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RE: Final Technical Report for N00014-13-1-00697

To Whom It May Concern:

Per the instructions on the award document, we are sending a copy of the Final Technical Report for N00014-13-1-0097 to this address. The SF 298 form and the Final Technical Report were also submitted on October 31, 2017 via email to the Program Officer, Dr. Joong Kim.

If you have any questions or need more information, you may reach me at kseith@princeton.edu.

Best regards,

Kristen Seith
Program Manager
Woodrow Wilson School
Robertson Hall
Princeton University
Princeton, NJ 08544 USA

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Shapiro, Jacob N. (Principal Investigator, Princeton University)
Steele, Abbey (University of Amsterdam), and Vargas, Juan F. (Universidad del Rosario)

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Developing evidence-based lessons for how to address the stabilization challenge in conflict-affected states requires consistently measuring outcomes across a range of locations, some of which receive a given program and some which do not. We demonstrate a novel approach to assessing relevant outcomes in the context of a large-scale policy initiative in Colombia, which aimed to "consolidate" (or build) state presence in regions of the country where it has not had full control. While we find no strong evidence that the initiative had significant positive impacts on key outcomes, we were able to validate the data collections approach and developed a number of important lessons learned for future efforts.

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ONR FINAL TECHNICAL REPORT

Submitted to: Joong H. Kim, PhD, Program Manager, Office of Naval Research (ONR)
October 31, 2017

Grant Award Number	N00014-13-1-0097
Title	State-building at the Community Level: Evaluating the Impact of Colombia's Consolidation Program
Principal Investigator	Jacob N. Shapiro, PhD
Institution	Princeton University
Co-Investigators (Institution)	Abbey Steele, PhD (University of Amsterdam) Juan F. Vargas, PhD (Universidad del Rosario)

Abstract

Developing evidence-based lessons for how to address the stabilization challenge in conflict-affected states requires consistently measuring outcomes across a range of locations, some of which receive a given program and some which do not. Traditional approaches rely upon administrative data on conflict events, which offer limited insights into many important outcomes, or upon extremely expensive household surveys. We demonstrate a novel approach to assessing relevant outcomes in the context of a large-scale policy initiative in Colombia, the Politica Nacional de Consolidación y Reconstrucción Territorial (The National Policy for Territorial Consolidation and Reconstruction - PNCRT), which aimed to "consolidate" (or build) state presence in regions of the country where it has not had full control. While we find no strong evidence that PNCRT had significant positive impacts on key outcomes, we were able to validate the data collections approach and developed a number of important lessons learned for future efforts.

Summary

Major goals and objectives of this project

A vexing challenge in international affairs is how to help states establish a durable presence in previously un-governed regions and those currently controlled by non-state actors, what has been termed "stabilization" by the U.S. policy community in recent years. Developing evidence-based lessons for how to address the stabilization challenge requires consistently measuring outcomes across a range of locations, some of which receive a given program and some which do not. Traditional approaches rely upon administrative data on conflict events, which offer limited insights into many important outcomes, or upon extremely expensive household surveys. We demonstrate a novel approach to assessing relevant outcomes in the context of a large-scale policy initiative in Colombia, the Política Nacional de Consolidación y Reconstrucción Territorial (The National Policy for Territorial Consolidation and Reconstruction - PNCRT), which aimed to "consolidate" (or build) state presence in regions of the country where it has not had full control.

From Fall 2012[1] through Spring 2017 we collected 19 waves of quarterly panel data on a set of 107 passively observable indicators of key consolidation outcomes across the full set of

[1] Data collection prior to the award start date was funded by another source.

PNCRT municipalities, as well as a group of matched control municipalities.[2] These indicators covered measures of government physical control, as well as local bureaucratic capacity, social and economic integration with the rest of Colombia, and local economic conditions.

Outcomes were organized along three key dimensions of state-building from both scholarly work and the PNCRT policy aims of the U.S. Agency for International Development (USAID) and the Government of Colombia (GoC), which are further discussed below. States are diverse, but all minimally include some degree of territorial control, administrative capacity, and integration across the territory (physical, economic, and political). The PNCRT reflected an effort to improve the GoC across all of these dimensions in the targeted municipalities. Accordingly, we developed indicators for each.

Outcome variables include:

1) *Territorial Control*: proxies of security such as the number of police officers assigned to the municipality; the number of homicides, thefts, and robberies, presence of illegal mining and presence of propaganda (in the form of poster, pamphlets or graffiti) about illegal armed groups

2) *Administrative capacity*: the share of properties that have titles, the share of properties that pay taxes, how taxes are collected, and key peacebuilding variables such as the amount of land restituted to owners previously dispossessed.

3a) *Integration (political)*: proxies of governance and political integration such as whether public servants are appointed and are seen in their offices during working hours.

3b) *Integration (economic)* proxies of economic activity as well as integration with the department capital and the main markets of the country[3], such as the number of financial institutions, the number of shipping companies (and the prices of shipping a standard envelope to different parts of the country), presence of utility providers, internet providers (and the price of the connection), pharmacies, hotels (and the average price of a standard room), the prices in shops and markets of basic consumption goods such as oil, butter, rice, bread, salt, milk, eggs, flour, as well as several fruits and vegetables

3c) *Integration (physical)* proxies such as cell phone signal coverage, availability of public transportation to the department capital (and the cost of a ticket and the duration of the trip), coverage of tertiary roads in the municipality

Combining these panel data with separately collected survey data from the PNCRT communities and matched controls enabled us to study the impact of Consolidation and to assess the performance gains from using long-term measurement of passively observable outcomes. We find weak evidence that PNCRT had significant positive impacts on key outcomes. Specifically, roughly twice as many outcomes show positive treatment effects as one would expect by chance, but many outcomes show only modest changes and these are often inconsistent across regions.

We were, however, able to validate the data collections approach and developed a number of important lessons learned for future efforts. The main scientific goal of the project was therefore met, even though the underlying state-building intervention appears to have been a very modest success at best.

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[2] See Appendix A for the full list of measures.

[3] In Colombia, departments are equivalent to U.S. states.

Technical Objectives

This project was designed to make a significant methodological contribution to studying large scale government initiatives to enhance state presence in conflict zones or ungoverned spaces by testing a new approach to measuring outcomes.

In many places around the world non-military interventions (i.e. economic development, governance, health, and rule of law programs) are implemented in conflict zones. In Iraq and Afghanistan, the U.S. government spent more than $150B on such programs to little clear effect. Mostly the impact of such programs is not systematically evaluated at all. This is in large part because existing evaluation methods rely on measures derived from household surveys which are extremely costly. In Colombia, for example, it costs roughly $75/respondent to do a quality 90-minute household survey (roughly 150% of the cost in Afghanistan). A survey that aims to achieve a margin of error of +/- 5% in a given community, say a municipality in Colombia, requires spending at least $30,000 in that community. Such costs are reasonable for generating baseline and endline data for community-level outcomes in a limited set of places (i.e. 40-80), but are cost prohibitive for measurement at higher frequencies or across larger samples (e.g. if one wanted to look at a 2x2 design that would require many more communities). And even for a baseline/endline design in 50 treated and 40 control units (roughly our sample) the standard approach would cost close to $3M in data collection costs alone, and so may only be done for the largest projects.

Our project tested an alternative approach to measuring outcomes which involves quarterly data collection of observable indicators of state presence using a matched control design. The cost of this new approach is substantially lower (less than $40K per wave, including admin costs and as many as 92 treatment and control municipalities).The 19 waves cost less than $760K. A 19-wave household survey would cost $25M or more (a figure higher than any development project has paid to our knowledge).

Technical Approach

Our goal was to validate the approach of using long-term passive collection of observable measures of state presence as a way of studying state-building interventions in conflict zones. The specific context of our research is a large-scale development program in Colombia that was designed to foster state-building called Política Nacional de Consolidación y Reconstrucción Territorial (PNCRT). We spent roughly $40,000 each quarter to collect a range of outcomes in 92 municipalities (51 treatment and 41 control). As McKenzie (2011)[4] highlights, there are massive inferential gains from more frequent measurement. Applying this approach to the PNCRT evaluation allowed us to evaluate a new approach to cost-effectively evaluating large-scale, high-profile programs in conflict zones.

The observable measures selected for our data collection were designed with three broad questions in mind: (1) Can large-scale programs like the Política Nacional de Consolidación y Reconstrucción Territorial (PNCRT) foster state-building?; (2) How do the impacts vary across communities, i.e. does the efficacy of the treatment depend of observable community pre-treatment traits?; and (3) What are the mechanisms driving state-building? If frequent

[4] McKenzie, David. 2011. "Beyond Baseline and Follow-up: The Case for More T in Experiments." *Journal of Development Economics* 99: 210–221.

collection of observable indicators can capture meaningful data on these broad questions, the approach could be adapted for other locations and initiatives that are rolled in other places experiencing conflict.

To answer these questions, our project collected data from communities that were targeted for the PNCRT state-building program in Colombia with the support of USAID, as well as communities that are similar to those in the program, but which did not receive aid. These "controls" were identified on the basis of similar past trends in five factors: 1) historical presence of illegal armed groups; 2) market integration (or lack of); 3) trends in contestation; 4) presence of coca or other illicit crop, and potential for trafficking; 5) strategic importance.[5] We collected observable indicators of state-building in 92 Colombian municipalities (51 treatment and 41 controls) on a quarterly basis for 19 quarters over more than four years (a few waves were completed prior to the start of this grant).

To summarize, the major goals of the project were to:

1. Collect and review quarterly panel data of observable indicators in 92 municipalities in Colombia (51 treatment municipalities and 41 matched controls) from 2012-2017.
2. Provide empirical results on the impact of the PNCRT state-building efforts in terms of physical control, administrative/bureaucratic capacity, and integration, drawing on five years of quarterly panel data and separately collected survey results.
3. Provide an assessment of how and where state-building has worked, within a broader context of state-building theories
4. Share results with both the academic and policy communities

Technical Accomplishments

Five-Year Panel Database of Observable Indicators in Colombia

Quarterly panel data of observable indicators in 92 municipalities in Colombia (51 treatment and 41 controls) were collected quarterly. The final panel database includes 19 waves collected from 2012 to 2017. This is the longest time-series of local level outcome data and detailed price data for areas going through consolidation that we know of. In addition to the unprecedented length and level of detail, this is the first time that high frequency data on prices is collected for areas that, because of their characteristics of being mainly rural and affected by armed conflict: i) are not included in CPI measures by the Colombian Statistical Office (the monthly CPI is only representative of the 13 main metropolitan areas); ii) do not have (or have very few) formal shops or marketplaces; iii) prices of basic consumption goods as well as those of transportation, internet, shipping, and so on, which are not listed online and so cannot be obtained in any other way. Moreover, even though prices provide the most accurate information about economic and social changes over time, not even development

[5] As described in the original proposal, interviews with Colombian and US government officials suggested that these five factors were the criteria used for selection of the PNCRT municipalities in the first place. We used several variables to capture each dimension, then generated a covariate balancing propensity score (CBPS) for selection to treatment. CBPS is a GMM (Generalized Method of Moments) based method for generating propensity scores which seeks to balance the two objectives of propensity score matching: generating balance on relevant covariates and identifying places that are equally likely to have been selected into treatment. We selected matched control using an optimal matching algorithm to pick the closest non-treated municipalities in terms of propensity score, after stratifying by the four major regions in which PNCRT programming took place.

economists who work in the field are likely to have access to high frequency and good quality data on prices of a large set of goods and services.

After the first journal article is approved for publication, the dataset will be made publicly available on the Empirical Studies of Conflict Project's website (http://esoc.princeton.edu).

Development of New Measures

This project demonstrated the viability of long-term direct, passive observation of state-building indicators at the local level. This approach is substantially cheaper than traditional survey-based measures and can be conducted with much lower enumerator risk in challenging environments than face-to-face surveys.

We also developed indices to measure changes in key dimensions of state-building. We evaluated a broad range of indices in conversations with government and USAID officials as well as local officials and development practitioners. The three lowest noise indicators that had face validity in the local policy community are:

1) Security. The security index is calculated by taking the simple average of indicator variables for whether one or more of the following occurred in the municipality in the previous quarter: homicide, major theft, robbery, illegal mining by illegal armed groups, and propaganda in favor of the illegal armed groups in the municipality;
2) Administration. The government administration index captures staffing levels at the municipality level. It is measured as the proportion of the municipal administration positions that are staffed at the time the enumerator visits the main municipal office.
3) Integration. The economic integration index is calculated by taking the simple average of the indicator variables for the presence of: private shipping firms, private banks, public or estate banks, money transfer locations, and internet connections in the rural areas of the municipality. (If any of these entities or services exists in the previous quarter, the enumerator reports a "1.")

We therefore focus on these outcomes below in reporting key findings.

Best Practices for Passive Data Collection in Conflict Zones

Since part of the goal of this project was to validate and improve a measurement approach we worked with our data collection firm (Econometría) and locally-based enumerators to identify best practices for this type of work. Several key lessons emerged which we summarize below.

(1) Local enumerators. One of the most important pieces of our research design was to collect data by direct observation or by interviewing local officials. To this end we decided to hire and train local enumerators through a local firm. Their familiarity with their municipality including the identity of the incumbent officials and how to approach them, the location of marketplaces and other businesses, etc. was a key for the success of our strategy. An outside enumerator (e.g. someone from the capital or abroad) would have faced significant challenges in developing the requisite knowledge, in addition to distrust from the local population, thus compromising the very essence of the effort.
(2) Plan to modify data collection. In our case, for example, the initial questions we designed on taxation were not sufficiently precise. This was because the great variation in tax institutions across Colombian municipalities was not widely known (neither co-PI

Vargas, who is a leading Colombian economist, nor our data collection firm, which is one of the top survey firms in the country, were aware of the issue). We therefore added a range of questions to determine which *type* of taxation is used in the municipality; and the range of tax *rates* across property values (rather than for each segment of property values, because each municipality that uses this system is different).[5] We suspect that in many areas going through consolidation/stabilization processes the nature of local institutions will be opaque so the general principle of planning to modify data collection is important.

(3) Treat missingness as data. In our experience the reasons that certain kinds of administrative information were missing shed light on state presence and the nature of local administrative practices. For example, it was informative whether a given piece of information was not available because (1) the relevant official was unavailable, (2) the municipality did not track the information, (3) the official did not respond or collaborate, (4) the information was considered confidential in that place even though it was not so by law, (5) the information had to be requested formally in advance, or (6) the information was out of date or considered unreliable by local officials. Each reason was indicative of a different kind of challenge with state administrative capacity. Based on feedback from the enumerators, we adapted our questionnaire to include these possible reasons to report, depending on which was the source of missing data.

(4) Focus on market centers. Many data collection efforts spend a great deal of time and money reaching out into rural communities, particularly survey efforts. For panel data collection on stabilization this was unnecessary. Local administrative staffing and policies, security indicators, and economic conditions (e.g. price and quantities as well as market activity) could all be observed without travel beyond local market centers.

(5) Enumerators are sensors. Problems encountered in gathering the data, i.e. access restrictions, and municipal-level challenges such as electricity outages, national or regional strikes or natural disasters are all valuable inputs to understanding stabilization conditions. Over time, we identified a wide range of background conditions which could be measured on a regular basis to feed into our analysis. With each wave of the data collection, the enumerators also reported on any unusual conditions in a systematic way.

(6) Track turnover in government officials. As described below, the turnover of local government officials was a significant and unexpected source of variation in data quality. Since such turnover can be an important outcome, passive data collection efforts should record the names and identities of key public servants every quarter in order to assess changes in local administration and to be able to control for such changes in data analysis.

Challenges related to relying on local enumerators and local officials

Our review of the multi-year waves of data led us to identify two challenges to this method that will likely to apply in other conflict zones where repeated collection of passively observable indicators is used:

A) There are tradeoffs inherent in working through local enumerators who have to balance security concerns with work requirements in extremely uncertain environments.

B) High turnover of local officials in conflict zones is common.

Since these challenges represent potential limitations to our method, we describe them in more detail in this section.

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[5] As a result of enumerators' reporting that tax policies varied so significantly across municipalities, we designed a related research project to collect data on this across all municipalities in Colombia and to analyze this variation. Given how important tax policies are to state-building, we believe this documentation and analysis of the variation is important.

Local Enumerators: As mentioned above, there are two main benefits to hiring local enumerators:

1) Local enumerators know local conditions better than any outsider. They know where to look for the information we ask in the questionnaire, they know who to ask and when to ask, and they know the local security and the local social norms.
2) Panel municipalities are spread across the country and sending enumerators from Bogotá to these places would be prohibitively costly.

However, we also identified two types of challenges with local enumerators:

- Remote training/supervision. Any instrument for long-term panel data collection is likely to be long and require different types of efforts from the local enumerator. This implies a number of actions. First, a data collection manual needs to be developed which provides precise instructions covering each step of data collections with instructions that are simple enough that enumerators can be trained in their execution by phone (training of enumerators should be face-to-face when possible, but the instructions should be simple enough that when physical access is impossible the training can still be done). Second, supervisors should employ random audits such as follow-up calls to offices where the enumerator should have visited. Third, data users should understand that data will be noisy because rates of shirking by enumerators will likely be higher than on traditional surveys. This is because the concentrated nature of survey field work facilitates rapid detection of shirking through survey forensics; i.e. GPS trackers reveal the enumerator is not actually visiting households according to the proper selection rule, or when an enumerator does ten forms in a day the distribution of last digits on a consumption question can quickly be checked and the enumerator fired if they are all the same number. Both kinds of auditing are harder in this context.
- Enumerator turnover. Local economies are seasonal in most conflict-affected regions, so retaining enumerators year-round is challenging. Even when passive data collection jobs pay competitive wages, they only offer employment for a few days every few months, rather than a steady position. Relatively high turnover impacts the efficiency and cost structure of passive data collection, since additional hiring and training are required. High turnover affects data quality in two ways. First, since much of the data collection is through direct observations, there is an element that is subjective and hence "enumerator-specific." Despite focusing on objectively observable indicators, high turnover can make direct comparison of data across waves challenging and leads to different variance across locations (i.e. higher turnover municipalities have noisier measures), making correct calculation of standard errors a challenge. Secondly, some public officials in our experience were reluctant to provide information to new enumerators they were not familiar with, leading to higher rates of missing data in high-turnover locations.

The challenges we encountered with local enumerators may also apply to future projects with quarterly data collection in remote areas. One way to minimize these challenges would be to increase the professional staff involved on the ground, but that comes with significant financial costs. It's possible that technological advancements, such as smart phones, may be able to cost effectively improve the challenges of remote training and supervision, and future projects could study this. Enumerator turnover is likely to be a challenge in many remote areas with seasonal economies. It may be necessary to design a different payment structure to help retain trained local enumerators, or it may be that using local enumerators for quarterly data collection is best reserved for instruments with highly objective and simple measurable indicators that don't require significant training. Firms such as Premise.io are developing

crowd-sourcing infrastructure exactly to solve the challenges we identify, but they are not working in insecure areas and so will not likely be a viable solution for the foreseeable future.

Turnover of local public officials: In terms of the challenges related to the turnover of local public servants, public posts in many post-conflict settings are used for political reasons, so when the local political equilibrium changes public servants are reshuffled. This can make keeping the flow of information consistent from one quarterly wave to the other quite difficult. New public servants are often unaware of where to find the information they are being asked for or reluctant to share it, even though it is legally public information. This means there can be a substantial educational requirement for the enumerators each time the post changes hands. And, of course, sometimes public servants are reluctant to provide information that they think makes them or the municipal administration look incompetent and that (they think) would probably get them in trouble. Since such assessments are highly variable across public servants, high turnover on their end leads to variance in the data.

The high turnover of public servants and their ineffectiveness at conveying public information is, unfortunately, a systemic problem that could be difficult to impact with a different research design. Future efforts to employ this technology should deliver a standard training package with higher-level government support to ameliorate this issue.

That said, as noted above failure to follow the laws on information sharing itself provides insights on the effectiveness of the state-building effort. Data collection protocols should therefore follow our design and include careful tracking of the reasons provided for not sharing information.

Complementary Data Sources - Household Survey and MONITOR

This ONR-supported data collection complemented a broader evaluation design (budgeted separately as part of the USAID support to PNCRT) that involves collecting two additional sources of data, both of which have been organized to integrate with the panel data:

- USAID's MONITOR database collects a broad range of information on the PNCRT-related interventions themselves, including budgets, traits of beneficiary households, and reports on project execution. These data, which are updated quarterly, allow us to estimate treatment "dosages" at the community levels by type, scale, duration and quality of intervention. We have matched these project-level data to communities to measure whether and to what extent these interventions affect our observable indicators of state-building.
- Household-level longitudinal surveys in the same treatment and control municipalities. The baseline and midline are complete, and an endline was originally planned for 2018.[7] This survey includes measures of PNCRT program impacts on a standard set of LSMS variables as well as a range of political variables. The midline was completed in June 2016, and we have cleaned the midline data and merged them with the baseline for analysis. When the endline is in place we will next study changes in average experiences and impressions of state-building over time, alongside the higher-frequency changes observed in the panel data.

[7] We have heard that USAID may cancel the endline, but we have not received confirmation. If the endline does not take place, we will analyze the changes in the midline with reference to the panel.

Key Findings Regarding Consolidation

While we are still analysing these panel data and the complementary sources, our analysis to date provides weak evidence of treatment effects. While the results remain preliminary, as we are doing a range of analyses now to understand heterogeneity in the intensity of PNCRT programming across the municipalities, we report our assessment so far on two analyses we have conducted.

First, using survey data separately collected by USAID, we conducted a traditional difference-in-differences analysis using the matched controls. In that analysis we assessed the impact of PNCRT programming on approximately 200 outcomes. We found that roughly twice as many outcomes showed statistically significant positive effects from PNCRT as would be expected by chance. The magnitudes of these effects were modest, however, and they were inconsistent across regions. The survey data thus provide, at best, modest evidence that PNCRT was a successful stabilization program.

Second, we analysed trends in the panel data. To simplify the analysis for this report we focus on 3 time periods: *beginning* (waves 1, 2 and 3), *midline* (waves 9, 10 and 11) and *end* (waves 17, 18 and 19). We divided municipalities into four categories based on their scores on a simple additive index of administrative capacity and economic integration. For each dimension, we assessed whether a given municipality was above or below the median for that index at baseline. In each period, we could then divide municipalities into four categories: high-high (HH), low-high (LH), high-low (HL) and low-low (LL) categories. We then asked a simple question: how many control or treatment municipalities transitioned to the HH category from one of the other three between periods.

We again found modest evidence of impact. From beginning to midline, 14 treatment municipalities moved into the HH category (that is, they scored high on both the administrative capacity and economic integration measures), but only 4 control municipalities did so. Since the categories were roughly balanced at baseline this suggest some positive impacts through midline. Some of these gains were not sustained, however, and by endline 10 treatment and 5 control municipalities had made the move to the HH category on these two indices. Figure 1 below highlights these trends, showing the movement in treatment and control on two indices: one for overall administrative capacity; and one for economic integration.

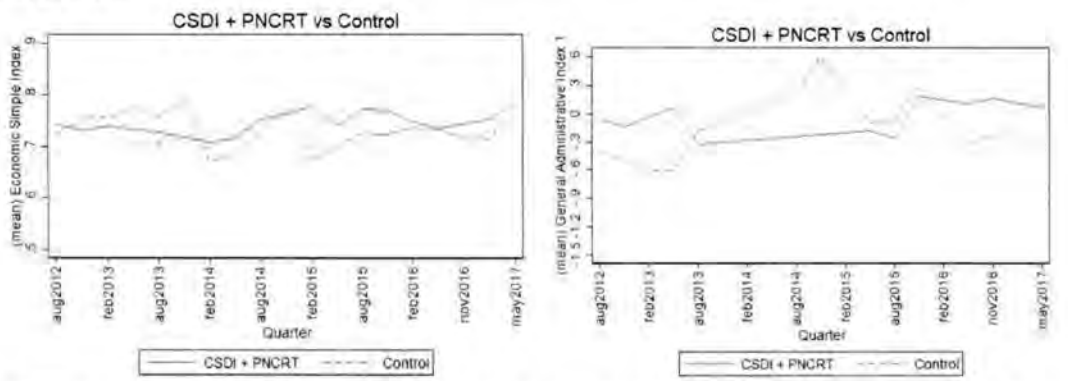

Figure 1. Changes in economic integration and overall administrative presence index over time in PNCRT municipalities and matched controls.

Trends in security were somewhat more positive in so far as PNCRT municipalities showed consistently higher security ratings. This was perhaps mechanical at baseline as the baseline coincided with a significant push by the Colombian military. But it was sustained over the longer term, as Figure 2 shows, suggesting that perhaps the PNCRT programming helped.

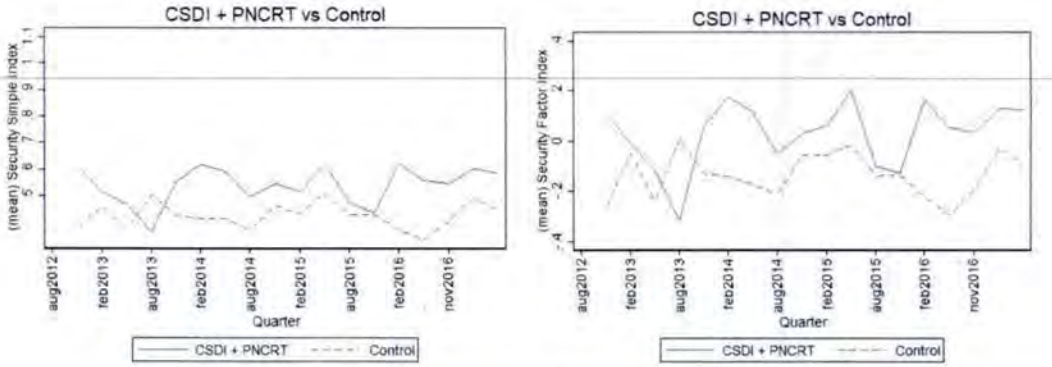

Figure 2. Security ratings across two different indices over time for treatment and control municipalities.

Overall, we find modest evidence that PNCRT worked in our initial analysis. More importantly, we find that panel data are a useful measurement approach. In ongoing work, we are assessing how it responds to more granular changes in treatment, as measured in the MONITOR system described above.

Publications and Academic Papers

Steele, Abbey and Jacob N. Shapiro. 2017. "Subcontracting State-Building." *Small Wars and Insurgencies* 28(4-5): 887-905.
http://www.tandfonline.com/doi/abs/10.1080/09592318.2017.1323408

Working Paper
Vargas, Juan F., Abbey Steele, Jacob N. Shapiro and Rafael Ch. 2017. "Endogenous Taxation in Ongoing Internal Conflict: The Case of Colombia." Unpublished Manuscript.

Work in progress
Vargas, Juan F., Abbey Steele, Jacob N. Shapiro and Rafael Ch. 2017. "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia."

Vargas, Juan F., Abbey Steele, Jacob N. Shapiro and Rafael Ch. 2017. "The Impact of Large US-backed State-Building Efforts: Evidence from Colombia's PNCRT Consolidation Program."

Presentations about this Research

Abbey Steele, "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia." Political Economy and Transnational Governance Research Group Seminar, University of Amsterdam, November 9, 2017.

Rafael Ch, "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia." Workshop of Applied Microeconomics at Universidad del Rosario, August 2017.

Juan Vargas, "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia." Evidence on Governance and Politics (EGAP), 20th Meeting, Bogotá, Colombia, May 2017.

Abbey Steele and Juan Vargas, "Endogenous Taxation in Ongoing Internal Conflict: The Case of Colombia." The Subnational State in Latin America: Institutions, Citizenship and Regime Type Within and Across States, Amsterdam, March 2017.

Abbey Steele, "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia." Workshop on New Research on Political Violence, University of Amsterdam, March 24, 2017

Juan Vargas, "Illicit Behavior and the Foundations of State-Building: Evidence from Colombia." Drug Policy Program, CIDE, México, February 2017.

Abbey Steele, "Endogenous Taxation in Civil Conflict: Evidence from Colombia." Uppsala University (Sweden), 12 Nov 2015, and at Konstanz University (Germany), 26 Nov 2015.

Jacob Shapiro and Juan Vargas, "Endogenous Taxation in Ongoing Internal Conflict: The Case of Colombia." World Bank, July 2015.

Juan Vargas, "Endogenous Taxation in Civil Conflict: Evidence from Colombia." State Capacity Workshop, CAF-Development Bank of Latin America, July 2015.

Jacob Shapiro and Juan Vargas, "Endogenous Taxation in Ongoing Internal Conflict: The Case of Colombia." Empirical Studies of Conflict Annual Meeting, Washington DC, May 2015.

Abbey Steele and Juan Vargas, "State Building in the Works: Long-Term Impact Evaluation of Consolidation and CSDI." USAID Mission, Bogota, Colombia, December 2014.

Jacob Shapiro, "Understanding the Value of Humanitarian Assistance Projects on Economic and Political Stability in Colombia." ONR SAEEF Review, Arlington Virginia, October 2014.

Synergistic Activities/examples of how results were disseminated to communities of interest

Professor Vargas has also been engaged in a project funded by USAID-Colombia in analyzing the impact of consolidation. Data from this project will be used in the final report for that project.

Vargas, Juan F. (presenter), Rafael Ch, Abbey Steele, Jacob Shapiro, "Evaluating the Impact of State-building Exports on Illegal Behavior: The Case of Colombia." November 24, 2016. Universidad de los Andes, Bogotá, Colombia. This academic workshop on Illicit crops was organized by CESED in Universidad de los Andes and the London School of Economics. The household survey data that Professor Vargas presented on was not funded through this ONR grant, but survey results given to the PIs provide complimentary data to the quarterly observational data collection funded by this ONR grant.

Training/Professional Development for Young Scholars

Rafael Ch, a PhD student at NYU who is fluent in Spanish and English, conducted research assistance for Prof. Shapiro at Princeton and for Prof. Vargas at Universidad del Rosario in Colombia, and is a co-author on publications. This provided experience in social science data collection and econometric analysis.

One graduate student at Syracuse University, Laura Rodríguez, worked as an RA under the direction of Abbey Steele during 2014-15 (while Dr. Steele was at Syracuse, prior to joining the University of Amsterdam).

Five undergraduates and three graduate students received training as research assistants under supervision of Prof. Vargas at Universidad del Rosario as follows:

Name	Role	Dates worked on project
Juliana Aragón	RA-undergraduate	7/1/2015-6/30/2016
Nathalie Basto	RA-undergraduate	7/1/2015-6/30/2016
Viviana García	RA-undergraduate	7/1/2015-6/30/2016
Angie Ovalle	RA-undergraduate	7/1/2015-6/30/2016
German Pulido	RA-undergraduate	7/1/2015-6/30/2016
Juan Carlos Angulo	RA- graduate student	7/1/2015-6/30/2016
Juliana Aragón	RA-graduate student	4/16/2017-7/31/2017
Carlos Cardona	RA-graduate student	1/15/2017-4/15/2017
Rafael Ch[8]	RA-graduate student from NYU	Summers 2015 and 2016

[8] Currently, Rafael is a PhD student at NYU and co-author on several papers from the project.

Appendix A: Panel Data Questionnaire

Dependent Variable	Dimensions	Indicator	Measurement
1. Control	Security Force Presence	Existence of a police station or CAI	Police department
		Number of police stations, sub-stations, or CAI in the cabecera	Police department
		Number of police in the cabecera	Police department
		Violent events registered by the police	As reported to the police
		Any homicides in last 3 months?	Police department
		Number of homicides in last 3 months	Police department
		Any thefts in the last 3 months?	Police department
		How many thefts in last 3 months?	Police department
		Any robberies in the last 3 months?	Police department
		How many robberies in the last 3 months?	Police department
		Are armed groups controlling or managing any mining in the municipality?	Police department
		Police patrolling? (on day of work: yes or no)	Direct Observation
		Presence of illegal armed group graffiti	Direct Observation
		Which armed group was the graffiti referring to?	Direct Observation
2. Administration	Staffing	Is the mayor's office fully staffed?	Observed, yes/no? (municipal office)
		If public accounting meetings happen	As reported at the municipality mayor's office

Dependent Variable	Dimensions	Indicator	Measurement
		Number of public accounting meetings	As reported at the municipality mayor's office
		What was the theme of the meeting?	As reported at the municipality mayor's office
		Where did the meeting take place?	As reported at the municipality mayor's office
	Counting	Number of legal land titles	Mayor's office, Department of Planning
		Number of plots of land	Mayor's office, Department of Planning
		Number of businesses in community	Mayor's office, Department of Planning
		Number of people registered in SISBEN (social welfare rolls)	Mayor's office, Department of Planning
		Number of people in SISBEN but not eligible for health benefits	Mayor's office, Department of Planning
		Number of centros poblados (corregimientos, police posts and small clusters where veredas are linked)	Mayor's office, Department of Planning
		Is there mining in the municipality?	As reported at the municipality mayor's office
		Number of mines in use	As reported at the municipality mayor's office
		Number of mines with a mining title	As reported at the municipality mayor's office
		Number of mines that acquired a title in 2012?	As reported at the municipality mayor's office

Dependent Variable	Dimensions	Indicator	Measurement
		Number of cases of property restitution in process	As reported at the municipality mayor's office.
		Number of restitution cases resolved in last 3 months	As reported at the municipality mayor's office.
	Taxation	Percentage of property titled	Catastro, Mayor's office
		Number of properties that pay taxes	As reported at the municipality mayor's office.
		Tax rate - 2011	As reported at the municipality mayor's office.
		Tax rate - now	As reported at the municipality mayor's office.
		Number of firms that pay commercial taxes	As reported at the municipality mayor's office.
		Type of taxation	As reported at the municipality mayor's office.
		Corporate Tax Receipts	As reported at the municipality mayor's office.
		Value of property taxes	As reported at the municipality mayor's office.
		Number of properties that pay tribute taxes	As reported at the municipality mayor's office.
		How much did the municipality receive in royalties from oil?	As reported at the municipality mayor's office.
		How much did the municipality receive in royalties from other mining activity?	As reported at the municipality mayor's office.

Dependent Variable	Dimensions	Indicator	Measurement
		Number of centros poblados that have public transport routes	As reported at the municipality mayor's office
		What is the most common form of travel used in the municipality to go to the departmental capital	Ask in transport hub
		Price of tickets to travel to the department capital, on most common form of transport	Ask in transport hub
		How long does it take to get from the cabecera to the dept. capital?	Ask in transport hub
		Is there a postal service in the cabecera (Adpostal or 472 or Correos de Colombia?	Observed
Integration	**3. Physical Integration**	Number of tertiary roads	Recorded at the municipality mayor's office
		Percentage of tertiary roads that are transit able	Recorded at the municipality mayor's office
		Percent of communities with public transport routes	Recorded from schedules of public transit
		Electricity coverage	Recorded at the municipality mayor's office
		Coverage of cellular phone service	Is there coverage on specific networks
		Internet coverage	Recorded at the municipality mayor's office
		What is the form of internet access in the cabecera?	Recorded at the municipality mayor's office

Dependent Variable	Dimensions	Indicator	Measurement
	4. Political Integration	Election results by polling station	As reported at the local election office
		Number of voters by polling station	As reported at the local election office
		If there's a citizen oversight committee	As reported at the municipality mayor's office
		Number of denunciations to the justice system	As reported at the local prosecutor's office
		Percentage of cases resolved	As reported at the local prosecutor's office
		Is there a hospital?	Secretary of health
		How many hospitals are there, by level of attention?	Secretary of health
		Number of households affiliated with the health system	As reported at the municipality mayor's office
		How many health centers are there?	Secretary of health
		How many health posts exist	Secretary of health
		Number of health service personnel per habitant	Secretary of health
		Number of schools, by level	Secretary of education
		School slots by level of education	Secretary of education
		School enrollment rate by level of education	Secretary of education
		School pass rate - overall	Secretary of education
		School "held back" rate	Secretary of education
		School dropout rate	Secretary of education

Dependent Variable	Dimensions	Indicator	Measurement
		Presence of a prosecutor (fiscal)	Is there a fiscal present in the municipality today?
		Number of days the prosecutor is in the municipality per month	Courthouse: Ask secretary
		Presence of a judge	Is there a judge present in the municipality today?
		Number of days the judge is in the municipality per month	Courthouse: Ask secretary
		Procurador present?	Observed
		Notary present?	Observed
	5. Economic Integration	Is there a hotel?	Observed, yes/no?
		How many hotels?	Observed
		Cost of one night in a hotel for one person	Observed
		Number of private banks	Observed in the country seat - count
		Number of pharmacies in cabecera	Observed
		Number of public banks?	Observed: yes/no?
		Is there money transfer companies?	Observed: yes/no?
		Is there unpasteurized milk, other goods, in this municipality?	milk supply that's most commonly used
		How much does unpasteurized milk and other goods cost?	milk supply that's most commonly used
		Number of stalls in the market	Observed: count

Dependent Variable	Dimensions	Indicator	Measurement
		Price of fruits and vegetables	Prices for 1 kg each of bananas and potatoes at closest store
		Price for a household basket of goods	Prices for 1 kg. each of rice, cooking, oil, and lard.
		Are there private shipping businesses?	Observed
		How many shipping businesses are there?	Observed
		Price to send the same-size package to the department capital	Cost for sending a 1kg, 5kg, 10kg, envelope package to the county seat
		Number of land transactions	Recorded at the municipality mayor's office
Other Desirable Outcomes	**Social Capital**	Marriage registers	As reported at local registry
		If there's a community house	Observed, yes/no?
		Maintenance of bridges in the communities	When traveling in municipality, note condition of bridges
		If a community action committee (JAC) exists	As reported at the municipality mayor's office
		How many people participate in the JAC	As reported by the community action committee
		How many times the JAC meets	As reported by the community action committee
		Is there a place to throw garbage in the main park?	Observed
		How many garbage bins are there?	Observed

Dependent Variable	Dimensions	Indicator	Measurement
		How many garbage bins are overflowing?	Observed
		Catholic Churches	Observed
		Christian Churches	Observed
	Consolidation / State visible Presence	Is there an office for Colombia Responde?	Observed
		Have you seen in the cabecera any sort of banner or poster for Colombia Responde?	Observed
		How many Colombia Responde banners are there?	Observed
		Have you seen in the cabecera any sort of banner or poster for USAID?	Observed
		How many USAID banners are there?	Observed
		Have you seen in the cabecera any sort of banner or poster for the army or national police?	Observed
		How many army/police banners are there?	Observed