or if there is a turnout area for traffic at or near official-looking buildings, kiosks, gates, etc.
- Code 0 if the road does not widen or split in any way at the border, even if it is two lanes each direction.
- Code 0 if the road does not widen *on one side*, even if it does widen on the other side.

green (practically no capacity). The map confirms many intuitions. The United States' northern border is somewhat thinner than that to the south. Thanks to liberalization and especially the Schengen area within Western Europe, the built environment reflects the ability to cross borders within these regions easily. Evidence of filtering mounts on the eastern edge of the European Union. Border crossing in Sub-Saharan Africa are generally tremendously porous. But it is clear that South Africa has put far more effort into controlling cross-border movements than have states to the north. Official presence seems to wane along borders that are more remote or constitute natural barriers. The series of green balls along the crest of the Southern Andes suggests that states do not put resources into guarding borders that have a tendency to guard themselves.

[Figure 4 about here]

Figure 4 suggests visually that official control at border crossings is a strategy largely used by the wealthy. In this Figure, green states are the wealthiest, and red states are the poorest. Red balls along the edges of green states suggests a motive for control: the desire of the wealthy to block entry of cheaper goods and poorer people from their neighbors. Green balls among red states suggests the reverse, and also suggests that there may be obvious limitations on state capacities to filter. Official border presence requires resources, which poorer states are far less likely to have a motive to deploy in this way.

Aggregating crossings by state makes this relationship fairly clear. Figure 5 (abc) averages all crossings on all borders – whether with rich neighbors or poor; whether remote or central – and plots them by state. In this figure a state with only one crossing has as much representation as one with a dense network of transnational roads. Abstracting therefore from geography, infrastructure density and the nature of one's neighbor, there is a clear tendency for wealthier states to establish an official presence on their borders. Figure 5a plots this relationship, with GDP per capita on the horizontal axis and border presence on the vertical axis. The upward slope suggests that official border presence increases the wealthier the state. This relationship will surprise no one. In fact, it is more useful as a check on the validity of the data than as an interesting hypothesis.

Figure 5a has some interesting outliers, however. States below the line characteristically have thinner than expected border presence, at least relative to their GDP per capita. Norway is rich, but relatively remote. Haiti is poor, but insists on a presence at its border with the Dominican Republic. (There is a tendency of states to mimic their neighbors, as discussed below). The Balkans (Albania, Bulgaria) guard their crossings much more than we would expect based on their wealth alone. And we can infer some explanations for the significant difference between Qatar and Kuwait attributable, again, to geography: despite similar wealth, Qatar's peninsular geography makes it much less likely to rely on official border presence than the more dangerously situated Kuwait. Note also, however, that averaging by state tends to make outliers of states with relatively few highway border crossings; e.g., Ireland, Qatar, Chad, Congo. Nonetheless, there is good evidence of a relationship, on average, between wealth and official presence at important border crossings. This is only a correlation, but a potential causal story from GDP per capita to state border presence seems easy to motivate theoretically, and more likely than the other way around.

There also appear to be some interesting cultural relationships in the state-averaged data. To illustrate this as a first cut, I have used the data gathered by Alesina et al on religious, language and ethnic fractionalization. Since the interest here is simply to explore a general relationship, these three indicators are added together for a broad view of “cultural heterogeneity.” States with populations that are relatively homogeneous tend to establish a stronger presence at their borders than do states with more heterogeneous populations (Figure 5b). South Africa is an outlier – highly diverse by our measure of cultural heterogeneity, and yet a border crossing builder. Again, Norway and Ireland are outliers in the opposite direction – despite their relative homogeneity, their state presence at the border appears relatively thin, suggesting again that peripheral location matters.

Finally, consider the possibility that border presence has an element of “mimicry.” Once again taking a rough first cut, I average the total scores for state presence across all border crossings for a given state, and compare that average to its neighbor’s equivalent average. There is a very tight positive relationship: states tend on average to develop border presence very similarly to those of their neighbors. Of course there are a number of reasons this might be the case. One is *literal* mimicry: State A builds a presence similar to State B on the opposite side of the border, whether for reasons of prestige, to emulate, or simply to retaliate. More likely, though, this positive relationship picks up other spatially clustered effects: wealthy states in geographically accessible regions are likely to cluster, and the positive correlation depicted in Figure 5c is the result.⁹

Which borders crossings are tended? Evidence within state by border crossing¹⁰

The scatterplots above are based on states averages. It is also useful to understand more precisely *which* border crossings states decide to invest in a presence. Taking each border crossing as a unit of analysis, we can test slightly more nuanced relationships, controlling for a range of other conditions. Table 1 reports the results of a regression with *Total Presence* at each border crossing, using directed dyads to account for each state’s presence on each side of the border, state dummies and robust standard errors clustered on border pair. Using this as a preliminary model, many of the same relationships come through. First, there is clearly strong symmetry in state presence on each side of a border crossing. But again, whether this relationship is strategic, or homophily explained by other state or local similarities is not clear.¹¹

[Table 1 about here]

There is also some evidence in Table 1 of economic motives for state border presence. Yes, the wealthy are more likely to place official structures at their border crossings, but

⁹ It is also possible that the positive correlation is picking up coder biases: coders who “see” an official presence on one side of the border may be more likely to “see” such a presence on the other side as well, which becomes reflected in scores on opposites side of the border that are more similar than if coders were randomly assigned to one side only. For this reason, in the analyses that follow this measure is included as a control variable, reducing the likelihood that correlations of interest are due to other factors that cluster locally or to coder bias.

¹⁰ Please note: this is a very first cut look at patterns in the data. These are simple models that will be refined in future versions of the paper. All findings are extremely preliminary.

¹¹ It is even possible that coders try to impose consistency on their judgments; it is therefore possible that controlling for the coding for the other side therefore also acts as something of a coder control as well.

controlling for their own wealth, states are even more likely to man the crossing the greater the *wealth gap* with their neighbor. The richer a state compared to its neighbor, the more official presence is reflected in the built environment on the wealthier state's side of the crossing. This is consistent with concerns about the incentives lower-paid or under-employed workers may face to cross the border in search of economic opportunities. Political pressures in the wealthier country may induce states to respond with structures and symbols designed to filter and deter such crossings.

Interesting, the finding on cultural heterogeneity remains strong even when controlling for neighbor's state presence and income differentials. The more homogenous (heterogeneous) a country culturally, the more (less) likely it is to build an official presence at its border. If this finding holds up with further testing and model refinement, it is a very interesting result. It would suggest, for example, that there may be a very specific politics associated with "ontological security" (Mitzen 2006) in societies with very clear cultural identities.

Finally, political geography in the most traditional sense appears to matter in a big way for state presence at border crossings. The closer a border crossing is to a state's own capital, the more likely it is to construct an official presence at that crossing. The greater the log of the distance to the capital, the less likely a state is to build structures at the border crossing. There is also some evidence, though it is not as robust, and is correlated with distance to state capital, that other measures of remoteness (distance to a major city, altitude) work in the same direction. States seem to invest most in the most politically salient and geographically accessible regions of their periphery.

Wealth, culture, and political salience all seem to have a consistent effect on state presence. Security variables were less strong, but generally in the expected direction. A civil war in a neighboring state is associated with heavier state presence at the border, and an international conflict in either home or a neighboring state might have a similar effect, but these results are not statistically significant using state fixed effects models. Surprisingly, at least at first blush, the *greater* the relative population density of a neighbor, the *less* likely is an official border presence. This result is highly counterintuitive, and may not survive when population density within a more delimited radius around the border is tested. The strongest results in these models appear to be economic and cultural.

Table 2 takes another cut at these issues using a mixed (hierarchical) model. This model accommodates context by parsing out variance attributable to the state level (both ego and neighbor) from that attributable to the level of the crossing.¹² It also uses a more flexible random effects approach rather than arbitrarily fixing effects – an approach that is well justified in this case since inclusion of the covariates significantly reduce the random effects parameters at all levels (ego state, neighbor state and border pair). In this case, I have separated out different dependent variables, testing separately for the presence of gates, official buildings, and overall total state presence.

[Table 2 about here]

¹² Without covariates, the mixed model suggests that factors at the ego state level account for about 17-20% of the variance in border crossing presence, while about 10-12% of the variance is accounted for by neighbor-level factors and about 6-10% of the variance is attributed to the level of the border pair.

Using a hierarchical model with random effects for each state and each common border, some of the same themes emerge (Table 2). The mixed effects model reinforces a significant symmetry on each side of the border – for whatever reason, a heavy border presence on one side is met with a heavy presence on the other. This is the case for all three measures of presence – gates, buildings and overall presence. Rich countries are more likely by all three measures to have a state presence at the crossing, which likely represents the resources to build. In addition, in two out of three of the cases, wealth differences matter: even controlling for domestic wealth, states are more likely to maintain a border presence the poorer their neighbor.

It is clear, though, that economic resources and differences are not the whole story. Cultural motives may well be at play as well. Again we see consistent results across gates, buildings and total presence: states of culturally homogeneous societies are more likely to project the state to their border crossings than are more culturally heterogeneous ones. There is good evidence as well that more democratic states have thinner state presence at the borders than do more authoritarian states (importantly, when controlling for wealth). This pattern suggests that repressiveness in governance may well tend to be reproduced at a state's border. Security concerns are reflected in the tendency for political conflict both at home and in a neighbor to result in stronger border official presence. Finally, political geography matters in this model as well: states appear less concerned to man border crossings that are remote from their national capitals and major cities.

Change over time?

Globalization was associated with the idea of a borderless world in its early formulations, but as we have seen few observers believe the world is truly borderless. Satellite images confirm that states and societies have continued to flank their transnational roads with varying kinds of architectural filters, from inspection lanes to gates to customs stations. But have these structures thickened *over time*? Have states enhanced the symbols and structures that reflect their multiple purposes at international crossings?

Answering this question is difficult due to the spotty nature of historical satellite data on a global scale. But to begin to address this question, satellite data available centered on the precise border crossing coordinates were collected from Google Earth, for as many years back in time (to 1990) as possible and were visually inspected by human coders for change over time. Coders were looking for evidence of new official buildings, inspection stations, gates and barriers or important changes in lane configurations reflecting of an enhanced capacity or intent to filter trans-border movements. Two trends are problematic for data collection: first, the more remote areas of the world were even less well represented in the available imagery; and second, the general quality of images gets much worse the older the image. Furthermore, images are available at what appear to be random times rather than regular intervals. It is possible, therefore, that short term dips and rises over time in apparent border presence are driven by patterns of missing data rather than real average year-on-year change.

Ignoring for now the erratic year-on-year changes,¹³ contrary to the notion that globalization has led to a borderless world, there is some evidence of a slight drift upward in border presence over time. The overtime change is most significant for gates built by the United

¹³ Exacerbated by the incomplete collection and coding efforts currently ongoing.

States. (The United States is also much more likely to have a heavy border presence by every measure considered here, compared to the European Union, whose internal borders are largely unguarded, or to the rest of the world.)

[Figure 6 about here]

IV. Conclusions:

Border crossings reflect territorial institutions at specific geographic locations on the ground. They simultaneously represent the extent of two states' jurisdiction and the desire connect across political borders. These are special places on earth, where states express their jurisdictional authority and try to define their relationship with their neighbor and to some extent the rest of the world. Border crossings are geographical, architectural, technological and symbolic. They reflect who and what a society wants to be, with whom and what they want contact, and the investments they are willing and able to make to filter transactions with various others.

Exploring these crossings visually is therefore worthwhile and perhaps even necessary for understanding a society's domestic political economy as well as its identity politics. Clearly, geography makes some crossings much more salient than others. Remoteness matters.¹⁴ The further a crossing is from a major city and especially a national capital, the less likely the state is to establish a presence at the border. Crossing are simply not homogeneous with respect to their political, economic or cultural salience. Some that are especially remote practically "guard" themselves.

States governing wealthy societies in particular have constructed evidence of their authority at border crossings. The obvious explanation for such displays is capacity: with the resources to do so, wealthy states build structures suited to the task of filtering. But capacity alone hardly explains officialdom at the border. *Why* make such investments? The evidence presented here suggests that a big part of the answer is likely to have roots in the domestic political economy: even controlling for a capacity to build and project as measured by GDP per capita, states are *even more* likely to establish a border crossing presence when their neighbors are relatively poor. It is not difficult to sketch out a domestic political economy story in wealthy countries for demands to erect barriers to transactions and mobility from poorer neighbors. Indeed, these dynamics have been clearly on display in recent American politics.

And yet, such a political economy story does not explain everything. The finding that democratic governments are less likely to maintain a heavy border crossing presence compared to more repressive authoritarian regimes suggests that not all societies are demanding such filters. Civil society may demand openness and free movement across borders, at least when we control for important characteristics of one's neighbors. More repressive regimes are more willing to display a heavy hand at international border crossings, just as they are in many other areas of governance. Whether this is a display to bolster a regime's legitimacy, or whether this is

¹⁴ Elevation is also negatively related to state presence at the border – mountain passes are less likely to have gates, official buildings and inspection lanes than are crossings at lower elevations – but elevation is correlated with major cities and capitals, and so was not included in the above analyses.

a serious effort to control exit (as with the Berlin Wall), there is some tendency for domestic governing values and institutions to find expression at the very edges of states' jurisdictions.

International politics are also expressed where the border meets the road. The built environment around border crossings is to some extent influenced by violent security threats, but the relationship is less robust than one might have expected. Neighbors' civil wars and involvement in international conflicts are positively though weakly correlated with a stronger official presence at the border in the state fixed effects models. In the more flexible hierarchical models with random effects, a measure of political violence in both states appears strongly correlated with official buildings and total presence, but ironically not as strongly with gates and barriers across the road. But it is important to keep in mind these measures of violence are coded at the national level and may simply be too coarse to detect more localized security threats. More geographically precise violence data may prove an even stronger relationship, as intuition would suggest.

One of the most interesting findings in this very preliminary research is the role of culture in influencing the built environment at sites of transnational crossing. Almost all explorations of the satellite imagery strongly suggested that states that are highly homogeneous culturally are significantly more likely to establish a strong state presence at their border crossings. Although we cannot say anything at this point about some of the *most* culturally homogeneous states such as Japan (who is not in the dataset at all) and Ireland (with only one or two coded crossings), the continental evidence seems to suggest that anxieties about preserving a clear cultural identity could explain some of the teicho-politics displayed at border crossings. More culturally homogenous nations tend to deploy more state authority at their cross-roads with the world, controlling for a range of other influences. But again, this relationship is based on data at the national level. Do the politics of official filtering vary when the border divides a locally homogenous group compared to when it separates clearly identifiable cultural differences (ethnic, linguistic or religious)? Many people make normative arguments against sovereigntist territorialism, where legal and cultural hybridity seems less possible (Berman 2012). States are innovating ways and means by which to maintain borders and hence their authority by trying to support various boundaries around political and cultural communities, and looking for ways to endow borders with new meaning (Goff 2000). More fine-grained evidence of such communities will be important in exploring these endeavors. We are in the process of collecting and analyzing geo-coded data on ethnic groups as a way to further explore how anxieties about cultural difference is expressed at the border.

This paper has only begun to scratch the surface of the patterns and politics of transnational relations and state presence where formal jurisdictions meet on the ground. First, there is much more to do with the current data collection. The time series coding is only partial, and the findings highly preliminary. Second, data collection is now underway for localized information at the specific border crossings, including the geo-location of ethnic groups, population density and lights at night within a specific radius of each crossing. A measure of wealth on each side of the border crossing can also be estimated by comparing the ratio of light

intensity to population density, which may yield insights into the extent to which the border crossing is more of a population dam than a filter.¹⁵

The next phase of this project will place the built environment at the border crossing in its broader institutional context. I have argued that the physical environment is important because rules may be meaningless without a capacity to enforce them. But this is no reason to ignore the rules themselves. It is important to collect information on visa requirements, importation restrictions, and border closures, many of which are specific to the particular border crossings investigated here. Additionally, it will be important eventually to move away from the physical interstate borders, and understand the layers of official bordering that support filtering of mobility and trade at points internal to the state and, increasingly, externally as well. Relatedly, since capacity is also defined by the quality of information available to officials, a next phase of this research project will collect information on the intensity of electronic surveillance directed at and around border regions. These count as “state presence” that cannot be assessed using even the best satellite imagery.

More futuristically, this project will push toward computerized methods for understanding the “strength” of border institutions. Borders “matter” where they alter human activities, from land use to resource development to the patterns and (im)permanence of human settlements. Some of these activities will produce detectable differences on the ground. Training a computer to detect and score “difference” on each of two sides of an international border would be an outside-the-box step toward establishing the strength and effects of international borders on the ground.

Finally, it is not only important to understand why states assert their presence to the outer limits of their formal authority, but what are the *consequences* of doing so. Does state presence contribute to the stabilization of international borders, more efficient economic relationships, and more amicable local relations, or the reverse? Does it tend to signal a willingness to cooperate with neighbors, or the reverse? Dismantling physical evidence of territoriality in Europe, for example, has been accompanied by varying degrees of cross-border regionalism and cooperation (Sousa 2013, Aromaa and Viljanen 2006). Whether changing modes and degrees of state presence at the borders can sustain cooperation under ever more intense global pressures yet to be seen.

¹⁵ In addition to border crossings on land, the project will expand to international airports and seaports. In contrast to crossings by road, which were constructed from scratch by overlaying infrastructure images over political maps, the exact location of the world’s airports and seaports are well-known. Data on transactions and in many cases formal rules of entry are also much better developed at these sites. While excellent case studies exist, less is known about the physical presence and symbolism that states project at such ports of entry.

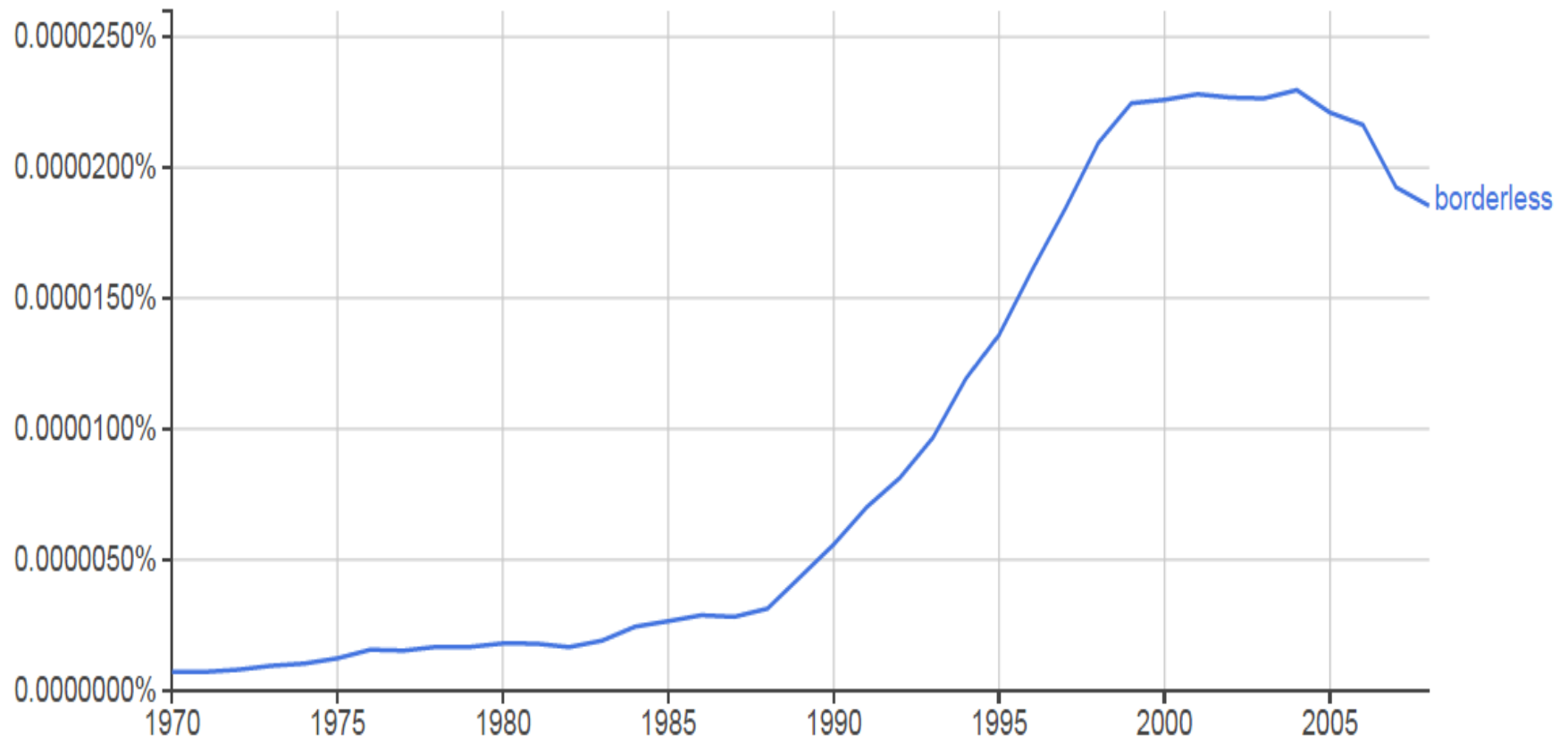


Figure 1: The rise, leveling and decline in references to “borderless” according to ngrams. Source: <https://books.google.com/ngrams>.

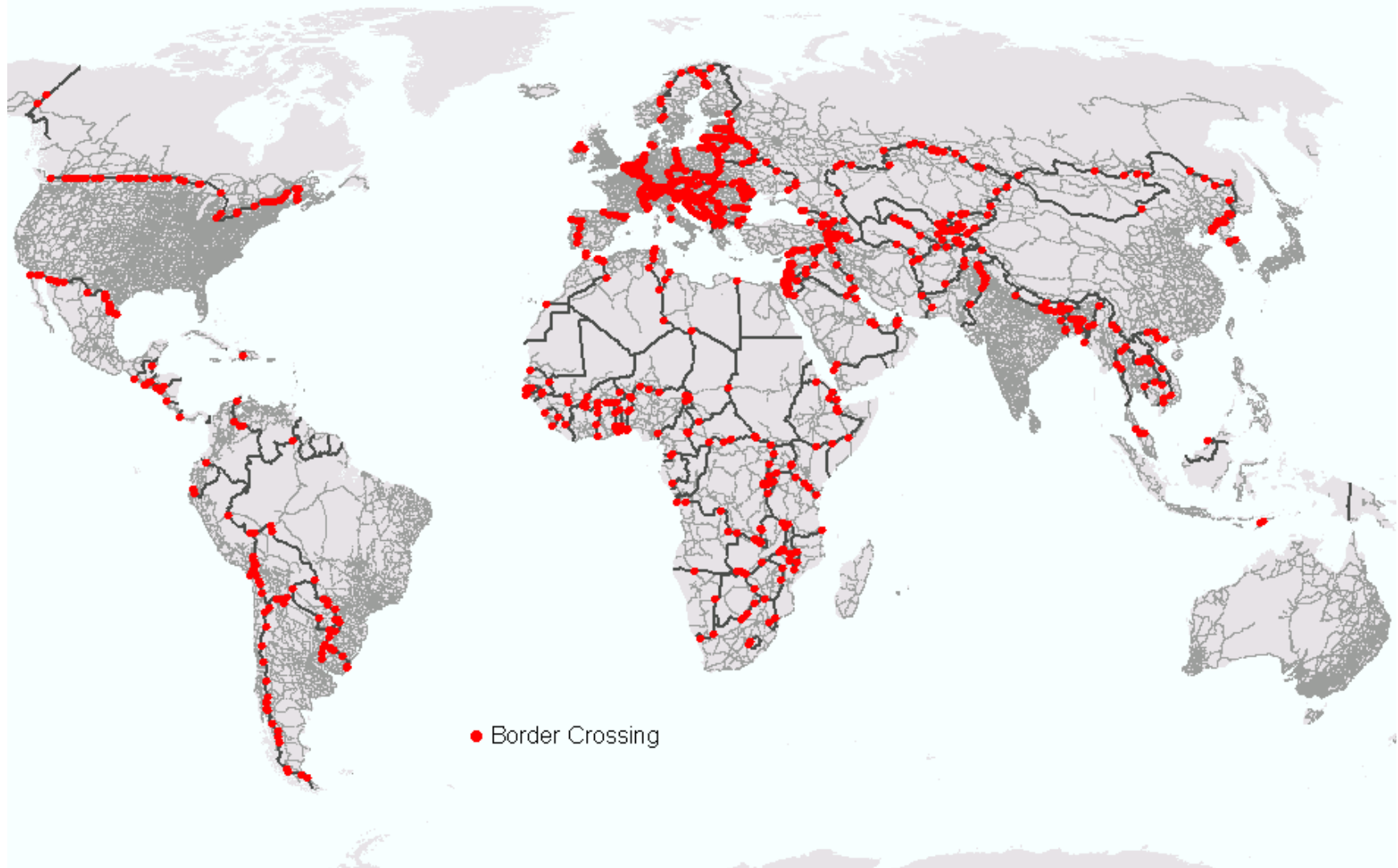
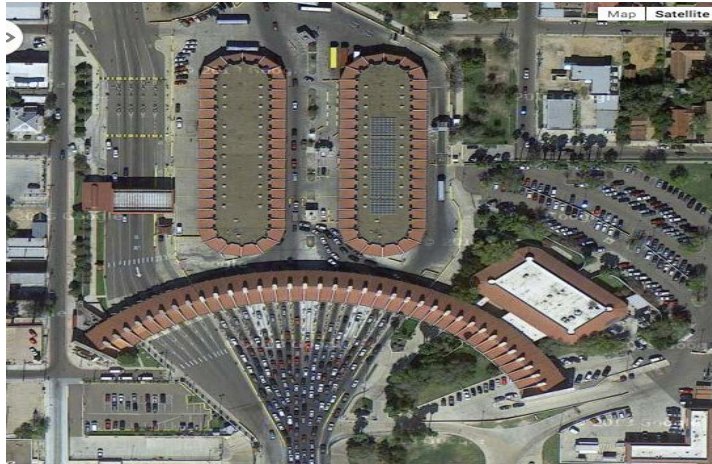
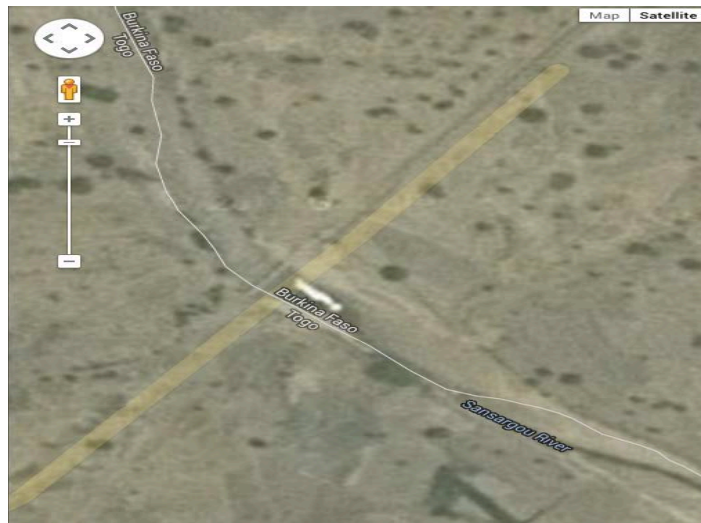


Figure 2: Global Border Crossings – the intersection of major highways and interstate borders on land

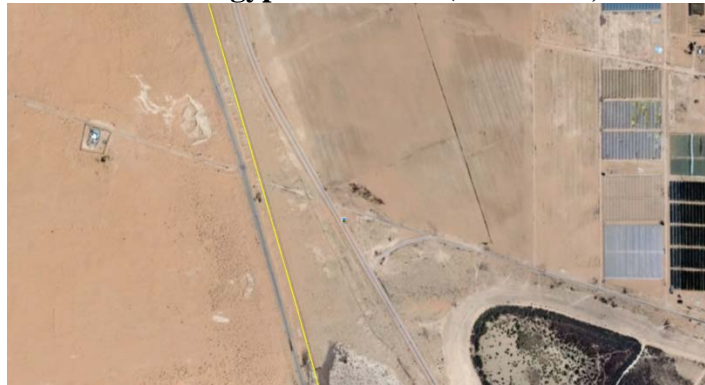
- a. **United States and Mexico (Latitude: 27.354159, Longitude:-99.45647)**



- b. **Burkina Faso and Togo (Latitude: 10.977346, Longitude: 0.514248)**



- c. **Deleted from the dataset: Roads that approach but do not actually cross the border: Egypt and Israel (30.965065, 34.361728)**



**Figure 3: “Thick” and “Thin” State Presence at Border Crossings;
and an example of a deleted case.**

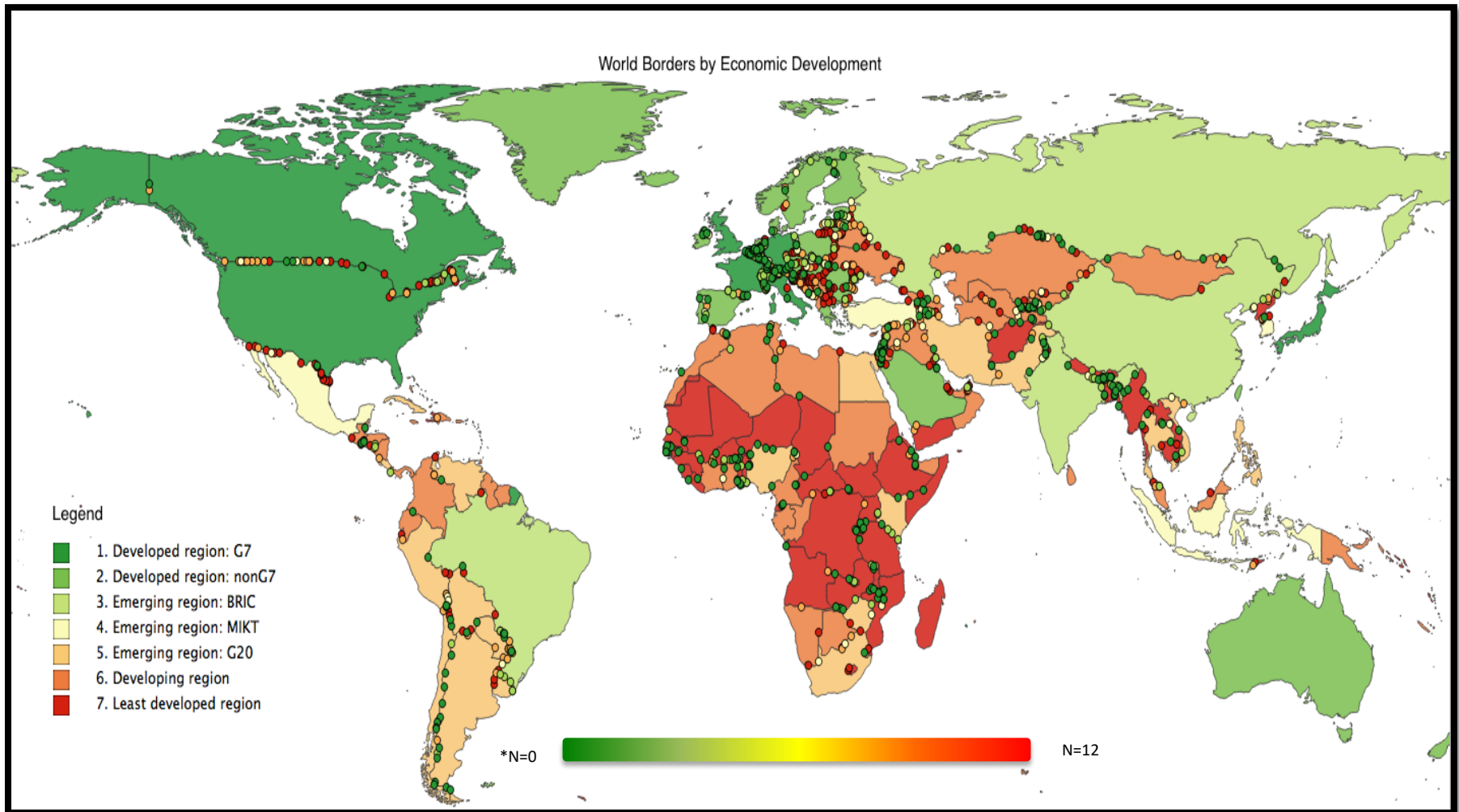
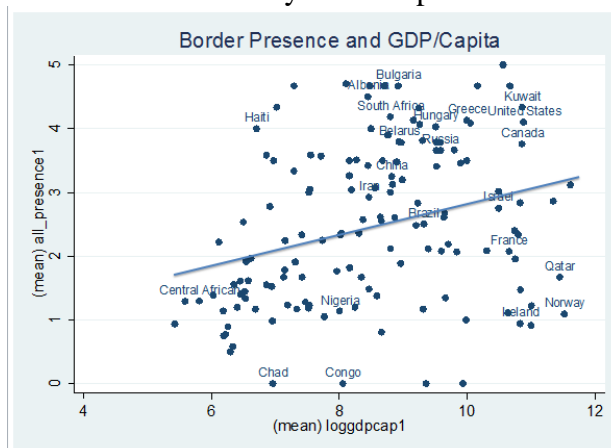
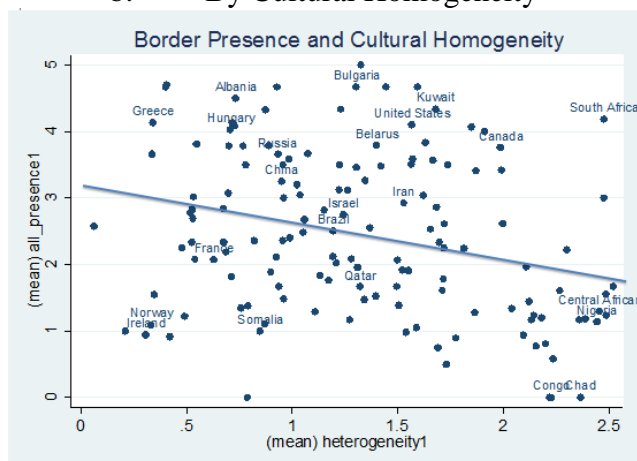


Figure 4: Border Crossings and States Presence World Wide. *N = For each border crossing, N represents the accumulated value of 12 measurable binary variables (0 for Yes, 1 for No) indicating higher state presence as N increases.

a. By GDP/Capita



b. By Cultural Homogeneity



c. Compared to Neighbor

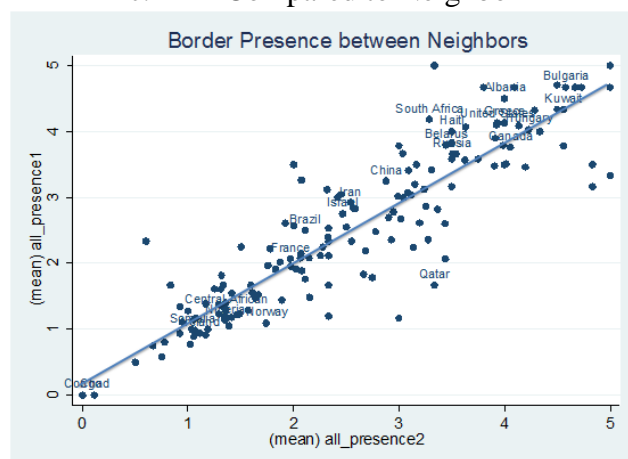


Figure 5: States' Average Presence at Border Crossings

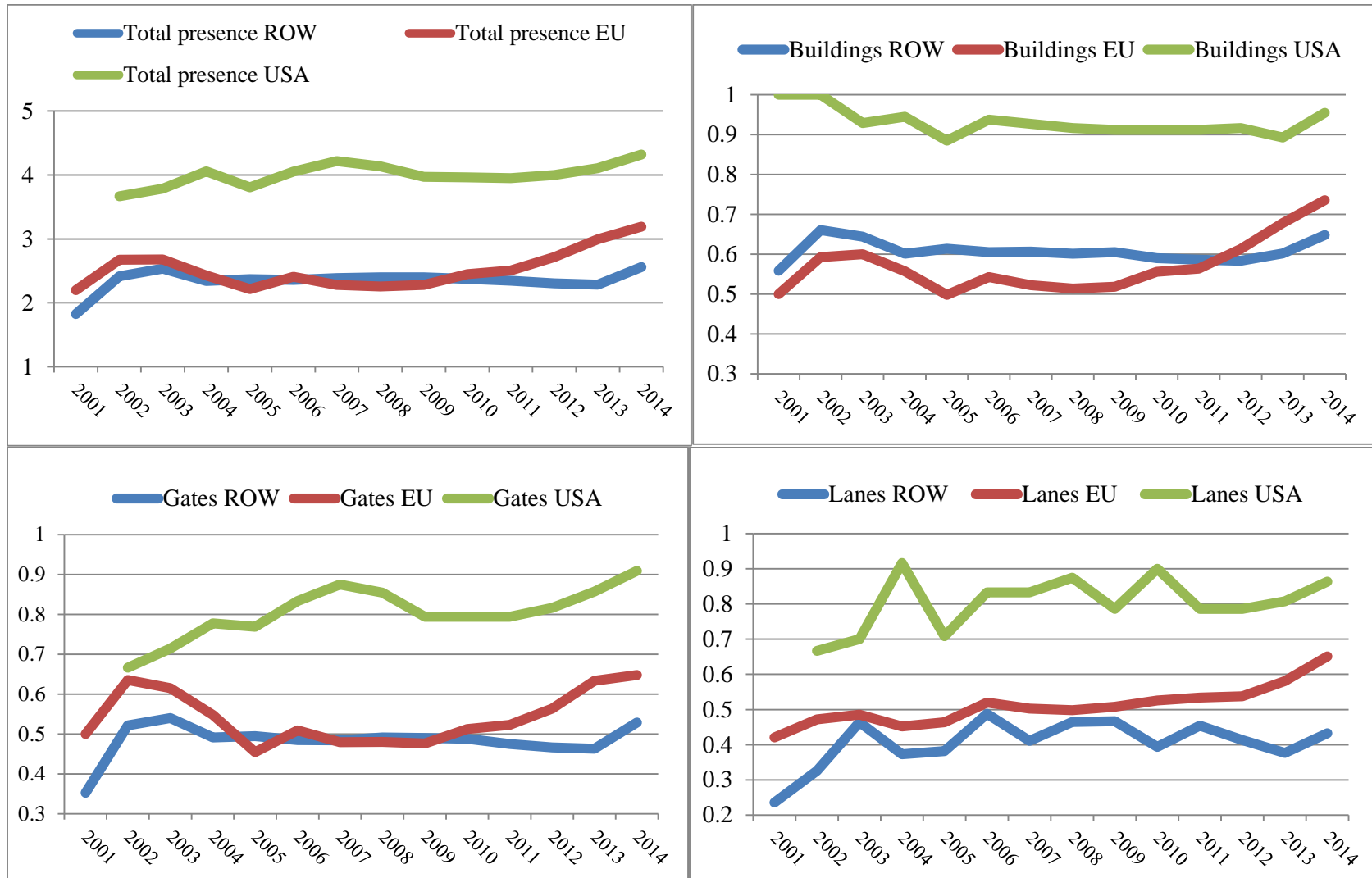


Figure 6: General trends in official presence at border crossings over time. “Average total presence,” and the probability of observing official buildings, gates, and inspection lanes at the border crossing.

EXPLANATORY VARIABLES:	(1)	(2)	(3)	(4)
Total presence, neighbor	0.625*** (0.022)	0.630*** (0.022)	0.630*** (0.022)	0.623*** (0.022)
Log of GPD/capita	0.284* (0.158)	0.321* (0.165)	0.280* (0.167)	0.281* (0.157)
Difference in log GDP capita (state1-state2)	0.096*** (0.033)	0.090** (0.035)	0.093*** (0.034)	0.099*** (0.033)
Cultural heterogeneity	-1.34*** (0.444)	-1.29*** (0.450)	-1.33*** (0.450)	-1.31*** (0.433)
Log of distance to state's capital	-0.090** (0.0441)	-0.090** (0.0454)	-0.099** (0.0453)	-0.089** (0.0441)
Neighbor's civil war		0.0311 (0.0238)		
International war			0.0663 (0.0567)	
Difference in Population density (state1-state2)				0.000350* (0.000187)
Constant	0.433 (1.269)	5.62e-05 (1.378)	0.472 (1.408)	0.422 (1.267)
Observations	1,660	1,630	1,613	1,660
R-squared	0.640	0.639	0.637	0.641

Table 1: Correlates of state presence at border crossings. Results of an OLS regression model using directed dyads; dummy variable for state1 (not reported). Unit of analysis is the border crossing. Robust standard errors clustered on border pair (of which there are between 419 and 447) in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1) gates	(2) buildings	(3) total presence
Neighbor's Gates	0.638*** (0.0190)	--	--
Neighbor's Buildings	--	0.643*** (0.0191)	--
Neighbor's total presence	--	--	0.664*** (0.0184)
Log of GPD/capita	0.0540*** (0.0167)	0.0262* (0.0149)	0.0764*** (0.0284)
Difference in log GDP capita (state1-state2)	0.0400** (0.0204)	0.0174 (0.0176)	0.0600* (0.0344)
Cultural Heterogeneity	-0.0622* (0.0343)	-0.0646** (0.0321)	-0.131** (0.0586)
Political violence, both states	0.0511 (0.0347)	0.0729** (0.0315)	0.126** (0.0596)
Democratic	-0.0113*** (0.00316)	-0.00729** (0.00298)	-0.0189*** (0.00542)
Remote (distance to capital, major city)	-0.00355* (0.00181)	-0.00300* (0.00163)	-0.00565* (0.00307)
Constant	0.0773 (0.180)	0.340** (0.163)	0.389 (0.306)
Observations	1,602	1,588	1,588

Table 2: Correlates of state presence at border crossings. Results of multilevel model using directed dyads. Unit of analysis is the border crossing. Models allow for random effects at the level of the state, its bordering neighbor, and the border pair. Robust standard errors.

*** p<0.01, ** p<0.05, * p<0.1

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