Are the Harms of Artificial Statehood Reversible? Development Outcomes Along the Shifting Niger-Burkina Faso Border

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1 Introduction

Social scientists have long argued that artificial states—those in which political borders do not coincide with the desired nationalities of the individuals in the territories—are associated with negative political and economic development outcomes. Colonizing powers imposed state boundaries that often did not reflect the distribution of populations on the ground, separating existing communities and combining people who preferred not to live in the same state. Simultaneously, these exogenous borders created political topographies with ethnically heterogeneous groups, making the challenging tasks of building nationalism and extending state control all the more difficult. In the long run, this depressed economic wellbeing and weakened state institutions (Easterly and Levine 1997; Herbst 2000). Approximately 80 percent of the colonially imposed borders in Africa follow latitudinal or longitudinal lines, suggesting that the artificiality of states on the continent is particularly high (Alesina, Easterly and Matuszeski 2011). During a wave of independence in the 1960s and 1970s, African political leaders opted to maintain the borders drawn by colonizers so as to avoid conflict amongst themselves.

Studies on state artificiality and subsequent development outcomes abound (see Section 2 of this proposal), but scholars have not yet investigated whether state artificiality and its attendant harms can be *reversed*.[1] This is in part due the relatively rare occurrence of

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[1]McCauley and Posner (2015) note the possibility of populations migrating or "sorting" around African borders, but they emphasize the implications for natural experiments rather than for development outcomes.

modern border changes.[2] We exploit a recent decision by the International Court of Justice (ICJ) that redefines the colonially drawn border between the Sahelian countries of Burkina Faso and Niger in West Africa. The border change, arbitrated by the ICJ with joint input from the governments of Burkina Faso and Niger, has resulted in the exchange of 18 villages between the two nations, to take place over the next five years; furthermore, citizens in the affected regions will be allowed to choose their individual citizenship. By investigating the developments in the wake of this historic decision, we advance a theory and conduct a pioneering empirical test of the relationship between state artificiality and political-economic development.

This pre-analysis plan (PAP) sketches our theory and outcomes of interest, outlines the preliminary data collection to occur in January 2016, and specifies our data analysis scheme. We present a PAP even though our research in January 2016 is observational. The use of PAPs is most common in experimental research, principally to mitigate the pronounced risks of harming human subjects and failing to report on ineffective treatments (Pearce 2011). However, it is increasingly common to register PAPs in on-line repositories for observational studies (Dal-Ré et al. 2014; Editors of *The Lancet* 2010). We are aware of common criticisms of this practice—namely that PAPs do not ensure quality data or valid inferences (Savitz 2011) and that they may pose a barrier to starting important research.[3] Nevertheless, there are several distinct benefits that we hope to gain by writing and registering a PAP:

- **Minimize ethical breaches**: Observational studies may pose ethical risks, even if they do not involve randomized interventions in the lives of human subjects. Asking politically sensitive questions on a survey, for example, could make respondents vulnerable to government or social sanctions. Furthermore, the mere asking of questions (sensitive or not) may inadvertently alter subjects' attitudes or behaviors despite the investigator's best efforts to prevent that. A PAP allows investigators to thoroughly consider the ethical implications of their work, devise ways to minimize risks, and provide detailed protocols to Institutional Review Boards.

- **Prevent data mining:** A PAP "ties our hands" by pre-specifying statistical models and other important details of the research design. Making the PAP publicly available prevents author bias from cherry-picking results or revising hypotheses post-hoc (Christensen and Soderberg 2015). We follow suggestions for a "comprehensive but

[2]The most famous exception is South Sudanese independence, which we will discuss in our final report. However, we focus on the Niger-Burkina case because our advance notice of the border change presents an unusual opportunity to study the change as it is implemented. Surveys conducted "in the moment" have numerous advantages over retrospective surveys, including reduced bandwagoning and preference falsification (Beissinger 2013, 5).

[3]Pearce (2011) asks, "Should Darwin have pre-registered his hypotheses before commencing the voyage of the Beagle?"

nonbinding" preregistration plan (Humphreys, de la Sierra and Van der Windt 2013). Critics of PAPs in observational research contend that predetermining every detail of a study hinders investigators from discovering and publishing unexpected but important findings (Pearce 2011). We will avoid this hindrance by clearly labeling inductive findings in all our deliverables. Comprehensive, transparent results will improve readers' ability to understand and judge our findings at face value.

- **Avoid type 1 errors:** Authors of observational studies are less likely to publish false-positive results when they predefine their hypotheses (Dal-Ré et al. 2014, 2). A PAP does not guarantee valid inferences, but "hypothesis-based research is more likely than post hoc analysis to involve study populations appropriate for testing the hypothesis, to measure relevant exposures and outcomes in necessary detail, and to collect pertinent covariate information" (Dal-Ré et al. 2014, 2).

- **Lay a foundation for experimental research:** In medicine, randomized controlled trials (RCTs) usually serve the purpose of testing the effects of newly invented drugs or treatments. In contrast, social scientists often use RCTs to confirm the causal nature of already-observed relationships between variables. Observational studies generally involve "dataset observations" (patterns of X, Y correlation) and "causal process observations," or some combination of the two (Humphreys and Jacobs 2015). This work must be of a high quality to effectively guide experimentalists toward questions and hypotheses; a PAP promotes quality research.

The remainder of the pre-analysis plan proceeds as follows. Section 2 outlines established research on the role that artificial boundaries play in determining developmental outcomes. The third section presents background on the Burkina Faso and Niger border dispute and the decision by the ICJ to shift the border. Section 4 builds our theory of artificial states and development, establishing the hypotheses to be tested with the data we generate during field work. The following section clarifies the primary variables of interest and their operationalization, describes our key data sources, and addresses potential complications in the analysis. We finish by providing a project timeline and discussing future extensions of our work.

2 Existing Knowledge on State Artificiality and Development

The Berlin Conference of 1884-1885 was arguably the most fateful moment in African history (Adebajo 2014). German Chancellor Otto von Bismarck, hoping to ease conflict amid Europe's "scramble for Africa," convened a meeting of delegates from colonial powers including Britain, France, and Belgium. The delegates divided territory by drawing a map

with hardly any regard for preexisting social and political frontiers, resulting in countries with mostly straight lines for borders. On the rare occasion that anyone consulted with African leaders about territorial claims, they wrote treaties that were deliberately vague so European interests would prevail (Donaldson 2012). Alesina, Easterly and Matuszeski (2011) summarize four reasons why this experience could have hampered Africa's development. First, borders often assigned territories to one group, ignoring other groups that had laid stakes to the land as well. Second, boundary lines occasionally split one ethnic group into different countries, spurring irredentist unrest as in the Horn of Africa. Third, borders sometimes combined multiple groups that each wanted independence, leading to secessionist conflicts like the Biafran War in Nigeria. Even when secessionist conflict did not break out, ethnically diverse countries provided a weak environment for generating nationalistic sentiment. Complementary studies suggest that a lack of nationalism can impede tax collection (Herbst 1990), national defense (Herbst 1990), social cooperation (Habyarimana et al. 2007), and public goods provision (Habyarimana et al. 2007; Miguel 2004). Finally, Englebert (2000, 6) argues that the Berlin Conference gave rise to postcolonial states with low domestic legitimacy—a condition under which "bureaucrats are insufficiently loyal to the state and private agents distrust its institutions. This raises the relative returns, for the elites, of neopatrimonialism over developmental statehood." Today, "artificial states" suffer from systematically lower incomes per capita, less economic growth, and worse governance than countries with endogenously defined borders and populations (Alesina, Easterly and Matuszeski 2011; Englebert 2000).

This situation seems particularly hopeless because artificial borders are ostensibly permanent. At the 1964 Cairo Assembly, the leaders of newly independent African countries pledged to honor the boundaries that they inherited from colonial occupiers—a principle known as *uti possidetis*, which translates roughly to "as you possess so you shall possess" (Donaldson 2012, 6). Mali's then president Modibo Keita explained the rationale: "We must take Africa as it is, and we must renounce any territorial claims, if we do not wish to introduce what we might call black imperialism" (Kornprobst 2002, 375). *Uti possidetis* had its detractors. President Kwame Nkrumah of Ghana, for example, viewed it as antithetical to his Pan-Africanist ideals and vehemently advocated for "eradicating the artificial divisions and boundaries which are responsible for the balkanisation of our continent" (Oduntan 2015, 332). More recently, Rwandan president Pasteur Bizimungu shocked attendees at the 1998 France-Afrique summit by declaring that "Africa needs a new Berlin conference" (Englebert 2000, 186). Nevertheless, the norm of preserving colonial borders has remained remarkably strong given the weak empirical sovereignty of many African states.

There are two ways for states to become less artificial: borders can move or people can move around borders (Alesina, Easterly and Matuszeski 2011; McCauley and Posner

2015). Both have proven difficult in Africa. One reason is that there are demographic and topographic impediments to reconfiguring Africa's borders: pre-colonial frontiers were highly fluid and hence offer no template for drawing contemporary borders; the fluidity of ethnic identities likewise prevents ethnicity from informing more "rational" borders; and Africa lacks the numerous mountain ranges and rivers that naturally divided territory in Europe, Asia, and the Americas (Herbst 1989). The dramatic independence of South Sudan in 2011 notwithstanding, Africa has experienced fewer secessionist conflicts and border changes than most other regions of the world (Englebert and Hummel 2005). Moreover, efforts to ease intra-regional migration—such as the Economic Community of West African States' push for a "borderless West Africa"—have failed due to poorly funded economic unions, profitable road blocks, and officials who use their affiliations with established states to dominate local people (Adepoju 2007; Englebert 2009). A recent legal decision regarding the border between Burkina Faso and Niger raises the unusual opportunity to move both borders and people in ways that could make the states less artificial.

3 The Niger-Burkina Faso Border Dispute Resolution: A New Berlin Conference?

The 650-kilometer-long border between Burkina Faso and Niger has been contentious since independence,[4] as French colonial officials clearly demarcated only about one-third of the border. The general border area was delimited by two French administrative *arrêtés*, or decrees, in 1927, but representatives from Burkina Faso and Niger were unable to agree on how to interpret the *arrêtés*. In 1987, a consensus between the two countries declared that, in areas where the *arrêtés* remained insufficient in demarcating the boundaries, a line depicted on the 1960 edition of the French National Geographic Institute's 1:200,000 topographical map series would be used instead (Oduntan 2015). Despite such efforts, contention regarding the border's "true" position persisted, and, in July 2010, the two countries jointly submitted the case to the International Court of Justice (ICJ). Figure 1 depicts the parties' claims and the 1960 French demarcation. Taking into account the work of Burkina Faso's and Niger's joint technical commission in the past, the ICJ was tasked with determining the boundary between the astronomic marker of Tong-Tong in the north to the beginning of the Botou bend in the south (ICJ 2010).

The ICJ delivered its judgment in April 2013, mapping out roughly two-thirds of the land that was previously in dispute (Figure 2). The decision resulted in a significant exchange of territory: 786 square kilometers were assigned to Burkina Faso, and 277 square kilometers

[4]Burkina Faso gained independence from France in 1958 when it was known as The Republic of Upper Volta. Niger gained independence from France in 1960.

to Niger (*The Guardian* 2015). As part of the exchange, Burkina Faso will gain 14 towns and Niger will gain four. Individuals living in the affected zones will be allowed to choose their citizenship within the next five years. Such a bureaucratically imposed alteration to nationality is unprecedented in recent times. In May 2015, the two countries accepted this decision. The Nigerien Justice Minister, Marou Amadou, stated publicly that the ICJ's decision seems fair; the Burkinabé Minister of Territorial Administration and Security, Jerome Bougouma, said that despite concerns over "security forces, patrols, and the collection of taxes," Niger and Burkina Faso are "parting as good friends, very good friends" (*BBC News* 2013). Implementation is set to occur over the next five years.

4 Hypotheses

Two questions guide our project: First, is the reconfigured border between Niger and Burkina Faso less artificial than the previous one? And second, how does the change in state artificiality affect development? Answering the first question will allow us to evaluate the assumption that African borders are necessarily fixed. If the ICJ ruling and its implementation result in a less artificial Niger and Burkina Faso, then the Niger-Burkina experience may offer a model for peacefully moving borders elsewhere. Answering the second question will build on earlier studies that indicate cross-sectional correlations between state artificiality and low development (e.g. Alesina, Easterly and Matuszeski (2011), Englebert (2000)). Those studies likely suffer from missing variables as well as unobserved confounding variables; we can control for some of those variables by collecting micro-level data and exploiting temporal variation within Niger and Burkina Faso respectively. We can then test the robustness of our findings by comparing both countries' estimated changes in development outcomes before and after implementation of the ICJ ruling. We summarize our priors in the following hypotheses, which are testable in the short and medium terms following implementation.

4.1 Hypotheses on State Artificiality

H1: The states of Niger and Burkina Faso will be less artificial after reconfiguration, because Nigeriens and Burkinabés were able to draw a border and define citizenship laws according to their own identities and institutional preferences.

H2: The states of Niger and Burkina Faso will be more artificial after reconfiguration, because Nigeriens and Burkinabés deferred to French colonial documents to resolve their dispute, essentially reinforcing exogenous, colonial frontiers.

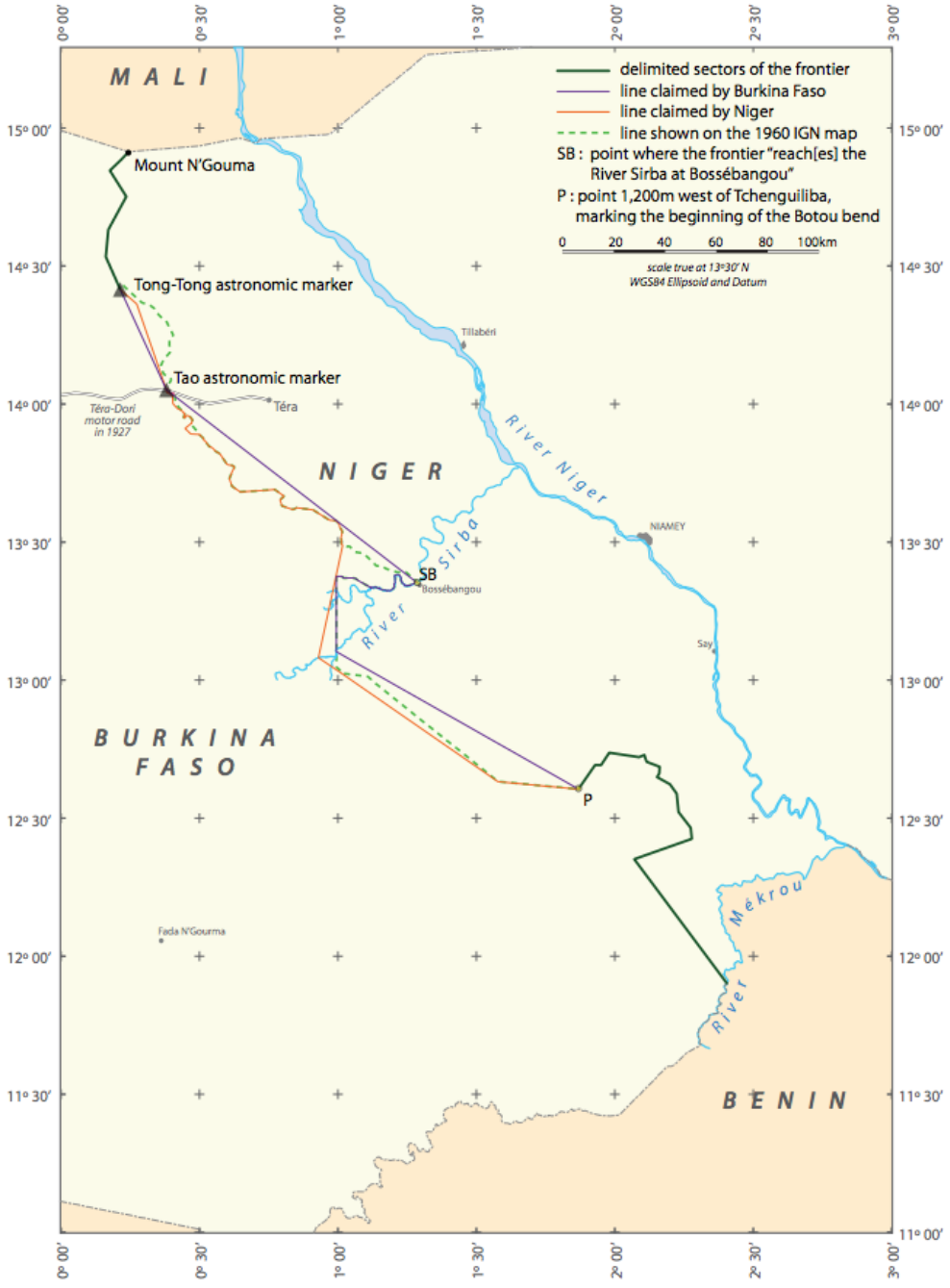

Figure 1: Parties' 2010 Claims and Line Depicted on the 1960 IGN Map

Source: ICJ. "IGN" refers to the French *Institut géographique national*, or National Geographic Institute.

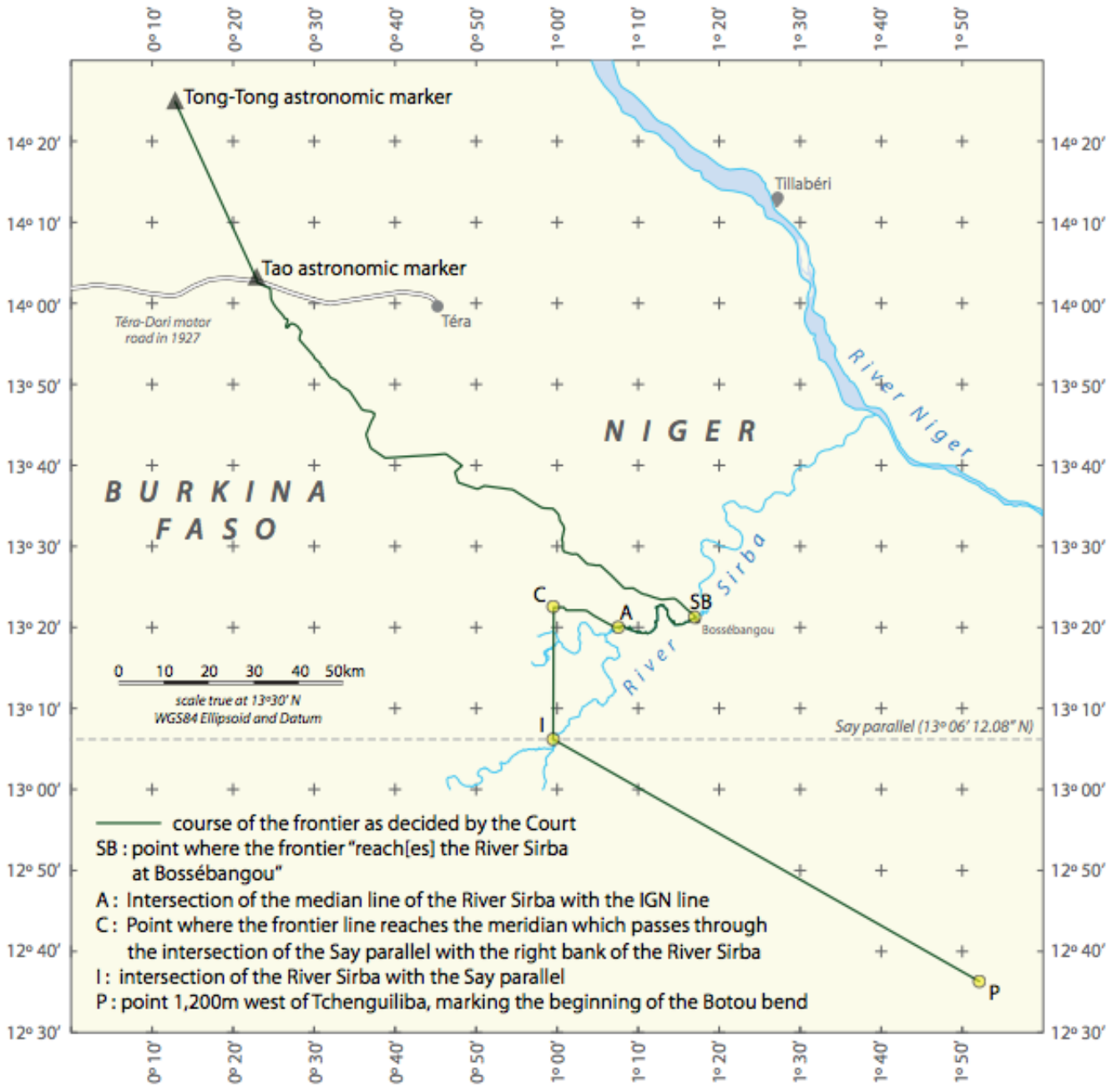

Figure 2: Border as Decided by the ICJ in 2013

Source: ICJ.

4.2 Hypotheses on the Consequences of State Artificiality

H3: The less artificial the state of Niger (Burkina Faso), the better citizens' access to public goods, because identity groups that are not forcibly partitioned across a border will be more homogeneous and hence better able to cooperate around obtaining public goods.

H4: The less artificial the state of Niger (Burkina Faso), the stronger citizens' sense of nationalism, because citizens will be able to sort into national communities with which they most closely identify.

H5: The less artificial the state of Niger (Burkina Faso), the weaker citizens' sense of nationalism, because borders will conform more closely with ethnic, sub-national cleavages.

H6: The less artificial the state of Niger (Burkina Faso), the stronger citizens' perceptions of the right to ownership (i.e., property rights), as the decision from the ICJ and the national governments reifies notions of possessive territoriality shaped around common identities and preferences.

H7: The less artificial the state of Niger (Burkina Faso), the weaker citizens' perceptions of the right to ownership (i.e., property rights), as the decision from the ICJ and the national governments challenges the notion of stable property and territoriality.

5 Research Design

In this section, we detail a plan for testing the above hypotheses. We describe our variables, key data sources, sample, estimation model, and procedures for addressing survey attrition, outcomes with limited variation, and multiple hypothesis testing.

5.1 Variables

We operationalize the variables in our hypotheses as follows:

- **Border artificiality:** Borrowing from Alesina, Easterly and Matuszeski (2011), we adopt two measures of border artificiality: *FRACTAL* and *PARTITIONED*.
  - *FRACTAL* is a number indicating how squiggly a country's borders are, with squiggly lines associated with less artificial states. It is calculated using a box-count method first developed by Peitgen, Jurgens and Saupe (1992). Alesina, Easterly and Matuszeski (2011, 10) explain: "For this method, a grid of a certain

size/scale is projected onto the border, and the number of boxes that the border crosses is tallied. The scale of this grid is also recorded, as measured by the length of a side of a box in the grid. This gives a pair of numbers: box-count and box-size. The process is then repeated using grids with different box-sizes, each time recording both the box-size and the number of boxes that the border crosses. Given the pairs of data, box-size and box-count, the log-log plot of this data gives the fractal dimension as follows, where the negative of the slope (b) is the fractal dimension of the line: $ln(boxcount) = a - b * ln(boxsize)$." Examples of grid projections appear in Figure 3. This method yields a number that varies from 1 (indicating a maximally straight line) to 2 (indicating a maximally squiggly line).

  - *PARTITIONED* is the percent of a country's population that belongs to a group partitioned across a border. We will collaborate with government census-takers to measure the distribution of ethnic groups in border villages at different stages of the ICJ ruling implementation.

- **Public goods access:** Surveys will measure respondents' access to the following public goods: public schools, public health clinics, and water points. Surveys will also measure the quality of those goods. We chose this particular combination of public goods because they are local and thus could plausibly vary in availability and quality according to local groups' ability to cooperate around fund-raising or maintenance projects. To the extent that it is available, we will also use local administrative data to construct measures of public service provision. This, in combination with the surveys, will provide a sense of both the actual and perceived access to public goods in the area of study.

- **Nationalism:** Surveys will measure the absolute strength of respondents' national identities and the relative strength of national identities to sub-national identities. The surveys will probe respondents in the zones of study on the perceived shared or differing preferences between towns, to better triangulate the change in artificiality of the border.

- **Time since implementation of ICJ ruling:** One aspect of the ICJ ruling (where the border lies) is in effect as of May 2015, when representatives from Niger and Burkina Faso announced the start of implementation; the other aspect (the citizenship of borderland residents) will take five years to go into full effect. We expect measures of the dependent variables to respond gradually to the border reconfiguration. We therefore operationalize time since border reconfiguration as dummy variables indicating roughly one and two years after the implementation of the ICJ ruling.

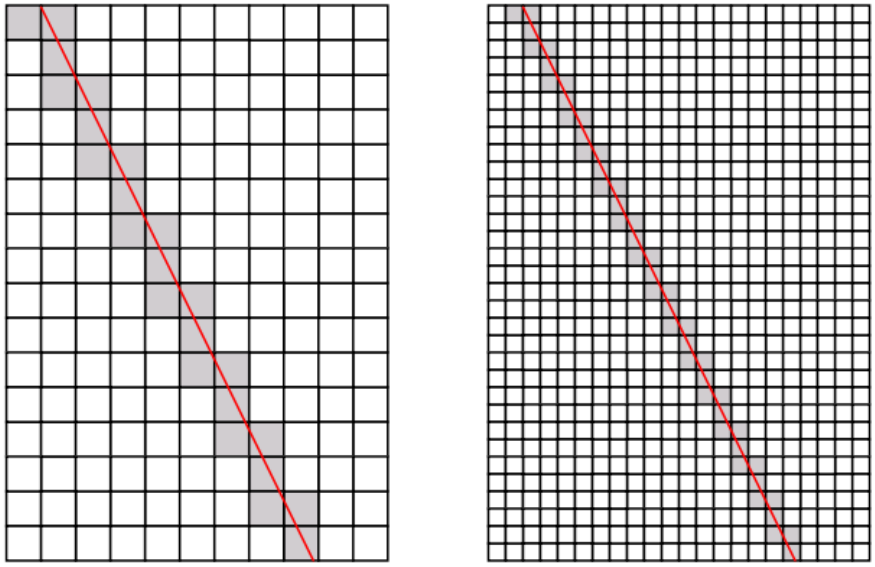

Figure 3: Example of Box-Count Method for *FRACTAL* Measure

These projections, from Alesina, Easterly and Matuszeski (2011, 24), show grids of different sizes on a relatively straight line (left) and a relatively squiggly line (right). On the left, the box size is 2 and the box count is 24; on the right, the box size is 1 and the box count is 48.

- **Strength of property rights:** Surveys will measure respondents' perceived access to property rights. Questions regarding access to credit in local markets will establish the degree to which the trade of property is secure and protected. Additional survey questions regarding the perceived expropriability of individuals' land and goods will measure the degree to which the ownership of property is protected from both the state and from other people.

5.2 Key Data Sources

Our data collection strategy requires key information from several sources. Primary among them is a survey that will conducted along the border between Burkina Faso and Niger, in the villages affected by the ICJ's border-alteration decision. The survey will be implemented in the 18 villages that are swapping nationalities, and also in neighboring villages whose central authorities are not changing as a result of the ICJ decision. This latter group of villages was under consideration for nationality change yet ultimately unaffected by the decision; therefore, collecting data in these villages will allow for rich comparisons and robustness checks in the data analysis. This survey will be piloted during the first round of field research in January 2016, when we will collect information on individuals' preferences and identities, perceptions of property rights, nationalistic sentiment, and access to public goods.

(Note for WGAPE reviewers: The survey instrument is currently being drafted, and will be shared with WGAPE attendees in advance of the conference.)

Administrative data, where available, will supplement the information obtained in the surveys on key variables and provide information on relevant covariates in the territories under study. Before traveling to the shared border with Burkina Faso, we will work with key actors in the Nigerien capital of Niamey to gain a sense of the administrative data available. Due to recurring security and food crises, NGO and GO presence in Niamey is high, and interviews with key organizations will help establish the types of data available. We will also pursue data collection through the Nigerien government's Institut National de la Statistique, obtaining census data as well as government-conducted socioeconomic survey data. We will also make contact with the survey firm conducting the ICJ census along the Burkina Faso-Niger border.

Research to estimate state artificiality requires two tasks. First, GIS data obtained from the ICJ will be used to reconstruct Alesina, Easterly and Matuszeski (2011)'s *FRACTAL* measure for the Burkina Faso-Niger border case. Existing satellite data along with the new geocordinated border data will produce measures for the border before and after the decision is implemented; we will produce maps detailing the change, and, following recent work in economics that uses nighttime lightness as a measure of economic activity and development, also incorporate such data where it is available. The second part of this phase will include ethnographic observations for causal inference driven by process tracing. This work will be done in villages along the border to gain a sense of how the border and population changes conformed to preexisting identities and preferences versus those prescribed by French colonial administrators.

5.3 Sample

This project requires two samples: a survey sample, and another for ethnographic observation. We will draw our survey sample from villages that were under threat of shifting state authorities when Burkina Faso and Niger submitted their dispute to the ICJ. These are the villages that were most likely to be affected by the ICJ's eventual decision and, as such, the villages that are most likely to demonstrate the consequences of the shared border's shifting artificiality. Our sample includes all villages that fall in the bandwidth between the border line claimed by Niger and the border line claimed by Burkina Faso. In Figure 1, this is the area that falls between the orange and the purple lines. To both capture the effect of spillovers and to ensure that villages within the catchment area are not unique in potential outcomes due to various selection processes, we will expand the bandwidth of our sample to include villages that are 5 kilometers in either direction from both Burkina Faso's and Niger's claimed border lines. This sample includes less than 30 villages; although the pilot

study will not reach all villages, it is feasible for the baseline survey to reach them all.

To construct the *PARTITIONED* variable, we must measure the distribution of ethnic groups in border villages, ideally during different stages of the ICJ ruling implementation. The survey, mentioned above, will collect information regarding respondents' ethnicities, but to bolster the data collected in the survey, we will produce more in-depth measures of ethnic diversity in certain villages in our population. This step proceeds with in-depth censuses as well as ethnographic observation. A random sample of villages will be selected for the first step, and in collaboration with census takers, we will collect measures of villages' ethnic diversity. These are also the villages in which we will conduct our ethnographic observation for the second phase.

To approximate the power of this analysis and determine the requisite sample size for the surveys, we use the following formula reproduced from Gerber and Green (2012):

$$\beta = \Phi\left(\frac{|\mu_t - \mu_c|\sqrt{N}}{2\sigma} - \Phi^{-1}\left(1 - \frac{\alpha}{2}\right)\right)$$

in which β is the statistical power, Φ is the normal cumulative distribution function (CDF), and Φ^{-1} is the inverse normal CDF. Following convention, we set α (the significance level) to 0.05 and β to 0.80. As in typical in power calculations, estimates of the average treatment effect ($\mu_t - \mu_c$) and the standard deviation of outcomes (σ) requires some guesswork. Taking one outcome as an example, to detect with a probability of 0.80 a shift in nationality of 0.25 along a 5-point scale, with a standard deviation in outcomes of 1.5, around 1100 subjects are needed. This is well within the realm of possibility of our surveys. Figure 4 demonstrates this graphically for varying sample sizes.

When recruiting individual respondents for our surveys on development outcomes, we will stratify by village and use a quasi-random sampling technique that involves drawing random numbers to indicate how many houses enumerators must pass before they recruit the next subject. Enumerators will begin walking from a central location and have instructions to recruit subjects that match a sample frame which we will derive from census data gathered in collaboration with government staff.

5.4 Estimation Model and Strategy

At the moment, we have conflicting priors over whether outcomes among the population in villages that are shifting state authorities will change at different rates than those in villages that were under threat of nationality change but ultimately remained the same after the ICJ decision. On the one hand, the ICJ ruling foreseeably affects everyone in the border region—regardless of whether a village has switched nationalities or not—by changing the

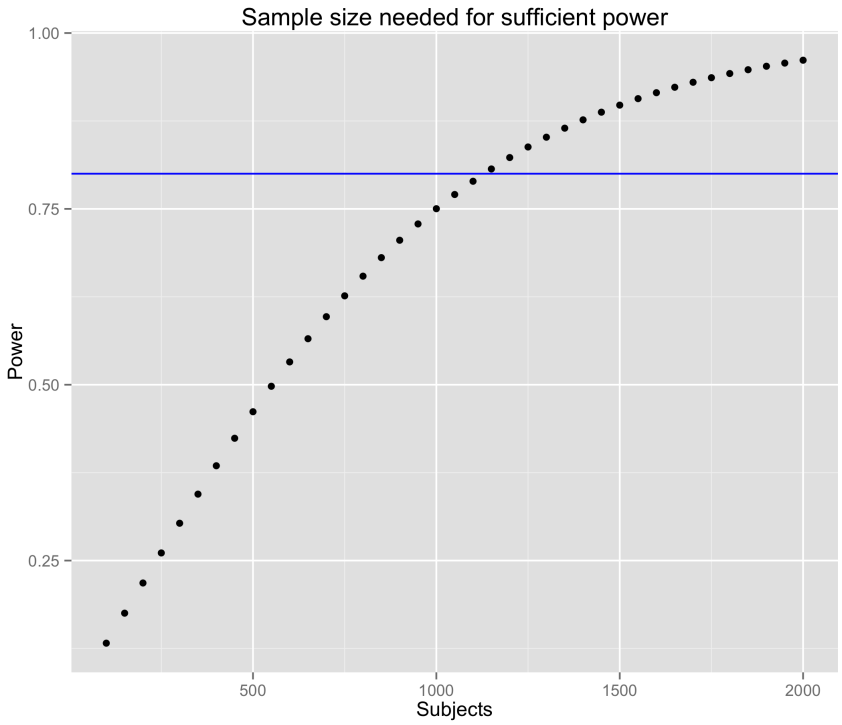

Figure 4: Power Calculation

This power calculation is done with an estimated average treatment effect size of 0.25 and a standard deviation in outcomes of 1.5. The horizontal blue line depicts the conventional threshold of 0.80 probability in detecting the treatment effect. α is set at 0.05.

composition of their communities. We are studying the effects of forming more endogenous, less artificial states, and in so doing, we expect to detect changes in both types of villages, as we expect state artificiality to change everywhere in the border region as a result of a shift to a more endogenous border. In short, we are not testing the effect of switching countries; we are testing the effect of living in a community that is less artificial, with a more squiggly border and/or a lower proportion of people partitioned across the border.

On the other hand, however, we might also expect the changes to occur at a more accelerated rate in villages that have shifted nationalities. It is possible that changes in state artificiality will be more salient in communities that have shifted nationality and central authority than in communities that remain under the same authority. As a result, we might detect differences between villages that have shifted nationalities and those that have not.

In this section, we provide empirical strategies for both scenarios described above. We note to the reader that this section will be further developed and finalized before the official registration prior to pilot survey implementation in January 2016.

Under the assumptions of our first priors, the base specification would be as follows:

$$Y_i = \alpha_i + \beta_1[TIME] + \mathbf{X_i} + \mathbf{u_i}$$

in which Y_i is our developmental outcome of interest, *TIME* is the time since ICJ ruling implementation, and $\mathbf{X_i}$ is a matrix of covariates. We will include village fixed effects, and will cluster standard errors at the village level. Incorporating priors that suggest that outcomes will be different for "treated" and "untreated" villages, we will also run a specification that includes a treatment indicator as an additional independent variable:

$$Y_i = \alpha_i + \beta_1[TIME] + \beta_2[TREATED] + \mathbf{X_i} + \mathbf{u_i}$$

There are other potential estimation strategies going forward if we expect outcomes to change at differing rates between treated and untreated villages. Leveraging the data from both affected and non-affected villages in the sample, a difference-in-differences design will contribute towards better-identified estimates. The following equation specifies this approach:

$$Y_i = \alpha_i + \beta_1[TREATED] + \beta_2[TIME] + \beta_3[TREATED \cdot TIME] + u_i$$

In this specification, Y_i is the development outcome under study, *TREATED* is an indicator variable for the villages in which the border changed the central state authority, and *TIME* is the indicator variable for the time period—before or after the decision is implemented—of

the observation. The β_3 coefficient will give us the difference-in-differences estimate. In the case of the border decision and implementation, the parallel trends assumption between the affected and non-affected villages is defensible.

Another potential strategy exploits the timing of our survey before the implementation of the ICJ's decision. By collecting rich pre-treatment data in both the affected and non-affected villages, we will be able to conduct matching that is robust to the post-treatment effects; this avoids the complications of matching strategies from which much post-treatment research suffers, and allows us to match on prognostic variables beyond the typical (and less prognostic) covariates of age, gender, etc.

5.5 Procedures for Addressing Survey Attrition

We anticipate low attrition in the survey due to the nature of most questions as not politically sensitive and the low rate of migration in these rural areas. However, we will not impute missing values and will drop from our estimation model any covariates with significant missing observations. We do not expect this to severely undermine our estimates, as most control variables such as gender and birth year will remain unchanged for each subject, given our panel survey design.

5.6 Procedures for Addressing Outcomes with Limited Variation

We will drop from the analysis any survey questions for which 95 percent of observations have the same value.

5.7 Procedures for Addressing Multiple Hypothesis Testing

We have the option of testing hypotheses individually or jointly, both for our question about state artificiality and our question about development outcomes as consequences of state artificiality. When testing jointly, we will construct indices of variables in each category (artificiality or development outcomes) following the process of Casey, Glennerster and Miguel (2008) and Anderson (2008). When testing individually, we will control for the family-wise error rate using the Holm-Bonferroni Step-Down procedure.

6 Research Timeline

January 2016: We will conduct a pilot survey during the initial round of field work in January 2016. Before implementing the survey, we will meet with NGO, state, and census officials in Niamey to explore the background of the case, gain access to relevant administrative data, and train enumerators. We will also meet with Nigerien border officials to

verify the coordinates of the old border, and ICJ officials to confirm the coordinates of the new one. Based on funding, we will implement our pilot survey in certain villages within the area of Niger's claimed line and Burkina Faso's claimed line. The full baseline survey will be implemented in villages within a 5-kilometer bandwidth of the lines to produce data for validation checks and spillover analysis, though for the piloting round, data will only be collected in villages within the catchment area.

Summer 2016: The baseline survey will be implemented beginning in June 2016 in villages along the border, including the 18 that are shifting state authorities as well as villages who, though under threat of changing by the ICJ's eventual decision, remained in the same country. Ethnographic fieldwork will coincide with the baseline survey in villages under study. The full scale of the baseline survey will depend on the level of funding the project receives, though we are confident that we will be able to reach enough subjects to reach sufficient power as depicted in Figure 4.

Follow-up surveys: Depending on the initial stages of the project, follow-up surveys will be planned and implemented in either December 2016 or Summer 2017, perhaps both. The initial round of field work and piloting will make clearer the time horizon of this project.

7 Deliverables and Extensions

The main deliverable of this project will be a paper that provides statistical and ethnographic evidence of the shifting artificiality of states, and the development outcomes associated with such a shift. In the short and medium terms, do compositional realities on the ground reflect political science's theories of endogenous boundaries and state power? Micro-foundational work on this subject is rare in the political economy literature, and we will contribute one of the first rigorous empirical tests of these classic theories.

Extensions of this project are numerous, as we expect the effects of the ICJ decision implementation to proliferate over time. Our long-term research could produce multiple papers. Particularly exciting is the personal vote on nationality within the 18 villages that are being handed over to either the Nigerien or Burkinabé side. What factors will determine how individuals choose their nationalities? As such a choice is rare in post-colonial Africa, this historical moment presents a valuable opportunity for assessing the determinants of nationality. Among other hypothesized variables, we expect that the state's past history of service provision, an individual's ethnic group, and economic networks (i.e., whether people prefer trade routes to Ouagadougou or Niamey) to influence how individuals choose their nationalities.

In addition to the determinants of nationality, there are many potential contributions that this line of research can make to the political economy literature. A promising avenue would be to assess theories arguing that state boundaries and economic boundaries change together. We can test, for example, whether villages that were formerly in Burkina Faso and whose economic ties were to Ouagadougou will reorient their economic ties to Niamey after they join Niger. Will economic borders change along with national borders? Is this something that happens at the village level, or at the individual level (i.e., as a consequence of how people choose their nationalities)? This is among the many fruitful avenues for research on the downstream effects of the border change.

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