

Proposal: A Randomized Control Trial Experiment to Understand Heterogenous Findings  
Around the Impact of Acquiring Property Rights

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PolSci 750- Political Economy of Development  
08.12.2017

Project Summary

While several centuries of theoretical work have emphasized the importance of property rights, recent evidence has called into question their true impact. While strong positive findings are consistent where property rights are strongly enforced, in areas with weak state capacity- such as those seen in urban informal settlements- authors have begun to suggest that formal recognition is perhaps the way to go. In examining the recent work done around the importance of property rights, I observed that positive results are more common when titling is universal. As a result, I hypothesize that titling can take the form of a timeline with three stages along the move from informal to full property rights. These stages are formal recognition, haphazard private title and finally, universal title. I further hypothesize that universal title is the optimal long run equilibrium, but that an economic trap may exist that would prevent settlements from reaching this equilibrium. I further suggest that governments may avoid this trap by issuing simultaneous, universal private title to informal settlements. I believe this simultaneous action will achieve the positives from collective action associated with formal recognition while maintaining the long-term, optimal equilibrium. To test these hypotheses, I propose a randomized control trial in Mexico City. This trial will take the form of three treatment groups assigned to each of the stages outlined above, with a control that remains informal. This setup will allow testing of each hypotheses, and my expectations are laid out below. Mexico City is an excellent location due to Mexico's history of friendliness towards RCTs, but also because each of the stages I hypothesize already exist in Mexico. Additionally, the sheer size of Mexico City means that I will have access to an incredibly large number of informal settlements, spread over a wide area, that should allow me to find plausibly indistinguishable test sites and ensure treatment isolation.

## **I. Introduction: What are the Causes of Inconsistent Results from Property Rights?**

The importance of property rights is a key concept in economics, with origins all the way back to Adam Smith- if not further (Besley and Ghatak, 2009). Myriad authors have identified property rights as being fundamental to economic development (North and Thomas, 1973). However, despite the emphasis on the importance of property rights, significant portions of the worlds population lack formal recognition (Bannerjee and Dufflo, 2006). While the causes of property rights or lack thereof is an area of worthwhile study- but outside of the scope of this proposal- recent findings have called into question the original hypothesis of their importance in development. Indeed, growing evidence finds null, or even negative impacts associate with individual property rights (Wibbels, et al. 2017). Recent work in the field by Wibbels, Krishna and Sriram supports work that had previously been done by Van Gelder, 2009, Payne, et al. 2009, and others, that identifies negative or null impacts around a variety of economic metrics. For example, Wibbels, et al. find that individual titling in formally recognized settlements has a negative effect on tenure security. These findings conflict with the strong findings of Galiani and Schargrodsky in 2010 and Field in 2005, who find strong positive effects of individual titling. This raises an important question- why are some authors finding such strong evidence for positive effects of property rights, while other authors fail to identify effects or find the opposite.

I hypothesize that these discordant findings are caused by the fact that authors are studying settlements in differing positions along a transition from informal settlements to universally titled settlements. This transition is composed primarily of three stages- formal recognition of the settlement, followed by intermittent, piecemeal granting of private titles, and concluding with widespread, universal private property rights. If this hypothesis is correct, the findings by Wibbels, et al. could suggest the location of an economic “trap”, similar to the poverty trap in Carter and Barret, 2006. A plausible explanation for the existence of this trap is that in areas of weak state capacity, property rights are not strongly enforced (Murtazashvili and Murtazashvili, 2015). If this is the case, then universal titling may not happen without intervention in some situations. However, Wibbels, et al. still find positive findings resulting from formal recognition of formerly informal settlements. Because of this, I further hypothesize that governments can avoid the potential trap- and other negatives potentially associated with piecemeal property recognition by instead offering formal, universal private property rights from the outset.

These hypotheses should be tested empirically though, preferably by use of a random control trial. I propose making use of the current circumstances of Mexico City to test my theory. Mexico City is ideal for three reasons. First, because the property rights regimes I wish to study are already extant (USAID, 2011). Second, Mexico has a strong history of friendliness towards RCTs (Blair, Iyengar and Shapiro, 2013). Third, because Mexico City has the worlds largest network of slums, identifying randomized treatment and control groups should be plausibly achievable (Wigle, 2013). This paper will proceed in the following way. Section two will define some of the concepts that I will be working with, provide theoretical and empirical background surrounding the importance of and the results from introducing property rights, and will conclude with the intellectual merit of my proposal. Section three will formalize the key question I wish to answer as well as introduce and characterize my hypotheses. Section four will explain the test I propose to test my hypotheses, how the test will provide evidence in support of, or against them and explain measurement. Additionally, I will justify the choice of my location. Finally, section five will conclude.

## II. Definitions, Background and Intellectual Merit

This section will identify key definitions, critical readings in the literature that form the background for this proposal and clarify the intellectual merit of the experiment. This section should illuminate why there is a need to ask more questions about the impact of property rights and elucidate the need for experimentation to test the concepts.

### II. A: Definitions

Before beginning this proposal, it is necessary to first lay out definitions which will guide the formulation of my hypotheses and the resulting tests. I will briefly define terms that will appear throughout the rest of the paper.

#### *- Property Rights*

Property rights are defined as the right to exclude, the right to transfer, and the right to persistence of ownership. Explanations in brief: the right to exclude encompasses the right to prevent others from using or occupying your home. The right to transfer is encapsulated by the ability to sell your property. Finally, the right to persistence of ownership is best defined as protection from others seizing or controlling your property without your permission (Klein and Robinson, 2011).

#### *-Informal Settlements/Slums*

Informal settlements are communities of homes, tents, and other forms of residency that lack legal recognition as housing. Informal settlements have numerous possible characteristics, but common among them are: lack of access to public services, absence of legal occupation (squatting), and absence of formal property rights (Wiggle, 2013, Larreguy, et al. 2015).

#### *-Economic Trap*

An economic trap is most commonly noted in the poverty trap of Galor and Zeira. In essence, they argue that there may be multiple long-run equilibria that a system can converge to. As a result, depending on the initial state of the system, a long-run equilibrium may occur at a sub-optimal outcome (Galor and Zeira, 1993, Carter and Barret, 2006).

#### *-Collective Action*

Collective action is defined as communal response. It is a group of people with a common interest who make concerted efforts to further that interest (Hardin, 1982). However, collective action is not a given, giving rise to what is known as the collective action problem. "Unless the number of individuals in a group is quite small, or there is coercion... rational, self-interested individuals will not act to achieve their common or group interests (Olson, 1965)." Fortunately, this pessimistic view is not always the case. "Extensive fieldwork has by now established that individuals... voluntarily organize themselves... [to] gain the benefits of trade, to provide mutual protection against risk, and to create and enforce rules (Ostrom, 2000)." Further findings suggest that individuals in these organizations invest resources to monitor and sanction rule-breaking and free-riding by others within the community (Ostrom, 1990).

### II. B: Background

This section will provide a brief overview of the literature surrounding the historical theories that emphasize the importance of property rights before diving into evidential studies. It is clear from reading the literature that the importance of property rights is an entrenched concept- though some authors argue that there are alternatives- but the evidence from the field is decidedly less clear. A key question is what effect property rights have if they are weakly enforced.

## **II. B.1: Historical Theory**

Property rights are considered to be crucial to economic growth and extensive work has gone into formulating theories surrounding their importance. Adam Smith argued that “where there is tolerable security of property, every man of common understanding will endeavor to employ whatever [capital] stock he can command... where men are continually afraid of [violence]... [they] bury and conceal a great part of their [capital] (Smith, 1776).” Economies where security of property is lacking run the risk of stagnation (De Long and Shleifer, 1993). “Economic growth will occur if property rights make it worthwhile to undertake socially productive activity (North and Thomas, 1973). Individuals will only have the proper incentives to pursue innovation and economic gains so long as they are permitted to capture a substantial proportion of the fruits of their labor (North, 1981). Countries with better, more secure property rights, will invest more in physical and human capital (Acemoglu, Johnson and Robinson, 2001). Country level data suggests that less secure property rights may experience lower levels of economic growth (Knack and Keefer, 1995). Additionally, even if there is access to credit, “weak property rights discourage firms from reinvesting their profits (Johnson, McMillan, and Woodruff, 2002). Despite it’s importance, a large percentage of the world’s population experience weak or nonexistent property rights in the form of urban dwelling without legal title (Banerjee and Dufflo, 2006). Unfortunately for those in these conditions, “[for the poor] land is the primary means for... investing, accumulating wealth, and transferring it between generations (Deininger, 2003).” Those without formal title, however, are discouraged from pursuing these investments because of the lack of security (De Soto, 2000). The theoretical work surrounding the importance of property rights gives rise to assumption 1:

*- Assumption 1: The optimal long-term equilibrium is universal, well protected, individual property rights.*

Which serves as the foundation upon which my hypotheses are based.

## **II. B.2: Evidence**

Despite the strong historical theory surrounding the importance of property rights, the evidence from the field is more mixed. The evidence should be examined in two forms- where there is strong state capacity and where state capacity is weak- as weak enforcement of property rights is likely to reduce their impacts (Murtazashvili and Murtazashvili, 2015).

### **II. B.2a: Where State Capacity is Strong**

The evidence from areas with strong state capacity is robust. Introducing property rights lead to a significant increase in investment in housing (Field, 2005). Additionally, property rights increase adult labor, decrease child labor, and encourage employment outside of the home (Field, 2007). The protection of property rights is shown to lead to increases in development (Hornbeck,

2010), and the lack of property rights can impede the long-term transformation of wealth into capital (De Soto, 2000). Land ownership security has strong positive effects on agricultural performance as well (Feder, et al. 1988). The work of Galiani and Schargrodsky though, is one of two works that encouraged the question that this proposal seeks to address. They find robust results that suggest that the receipt of property rights increased housing investment, reduced household size and enhanced education among children (Galiani and Schargrodsky, 2010). Strong enforcement of property rights seems to drive significantly positive outcomes, but what happens if enforcement is weak?

## **II. B.2b: Where State Capacity is Weak and the importance of Collective Action**

The strong findings related to property rights may disappear in cases where enforcement is weak. It may be the case that “tenure legality and tenure security are significant predictors of housing improvement... [but]there is no relationship between tenure legality and access to credit (Van Gelder, 2009).” Indeed, it may actually be perceptions of security that drive increased investment rather than titling itself (Van Gelder, 2012). Additionally, private title may not actually lead to decreases in poverty (Payne, Durand-Lasserve, Rakodi, 2009). Property rights also seemingly do not have any significant increase on access to credit markets (Di Tella, et al. 2007). The link between property rights and perceived tenure security is also dubious- indeed, it may even be negatively related (Wibbels, et al. 2017).

Despite the negative findings surrounding property rights in weak states, there is increasing evidence to suggest that formal recognition may be a good substitute. “When the government acknowledges the existence of a habitable settlement, households behave as if they had private title (Wibbels, et al. 2017).” Following their work on the impact of weak state capacity on private title, Murtazashvili and Murtazashvili suggest that formal recognition may be optimal (Murtazashvili and Murtazashvili, 2016). “When individuals have lived [together]... for a substantial time and have developed shared norms and patterns of reciprocity, they possess social capital with which they can build institutional arrangements (Ostrom, 1990).” Formal recognition may be sufficient to achieve many of the benefits of private title- indeed recognition should be sufficient to allow access to public goods, an essential factor in growth (Larreguy, et al. 2015). An argument for why formal recognition is a benefit more so than individual private title in weak state capacities is that individuals can band together for mutual defense- “collective action is more likely when encroachments bear on shared rights than on private ones (Wibbels, et al. 2017).”

## **II. C: Intellectual Merit**

Examining the literature provides evidence to support the intellectual merit of attempting a randomized control trial to study the impacts of property rights. NGO’s such as Habitat International Coalition make the provision of private title a key area of focus (Zarate, 2016) and international organizations have spent decades attempting to formalize and extend rights (Trebilcock and Veel, 2008). Additionally, countries such as Mexico have sought to expand formalization of rights through programs such as CORRET and Progreffa (Larreguy, et al. 2015). Because of these extensive efforts, it is essential that research is done to attempt to clarify and explain the complicated findings surrounding the impacts of property rights. Understanding the framework for how to institutionalize property rights- whether to institute only formal recognition, or to pursue private titling, is key for making policy recommendations to governments moving forward. A key problem with current literature that examines property rights is that property rights

are likely endogenous and this creates selection problems that are hard to address. The cause of property rights and examining their institutional history is a widely studied subject, but empirically testing them is much less common because of these selection issues (Galiani and Schargrodsky, 2010).

### III. Framework for Investigation

This section addresses the hypotheses that I have derived based on my readings of the literature. It will lay out the fundamental question that led me to pursue this analysis before examining in specific detail the resulting hypotheses and their individual justifications.

#### III. A: Question and Hypotheses

*-Question: Why do researchers sometimes observe null or negative findings associated with individual property rights and sometimes find strong positive impacts?*

Despite the extensive literature around property rights and their importance, there is rumblings of conflict between the theoretical impacts of property rights and the evidence that we observe in the world. Wibbels, et al. find evidence that suggests that individual property right titles may actually detract from tenure security. This evidence is supported by the work of van Gelder in 2009, and Galiani and Schargrodsky who found no evidence of increased access to financial markets. Payne, et al. 2009 also suggests that private tenure may not actually lead to investment in homes or reductions in poverty. On this second point though, both Galiani and Schargrodsky in 2010 as well as Field in 2005 find strong evidence that private title does lead to positive outcomes, both in terms of home investment, but also myriad other factors that can lead to reductions in poverty. Explanations for these null findings vary, but a likely argument is put forward by Murtazashvili and Murtazashvili, 2015, who argue that in some situations where state capacity is weak, enforcement of private title rights becomes untenable. The question then, is what is the explanation for the strength of the findings of Galiani and Schargrodsky in support of private property rights and positive findings relating to formal recognition in areas of weak state capacity (Wibbels, et al. 2017)?

*- Observation 1: the null findings of Wibbels, et al. and Payne 2009 take place in situations where individual property rights are piecemeal, whereas the positive findings of Galiani and Schargrodsky take place in situations where property rights are universal.*

*- Hypothesis 1: Where property rights do not exist, the movement from no property rights to universal property rights potentially follows a set of stages:*

*Stage 1: Formal Settlement Recognition- this stage is characterized by legal recognition that a settlement exists*

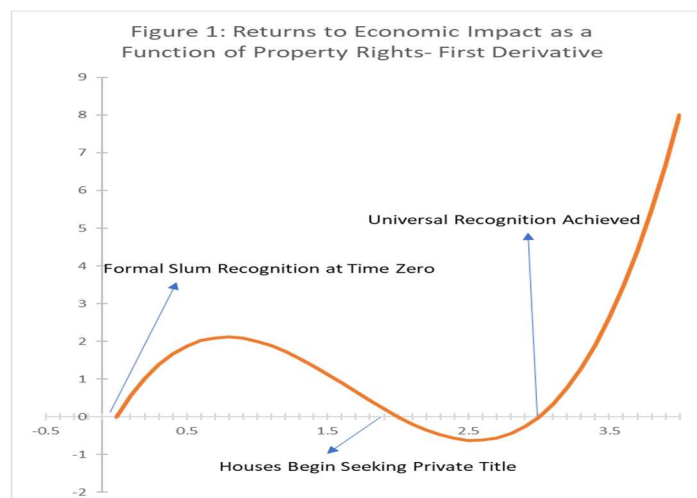
*Stage 2: Piecemeal, individually recognized property rights. This stage is characterized by individual households applying for property right recognition through standard legal channels*

*Stage 3: Widespread/Universal individually recognized property rights. This is the final stage in the progression and is characterized by uniform legal property rights. By Assumption 1, this is the long run optimal economic outcome- when everyone in the settlement has legal ownership over their own home*

In addressing the identified discrepancy between the findings of Wibbels, Krishna and Sriram and those of Galiani and Schargrodsky, I identify a different mechanism by which property rights may impact socio-economic outcomes. The focus of empirical work has been on individually recognized titling programs and communal or slum recognition that comes without formal rights. I propose that a third stage, which is seen in Galiani and Schargrodsky but goes unidentified, is that of simultaneous, large scale individual property right recognition. These mechanisms should not be thought of as distinct states that are inseparable, but rather parameters in a time trend of property rights. Formal recognition in many communities precedes individual title, which in the long run- possibly decades- may result in (near) universal individual property rights. The exception to this would be if there is an economic trap. My hypothesis is founded upon Assumption 1; that universal property rights is the optimal long-term scenario. Of course, achieving recognition may be difficult in places with weak state capacity, and protecting those rights may be impossible for any individual if rule of law is sufficiently weak. This may create the aforementioned economic traps where universal recognition is not achieved, and instead titling is halted at a suboptimal equilibrium.

*- Hypothesis 2: An economic trap may exist somewhere between stage 1 and stage 2 that prevents a movement to stage 3. This trap may be caused by negative consequences associated with stage 2 piecemeal individual title in areas with weak enforcement of property rights.*

The null and negative findings of authors around property rights in weak regimes is a cause for concern and should lead to reexamination of the theory surrounding property rights. As informal settlements receive formal recognition, the literature suggests there should be strong growth (Wibbels, et al. 2017) and increased access to public goods (Larreguy, et al. 2015). However, when houses move from formal recognition into piecemeal private property rights, we see null findings in the literature- and even possible negative findings (Wibbels, et al. 2017). This suggests the possibility of an economic trap, which is displayed graphically in Figure 1:



This figure displays a plausible first derivative of the economic returns of property rights that fits the evidence we see in the real world. In this example, formal recognition at the origin causes economic gains for the settlement. The gains from communal recognition are potentially limited, however which causes individual households to seek out private title. As houses begin to

seek private title, the gains may disappear, and potentially become negative- reflective of the findings of Wibbels, et al. This is the area where a trap may occur. In this graph, there are two important points- at point two and at point three- where the first derivative crosses the origin. In this model, at the first point of crossing, individuals may experience losses associated with private titling. If this is the case, households may abstain from continuing to seek title, trapping the settlement at this lower equilibrium. Without some shock- possibly by government intervention- it can become impossible to move towards the better equilibrium of universal recognition.

As one can see in this example, when title recognition becomes essentially universal however, economic gains are again made. This graph is, of course, purely depictional and the slopes are theoretical, but it captures the essence of my hypothesis. Note that these effects take time, and that is a plausibly key distinction between the Wibbels, et al. paper and the Galiani and Schargrotsky paper. The latter studies the impacts of titling over a period of almost thirty years, whereas the former took place over six years. By my hypothesis, while the gains of formal recognition without private title are likely to be undeniable, they may be ultimately limited in scope- even as state capacity in the district grows. If this is the case, then the optimal policy that governments should pursue is summarized in Hypothesis 3:

*-Hypothesis 3: Governments seeking to encourage growth can avoid the potential economic trap associated with the movement from formal recognition to universal private titling by granting universal titling from the outset.*

Based on Assumption 1, governments seeking to maximize economic outcomes may be best served by granting simultaneous, individual titling to the district. This should both capture the positives of formal slum recognition, and minimize the negatives associated with decreased tenure security in piecemeal recognition; with the added benefit of most quickly reaching the optimal long-term condition. This will enable informal settlements to avoid the potential economic trap associated with formal recognition followed by piecemeal private titling. An important question though, is through what means will universal titling achieve optimal economic outcomes in a way that piecemeal titling does not in areas with weak state capacity?

*-Hypothesis 4: Collective action is the means by which both formal slum recognition and universal titling achieve economic gains, even in areas of weak state capacity. By making property rights universal simultaneously, government can limit the collective action problem associated with intermittent titling.*

I hypothesize that through the collective action enabled by simultaneous recognition, the impediments to growth which are associated with intermittent individual recognition- whether through weak state protection of rights or through exposure to exploitation- may be overcome in a way that we see in the communal slum recognition in Wibbels et al. Collective action is defined here as in Ostrom, 2000- individuals working together to achieve common interests. In this scenario, collective action is only applicable because each individual in the community finds themselves in the same position- which is not the case for piecemeal private property recognition. Collective action is more likely to take place whenever individuals share in the losses associated with outside threats (Ostrom, 2000). By making titling universal, threats to any individual within the settlement are plausibly threats to all individuals in the settlement- which may encourage



collective action. For example, simultaneous, community wide individual recognition may allow for collective action in the defense of property rights against outside threats to ownership, either through pooled resource access to the legal system or through the sheer difficulty of exploiting sufficiently large groups of unified individuals.

How might this unified action work? One explanation may be that individuals in the community have information about the experiences of others. No assumptions need be made about communal bonds in this scenario- if an individual perceives that another member of the community has their property rights threatened, a reasonable implication may be that their own rights will be threatened. Utility maximizing individuals may recognize that through organization, the possibility of resistance is stronger. Ostrom argues that “if a small core group of users identify each other, they can begin a process of cooperation without having to devise a full-blown organization.” One should note that the presence of a strong leader may be helpful in aiding organization- but the impact of leadership, its origins, and attempts to quantify it are incredibly difficult (Varughese, 1999). To be clear, in situations without universal title, individuals who lack title lack incentive to collectively defend those with title. In this situation, the collective action problem of Olson may be impossible to overcome. When the problem is one shared by the whole community however, individuals are more likely to band together against outside threats (Ostrom, 2000). One must ask though, if collective action is the answer to the question of why universal titling is better than intermittent titling, why is universal titling better than simple formal recognition?

*-Hypothesis 5: Universal titling is a better equilibrium than formal slum recognition. Better here means that it will provide stronger long-term economic outcomes.*

An important question that needs to be answered is how simultaneous, individual recognition may differ from simple slum formal recognition. Both suggest the possibility of collective action, however, unlike simple slum recognition, I believe that formal property rights will more rapidly improve outcomes through “increased physical and human capital investments” as observed in Galiani and Schargrodsky- namely increased investment in the household and enhanced education of children. This is because of key components of property rights mentioned earlier in the definitions section: the right to exclusion, the right to transfer, and the right to persistence of ownership (Klein and Robinson, 2011). These rights are critical to encouragement investment in the long term. While formal recognition, and the provision of public goods it brings, is expected to lead to better outcomes, it is undeniable that individuals still seek private title (Wibbels, et al. 2017). If this is the case, then there must be a reason.

The most plausible explanation is also the most simple- individuals believe that private title is a better economic situation than simple formal recognition, therefore they pursue private title. If private title is desirable to these individuals who have achieved formal recognition, it is likely that it is the long run equilibrium. While formal recognition of slums allows for the provision of public goods- electricity, water, and sewage (Larreguy, et al. 2015), which may account for the findings of Wibbels, et al. the findings of Galiani and Schargrodsky are much stronger. While Wibbels et al. find that houses with title are “on average, a little bit wealthier (Wibbels, et al. 2017)”, Galiani and Schargrodsky find “significant effects on housing investment, household size, and child education (Galiani and Schargrodsky, 2010).” To account for these stronger findings, and the evidence of individuals pursuing private title after having received formal recognition, I

hypothesize that the optimal long term sustainable outcome is that of widespread individual title rather than simple formal recognition.

#### **IV: Test Structure and Location**

This section will cover a proposed experiment to examine each of my hypotheses and ascertain their validity. I propose using a randomized control trial in Mexico City in an attempt to provide empirical evidence. In this section, I will lay out the test structure, how the impacts should be measured, and provide justification for the location of the test.

##### **IV. A: Test Structure and Measurement**

I propose conducting an experiment to test my hypotheses concerning the impacts of various regimes of property recognition. This experiment should be a randomized control trial to isolate the impacts from the various forms of endogeneity and selection bias found in observational data (Galiani and Schargrotsky, 2010). By using an experimental procedure, I hope to provide evidence for my hypotheses that should allow future researchers to examine the effects of property rights in a new light. In this experiment, I propose there should be 3 different treatment groups (mirroring the previously identified three separate stages of property recognition) and 1 control group. This experiment should identify informal settlement communities in Mexico City that are plausibly indistinguishable, and the informal settlements should be sizeable in terms of households- if feasible, numbering in the hundreds to provide sufficient sample size. The treatment method will be different across all 3 treatment groups in the following ways:

1. In group 1, “Communal Recognition”, formal recognition should be awarded to the informal settlement
2. In group 2 “Individual Private Property”, the slum should receive formal recognition, similar to group 1, however randomly selected individual households in this slum should receive private property rights
  - a. A fair question would be why this group is necessary? The answer lies in the cumbersome, time-consuming nature of applying for private title. By creating a group at the hypothesized stage 2, I ensure that I will be able to test both Hypothesis 1, that movement from informal settlements to universal rights takes on various stages, and Hypothesis 2, that there may be an economic trap somewhere in stage 2.
3. In group 3 “Simultaneous Private Property Recognition”, the entire community will receive both formal community recognition and individual private property rights.
4. The control group will be allowed to function independently
  - a. Similar to the question posed concerning group 2, it is reasonable to ask about the need for a pure control group. This group is to test whether there is a statistically significant difference between the treatment groups caused plausibly by the treatment. While the literature suggests strongly that formal recognition should lead to positive outcomes, since it has not been tested before in a true RCT this is an excellent opportunity to provide empirical confirmation.

This structure should allow for the measurement of the impact of the various form of property rights independently. In terms of randomization, I will make use of my recommended location- Mexico City- and its extensive network of informal settlements. Since there are myriad plausible

testing sites, randomization will take place by identifying as many settlements as possible that are plausibly indistinguishable. I propose to distinguish between them using any extant data, with particular emphasis placed on size and location. To randomize between sites, I will use computer randomization software once I have narrowed down the list to feasible settlements.

Outcomes from this test will provide evidence for my hypotheses in the following ways:

- Support for Hypothesis 1 will be shown if movement occurs in group 1 towards group 2 in that a subset of individuals within group 1 apply for private property. If the movement towards universal property rights is best described as multiple stages, then without outside impetus, individuals who achieve formal recognition will be expected to begin to pursue individual title.

- Support for Hypothesis 2 would result if at the end of the experiment, group 2 has not moved significantly closer to group 3 in terms of titling within the community. Additionally, the strongest support will be if there is no statistical difference between group 2 and group 1 at the conclusion of the test in terms of frequency of title since this will suggest that group 2 has become trapped.

- Support for Hypothesis 3 will be provided if there is no backsliding from group 3 towards group 2. If universal title is truly an equilibrium, then the system should be stable in terms of property rights and therefore the presence of title should be the same after the conclusion of the experiment as it is immediately following treatment.

- Support for Hypothesis 4 will take the form of measured perceived tenure security being the strongest in group 3. While it may not be significantly different from the measured effect in group 1, both of these groups should be stronger than the control group.

- Support for Hypothesis 5 will be demonstrated if the measured economic outcomes from the experiment are statistically stronger for group 3 than it is for either group 1 or group 2. To confirm the ideas of the existing literature, all three groups should be significantly different from the control group.

Measurement should be conducted similarly to both Wibbels, et al. and Galiani and Schargrodsky- at the household level using survey data. These surveys should attempt to measure a variety of dependent variables proposed in the literature: housing investment and structural quality, access to credit and labor earnings, human capital accumulation and education, household family size, and household perception of tenure security. My expectations are that positive increases should be observed in housing investment, human capital accumulation and education and decreases in household size across all three treatment groups. Additionally, based on the evidence from the literature, one may expect positive increases on perception of tenure security in group 1 and 3, but this effect should be lessened in the homes that receive title in group 2 if there is indeed an economic trap. Based on the findings in other works, I also expect to find null effects on access to credit, but potentially positive results in labor earnings. In order to accurately assess the impacts, surveys should be conducted at the outset of the experiment to establish a baseline, with a follow up survey conducted no sooner than five years after treatment. Since the theoretical impact of property rights are persistent- but potentially slow moving- the ideal measurement would include, if possible, a final survey measurement conducted no sooner than ten years after treatment.

#### IV. B: Location- Mexico City, Mexico

The choice of location to conduct this experiment is absolutely critical. I have identified Mexico as the best possible location for conducting this test. The justification for this is two fold- first, Mexico is notably friendly and familiar to political science RCTs, and second each of the types of property rights that I wish to study are already present. In terms of the former, Blair, et al. identified Mexico as the third most likely country in the world to be the location for a political science RCT (Blair, et al. 2013). A good example is provided by Gonzalez-Navarro and Quintana-Domeque, who in 2006 were able to conduct an RCT related to road paving in an effort to improve home values. Along these lines, there is already a strong push to improve property right access in Mexico. Indeed, a program already exists with the express purpose of titling urban slums- the CORETT program.

CORETT is a specifically urban titling program that provides formal private property titles to all individuals in urban informal settlements. This program is widespread and a strong benefit is that it is a highly bureaucratic organization. Due to this, it is relatively isolated from political party capture, and the program is considered an excellent source of isolation from political influence (Larreguy, et al. 2015). Because of its political insulation, it is plausible that work with the program to test my hypothesis is feasible. Additionally, there are already aid organizations focused on improving land titling in Mexico- such as Habitat International Coalition, who just last year published “Financing Urban Development: The Millennium Challenge” for Mexico City and identified as a key strategic goal the formalization of land rights. The ability to work with pre-existing government organizations, the potential support of aid organizations already working on the topic, and the friendliness of the federal government towards RCTs make Mexico an excellent choice before one even considers the second strength associated with Mexico.

The second persuasive argument for locating the experiment in Mexico is that the title regimes I wish to study are already extant. Urban property rights in Mexico are separated into 5 distinct groups. These are private property, federal property, ejidos ownership (communal agrarian property), tenure en colonias (informal but recognized settlements), and cuartos de azotea (unrecognized informal settlements) (USAID 2011). The preexistence of tenure en colonias and cuartos de azotea means that, along with the tenure work done by CORETT, all three of my treatments are extant. This means that as a researcher, I can focus on leveraging existing legal structures rather than attempting to introduce new methods of organization. An additional feature to note is the fragility of tenure en colonias. USAID notes that “Regularization has not, however, provided permanent tenure-security, as legalized properties can become illegal again (USAID 2011).” This essentially means that even if a slum has received formal recognition, this recognition can be revoked. Since recognition may not be permanent, it is plausible that I will find stronger benefits from treatment group 3, but if recognition persists throughout the duration of the experiment, tenure en colonias should serve as a solid means of studying the effects in treatment groups 1 and 2.

Identifying the city to locate the experiment in is relatively easy once Mexico is established as the country. Mexico City is one of the largest cities in the world. According to the UN, it has a population of roughly 21.3 million people, spread out over 573 square miles (Blouet and Blouet 2009, United Nations 2007). Additionally, the Neza-Chalco-Izta slums are the largest system of slums in the world (Davis, 2006). Home to roughly 4 million people (Tovrov, 2011), these slums

include approximately 835 distinct informal settlements (Wigle, 2013). I will be able to leverage this extensive network of informal settlements in order to identify settlements that are plausibly indistinguishable. Because of the large size of the city, it should also be possible to isolate the treatment groups from each other. This may be essential if there are unidentified spillover effects from treatment.

## V. Conclusion

For roughly three centuries, the importance of property rights went largely uncontested in the economic literature. However, beginning in the 1980s, questions began to arise about not only the origins of property rights, but also their universality. Nevertheless, governments, NGOs, and world organizations have sought to formalize and increase property rights in an effort to spur economic development (Trebilcock and Veel, 2008). More recently, empirical work has sought to identify the effects of providing property rights in areas that had previously lacked them. The results have been mixed, leading some authors to conclude that property rights may not be the holy grail that had been previously supposed. The mixed results though lead to a fundamental question—why does the observational data on the impact of property rights not always support the theoretical underpinnings.

While some authors suggest that weak state capacity is at the root of the null effects occasionally found related to property rights (Murtazashvili and Murtazashvili, 2015), authors have found strong results related to formal recognition, even in areas where state capacity is weak (Wibbels, et al. 2017). Based on the findings of Galiani and Schargrodsky of significantly strong results from a quasi-experimental analysis when property rights are awarded universally to an informal settlement, I hypothesize that simultaneously awarding property rights to all the tenants can lead to the same collective action that is observed in cases of formal recognition. Furthermore, I argue that the weak findings are plausibly the result of analyzing different stages of the movement from informal rights to full recognition. The results of some papers lead me to suggest the plausible existence of an economic trap during the movement from formal recognition to widespread private title.

Ideally, strong states can enforce private title, which should remove this trap, in states where state capacity for enforcement is weak, the optimal outcome of universal private title may potentially only be achieved by simultaneous recognition. To test these hypotheses, I propose conducting what may be the first randomized control trial surrounding the awarding of property rights. By taking advantage of the extant property right regime system in Mexico, I should be able to isolate out many of the endogeneity and selection concerns associated with observational work surrounding private title effects. While this will not answer the question of the origins of property rights and how they came to exist in certain places and not others, nor will it answer how to improve state capacity where it is already weak, it will plausibly provide a strong foundation for further examination of the impact of property rights. Furthermore, while this test will only serve as a continuation of existing research, and not a conclusion, it may hopefully help guide future research into understanding how governments should proceed in attempting to formalize property rights. Caution should of course be taken before assuming the generalizability of any of these results, however.

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