

**Border Orientation in a Globalizing World:
Concept and Measurement**

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Prepared for the Annual Conference of Social Science History Association
Panel on “Theorizing Borders: Multiscalar Approaches”
Phoenix, AZ
November 9, 2018

Please note: This is an early draft based on partially collected and coded data. All comments and suggestions are welcome, but please do not quote without the authors’ permission.

Border Orientation in a Globalizing World: Concept and Measurement

Borders have become a salient component of high international politics. Territorial jurisdiction – the exclusive right of a state to decide who and what enters its political space, and on what terms – has long been considered one of the key aspects of sovereign statehood. States have historically fought bloody battles to establish their authority over space. Territorial conflicts are commonly cited as one of the most important causes of war between states. Despite the globalization of markets, of information and of various security threats, international borders appear to be as important as ever in contemporary politics and policy.

Social scientists have an opportunity to sharpen their conceptual tools to study international and domestic borders. National borders have varying meanings for states and societies around the world, and these meanings animate political contestation and inform immigration, trade and security policy discussions nationally and regionally. These policy domains are often discussed as though they are independent. Instead, we advance a more general concept that we label *border orientation*. We develop this concept to describe the extent to which the State is committed to the authoritative display of capacities to control the terms of penetration of its national borders, and argue it captures fundamental values that both affect and are affected by a range of political processes and policies.

Border orientation taps a phenomenon that is sticky without being static; functional yet symbolic; general and yet relevant to specific issues. In its most essential form, this concept captures the inclination for authoritative displays of state control at the border. Such an unobservable inclination can be approximated by major physical investments along the border. We argue such features reflect how states attempt to filter and project their authority along the edges their sovereign territorial jurisdictions. The built environment represents a concrete effort – *functional and symbolic* – to control the terms of entry into (and potentially exit from) a national jurisdiction. These features constitute perimeter and access systems that can be analyzed as authoritative expressions. *Border crossings* denote filtering authority at ground-based points of entry and exit. Walls and fences are structures that signify a desire to protect, deter and contain along the state's perimeter. Since border orientation is unobservable, we construct a hierarchical latent variable model for measuring this trait at three levels, that of the *state* as a whole, for contiguous *country-pairs*, and even at the level of *individual border crossing sites*. These features convey a polity's orientation toward The Other – a neighbor, a neighboring region, perhaps even the rest of the world.

Border orientation is important to the study of politics because borders are fundamental institutions of governance. Internationally, they are the fundamental legal institutions in international law that constitute the units of the state system: territorial based nation-states.¹ Domestically, they are increasingly salient governance spaces, where governments display their ability to make and enforce rules, to deliver or deny services and to supply public goods. Governance can be accomplished through incentives (fines and rewards) as well as through physical structures of control (the built environment). We develop the idea that the latter is an

¹ Territorial integrity and the inviolability of state borders was written into two of the international “constitutional” documents of the twentieth century, the Covenant of the League of Nations (Article 10) and the United Nations Charter (Article 2.4). By the mid twentieth century, it constituted a core norm of international relations (Zacher 2001).

especially important cue for the nature and quality of governance. International borders, like other areas of political and social life, are governed via “infrastructures,” or routinized ways that information and commands are transmitted by the state. Borders and their governance are central to the social sciences because, as Mann has argued, political power *is* the territorially centralized regulation of social life (Mann 2008, 1984, Fukuyama 2013).

In this article, we hope to motivate a rediscovery of borders for the study of social relations, and especially politics. To do so, we conceptualize the phenomenon of “border orientation” and discuss how it is reflected in the built environment at and very near countries’ borders. As a spur to empirical study, we introduce new data gleaned from satellite imagery that allows a global view of major points of entry and exit on land and a novel strategy for measuring border orientation. We interpret this latent (unobservable) orientation along a continuum representing authority to filter territorial penetration. Importantly we show that this border orientation is conceptually and empirically distinct from a state’s wealth, military capability, and trade or immigration policies. We suggest instead that border orientation is a useful lens through which a range of national anxieties, aspirations, and capacities may be analyzed. That these anxieties are expressed at national borders in an age of globalization urgently requires theorization and innovative measurement.

I. International Borders and State Authority

The importance of borders in national and international life

In the 1990s, globalization was heralded as a process by which state borders would gradually lose their meaning. Visionary business strategists thought integrating markets contributed to a “borderless world” (Ohmae 1990) that rendered state authority much less relevant than in the past. 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. 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). Transnational threats – from insurgencies to cyber threats – are said to have “de-bordered” national security in new ways (Goodman and Portnoy 2009). The metaphor of a networked world displaced a territorialized and politically bordered one (Castells 2000).

Claims of the end of territorialized state authority are premature, as are images of a debordered world. Indeed, state borders are among the most globally recognized and revered institutions of any in human social relations (O’Dowd 2010, Diener and Hagen 2009, Diener 2012). International relations scholars have for decades researched border conflicts, settlements, demarcation, and territorial division.² 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,

² 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 Henehan 2001); some research has also shown that settled borders have pacific effects (Owsiak 2012), and by some accounts even facilitate democratic development (Gibler 2007). 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.

Buhaug and Gates 2002, Salehyan 2009, Gleditsch, Salehyan, and Schultz 2008). Their salience is underscored by the fact that between 2011 and 2015, about 48% of the violent incidents in civil and interstate conflicts occurred in a very narrow 100 km band around the world's international borders.³

Yet, interstate war, military confrontation, and political violence misses much of what goes on along state boundaries. Peter Andreas argues persuasively that traditional security concerns are no longer the major focus of border activities: "...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....Geopolitics is alive and well, but is increasingly based on policing matters" (Andreas 2003, 82).

International borders are crucial regulatory sites for economic relations as well. They are spaces where state infrastructural power is on display through the capacity to examine visitors' documents, inspect goods, collect taxes, offer services and impose rents. Despite "globalization," these border activities are substantial: The World Bank estimates that while border compliance is quick and low cost in the wealthiest countries, it takes an average of more than 106 hours just to comply with border procedures⁴ upon entering India, 49 hours for Brazil, and nearly 26 hours for China.⁵ For migrating humans, international borders seem increasingly to be asymmetrical jurisdictional dams: in 1990, the *difference in population density* on each side of a 5km radius from a major international border crossing border was a global average of almost 31 persons/km², while the disparity in 2010 had grown to about 46 persons/km². Such density differentials at the border suggest at least minimal state presence as a means of control. Of course, not all states have the infrastructural capacity to filter effectively. But even if unwanted entrants find ways to evade these such controls, state actors perform a "normalizing" function, by "imposing a rudimentary order with only limited sanction on those entering the country..." (Chalfin 2010, 72).

A third reason states maintain a salient border presence is cultural: to maintain a clear national identity. Territorial delineation and nation-statehood formation were largely co-constitutive processes; and interstate borders defined, reflected and helped to solidify national identities (Atzili and Kadercan 2017). Goemans (2006) argues that territorial designations are convenient ways for identities to form that address problems of collective action. National identities almost always have a territorial basis (Smith 1991, Gibler 2012). Ironically, the symbolic and identity functions of borders have increased alongside processes of globalization (Rudolph 2005). Ethnographies from the Caucasus to the Iberian peninsula confirm the claim that national borders have significant consequences for cultural identities, and are perceived to pose threats to these identities when they are liberalized (Pelkmans 2006, de Fátima Amante 2013).

While some may view territorial boundaries as "functionally similar,"⁶ empirically the world's international borders are as varied as its nation states. Forty independent states have no

³ Conflict data are obtained from the Uppsala Conflict Data Program (Program's Georeferenced Event Dataset (Croicu and Sundberg 2017). Geo-coded data on international borders (without coastlines) is from Natural Earth Data public domain map dataset (<https://www.naturalearthdata.com/>).

⁴ These are defined including customs clearance, inspections and port or border handling at the most widely used port of entry. It excludes documentary compliance, which is measure separately. See the World Bank's methodology at <http://www.doingbusiness.org/methodology/trading-across-borders>. (Accessed 7 August 2018.)

⁵ The complete dataset on the World Bank's Trade Across Borders measures can be found at <http://www.doingbusiness.org/data/exploretopics/trading-across-borders>. (Accessed 7 August 2018.)

⁶ In the sense that Waltz has used this term to describe subunits of the international system (Waltz 1979).

land borders. For those that do, they vary in length from the 8,893 km US Canadian border, to the 150 meters separating Namibia and Zambia. China's borders with Burma can be dated to a century BC, while Saudi Arabia and Qatar finalized their mutual border in 2009. The United States/Canadian border separates two of the most equal neighbors in terms of GDP per capita in the world; the Botswana/Zimbabwe border separates two of the most unequal. Given this heterogeneity, we should expect countries to have varying orientations toward controlling their borders, reflecting a broad mix of national, dyadic and localized concerns.

In short, international borders are crucial to local and national life, to neighborly relations and to order in the international community. As institutions that define the modern territorial nation-state and make collective action possible, states and their societies have existential stakes in border meanings and policies. Globalization has not elided the importance of international borders, nor has the existence of multiple and moving borders (Kinnvall and Svensson 2015, Zaiotti 2016) done much to reduce their salience. These days, most international borders are neither politically contested nor militarized, and yet many – though not all – bristle with the symbols and structures of state authority.

The Concept of Border Orientation

Recognized international borders everywhere share some common features, functions, and juridical status internationally. And yet states have varying orientations toward controlling their borders. Some invest massive sums of money to project control over borders, while others do virtually nothing. We argue that this variation reflects a state's underlying "border orientation," defined as *the extent to which the State is committed to the public and authoritative display of control over territorial entry and exit at its national borders*. This conception captures displays of the authoritative right and responsibility of the state to filter the movement of goods and people across its borders.

Border orientation is a spatial aspect of the exercise of state authority. It is a compound concept that combines the authority of the state to control and the location where that control is exercised. State control may be justified on the basis of protection (the paternal state) from foreign influence, culture, ideologies, violence, disease or other "dangers." State control may also be justified on the basis of public goods provision (the political economy state). Here the claim for border control rests on the responsibility to provide positive public goods, from the basics of democratic governance to a comprehensive public welfare state. These purposes do not have hard edges; we use them to illustrate the range of theories of the state that can justify an authoritative display at the border.

The *spatial* character of this authority is central to our concept. We are interested in describing a phenomenon that reinforces, possibly even reifies, the political boundary of the state as the appropriate place to concentrate authoritative display. There are several reasons for this spatial concentration. First, it is one of the least contestable, most legitimate and therefore least costly location to do so. Filtering and state control can certainly be exercised internally, but it is often criticized as an encroachment on civil liberties.⁷ It can also take place extraterritorially – in foreign airports, on the high seas, even on the sovereign territory of other states – but at the cost of accusations of imperialism and coercion. International law and norms have buttressed the common conception that every state has the right to "defend its borders" *at* the border. And yet

⁷ For example, see the American Civil Liberty Union's critique of internal filtering at <https://www.aclu.org/other/constitution-100-mile-border-zone>. (Accessed 14 August 2018).

not all in fact do so. To describe when and where this authority is exercised is a major purpose of this paper.

The concept of border orientation also includes an aspect of physical commitment and display. Governing through incentives (rules, law, threat of punishment) is ubiquitous, but border orientation is also based on “logistical power” – a form of power that derives from shaping and controlling the physical world (Mukerji 2010). The ability to control the mobility of people and goods “is premised on infrastructural strength that operates through increasingly territorializing means” (Martin 2012). The power to have a significant and systematic impact on the physical environment is one way that states exert their influence on social and political relationships. We see physical border structures as neither aberrations nor inevitabilities, but rather as a part of how political authority is displayed and exercised (analogously, see Gregson, Crang, and Antonopoulos 2017).

We define border orientation along a relatively unified dimension based on controlling the terms of entry and exit to and from the national territory.⁸ However, our conception is general about the nature of that access, whether aimed at the entry of products, migrants, or violence. Additionally, border orientation is typically stable over time. Attempts to publicly exert control over a border region often requires substantial investments in physical infrastructure. Political rhetoric or policy fluctuations may change in responses to emergencies, but a commitment to state presence at the border often requires the development and deployment of significant resources. Material changes at the border are therefore typically observed over years, rather than days.

Border orientation can be conceptualized at multiple levels, the highest of which reflects a *state*’s broad orientation toward its set of neighbors, or possibly the rest of the world. There are also lower-level components to border orientation. Some states seek to project more control over borders with *particular neighbors* versus others. While the United States seeks to display control along both of its borders, it arguably goes to greater lengths to demonstrate its control along its southern border than it does in the north. Similarly, states along the edges of the Schengen zone do more to project control over their outer borders than they do with their EU partners. Even along a particular border, certain *crossings* may vary in terms of displayed control. Some states that are highly committed to projecting control over its boundaries may have exceptional crossings where state presence is low (Big Bend National Park where Texas borders Mexico is an example). The higher a state’s overall orientation, however, the rarer such exceptions will be.⁹ In short, while border orientation can be conceptualized as a general feature of a state and its borders, it also has a dyadic, and even local component.

Authoritative display is not inherently utilitarian – it can and often does have a symbolic element. Flying a national flag over a port of entry reinforces the idea of the political authority of the state’s agents to permit or to refuse access to the national territory. Border walls and fences too are often symbolic of state control rather than strictly functional (Brown 2010). For whom is the display intended? We are agnostic. Information about border orientation can emit in two directions. It may be directed primarily to foreign audiences, signaling welcome, efficiency, or determination to deter. Or the border’s built features may primarily intend to signal protection,

⁸ States have other interests we are not attempting to capture, such as the cooperative management of border resources or infrastructure development (Guo 2017), which may involve access but only incidentally.

⁹ Just as the political ideology of an elected can be thought of as the proportion of “left” or “right” votes they cast - i.e., Martin and Quinn’s (2004) judicial ideology measure or DW nominate (Poole and Rosenthal 2000) – border orientation can be thought of as the proportion of a state’s border or borders where it seeks to project its presence.

competence, or outward magnanimity for a domestic audience. In many cases, authoritative displays at the border are intended to have a Janus-faced quality, communicating to both internal and external audiences simultaneously.

It is also important to distinguish our conception of border orientation from adjacent meanings. Our conception differs entirely from determinative geographic conceptions; geography does not in itself determine border orientation.¹⁰ We are sympathetic to the importance of bordering as social processes *writ large* (Lamont and Molnár 2002), but we narrow our concept to *state* expressions of these processes. Since we are interested in *displays* of control, we exclude their actual cross-border consequences. That is, orientation as a concept does not encompass policy or structural effectiveness. Nor do we consider covert filtering technologies such as invisible sensors or landmines to constitute public *display*. We are also aware that states often outsource border policies to non-state actors, from private security firms to the volunteer sector (Vasanthakumar Forthcoming), and that international organizations play a critical technocratic role in border management as well (Andrijasevic and Walters 2010), but here our focus is on public bordering expressions by the state's central government and/or its official agents.

A state's border orientation is latent – one cannot *directly* observe a state's commitment to publicly demonstrate control over its borders. We do however observe manifestations of border orientation and we suggest the best proxies are fundamental institutions and investments. The state's presence as reflected in the built environment around borders is a useful, observable indicator. The built environment – poured concrete, buildings, fences, barriers, barbed wire, gates and surveillance capacity – are a crucial *visual* indicator of a state's commitment to control. It summarizes the political purposes of the State and may well reflect those of the broader society. It signifies the belief that controlling entry merits a significant state investment, both at border crossings and along a state's perimeter, where walls and fences may be constructed to deter unauthorized crossing. For several reasons (resource constraints are one) the built environment is not a perfect indication, but it is a useful medium-term clue of a state's orientation toward controlling territorial entry.

Figure 1 presents border orientation along a unidimensional spectrum. At one end states seek to demonstrate little control over their borders. These states might do little other than determine and demarcate the presence of a border. Neither of these is trivial, but they are minimal in terms of signaling an intent to control entry. In the extreme, low filtering makes it hard to determine the existence of an international border on the ground at all. People and goods move freely, unencumbered by state structures or practices. The opposite is true at the other extreme. These states enact claims of tight control over entry and exit, including authenticating documents, carrying out inspections and imposing seizures or detention. These states make great investments to demonstrate control over their borders, which are often marked with walls, fences, and other physical structures. In this sense, states vary along this spectrum in terms of their displayed capacity for filtering at their borders.

¹⁰ We reject one early understanding of “border orientation” as largely determined if not defined by physical geography (Maull 1925). See the discussion in Scott (2016).

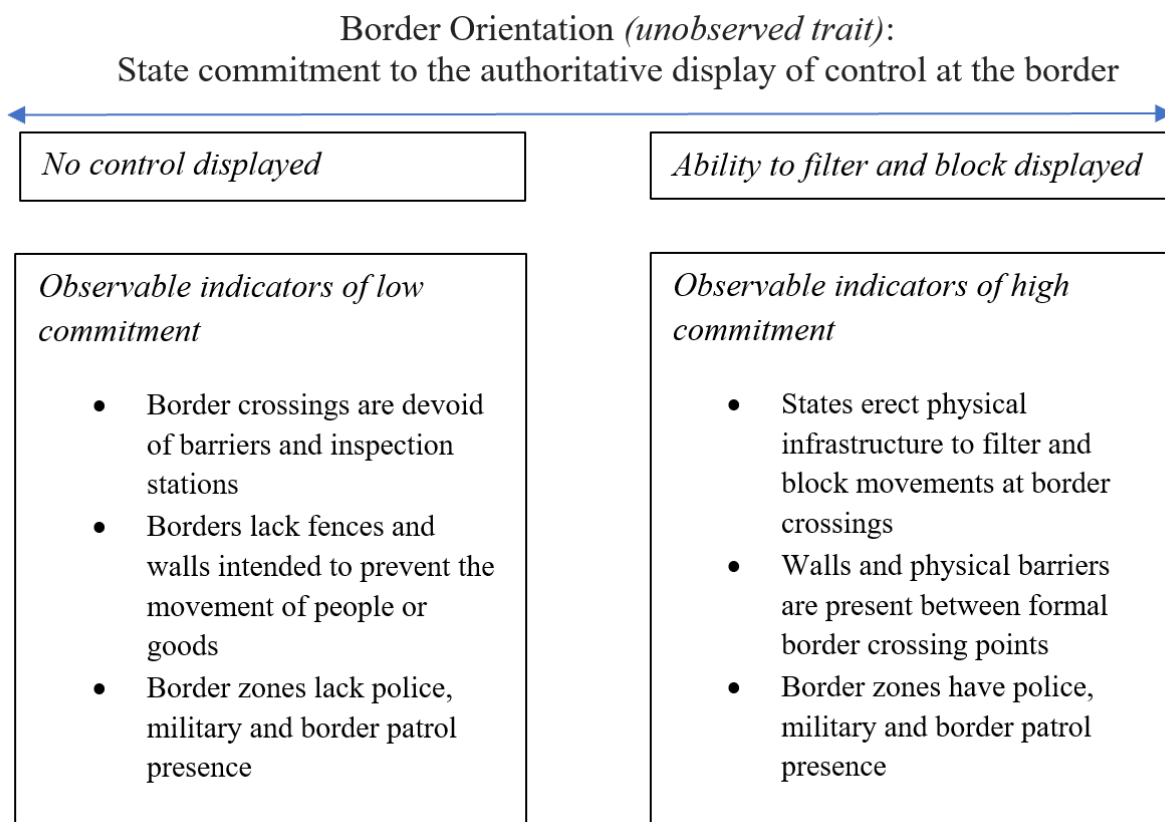


Figure 1: Border orientation is an unobservable state commitment to the authoritative display of control over the terms of territorial entry at or near national borders. The central dimension is a state’s projected control of its border.

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

To explore border orientation, we have created a first of its kind dataset on the physical investments made to control entry at the border. These are of two kinds: architecture at each land port of entry, and every wall or substantial fence built parallel to the border. Together, these structures constitute a system of control meant to channel transnational traffic to official ports of entry for documentation and a decision on entry.

Ordered Access Points: Border Crossings:

Border *crossings* are especially interesting political, economic and geographic phenomena. These are the spaces in which states tend to expend the most effort to *filter: to implement a mix of policies, structures and symbols that connect and separate, that facilitate and block exit and entry selectively* (Simmons 2017). Satellite images available in the USGS Global GIS database were used to create a worldwide dataset of major highways connecting each pair of

contiguous countries.¹¹ 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 procedure yielded well over a thousand border crossings throughout world (Figure 2), of which a little under one thousand could be visually validated.¹² These crossings generally reflect places where motorized vehicle can cross the border, with at least one paved lane each way.¹³

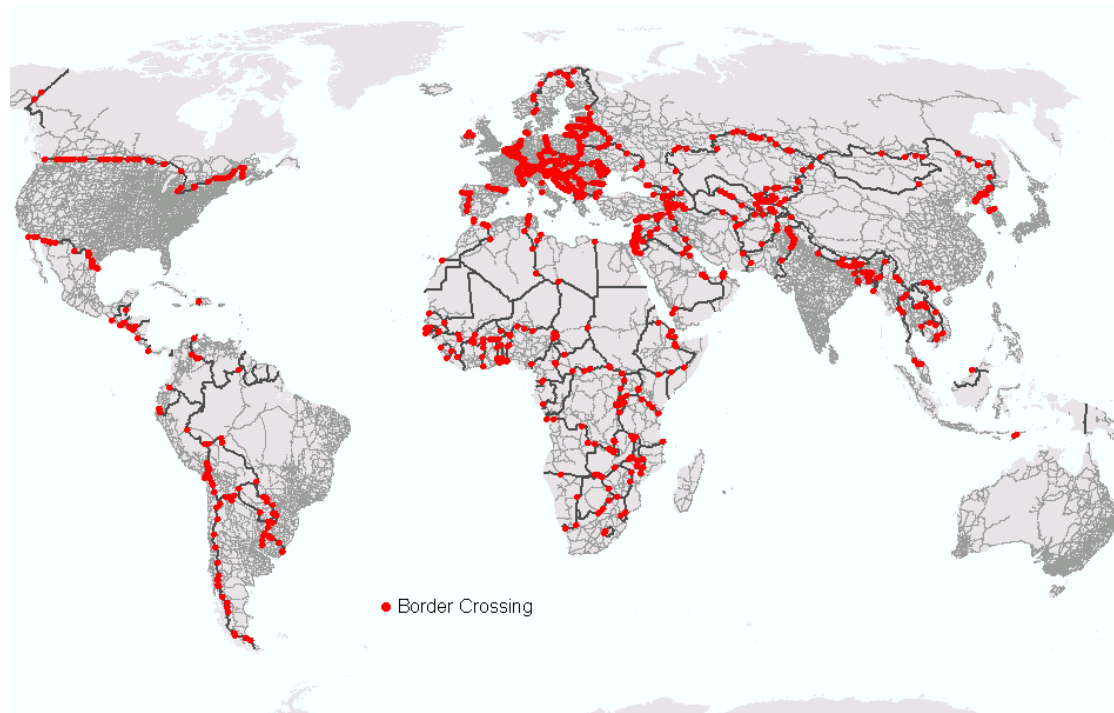


Figure 2: Global Border Crossings - the intersection of major highways and interstate borders on land

¹¹ 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_gr/roads_qk_ref.html. That source yielded approximate 1000 manually verified border crossings. Recently we have acquired data from the 2015 SEDAC global roads database which, when intersected with the Esri Data and Maps World Borders 2015, yielded approximately 9,000 border crossings. We are in the process of merging these data, confirming unique observations and deleting false positives manually. We anticipate a dataset that eventually contains between 7,000 and 8,000 verified international border crossings worldwide.

¹² 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 most cases, they could confirm the transection of an international border by a highway. Each human investigator then 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.

¹³ We remind the reader that the 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. We do not capture every dirt lane or trail head on earth that might lead across an international border; we do not detect underground tunneling, off shore transportation routes, train tracks or air traffic. We also do not observe every mile of an international border.

Next, we downloaded satellite imagery of the area within 10 kilometers of each border crossing.¹⁴ 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 border images are clear and frequent. Images of remote parts of the world are a low priority for paying customers and therefore 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 did not use these border crossings in the analysis below. The visual corpus is primarily a *cross-section* of images¹⁵ based on roads in existence by 1995 and images of the built environment produced between 2012 and 2015.

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 symmetries or asymmetries in the built environment on each side. Conceptually, we were looking for evidence of a displayed proclivity to filter persons, goods, and ‘threats’ at the border crossing. Such a proclivity implies that the state would likely post personnel and equipment near the border.¹⁶ Thus, the presence of *official looking buildings*¹⁷ is our first indicator of a built environment to facilitate filtering.

Second, we seek evidence of a state effort to slow, stop, and/or inspect vehicular traffic, specifically, *barriers or gates* at or proximate to the roadway that could be used to control traffic.¹⁸ Next, we looked for evidence of a *capacity to inspect* incoming vehicular traffic,

¹⁴ We relied primarily on Google Earth to collect these data, but in instances where satellite imagery was poor we also searched Bing and Yandex.

¹⁵ Time series collection is ongoing, but the problem of differential availability around the world is greatly amplified.

¹⁶ While there are many border crossings that are supplemented by border camcorders 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.”

¹⁷ 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.)

¹⁸ 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).
- 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.

including turnout areas or *split lanes*, where traffic can be routed for detailed inspections.¹⁹ 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 a concern. 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.²⁰ Every coder was instructed to indicate how certain they were about each specific coding (unsure, moderately sure, very sure). Since we cannot eliminate the possibility that coders might disagree about what they see at the border crossing, we used multiple coders, used increasingly precise instructions, and, in the end, recorded coder uncertainty.

Figure 3 depicts two extreme (and easy to code) examples. The United States has invested tremendously in symbols and capacity to filter activities at many of its border crossings with Mexico. Multiple lanes, inspection stations, barriers, and buildings are all arrayed to improve the chances of controlling across this political space. Parts of Africa provide a stark contrast, as shown by a remote border crossing between Burkina Faso and Togo.

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



a. *Burkina Faso and Togo (Latitude: 10.977377, Longitude: 0.511543)*

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

¹⁹ 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.

²⁰ 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).



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

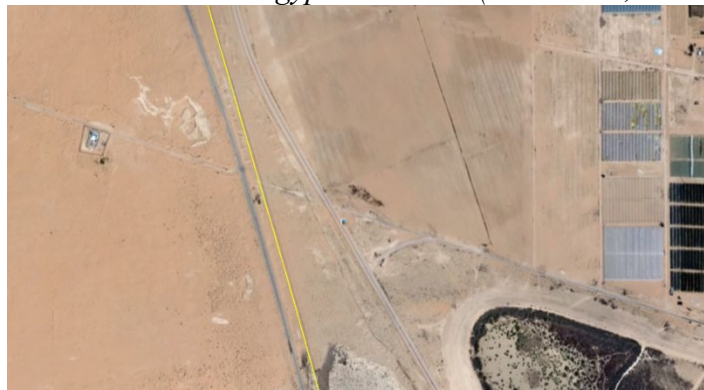


Figure 3: Images on which Border Orientation Indicators are based; "Thick" and "Thin" state presence at border Crossings

A time-series variant of the border crossings data using historic satellite imagery data ranging from 1990 to 2018 is currently underway. Of the 935 border crossings identified above, single-coder classification for a random sample of 573 crossings have been completed, recording state structures across time. We have combined these indicators into a five-point additive index, where a value of 0 corresponds to the absence of each of the features, and a value of 4 corresponds to the maximum presence of each. Values are interpolated for years in which imagery for a crossing was missing. Figure 4 displays changes in the mean value for official presence at each border crossing, both globally and within the Schengen zone, where, until recently, the trend has been countered to the global average. Because satellite imagery is sparse throughout much of the 1990s and early 2000s, we limit our sample to 2004-2018.²¹ The two trends are telling. First, the world average increase in state official presence confirms our initial intuition that the age of globalization has given way to a growing concern with filtering movements across international borders. The countervailing, trend we observe in the Schengen zone also indicates that this broader shift is neither inevitable, nor simply the result of infrastructural cumulation. Like the destruction of the Berlin Wall, the Schengen case reminds us

²¹ We also omitted border crossings where satellite imagery became available after 2004. We did so to prevent us from conflating changes in border orientation at particular crossings over time with changes in cross-sectional coverage in satellite imagery data. Trends are robust to using alternative cutoff years.

that infrastructure can be ripped away as easily as it is built. Whether the Schengen zone can continue to buck the global trend remains to be seen, and the modest increase we observed in 2017 seems to confirm the Western European commitment to open borders is under threat.

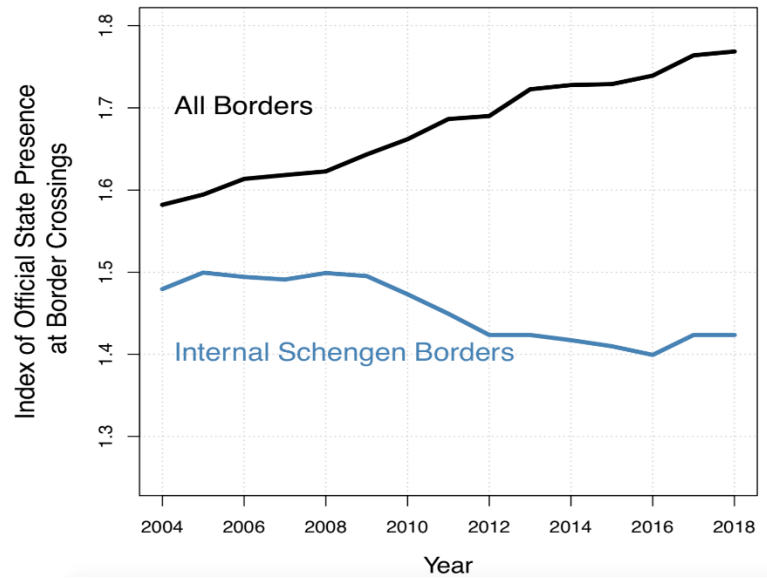


Figure 4: Official State Presence at Border Crossings, 2004-2018. From Google Earth imagery, based on a random sample of 573 border crossings; using a 5-point additive index (0=no presence; 4= maximal presence), based on barriers, buildings, and inspection areas.

Perimeters: Walls and Fences

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, Vallet 2016). In order to systematically document this trend, we conducted a manual expansion of the Carter and Poast (2017) data using nearly identical coding criteria. Our search was restricted to border walls located within about 10km along each side of an international borders. We began by searching official government documents, as well as local and international news sources for information relating to interstate border walls. We then recorded the wall’s construction and, when relevant, destruction dates, whether the structure was better classified as a wall or fence, and whether satellite imagery of the wall was available.²² Initial efforts are underway to geolocate these data, but for the analysis that follows we have dichotomously coded for the existence of a border wall or fence, noting which country was responsible for its construction.

Using these procedures, we have identified an additional 37 walls. Our initial searches targeted walls located in Africa, Latin America, and the post-Soviet space. Two patterns are notable. First, wall construction appears to be occurring unevenly across the globe. We found an additional ten walls in Africa, six walls in Latin America, and 21 in post-Soviet countries. Second, the acceleration of wall construction has not abated in recent years (Figure 5). In most cases, construction was either ongoing or began after 2014, the final year captured by the Carter and Poast (2015) data.

²² A small number of fences that appeared to deter the movement of unaccompanied animals were excluded, because these structures did not appear to target the movement of humans or impede economic activities.

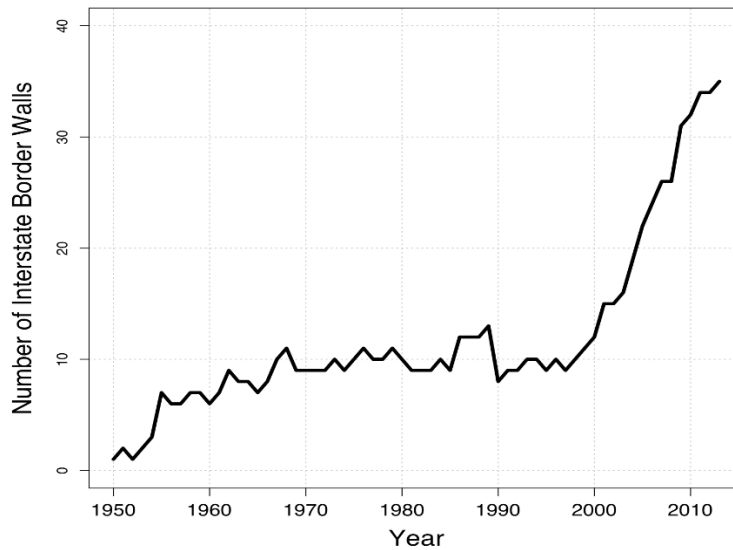


Figure 5: Number of Border Walls in Existence, based on authors’ augmented dataset originally created by Carter and Poast (2015).

In-Depth: Police Stations

Finally, we consider the possibility that states’ official presence is not right at the border; it may be in a border zone of control within a state, but designed basically for purposes discussed above: to control the terms of entry. Police have a role in such control. While they are structured differently across countries – some are centrally controlled at the state level, others are localized; some are civil while others are closely connected to the national military – policing institutions are an important aspect of state authority we are interested to capture. Policing is a “special source of the state’s monopolization of legitimate force on its territory” (Reiner 2010). Police are the presumptive national institution charged with enforcing the law and maintaining internal order (Brewer et al. 2016).

Border areas have long been associated with smuggling, trafficking and contraband of unwanted goods and people (Andreas 2015, Dube, Dube, and Garcia-Ponce 2013, Munro 2012). Especially since 9/11, ordinary police have become increasingly involved with the enforcement of state immigration laws, even in states, such as the United States, where such responsibilities have traditionally been outside of their job description (Wishnie 2003). Police have become central to the thickening institutionalization of cooperative “integrative border management” practiced in Europe and elsewhere (Bigo 2014). To the extent that the border is viewed as a place where crime and criminals must be deterred, police presence at and near the border has become a serious issue for many countries.

Where are police located? In contrast to border walls and border crossings, investments in policing are made throughout national territory. We assume they are arrayed spatially according to which locations are thought to need policing. Population centers are an obvious priority (Figure 6).

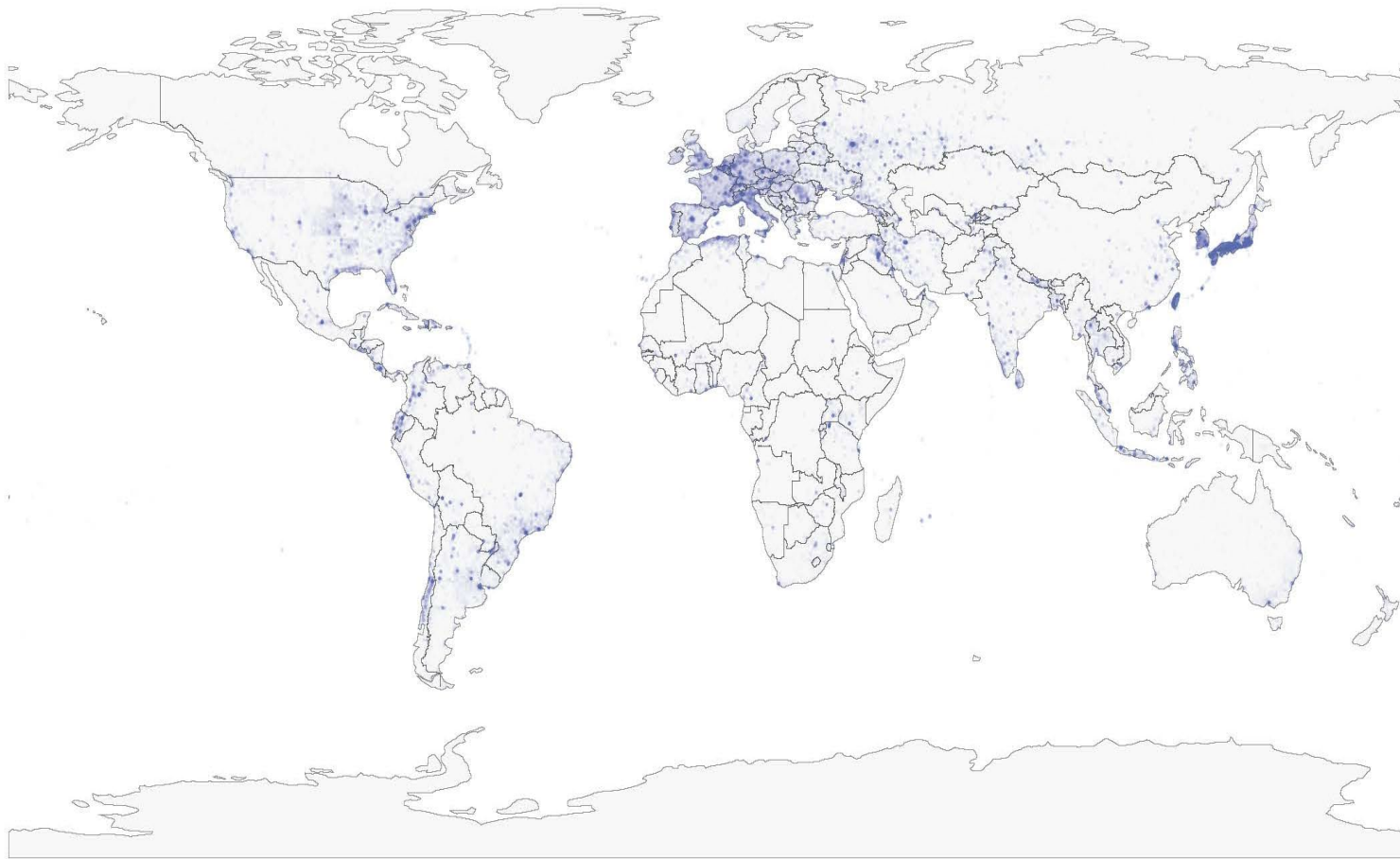


Figure 6: Police Presence. Source: Openstreetmap, https://wiki.openstreetmap.org/wiki/Map_Features#Amenity (see entry for police)

Where international borders themselves are increasingly perceived as spaces of criminality, they are also candidate areas for enhanced policing. Geocoded data on police stations world-wide are derived from Google maps street views, scraped in September 2018. These data therefore come with all the caveats inherent in the voluntary crowdsourcing data generating process. But they do give some indication of where police are located. Interestingly, police stations and border structures tend to be complements, not substitutes. The measure of state presence at border crossings described above is strongly and positively correlated with the log of the number of police stations within a 10km radius of the crossing (Figure 7). This suggests that the concerns that drive states to build and maintain a physical presence at their border crossings may also drive the decision to place police nearby as well.

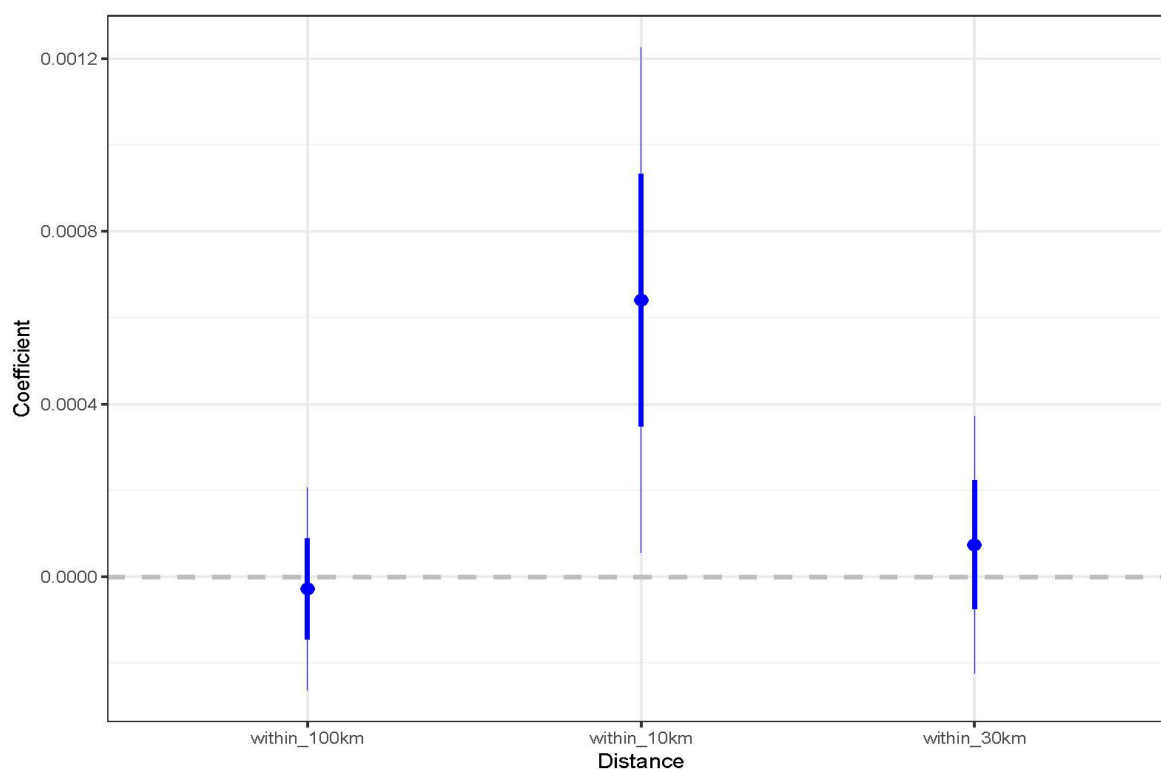


Figure 7: The Relationship between State Presence at Border Crossings and Police Stations. Showing that the log of the number of police stations is positive correlated with the built environment for a radius within 10kms of border crossings, indicative of a complement rather than a substitute presence.

Unlike the other authoritative displays discussed above, policing in border spaces calls for a relative measure; policing investments at or near the border compared to comparable domestic placement. Ultimately, we are interested in supplementing our measure of border orientation with evidence that states are more likely to police their border regions than they are comparable spaces nearer the interior. The next move is to develop a measure of police density in the border zone normalized for population and wealth. One way to do this is to compare police presence in a defined border space to a matched space internally and record the deviation at the border whether positive (indicative of a stronger border orientation) or negative (indicative of a weaker border orientation).

III. A Model of Border Orientation

Using the border crossing and wall data described above, we construct a hierarchical Bayesian latent variable model to generate estimates of each *state*'s border orientation, its orientation toward a specific neighbor across contiguous directed *dyads*, and at the level of *individual crossings*. Latent variable models provide a principled means for generating estimates of an unobservable concept based on its observable manifestations (Reuning, Kenwick, and Fariss forthcoming, Jackman 2009). Border orientation is manifest through a series of indicators that correspond to the built environment at a state's borders. Our set of indicators includes the observation of state presence at international border crossings described above, as well as augmented data building on Carter and Poast (2015) that records whether and when there is a wall present on each side of an interstate border.

Because we observe some variables at the level of the border crossing and others at the contiguous directed dyad, we construct a hierarchical model, indexing each border crossing $i = i \dots, N$ and each directed dyad $d = d \dots, D$. Each of the manifest variables, or "items", outlined in Table 1 is indexed $j = j \dots, J$ and is observed for either a border crossing i or directed dyad d such that y_{idj} is the value observed value of indicator j at border crossing i along a directed border dyad, d .

Table 1: Indicators of State Presence at its Borders

Border Crossing Features	Description
Gate or Barricade	Gates, barriers, or structures that cross the main road that itself crosses the international border. Includes partial structures that appear designed to slow, divert, or stop traffic. Gates are classified as either (1) "covered" or (2) "uncovered." Covered gates are shelter-like structures that straddle the road. Covered gates not only could stop traffic, but under which it is plausible personnel could be stationed to stop traffic, check documents, question travelers
Multi-lane Road	Identifies whether the road crossing the interstate boarder accommodates multiple lanes of traffic.
Split Lanes	Identifies any change in the road way to accommodate search, interdiction, inspection, or pullover areas.

Official Building	Codes whether there are buildings near the border that appear to be “official,” meaning a state-controlled border security facility. When buildings are present, cases are stratified by whether (1) only one building is present or (2) multiple buildings are present.
Directed Border Dyad Features	Description
Border Wall	Man-made structures erected across interstate borders with the intention of denying entry of unwanted materials or personnel. Data on walls are recorded at the directed interstate dyad and are obtained from an expanded version of Carter and Post (2015) data.

Our model generates two estimates of the latent trait. The first, θ_{id} , is an estimate of border orientation at a particular border crossing i along directed dyad d , while the second ξ_d , is a state’s overall orientation toward a particular neighbor.²³ Each of the manifest variables is linked to the latent trait through two conditioning parameters: a “discrimination” parameter β_j and a “difficulty” parameter α_j . The former pertains to each item’s ability to effectively split observations along high and low values of the latent trait, while the latter pertains to the conditional means of each indicator at along values of the latent trait. These are analogous to a slope and intercept or cut point parameters in a conventional regression setting.

The likelihood function for our model can be expressed as:

$$\mathcal{L} = \prod_{i=1}^N \prod_{d=1}^D \prod_{j=1}^J \left[F(\alpha_{jy_{idj}} - \beta_j \theta_{id}) - F(\alpha_{jy_{idj-1}} - \beta_j \theta_{id}) \right]^{v_j} \\ * \left[F(\alpha_{jy_{dj}} - \beta_j \xi_d) - F(\alpha_{jy_{dj-1}} - \beta_j \xi_d) \right]^{(v_j-1)}$$

Where $F(\cdot)$ denotes the logistic cumulative distribution function and v_j is a dichotomous indicator that is equal to 1 if indicator j is observed at the border crossing level and 0 otherwise.

Like all latent variable models of this family, identification constraints are required to resolve location, scale, and rotational invariance; we do so through the assignment of Bayesian priors (Jackman 2009). The latent traits are assigned the following hierarchical prior distributions:

$$\theta_{id} \sim \text{Normal}(\xi_d, \sigma) \quad \xi_d \sim \text{Normal}(0, 1) \quad \sigma \sim \text{Half Cauchy}(0, 2.5)$$

²³ In some analyses below, we also examine state-level orientation by averaging across a state’s border orientation scores with each of its neighbors.

The assignment of a standard normal prior ξ_d is imposed as an identification constraint to fix the scale and location of the latent trait. The prior assignments for the item specific parameters are:

$$\alpha_j \sim \text{Normal}(0, 10) \quad \beta_j \sim \text{Gamma}(4, 2) \quad \beta_{\text{wall}} \sim \text{Gamma}(4, 2)$$

The assignment of a strictly-positive distribution to the discrimination parameters, β , resolves rotation invariance by imposing the assumption that each of the manifest indicators will share a positive relationship with latent state presence at the level of both the border crossing and directed dyad. We assigned a stronger, more informative prior to the wall indicator than we do for the border crossing indicators. Border walls and state presence at border crossings each reflect important, but distinct facets of border orientation. The stronger prior on border walls was intended to prevent the model from under-weighting the importance of border walls due to the multiplicity of crossing-based indicators. Auxiliary analyses indicate this decision led to only modest changes in the latent estimates.

We estimate the model using RStan, a Bayesian modeling program.²⁴ Sufficient samples were obtained after running four parallel chains for 1,000, with the initial 500 from each discarded as burn-in. Trace-plots and \hat{R} statistics were consistent with convergence.

Figures 8, 9 and 10 displays global maps of the border orientation estimates at the border crossing, border dyad, and state level, respectively. At the crossing and dyad level, we report the average orientation score on each side of the border. Across all maps, low filtering (low border orientation scores) is displayed in green and high filtering is displayed in red. The maps confirms many intuitions. Thanks to the Single Market and 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 crossings in Sub-Saharan Africa exhibit sporadic to no government displays of control. But clearly 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 whose geography constitutes natural barriers. The series of green points along the crest of the Southern Andes suggests that states do not put resources into guarding borders that naturally guard themselves. Finally, State presence at border crossings is a strategy largely used by the wealthy. Infrastructural power is reflected in North America, the outer edges of Europe, and South Africa.

IV. Validation

For our measure to have analytic purchase, it must be valid (Adcock and Collier 2001); it must adequately reflect the underlying concept of border orientation. We take several steps to validate our model. We begin with an analysis of model fit through posterior predictive checks (Gelman and Hill 2006). This involves generating simulated data sets from a model's parameter estimates and then comparing these simulated data to observed data. Because we do not observe the latent traits themselves, this exercise is targeted at reproducing the aspects of border orientation we do observe. Thus, we aim to accurately reproduce each of the observed indicators

²⁴ Stan Development Team (2018). RStan: the R interface to Stan. R package version 2.17.3. <http://mc-stan.org/>.

reported in Table 1, making the unit of analysis the observed border feature. We begin by sampling 1,000 simulated draws, indexed s from the posterior distributions of the latent traits (θ_{ids}, ξ_{ds}) and item specific parameters $(\beta_{js}, \alpha_{js})$, and then generating predicted values for of each manifest indicator $\widehat{y_{ids}}$. We then compare the distribution of these predictions against the observed data, y_{idj} . When a model fits the data well, these two distributions will share similar properties.

The results from this analysis are displayed in Figure 11. A histogram of the observed distributions for each of the manifest indicators is displayed in blue. The orange lines correspond to the 95 percentile range of values obtained from histograms generated from the simulated data sets. In every case the observed distribution is within the range of distributions obtained from the posterior predictions. These results validate the modeling decisions used to link the latent trait to the manifest indicators.

A second validation of the concept of border orientation involves distinguishing it from adjacent but distinct concepts. Perhaps we are picking up little other than bureaucratic red tape or structures for rent seeking at the border. We are trying to measure a far broader concept: commitment to the authoritative display of capacities to control the terms of penetration of the

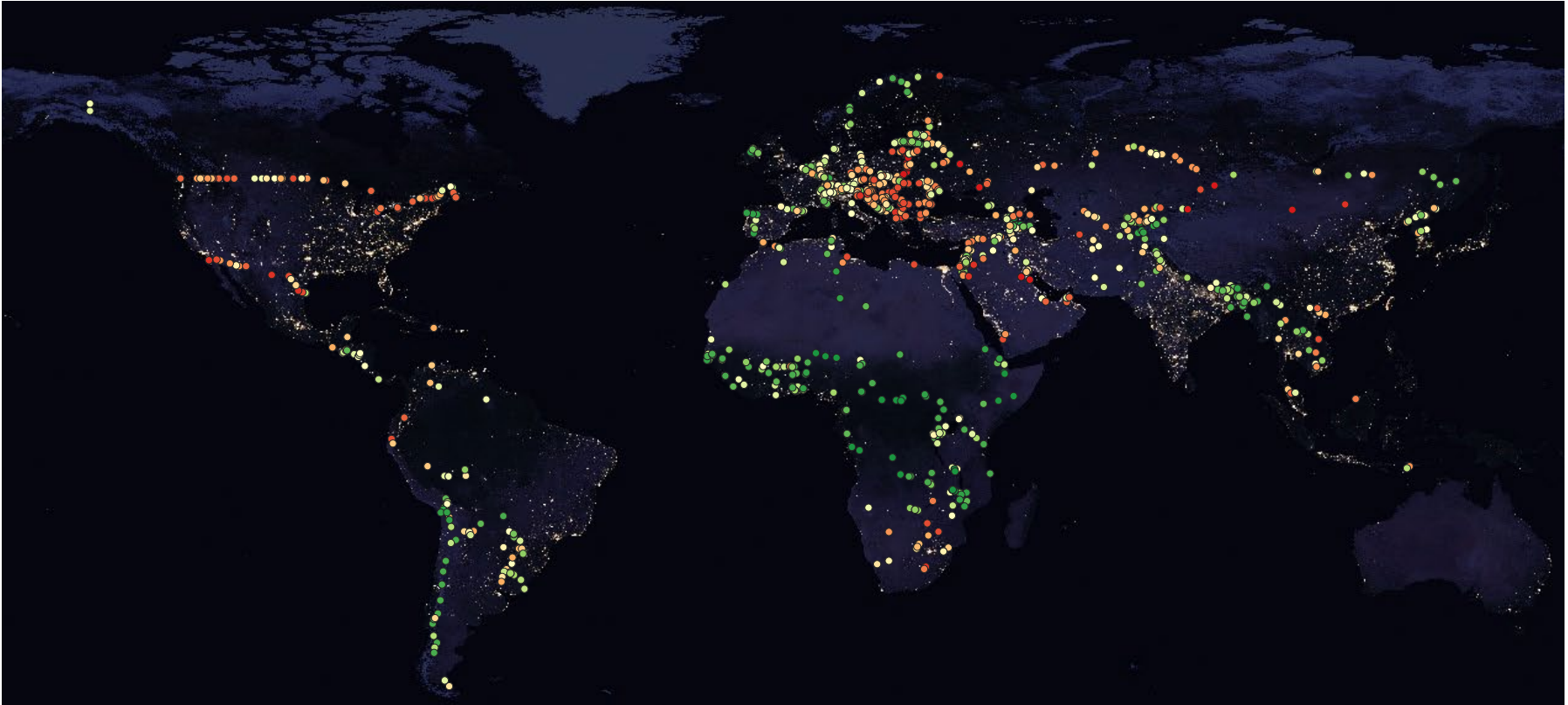


Figure 6: Border Orientation at the Level of the Border Crossing. Border crossings are displayed as points, color coded according to average latent border orientation scores from each state's side of the border. Green corresponds to minimum filtering and red corresponds to maximum filtering at the border crossing

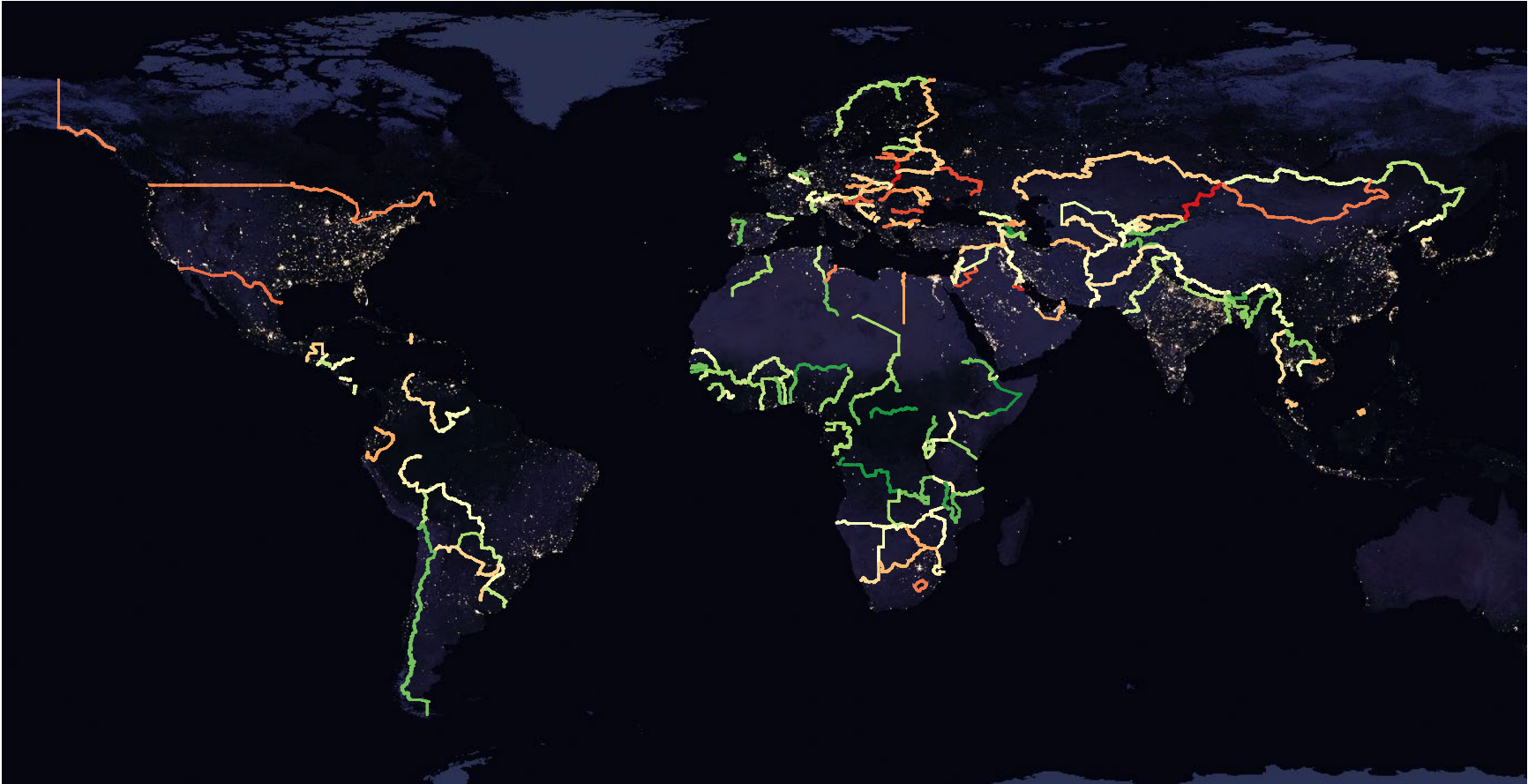


Figure 7: Border Orientation at the Dyad Level. Land Border dyads are displayed according to the average border orientation score on each state's side of the border. Green corresponds to minimum filtering and red corresponding to maximum filtering at the border. Borders without international crossings are left blank.

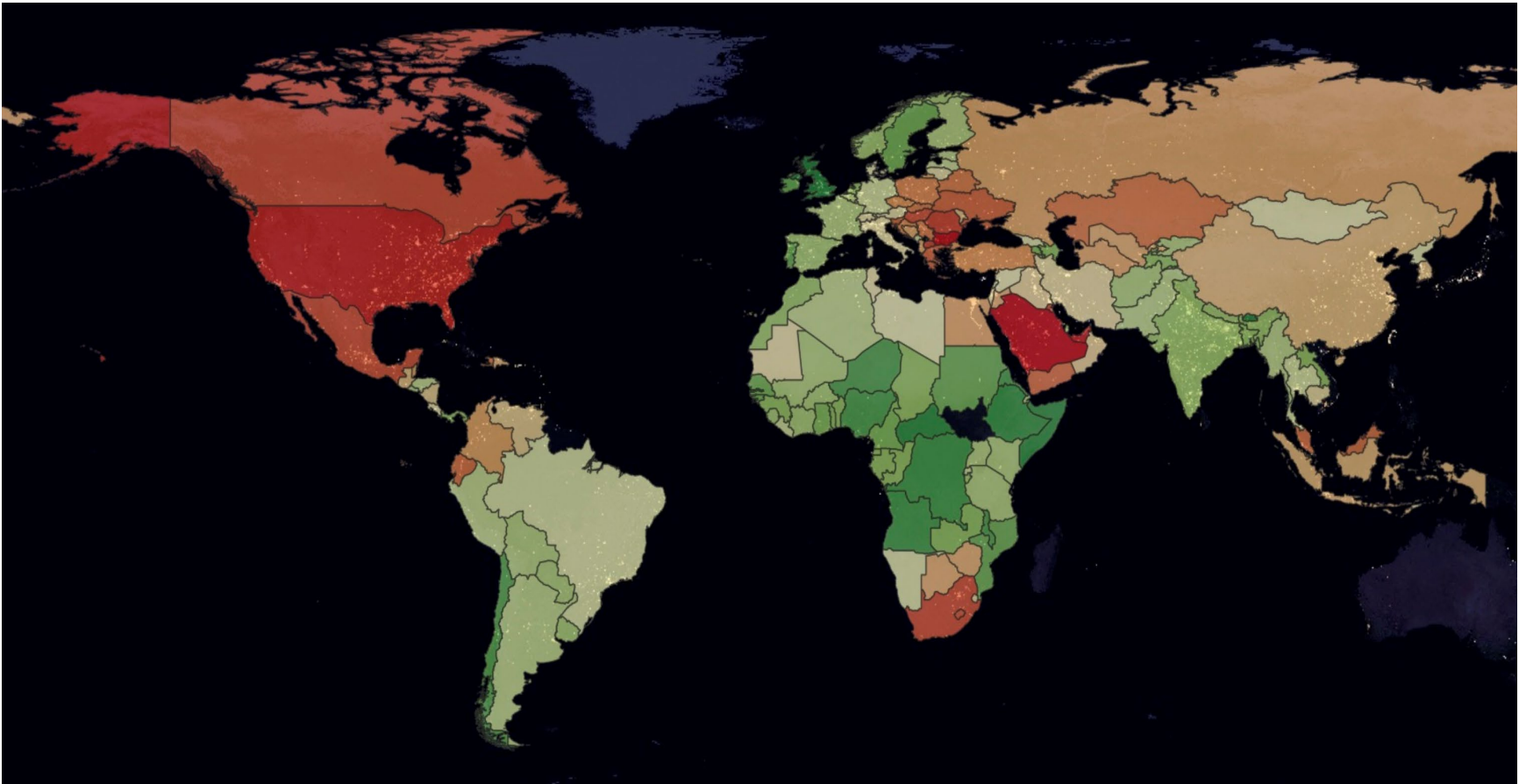


Figure 8: Border Orientation at the State Level. States are color-coded according to their average border orientation scores along all their border dyads. Green corresponds to minimum filtering and red corresponds to maximum filtering at international borders.

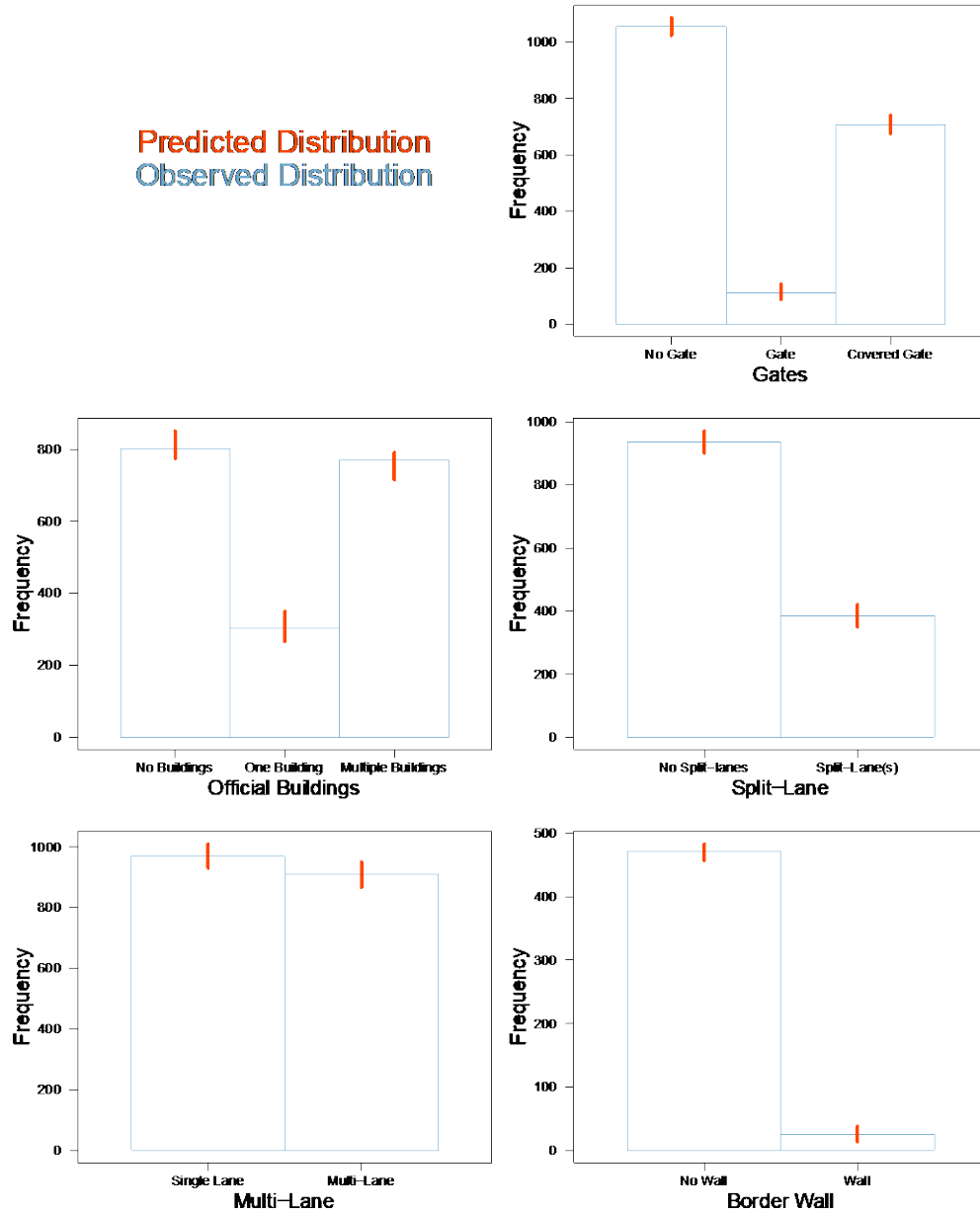


Figure 9: Summary of Posterior Predictive Checks. Note: Plot reports the observed distributions of each border crossing and border-dyad feature, along with the predicted distributions obtained from latent variable model of border orientation. Orange lines display the 95 percent credible intervals from the predictive distributions generated from 1,000 draws of parameter estimates

State’s national borders. Thus, it is important to explore our measure’s discriminant validity: the ability of a measure to distinguish between the concept of interest and a related, but distinct concept (Adcock and Collier 2001, Trochim and Donnelly 2008).

One plausible threat to our measure is that our infrastructure indicators are simply reflective of investments made for a narrower purpose, e.g., to ease or impede the flow of international trade. To evaluate whether this is the case, we calculate each country's mean border orientation score and compare this to the World Bank's Trade Across Borders Index, which is a composite of the time and cost for documentary and border compliance to export and import goods.²⁵ As displayed in Figure 12, these two indicators are only weakly related, having a Spearman correlation of .322. Moreover, the relationship is positive: more efficient border regimes are characterized by slightly more controlling border orientations. Both are likely driven by capacity, as we discuss below. But it is important to note that border orientation does not necessarily imply inefficiency. Rather, border orientation taps a distinct concept: displays of the authority of the State to control the terms of entry, rather than the capacity to do so efficiently.

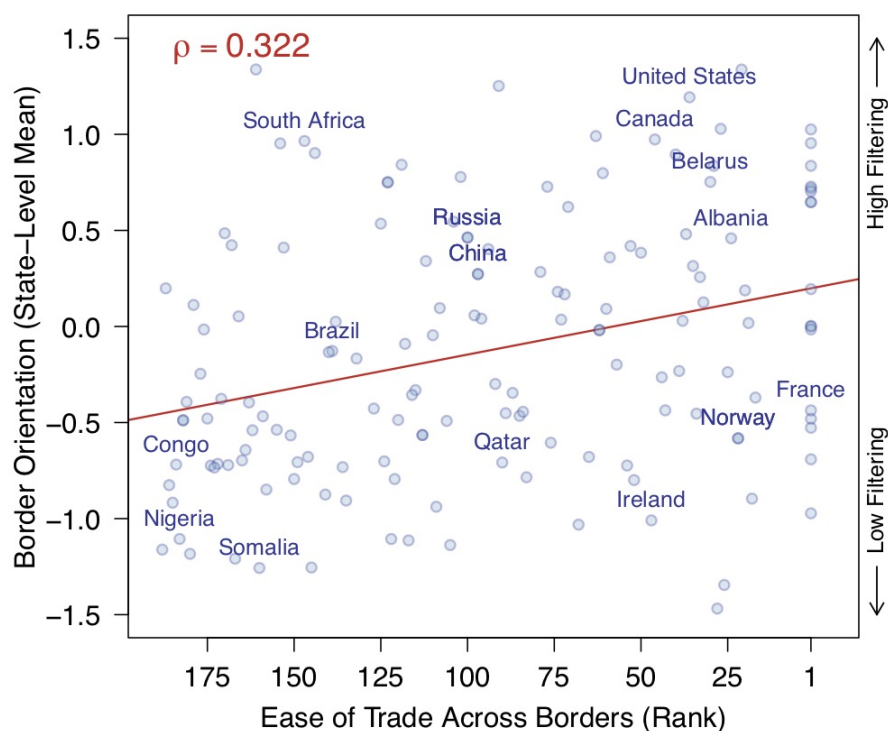


Figure 10: Border Orientation and the Ease of Trading Across Borders. Note: Bivariate regression line in red.

This raises the possibility that our measure of border orientation is simply capturing development. It may be that, with little exception, wealthy states build infrastructure along their borders and poor states do not. Figure 13 displays border orientation and logged GDP per capita. A more controlling border orientation does appear to be a prerogative of richer nations—few of the world's poorest countries receive high scores on our latent measure—but the relationship is

²⁵ The World Bank, *Doing Business: Trade Across Borders*. Available at <http://www.doingbusiness.org/data/exploretopics/trading-across-borders>. (Accessed 15 August 2018.)

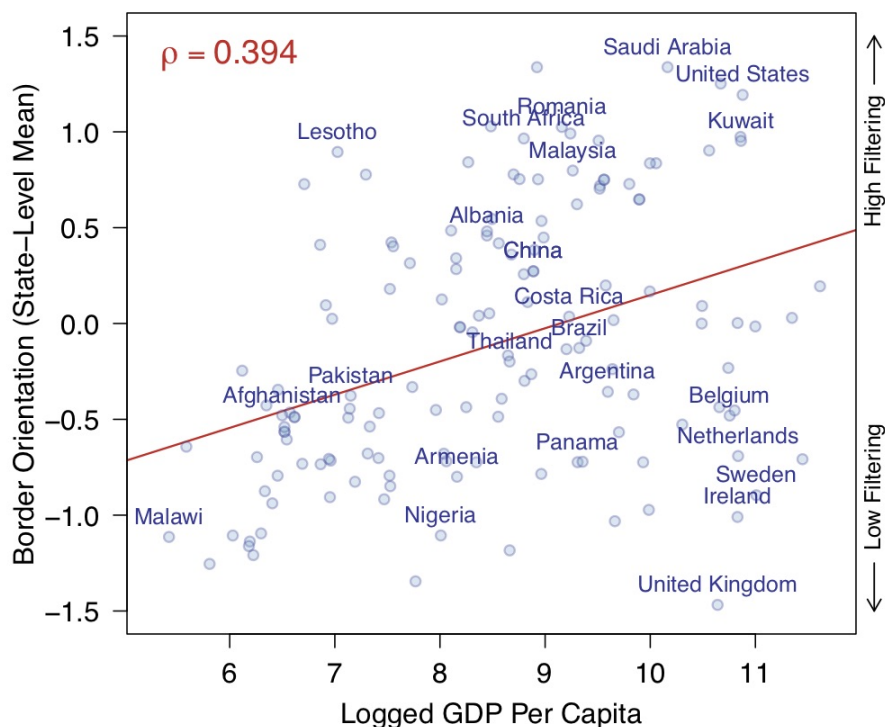


Figure 11: Wealth and Border Orientation. Note bivariate regression line in red.

surprisingly imperfect. The correlation between the indicators is only 0.394 and there is considerable variation in border orientation scores among moderately wealthy and wealthy countries. Lesotho's yearly per capita GDP is scarcely over one thousand dollars, but its orientation score is among the highest observed. Meanwhile, the United States' high presence along its borders contrasts with the low presence of other wealthy states like Sweden and the United Kingdom's border with Ireland. Our measure of border orientation is therefore more than a simple biproduct of wealth.

Our estimate of border orientation has even less in common with a state's national military capabilities, which we measure using the Correlates of War Composite Indicator of National Capabilities (CINC) data (Singer, Bremer, and Stuckey 1972). CINC scores reflect a country's share of the world's military personnel, military expenditures, total population, urban population, iron and steel production, and energy consumption. Though not a direct measure of such, CINC scores are often used to approximate a state's coercive leverage or military capacity. Comparing this with border orientation allows us to determine whether border orientation is simply a biproduct of a state's capability on a global stage. Figure 14 demonstrates once again that border orientation exists apart from capability; at 0.137, the correlation between these indicators is particularly weak.

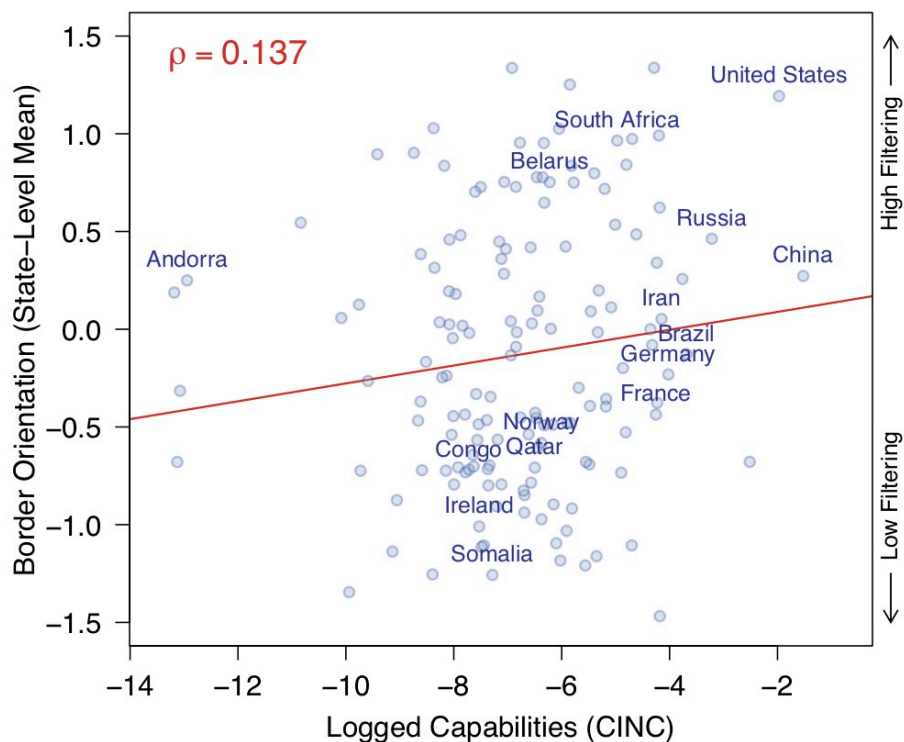


Figure 12: National Military Capabilities (logged) and Border Orientation. Note bivariate regression line in red.

Finally, does border orientation simply duplicate a state's immigration policies? We compare border orientation to international visa restrictions using data from Neumayer (2011), who identifies whether one or both sides of an interstate dyad has imposed visa restrictions upon the other. Figure 15 displays the density of our directed dyadic border orientation scores across each of these three categories. The mean value of border orientation (red dashed line) changes relatively little across these categories, though the data does suggest that dyads with asymmetric restrictions may have slightly higher border orientation scores, as one might expect. Overall, however, a state's display of border control appears to have little to do with broader restrictions on travel.

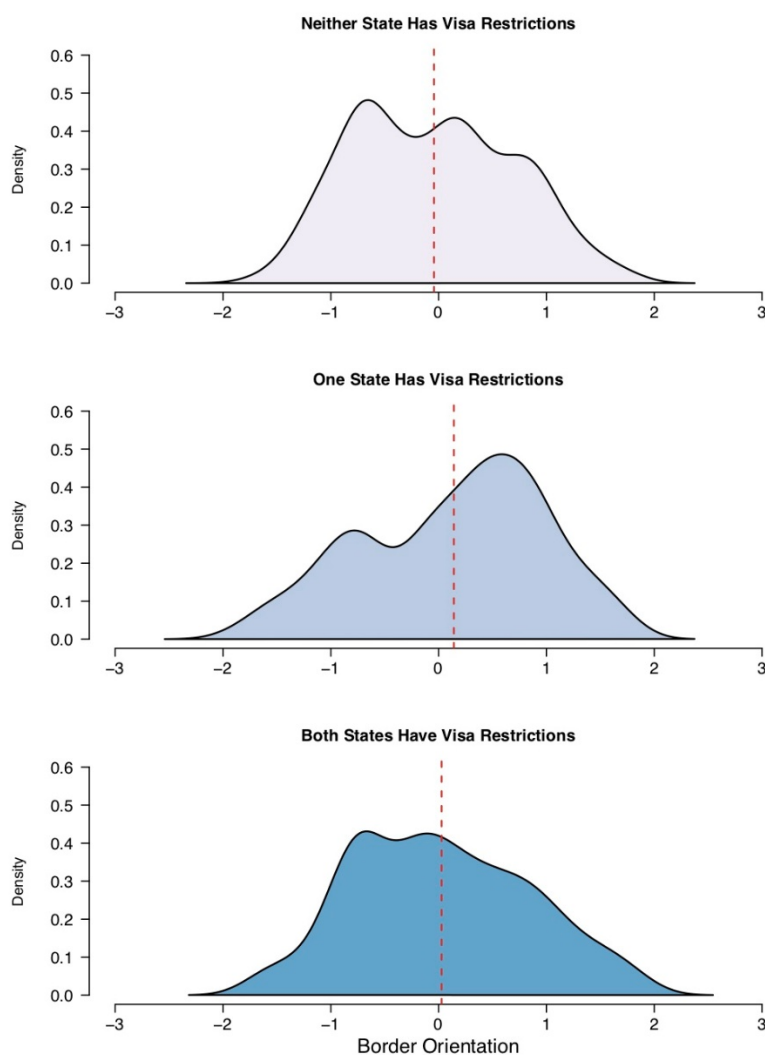


Figure 13: Visa Restrictions and Border Orientation.

Taken together, our model easily discriminates between border orientation and measures of a state’s receptivity to trade, its wealth, military capabilities, and travel restrictions. Border orientation is both conceptually and operationally distinct from adjacent concepts in international relations. We believe it captures a broader proclivity for border governance, which may help to explain other policies, but is conceptually distinct.

V. Empirical Analysis

Which factors explain variance in border orientation? To answer this question, we conduct a regression analysis of border orientation with a parsimonious set of explanatory variables. These analyses test from existing bodies of theory that emphasize the *capacity* to exert authority at the border; theories such as *emulation* (whether cooperative or competitive) that expect spatial autocorrelation; and theories based on various border-related anxieties flowing

from perceived *economic* threats, *security* threats, and *cultural* threats. The results are exploratory and should not be interpreted as estimates of causal effects. Yet, given the dearth of research on international border orientation, rigorous observational analyses are a critical first step to understand which factors most likely drive border orientation.

Table 2 reports the parameter estimates. We are interested in exploring the correlates of border orientation at the state, dyad, and border-crossing level, so our unit of analysis is one state's side of an international border crossing and the dependent variable is a given state's border orientation score at that crossing. Recall that our measurement model produces both mean predictions for each latent trait and estimates of uncertainty around these means. We therefore generate regressions in two different ways. In Models 1 and 2 we simply use the posterior means of border orientation obtained from the latent variable model. Next, we incorporate our estimates of uncertainty around each border orientation score in Models 3 and 4, using standard multiple imputation procedures.²⁶

Explanatory variables include: the border orientation score on the neighbor's side of an international border crossing; logged GDP per capita;²⁷ the difference in logged GDP per capita between a given state and its neighbor; cultural homogeneity;²⁸ democracy;²⁹ the logged distance between a particular border crossing and the state's capital; whether a state recently engaged in an militarized interstate dispute with its neighbor;³⁰ whether the neighboring state recently experienced a civil conflict;³¹ and whether the crossing is located at or near the Schengen zone. We operationalize the Schengen zone indicators two ways. First, we simply control for whether a state is a member of the Schengen agreement. Second, we identify whether both sides of a border crossing are within the Schengen zone and include another indicator that identifies whether one side of the border is a member of the Schengen agreement and the other is not.

Several robust relationships obtain across model specifications. The strongest of these pertains to a neighbor's border orientation. The relationship is tight and positive: states tend on average to have a border orientation scores very similar to those of their neighbors. How should

²⁶ Aggregated estimates obtained from ten regressions using simulated draws from the posterior distributions of border orientation for each observation. Parameter estimates are combined using the procedures discussed by King et al (2001) and Rubin (2004).

²⁷ World Bank (2015)

²⁸ Calculated from Alesina et al.'s (2003) ethnic, religious, and linguistic fractionalization scores. Scales are reflected such that higher values correspond to greater cultural homogeneity.

²⁹ Measured using the 11-point democracy-autocracy index from Polity2 (Marshall, Gurr, and Jaggers 2017).

³⁰ Indicates whether a Militarized Interstate Dispute occurred between neighbors 2000-2010 (Palmer et al. 2015).

³¹ Indicates whether a civil conflict resulting in at least 25 fatalities is recorded in the Armed Conflict Data (Allansson, Melander, and Themnér 2017).

**Table 2: Correlates of Border Orientation
At the level of the border crossing**

	Dependent Variable: Latent Border Orientation			
	(1)	(2)	(3)	(4)
Neighbor's Border Orientation	0.721** (0.017)	0.688** (0.018)	0.542** (0.024)	0.503** (0.025)
Logged GDP per capita	0.094** (0.022)	0.119** (0.023)	0.174** (0.038)	0.206** (0.037)
Difference in logged GDP per capita	0.097** (0.025)	0.077** (0.025)	0.050 (0.048)	0.022 (0.048)
Cultural homogeneity	0.090** (0.040)	0.066* (0.040)	0.084 (0.071)	0.044 (0.071)
Democracy (Polity 2)	-0.012** (0.004)	-0.012** (0.004)	-0.012* (0.007)	-0.012* (0.007)
Log of distance to capital	-0.018 (0.021)	-0.020 (0.020)	-0.029 (0.039)	-0.029 (0.038)
Militarized Interstate Dispute	0.059 (0.056)	0.027 (0.055)	0.095 (0.115)	0.044 (0.115)
Civil Conflict in Neighbor	-0.119** (0.056)	-0.121** (0.055)	-0.132 (0.098)	-0.137 (0.097)
Schengen Country	-0.200** (0.066)		-0.375** (0.104)	
Crossing in Schengen Area		-0.312** (0.069)		-0.525** (0.113)
Crossing at Schengen Border		0.320** (0.093)		0.478** (0.162)
Intercept	-0.771** (0.203)	-0.929** (0.203)	-1.384** (0.303)	-1.585** (0.296)
Observations	1633	1633	1633	1633
Uncertainty Adjusted Estimates	No	No	Yes	Yes

this be interpreted? One possibility is *literal* mimicry for reasons of prestige, to emulate, or simply to retaliate. Field research also suggests that similarity of border structures are valued and sometimes even jointly financed to facilitate cooperation with a neighboring state.³² It is likely, though, this positive relationship also picks up other omitted factors that cluster spatially such as wealth and geography.³³

Economic capacities and anxieties may play an important role. State presence at the border appears to be a prerogative of the rich, as we noted above. Across all model specifications GDP per capita exerts a positive, statistically significant relationship. There is also some evidence that wealthy states tend to fortify their borders against less wealthy neighbors more generally, though this relationship is insignificant in Models 3 and 4 after accounting for uncertainty in the latent trait. If this is the case, it points to evidence of concerns about inflows of low wage workers and low-cost goods from a neighboring state. Yet, wealth alone does not explain border orientation. States *within* the Schengen zone tend to have lower border orientation scores, reflecting more open borders. Crossings along the external borders of the Schengen area tend to be more controlled.³⁴ Thus, while many wealthy states have developed strong filtering capacities, those within the Schengen area have apparently outsourced border security to the edges of the European frontier.

Despite the strength of the wealth-border orientation connection, there are some interesting outliers (see Figure 13). Norway is rich, but relatively remote and has only one border crossing with a non-Schengen country (Russia). Haiti is poor but insists on a presence at its border with the Dominican Republic. The Balkans (Albania, Bulgaria) display control over their crossings much more than we would expect based on their wealth alone. The significant difference between Qatar and Kuwait may be attributable 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 and Qatar. Nonetheless, there is good evidence of a relationship, on average, between wealth and official presence at important border crossings.

Regime characteristics also appear to matter for border orientation. Across all four specifications we find that democracies have less controlling border orientations than do more autocratic states. The obverse of this relationship is perhaps more intuitive: autocratic states have adopted a more controlling presence at their international borders than have more liberal states. Yet, the rise of anxieties about border security within the United States and Europe call for a degree of caution about whether and how far these policies will extend into the future. In fact, one interesting hypothesis that we can explore with time series data (in the process of being collected) is that the border orientation of the wealthy democracies has tightened much more over time than has that of more autocratic states.

³² Author site visit and interview at the Norway/Russian border with Norwegian officials, including Border Commissioner Roger Jacobsen and Head of Storskog Border Station, Mr. Gøran Stenseth. June 20 and 21, 2018.

³³ 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 opposite 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.

³⁴ In auxiliary analyses we find that crossings along external Schengen borders tend to have higher orientation scores on both the Schengen and non-Schengen side of the crossing.

In some models, cultural homogeneity is associated with high border orientation scores. (Figure 16). Homogeneous countries tend to establish a stronger presence at their borders than do those with more heterogeneous populations. 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 border orientation appears relatively thin, suggesting again that peripheral location matters. While the cultural/border orientation as measured here is somewhat unstable, it indicates a need for further testing. Such analyses might include measures that more precisely operationalize dyadic measures of cultural similarity, as well as the ethnic composition in the specific region where border crossings are located.

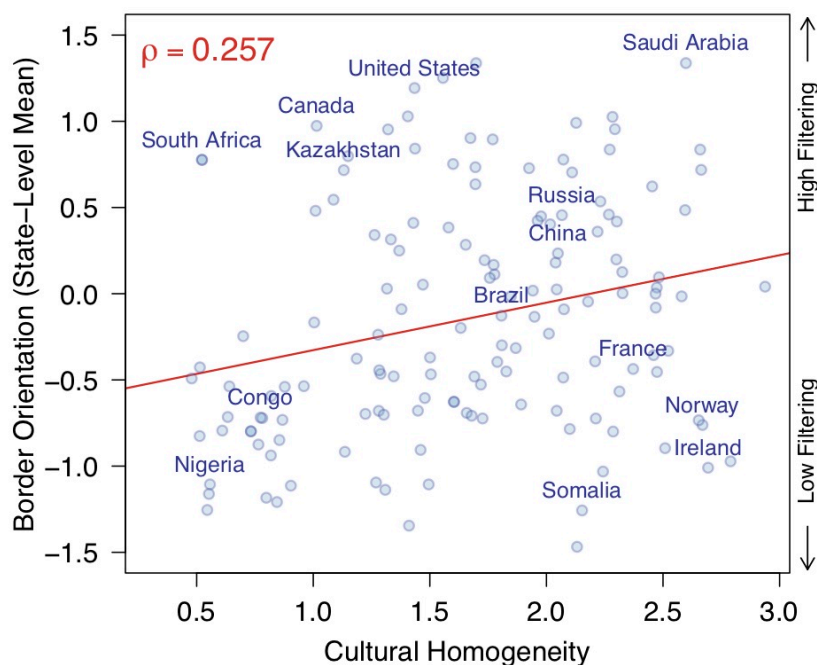


Figure 14: Cultural Homogeneity and Border Orientation. Note bivariate regression line in red.

Notably, indicators pertaining to traditional national security concerns lack a significant relationship to border orientation. A recently militarized dispute with a neighbor does not appear to make a state any more or less likely to display control at their shared borders. Further, sharing a border with a neighbor that has recently experienced civil conflict appears to exert little effect on border orientation; statistically significant relationship exists only in models that use the latent measure but do not incorporate measurement uncertainty. If these findings hold using more variegated and refined measures of security threats future research should explore the possibility that political leaders and their constituents may be reacting to ontological security (Mitzen 2006) rather than traditional threats.

VI. Conclusion

Borders are crucial institutions in international and domestic politics. We have argued they are sites of intense governance as well. They have special status in international law, as they rest on international agreements that bind not only adjacent states, but third parties as well, and cannot be abrogated unilaterally. They have come to define what it means to be a modern state. International borders have at least as much salience domestically. They delineate the space over which government have the authority to rule, but they also determine the people for whom national public goods are to be provided. Many scholars have gone even further to suggest that international borders shape the fundamental identity of a people. They do so by distinguishing the national from the transnational and the foreign.

Human life is organized across and around international borders, which makes understanding their governance all the more important. The world's 16 trillion dollars in yearly exports, 1.3 billion annual tourists, and 25 million refugees living abroad have crossed international borders. In 2016, almost 25 percent of the world's population – some 1.87 billion human beings – lived within 100 kilometers of an international land border.³⁵

Border governance is highly consequential for billions of people around the globe. And yet, very little systematic investigation has been made into governments' fundamental orientation toward displays of border control. We suggest that the spatial orientation of governance is as important as many of its other qualities, such as bureaucratic/administrative competence, civil/military relations, gender hierarchies and state/society relations. Instead the study of international borders has tended toward Balkanized policy studies, with trade restrictions studied separately from immigration policies, health and hygiene policies, military policies and policing policies. We propose a unifying concept, border orientation, that taps governments' commitments to displays of control over entry and exit. Ultimately, this orientation captures the effort that governments put into distinguishing the internal "we" from the external "they."

All abstract political concepts resist easy observation. As a latent characteristic, commitments to authoritative display of control at the border is not easy to detect, let alone to measure with precision on a global basis. We have suggested a set of observable indicators drawing from theories of logistical and policing power that direct our attention to ways in which governments have structured the environment to establish better means of control. Walls and fences around the perimeter and inspection stations, gates, border control shelters at border crossings and police stations near border crossings suggest a physical commitment signaling to both citizens and foreigners that This State intends to control entry and exit. Satellite imagery have proved to be a rich source of untapped evidence of this commitment. A hierarchical Bayesian latent variable model generates estimates of what we fundamentally cannot observe directly and can render information at three levels: specific crossings, mutual dyadic borders, and a state's overall orientation. We have shown these estimates are distinct from discrete policy preferences, such as preferences for efficient trade, military security, visa policies or more general measures of wealth or "capacity."

How might the concept of border orientation inform future research? One research agenda might focus on explaining border orientation itself. We have described a slow-moving

³⁵ Calculated using the Landscan database. Approximate 99 million (1.32%) live within 5 kms, 200 million (2.7%) within 10 kms, and more than 600 million (8.05%) live within 30 kms of an international land border. These figures all exclude coastlines.

phenomenon which might result from a cumulative confluence of historical circumstances. Historical precedents—or a lack thereof—intensely shape border politics broadly (Abramson and Carter 2016) and could contribute to more overt displays over border control. We have seen hints that cultural factors could be important as well. Nation states that are more culturally homogenous might find border control a natural fit for maintaining a clear national image of Who We Are. But the opposite could be true as well: heterogenous polities made need symbols of unity and distinction to accomplish collective ends. Such societies might wish to reinforce distinctions that would otherwise be difficult to detect by deploying official state presence at the border. We suspect these cultural explanations would be enriched by theories of distributive politics, with dominant groups who are gradually losing economic and cultural privileges making the loudest demands for border control.

Border orientation could also be explained by other broad governing ideologies. The whole idea of enhanced government control finds much more expression in polities where the state is strong relative to the society it rules. We have seen hints in the exploratory data analysis that controlling for other factors that democracies are associated with thinner control displays at the border than are more authoritarian regimes. Arguably, the latter are more likely to try to control a broader range of human movement and activity, both internally and transnationally. Research into the ideological justifications for border control would shed light on these relationships. Relatedly, prevailing attitudes toward private property, land ownership, and early susceptibility to the enclosure movement would be an interesting connection to examine. If enclosure (private property ownership) is understood to overcome the tragedy of the commons, is walling and fencing a solution to the national provision of public goods – in particular, territorial law and order?

The richest payoff to studying border orientation will be to understand its consequences. It may well be that this agenda will require time series data which are still to be collected. Ultimately, it will be good to know whether attention to border control pays dividends – that is, whether it achieves some (un)articulated goal. Does a commitment to filter and block at the border contribute to a safer society? Healthier trade relationships? Reduced crime and terrorism? An enhanced sense of a collective identity? Reductions in unauthorized inward migration? Does it have unintended consequences – send hostile signals to neighbors? Stoke nationalism? Divert rather than reduce transnational crime? Or is it the case that the impact of these investments is largely in the eyes of the beholder, enhancing a sense of psychological, rather than material security? By developing estimates at the level of the nation-state, border dyads, and even border crossings and segments, there will eventually be ways to leverage variance to explore some of these questions. This paper is a first effort to spur thinking about concepts, models and data that will eventually shed light on these issues.

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