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Author(s): Rafael Di Tella, Sebastian Galiani and Ernesto Schargrodsky

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# THE FORMATION OF BELIEFS: EVIDENCE FROM THE ALLOCATION OF LAND TITLES TO SQUATTERS\*

RAFAEL DI TELLA  
SEBASTIAN GALIANI  
ERNESTO SCHARGRODSKY\*

We study the formation of beliefs in a squatter settlement in the outskirts of Buenos Aires exploiting a natural experiment that induced an allocation of property rights that is exogenous to the characteristics of the squatters. There are significant differences in the beliefs that squatters with and without land titles declare to hold. Lucky squatters who end up with legal titles report beliefs closer to those that favor the workings of a free market. Examples include materialist and individualist beliefs (such as the belief that money is important for happiness or the belief that one can be successful without the support of a large group). The effects appear large. The value of a (generated) index of “market” beliefs is 20 percent higher for titled squatters than for untitled squatters, in spite of leading otherwise similar lives. Moreover, the effect is sufficiently large so as to make the beliefs of the squatters with legal titles broadly comparable to those of the general Buenos Aires population, in spite of the large differences in the lives they lead.

## I. INTRODUCTION

Numerous authors have stressed the link between beliefs and economic institutions. One example is work on American Exceptionalism suggesting that differences in beliefs and attitudes help explain why Europe and America are so different when it comes to giving government a role in the production and distribution of income.<sup>1</sup> For instance, Alesina et al. [2001] report that 60 percent of Americans—yet only 26 percent of Europeans—believe the poor are lazy, while spending on social welfare in 1995 in the United States was 16 percent of GDP as compared to an average of 25 percent for countries in Europe. Two questions

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1. See Hochschild [1981], Inglehart [1990], Piketty [1995], Ladd and Bowman [1998], Benabou and Ok [2001], Alesina et al. [2001], Hall and Soskice [2001], Corneo and Gruner [2002], Rotemberg [2002], Di Tella and MacCulloch [2002], Fong [2004], Alesina and Angeletos [2005], Benabou and Tirole [2006], *inter alia*.

arise. The first asks whether beliefs can change. And the second asks about the mechanisms through which beliefs may change. For example, differences in beliefs could simply arise because people's experiences differ and it is costly to find out which experience is most representative of reality, as formalized in Piketty [1995]. An alternative view is that beliefs are intentionally shaped either by the subconscious, or by one's parents or even by interest groups, as in the recent models of Glaeser [2005], Benabou and Tirole [2006], *inter alia*. In this paper we provide an answer to the first question and provide some suggestive evidence about the second.

We study the formation of beliefs exploiting a natural experiment. More than 20 years ago, hundreds of squatter families occupied an area of wasteland in the outskirts of Buenos Aires, Argentina, which they thought belonged to the State. In reality, the area was made up of several tracts of land, each with a different legal owner. After several unsuccessful eviction attempts, a law was passed establishing the expropriation of these tracts of land by the State in exchange for a monetary compensation. The objective was to later transfer ownership to the squatters. However, only some of the original legal owners surrendered the land, while others chose to contest the expropriation payment. Given the slow functioning of the Argentine courts, most of the disputes between the State and the owners who challenged the expropriation offer have not been resolved to this date. As a result, squatters who happened to settle on tracts of land that were not surrendered to the State have weak property rights, whereas the squatters who happened to settle on tracts owned by individuals who accepted the expropriation obtained full property rights.

Two features of this episode are important for our purposes. First, the allocation of squatters into groups with and without property rights is exogenous in equations describing their beliefs because, as the next section explains in detail, the decisions of the original owners to challenge the expropriation payment were orthogonal to the characteristics of the squatters. Second, we are able to compare individuals who are located in very close physical proximity to each other and under very similar life circumstances.

We find a significant difference in the beliefs that squatters with and without legal titles declare to hold. The beliefs we study are obtained through survey questions designed to broadly capture four beliefs that appear important to the workings of a

capitalist society, namely individualism, materialism, the role of merit, and trust. As an example, materialism is captured by the answer to the question “Do you think money is important for happiness?” The effect of this episode is large: the set of beliefs declared by squatters with property rights are significantly different from those held by squatters without titles. The change in beliefs resulting from the treatment induced by our natural experiment is consistently in the direction of what can loosely be called “Market Beliefs” (e.g., in the sense that they are more individualist and materialist). This is interesting because of the strong similarities in the lives of squatters with and without titles. Moreover, the estimated causal effect is sufficiently large so as to make the beliefs of squatters with legal titles comparable to those held by the Buenos Aires general population. This is interesting because of the remarkable differences in the lives these two groups lead.<sup>2</sup>

One interpretation of our results is that receiving property rights changes the beliefs that people hold.<sup>3</sup> This could happen, for example, because property rights may affect the incentives people have for self-manipulation of beliefs. Lucky squatters, for example, are more likely to report that people can succeed individually and without the support of a large group, when in fact their lives were drastically affected by an episode where success crucially depended on acting as a group. It is possible, however, that after property rights are obtained there are lower gains to collective action and a family can undertake the challenges they face on their own (saving, improving their houses, etc.). This is consistent with previous work on Lerner’s hypothesis where people who exhibit a high “belief in a just world” also tend to find

2. Assuming beliefs are part of a country’s institutional endowment, our results suggest that there is a potential channel through which economic performance affects institutions. For this debate, see Denzau and North [1994], Greif [1994, 2006], Engerman and Sokoloff [1997], La Porta et al. [1998], Acemoglu et al. [2001], Easterly and Levine [2003], Glaeser et al. [2004], Przeworski [2004], Rodrik et al. [2004], North [2005], *inter alia*.

3. A related paper is Earle et al. [1997], which finds that receiving and retaining property in voucher privatizations is associated with support for market reforms (see also Earle and Rose [1996]). See also the work on the political effects of owning property of Roland and Verdier [1994], Boycko et al. [1995], and Biais and Perotti [2002]. Di Pasquale and Glaeser [1999] present evidence on the connection with citizenship while Jones et al. [1999] documents evidence consistent with government attempts to widen ownership through privatization. Work on the effects of property rights on investment and other measures of economic performance includes Besley [1995], Alston et al. [1996], Alston et al. [1999], de Soto [2000], Lanjouw and Levy [2002], Do and Iyer [2003], Field [2003] and Galiani and Schargrodsky [2006].

more merit in lucky people and to blame the victims of crime.<sup>4</sup> We are only able to provide some suggestive evidence in favor of this interpretation. Thus, we note that an alternative interpretation is that receiving titles affects people's beliefs by changing their life experiences and the worlds they observe. This requires that the two groups of squatters—titled and untitled—have access to different information sets in spite of the close proximity in which they live. Another difficulty in the interpretation of our results is that it could be argued that the treatment that affected beliefs in this experiment was not the government transfer of titled property to lucky squatters, but rather the disillusion from the unfulfilled title promise experienced by unlucky squatters. Although we do not have extensive evidence to bear on this issue, we find that the beliefs of a group in the Buenos Aires population with comparable educational attainment are similar to those of untitled squatters, suggesting that lucky squatters receiving titles were the ones that changed their beliefs. Section IV discusses these issues further. The next section describes the natural experiment, data, and empirical strategy, while Section III presents our results, and Section V concludes.

## II. DESCRIPTION OF THE NATURAL EXPERIMENT, DATA, AND EMPIRICAL STRATEGY

### *II.A. A Natural Experiment*

An investigation of the role of property rights in the formation of beliefs has to address a problem of endogeneity. Motivated individuals, with greater self-efficacy and holding individualist or materialist beliefs are more likely to make efforts geared towards obtaining property rights. This means that there is only limited value in showing that beliefs are correlated with owning property (e.g., in a large scale survey such as the World Values Survey). Moreover, owning property is a portfolio choice for many individuals, who can, for example, choose to rent a house rather than own it. This decision may depend on preferences, access to credit markets, or other variables that can also be correlated with beliefs. In other words, the allocation of property rights across families is typically not random but depends on effort, wealth,

4. One example is Kleinke and Meyer [1990] who find that men who record a high belief in a just world tend to choose more negative adjectives to describe rape victims as well as recommend lenient sentences for rapists.

preferences, or other selection mechanism.<sup>5</sup> Thus, the personal characteristics that determine the likelihood of having land titles are likely correlated with beliefs.

We address this endogeneity problem by exploiting a natural experiment. In 1981, about 1,800 families occupied a wasteland area in San Francisco Solano, in the metropolitan area of Buenos Aires, Argentina. The occupants were groups of landless citizens (organized by a Catholic priest) who wanted to avoid creating a shantytown and immediately partitioned the occupied land into small urban-shaped parcels. At the time of the occupation, the squatters thought the land belonged to the State.<sup>6</sup> However, the occupied area turned out to be made up of thirteen tracts of land belonging to different private owners. The squatters resisted several eviction attempts during the military government. After Argentina's return to democracy, the Congress of the Province of Buenos Aires in 1984 passed a law expropriating these lands from the former owners in exchange for a monetary compensation, in order to transfer the parcels with legal titles to the squatters.

The resulting titling process, however, was incomplete and asynchronous. In 1986 the government made a compensation offer to each owner (or group of owners as some tracts had more than one owner) calculated in proportion to the official tax valuation of each tract of land. These official valuations had been set before the land occupation by the fiscal authority with the purpose of calculating property taxes and were indexed by inflation. After the government made the expropriation offers, the owner(s) of each tract had to decide whether to accept the expropriation compensation and surrender the land or to start a legal dispute in order to obtain a higher compensation. The owners of eight tracts of land accepted the compensation offered by the government. In

5. How such differences may persist is explained in Piketty [1995] through high costs of learning giving rise to different "ideological" dynasties even within countries. See also Bisin and Verdier [2000].

6. This is explained by the squatters in the documentary movie "Por una tierra nuestra" by Céspedes [1984]. On the land occupation process, see also CEUR [1984], Izaguirre and Aristizabal [1988] and Para [1989]. Institutional information was gathered through a series of interviews with key informants, including two former land owners, several squatters, the Secretary and Undersecretary of Land of the Province of Buenos Aires, the Director of Land of Quilmes County, the Secretary of Land Registry of Quilmes County, the General Attorney of the Province of Buenos Aires, an attorney in the expropriation offers' office, and a lawyer on an expropriation lawsuit. Further information on the expropriation process was obtained from the Land Secretary of the Province of Buenos Aires, the office of the General Attorney of the Province of Buenos Aires, the Quilmes County Government, the land registry, and the documentation from the judicial cases.

1989, the squatters living on those tracts were offered formal titles that secured the property of the parcels. Five former owners, instead, did not accept the compensation offered by the government and sued with the aim of obtaining a higher compensation (the law was approved by Congress and, thus, the expropriation itself could not be challenged, whereas the monetary offers made by the government could be disputed). One of these five lawsuits ultimately ended with a final verdict, and squatters who had settled on this tract of land received titles in 1998. At the time of writing, the other four legal processes are still outstanding in the slow Argentine courts.<sup>7</sup>

Accordingly, two types of squatters emerged: unlucky squatters that occupied a piece of land which is still under legal dispute (that we call the control group), and lucky squatters that obtained titles (that we call the treatment group). Within this latter group, we can distinguish between those that received titles in 1989 (the early treated) or in 1998 (the late treated).<sup>8</sup> Unlucky squatters cannot obtain titles until former owners and the State settle their disputes.

An important feature of this episode is that lucky squatters who occupied parcels located on the tracts of land surrendered by the former owners were *ex ante* similar and arrived at the same time as unlucky squatters who settled in the parcels of former owners who are still disputing in court the expropriation compensation. At the time of the occupation, squatters thought all land was State-owned and could not possibly have known that an

7. The urban design traced by the squatters in 1981 differed from the old tract divisions, so that some new parcels overlapped two (or more) tracts of land. This could be interpreted as further evidence of the squatters' ignorance about the previous land ownership status because following the old tracts would have exposed them to a lower chance of ending up in the untitled group (for regulatory reasons, a parcel in a block with at least one portion in dispute cannot be delimited and titled).

8. Lucky squatters could obtain the titles under some conditions. According to the law, they had to be living in the parcel to be titled for at least one year before the sanctioning of the law, they had to have no other property, and they could not transfer the parcels for the first ten years after titling. The market value of comparable land parcels was approximately 7.4 times the monthly average total household income for the first quintile of the official household survey of October 1986 for the Buenos Aires metropolitan area. This figure, however, constitutes only an upper bound of the differential wealth transfer received by lucky squatters for three reasons. First, the law established that each squatter had to pay the government the (proportionally prorated) value of the official valuation of the occupied tract of land. The law, however, established that monthly payments could not exceed 10 percent of the (observable) household income, with no indexation for inflation (which was high in subsequent years). Second, titled households are supposed to pay property taxes. Third, untitled squatters pay no rent.

expropriation law was going to be passed, nor what was going to be the future titling status of each piece of land. Indeed, the parcels of land in the titled and untitled groups are identical and next to each other. There are no differences in parcel observable characteristics and, for the families that arrived before the former landowners' decisions, there are also no differences in pretreatment household characteristics between the treatment and control groups.

The government offers were very similar (in per-square-meter terms) for the accepting and contesting owners.<sup>9</sup> Given the similarity in land quality and compensation offers, the different responses could instead reflect former owner heterogeneity in subjective land value, litigation costs, and decision making.<sup>10</sup> Importantly, the documentary movie, the articles, the judicial files, and our interviews with squatters, lawyers, public officers, and former owners coincide that the squatters had no direct contact with the former owners to influence their decisions of surrendering or suing. Moreover, the squatters had no participation in the legal processes (the lawsuits were exclusively between the former owners and the government), and the value of the dwellings they constructed was explicitly ignored for the calculation of the expropriation compensation. The land registry (and our informants) reports no side transactions between squatters and owners. Finally, note that if some owners challenged because their land is better, then untitled squatters would be standing on higher quality land.

Note that one of the five lawsuits ended with a final verdict, and the squatters on this tract of land received titles in 1998,

9. The accepted offers had a mean of 0.424 Argentine pesos (of January 1986) per square meter, and a median of 0.391. The contested offers had a mean of 0.453 and a median of 0.397. Indeed, the similitude of the offers is used as an argument by the government attorneys and by a low-court judge's verdict in these expropriation lawsuits to show that the offers were fair, as they were similar to the ones accepted by other owners.

10. The number of occupied tracts of land (13) is insufficient for a statistical analysis of the decision to challenge. But we note that the average number of owners in the accepting tracts is 1.25, while the average is 2.2 for the contested tracts. And when we define a dummy equal to 1 each time there are two owners that share the same surname (i.e. same family), and 0 otherwise, the average in the accepting tracts is 0.125, while it is 0.6 for the contested tracts. Thus, it appears that having many owners and several in the same family made it more difficult for the owners to agree in surrendering the tract of land. Within the challenging owners, we also found one case in which an owner was a lawyer and he was representing himself in the case (which may indicate lower litigation costs), while in another case, one of the original owners had deceased before the sanctioning of the law (in 1983) and her inheritance process was still under way at the time the family had to make a decision.



whereas the other four lawsuits are still pending. This is helpful in addressing the concern that the former owners' decision to surrender or challenge could be correlated with land quality. We are also able to compare the squatters in this late-titled tract of land with the untitled group, two groups of squatters that are similar regarding their respective former owners' decisions to challenge the compensation payment.<sup>11</sup> Given that land titling depended on the decision of the original owners to accept or challenge the expropriation payment and on the resolution of the expropriation lawsuits, and that these factors were uncorrelated to the squatters' characteristics, the allocation of property rights involves a form of randomization that solves the potential selection problem.

## *II.B. Data Description*

We obtained information on the legal status of each parcel of land in the area affected by Expropriation Law No. 10.239. The law covered a main area comprising 1,082 parcels, and also a separate group of 757 parcels, called the San Martin neighborhood, which is close but physically separated from the rest. An important aspect of our approach involves the comparison of individuals who had similar life experiences, with the exception of the treatment, and who therefore can be expected to have similar beliefs. To make comparability as extreme as possible, we focus on the 1,082 contiguous parcels (and then pool the San Martin parcels to analyze the robustness of our findings).

As explained, land titles were awarded in two phases. In the main area, property titles were awarded to the occupants of 419 parcels in 1989, and to the occupants of 173 parcels in 1998. Titles have not been offered to the families living in 410 parcels that were occupied under the same conditions and during the very same days of 1981. Finally, land titles were available for other eighty parcels, but the occupants did not receive them because they had moved or died at the time of the title offers, or had not fulfilled some of the required registration steps. Table I summa-

11. Within this group of challengers there are plausibly exogenous reasons why the remaining four trials are still going on. In one case, the legal process was delayed by a mistake made in the description of the parcels in a low-court judge's verdict. In two other cases, the expropriation lawsuit was delayed by the death of one of the former owners, which required an inheritance process. In the fourth case (mentioned in footnote 10), one of the original owners had died just before the sanctioning of the expropriation law and her inheritance process was still under way at the time the family had to make a decision.

TABLE I  
ALLOCATION OF LAND TITLES

Year	Property Right Availability = 1			Property Right Availability = 0	
	Property Right = 1	Property Right = 0	Total	Property Right = 0	Total
1989	419	23	442		
1998	173	57	230		
Total	592	80	672	410	1082

Notes: *Property Right Availability* equals 1 if land titles were available for the parcel, i.e., if the former owner surrendered the land to the State. *Property Right* equals 1 if the household has formal titles to the parcel.

rizes this information. The intention-to-treat variable *Property Right Availability* equals 1 for the parcels that were surrendered by the original owners and 0 otherwise; while the treatment variable *Property Right* equals 1 for the titled parcels, and 0 otherwise.<sup>12</sup>

During 2003, we administered a survey to the heads of households (or their spouses) for 448 randomly selected parcels (out of the total of 1,082). We found that 467 households live in the 448 parcels of the sample (nineteen parcels host more than one family).<sup>13</sup> In 313 of these households, we found that the first family member had arrived to the parcel before the end of 1985, i.e., before the original owners made the decisions of surrendering the land or suing, while for 154 families the first member had arrived after 1985. In order to maintain the exogeneity of treatment, we

12. The 757 parcels of the San Martin neighborhood belonged to one owner who surrendered the land. They were offered for titling in 1991, and 712 were titled.

13. We also administered the survey to 150 households in the non-contiguous San Martin neighborhood. All the survey interviews were carried out by Gestion Urbana, an NGO that works in this area. The interviewers were not informed of the hypotheses of our study and were blind to the treatment status of each parcel. We distributed a food stamp of \$10 (about 3 US dollars at that time) for each answered survey as a token of gratitude to the families willing to participate in our study. Parcels were randomly replaced when the survey could not be performed (because there was nobody at home in three visit attempts, the parcel was not used as a house, rejection or other reasons). Non-response rates were 10.3 percent in untitled parcels and 6.4 percent in titled parcels excluding the San Martin area, and 10.3 percent and 9.4 percent including it (the differences are not statistically significant).

TABLE II  
PRETREATMENT CHARACTERISTICS OF THE ORIGINAL HOUSEHOLD HEAD

Characteristics of the original household head	Property Right Availability = 0	Property Right Availability = 1	Difference
Age	48.875 (0.938)	50.406 (0.761)	-1.532 (1.208)
Female	0.407 (0.046)	0.353 (0.035)	0.054 (0.058)
Argentine	0.903 (0.028)	0.904 (0.022)	-0.001 (0.035)
Years of education	6.071 (0.188)	5.995 (0.141)	0.076 (0.235)
Argentine father	0.795 (0.038)	0.866 (0.025)	-0.072 (0.046)
Years of education of the father	4.655 (0.147)	4.417 (0.076)	0.237 (0.165)
Argentine mother	0.804 (0.038)	0.856 (0.026)	-0.052 (0.046)
Years of education of the mother	4.509 (0.122)	4.548 (0.085)	-0.039 (0.149)

Notes: We define the original household head as the family member who was the household head at the time the family arrived to the parcel they are currently occupying. *Property Right Availability* equals 1 if land titles were available for the parcel. The Appendix presents the definition of all the variables. Standard errors are in parentheses.

focus on the former group, as for them it was impossible to know the different expropriation status associated to each parcel at their time of arrival.

In Table II we show the similarity of pretreatment characteristics of the family member who was the household head at the time of the occupation for the nonintention-to-treat and the intention-to-treat groups (for families that arrived before the end of 1985). We cannot reject the hypotheses of equality in age, gender, nationality, and years of education of the original household head, suggesting a strong similarity between these groups at the time of their arrival to this area. Moreover, we do not reject the hypotheses of equality in nationality and years of education of the parents of the original squatter, suggesting similar socioeconomic trends before their arrival.<sup>14</sup> In Table III we compare

14. In 23 percent of the cases, the current household head does not coincide with the household head at the time of the occupation, either because she/he arrived later than the first member of her/his family that occupied the parcel, or because she/he arrived at the same time but was not the household head at the

TABLE III  
PRETREATMENT PARCEL CHARACTERISTICS

Parcel characteristics	Property Right Availability = 0	Property Right Availability = 1	Difference
Distance to creek (in blocks)	1.995 (0.061)	1.906 (0.034)	0.088 (0.070)
Distance to nonsquatted area (in blocks)	1.731 (0.058)	1.767 (0.033)	-0.036 (0.067)
Parcel surface (in m <sup>2</sup> )	287.219 (4.855)	277.662 (2.799)	9.556* (5.605)
Block corner	0.190 (0.019)	0.156 (0.014)	0.033 (0.023)

Notes: *Property Right Availability* equals 1 if land titles were available for the parcel. The Appendix presents the definition of all the variables. Standard errors are in parentheses.

\*Significant at 10 percent.

parcel characteristics, namely distance to a nearby (polluted and floodable) creek, distance to the closest nonsquatted area, parcel surface, and a corner location dummy.<sup>15</sup> We only reject the hypotheses of equality for parcel surface (at the 8.9 percent level of significance). Nevertheless, the difference is relatively small—parcels are only 3 percent larger in the non-intention-to-treat group—and it is the group without titles that has slightly larger parcels. The similarity across household and parcel pretreatment characteristics is consistent with exogeneity in the allocation of property rights.

The survey included a small set of questions designed to capture the squatters' market beliefs in a manner that follows the way political scientists and economists have approached the issue, albeit facing the restriction of the relatively limited educational attainment of the individuals in our sample, which only allowed for very broad ideological categories to be studied.<sup>16</sup>

arrival time. This percentage is similar for the treatment and control groups. We obtain similar results when we compare the pretreatment characteristics of the current household head between the two groups.

15. The area is flat (all parcels are within a five-meter topographical range) and urban (no agricultural production).

16. During a pilot ran in 2002 we observed that the limited education of our subjects prevented us from phrasing the questions using weights, as suggested by Dominitz and Manski [1997] and Durlauf [2002]. Relative to the population in the Buenos Aires metropolitan area, the squatters in our sample show low levels of income and education. Their average household income level is in the centile 25 of the distribution in the official household survey, while their average per capita

Thus, we settled on the set of questions selected from previous surveys of this type (mainly the World Values Survey and the GSS) that more closely captures beliefs consistent with the good functioning of markets, introducing small alterations to make them easier to interpret for our subjects.

At least since Adam Smith, a large body of work in history and economics has argued that individualism, materialism, and meritocratic inclinations are conducive to the functioning of markets. More recent work has insisted that trust belongs in this category.<sup>17</sup> Accordingly, we finally settled on four questions. The first was “Do you believe that it is possible to be successful on your own or a large group that supports each other is necessary?” The two possible answers were “It is possible to be successful on your own” and “A large group is necessary to be successful.” The second was “Do you believe that having money is important to be happy?” The possible answers were “Indispensable to be happy,” “Very important to be happy,” “Important to be happy,” and “Not important to be happy.” The third was “In general, people who put effort working end up much better, better, worst, or much worst than those that do not put an effort?” The possible answers were “Much better than those that do not put an effort,” “Better than those that do not put an effort,” “Worst than those that do not put an effort,” and “Much worst than those that do not put an effort.” The fourth and final question was “In general, in our country, would you say that one can trust other people or that people cannot be trusted?” The possible answers were “You can trust others” and “You cannot trust others.”

### *II.C. Estimation Strategy*

We analyze the effects of land titling by estimating the following regression model:

$$(1) \quad Y_i = \alpha + \beta X_i + \gamma \text{Property Right}_i + \varepsilon_i$$

where  $Y$  is the variable under study,  $X$  is a vector of controls,  $\varepsilon$  is the error term, and  $\gamma$  is the parameter of interest, which captures the effect of *Property Right* on the outcome under study. Controls

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income is in the centile 14. According to the average years of education of the household head, they are in the centile 14 of the official household survey distribution.

17. See Arrow [1971], Coleman [1990], Putnam [1993], Schotter [1998], Durlauf [2002] and Glaeser et al. [2002].

TABLE IV  
BELIEFS AND PROPERTY RIGHTS IN THE SOLANO SETTLEMENT

	(1a)	(2a)	(3a)	(4a)	(5a)
	Success- Alone	Money- Important	Effort- Better	Trust- Others	Market Beliefs
Property right	0.144** (0.064)	0.202*** (0.063)	0.072 (0.056)	0.108* (0.063)	0.527*** (0.131)
Controls	No	No	No	No	No
Observations	312	312	313	313	312
	(1b)	(2b)	(3b)	(4b)	(5b)
Property right	0.169** (0.066)	0.188*** (0.068)	0.022 (0.056)	0.139** (0.065)	0.520*** (0.133)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	312	312	313	313	312

Notes: All columns present 2SLS regressions where *Property Right* is instrumented with *Property Right Availability*. Regressions in the b panel are similar but control for parcel and household characteristics. The former include surface of the parcel, distance to creek, distance to nearest nonsquatted area, and a corner dummy. The latter include age, gender, nationality and years of education of the original household head, and nationality and years of education of her/his parents. The Appendix presents the definition of the variables. Values in parenthesis represent standard errors.

\* Significant at 10 percent level;

\*\* Significant at 5 percent level;

\*\*\* Significant at 1 percent level.

for characteristics of the original household head include age, gender, nationality, years of education, and nationality and years of education of her/his parents. Controls for parcel characteristics include surface of the parcel, distance to creek, distance to nearest nonsquatted area, and a corner dummy. A potential concern with this regression is that a number of families that were offered titles did not receive them due to unobservable factors that may also affect the variable under study. Our experiment can address this issue of noncompliance by instrumenting the treatment variable *Property Right* with the intention-to-treat variable *Property Right Availability*. Thus, we report two-stage least squares estimates.

### III. RESULTS

#### III.A. Beliefs and Property Rights

Table IV presents our basic set of results. Column (1) focuses on individualist beliefs, which we attempt to capture with *Suc-*

*cess-Alone*, the answer to the question "Do you believe that it is possible to be successful on your own or a large group that supports each other is necessary?" The *Property Right* coefficient is positive and statistically significant. Column (1a) includes no control variables, but column (1b) repeats the exercise controlling for parcel and household characteristics with similar results. The findings suggest that a higher proportion of individuals who received titles respond that "you can succeed on your own" relative to those without titles. To get a sense of the size of the effect, note that the proportion of squatters answering the individualist option in the group that does not have titles is 0.330 (standard error 0.040) while that for the group that has titles is 0.433 (s.e. 0.037). In other words, having titles increases the proportion of people giving the individualist response by 10 percentage points. This is an increase of 31 percent relative to the level for squatters without titles.

Column (2) moves to materialist beliefs, the answer to the question "Do you believe that having money is important to be happy?" The positive coefficient indicates that respondents with property rights are more likely to hold the materialist view.<sup>18</sup> To get a sense of the size of the effect, note that the proportion of people choosing the materialist answer in the group without property rights is 0.503 (s.e. 0.042), while that for the group that has titles is 0.676 (s.e. 0.035). In other words, giving property rights increases the proportion of people giving the materialist response by 17 percentage points, which is an increase of 34 percent.

Column (3) focuses on meritocratic beliefs by studying *Effort-Better*, the answer to the question "In general, people who put effort working end up much better, better, worst or much worst than those who do not put an effort?" In contrast to columns (1) and (2), the sample with property rights does not tend to report an answer that is statistically different from the response provided by the untitled (although the *Property Right* coefficient is still positive).<sup>19</sup> Both for the group without property rights (0.735 with

18. The four possible answers have been collapsed into a dummy that equals 1 for those answering "*Indispensable to be happy*", "*Very important to be happy*", or "*Important to be happy*"; and equals 0 for those answering "*Not important to be happy*". The use of only two categories does not affect the results. The sample with property rights has more weight in all three of the top categories and less on "*Not important to be happy*".

19. The four possible answers were collapsed into a dummy that equals 1 if the answer is "Much better than those that do not put an effort" or "Better than

a s.e. of 0.037) and for the group that has titles (0.791 with a s.e. of 0.030), the proportion of people choosing the meritocratic answer seems large (see Section III.D below for comparisons with the general population).

Column (4) in Table IV studies trust by focusing on the dummy *Trust-Others*, the answer to the question “In general, in our country, would you say that one can trust other people or that people cannot be trusted?” Squatters with titles are more likely to report that they believe that one can trust other people. To get a sense of the size of the estimated effects, note that the proportion of people declaring high levels of trust in the group without titles is 0.335 (s.e. 0.040) while that proportion for the group that has titles is 0.393 (s.e. 0.037). This increase of almost 6 percentage points represents a 17 percent rise for squatters without titles.

In summary, for three of the four categories studied the evidence suggests that individuals report different beliefs when they hold property rights. The sign of the effect in these three variables is always in the direction of making the beliefs more compatible with unregulated markets. This is so because a person that holds materialist and individualist beliefs is unlikely to demand market regulation. Similarly, trust (when it is not naive) fosters cooperation, which is valuable in a market when contracts are difficult to write. We summarize these findings in column (5) with an index *Market Beliefs* (the sum of the dummies for the four questions). The effect of property rights on *Market Beliefs* is positive and significant. The average answer for untitled squatters is 1.906 (s.e. 0.086), while that for titled squatters is 2.294 (s.e. 0.074), which represents an increase of 20 percent relative to the former group.<sup>20</sup>

### III.B. Attrition

As explained before, our survey found that some families arrived to the parcel they are currently occupying after the time the former owners made the decision to surrender the land or sue

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those that do not put an effort”, and equals 0 if the answer is “Worst than those that do not put an effort” or “Much worst than those that do not put an effort”. The effect of Property Right remains statistically insignificant if we estimate an ordered Probit with four categories (there seems to be a mild compression of the distribution in the sample with property rights).

20. The results in Table IV are robust to clustering the standard errors by block, side of a block, or former owner, to including the observations from the non-contiguous San Martin neighborhood, and to controlling for the characteristics of the current household head (instead of those of the original household head).



during 1986. As it is possible that families arriving after the former owners' decisions could have known the different legal status of the parcels (i.e., the different probabilities of receiving titles), in order to maintain treatment exogeneity we exclude from the analysis the families that arrived after 1985 to the parcel they are currently occupying. However, this raises a problem of attrition. The families that arrived after 1985 could have replaced some original squatters that had left before we ran our survey in 2003. Moreover, the migration decision could be correlated with the outcomes under study. The survival rate for parcels not offered titles is lower than the survival rate for those offered titles in 1989. The percentage of those surveyed in 2003 that had arrived before 1986 was 0.624 (s.e. 0.036) for the nonintention-to-treat group and 0.729 (s.e. 0.051) for the early intention-to-treat group. The survival rates for these two groups are statistically different at the 10 percent level.<sup>21</sup>

Fortunately, we have a group of squatters who were offered treatment at a later date, receiving titles in 1998. These squatters were under the same conditions as those in the control group for 17 out of the 22 years elapsed from the occupation until the time of our survey (77 percent of the relevant period), so we can expect them to have a broadly similar experience, for example, in terms of shocks that affect attrition. Indeed, the survival rate for the late intention-to-treat group (0.689, with s.e. 0.033) and for the nonintention-to treat group are not statistically different. Thus, if the estimated treatment effects for the whole sample were simply the result of attrition bias, whereby motivated squatters without titles left and motivated squatters with titles stayed, it would then be unlikely that we observe significant differences in beliefs between the late treated and the control groups. Additionally, the comparison of the estimated effect of titles for the late treated group with the effect for the early treated group leads to an indirect test of whether attrition in the latter group can be ignored. In Table V, we estimate a separate effect for the late and early treated. We still find strong effects of property rights on beliefs for the late treated group.<sup>22</sup> If anything, the point estimates for the late treated are stronger—not weaker—than for the

21. We may be overestimating attrition by assuming that there were no vacated parcels left after the occupation.

22. Similar results are obtained if we restrict the sample to the late treated and control groups.

TABLE V  
BELIEFS AND PROPERTY RIGHTS FOR THE EARLY AND LATE TREATED

	(1) Success-Alone	(2) Money-Important	(3) Effort-Better	(4) Trust-Others	(5) Market Beliefs
Property Right 1989	0.175** (0.086)	0.137 (0.088)	0.038 (0.074)	0.084 (0.086)	0.436** (0.173)
Property Right 1998	0.166** (0.075)	0.219*** (0.077)	0.012 (0.064)	0.172** (0.074)	0.570*** (0.151)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	312	312	313	313	312
F-stat 1989 = 1998	0.01	0.76	0.11	0.95	0.53

Notes: All columns present 2SLS regressions where *Property Right 1989* and *Property Right 1998* are instrumented with *Property Right Availability 1989* and *Property Right Availability 1998*, and include controls for parcel and household characteristics. The former include surface of the parcel, distance to creek, distance to nearest nonquatted area, and a corner dummy. The latter include age, gender, nationality and years of education of the original household head, and nationality and years of education of her/his parents. The F-stats test the null hypothesis: *Property Right 1989* = *Property Right 1998*. The Appendix describes the definition of the variables. Values in parenthesis represent standard errors.

\*\* Significant at 5 percent level;

\*\*\* Significant at 1 percent level.

early treated. Moreover, the  $F$ -statistics show that we cannot reject the null hypotheses that the effects for the early-treated and late-treated groups are similar. Overall, this contradicts the hypothesis that our results are driven by selection bias.

Alternatively, we also address the problem of attrition by implementing a matching estimator proposed by Ahn and Powell [1993]. They suggest a way of eliminating the potential selection bias induced by attrition, by differencing observations with similar probabilities of selection. We estimate a Logit model of the likelihood of survival since 1985 on the four parcel characteristics in Table III, the only pretreatment characteristics that we have available for the whole set of squatters (attrited and nonattrited). We find that distance to the nearby polluted and floodable creek significantly increases this survival likelihood, and then use these estimates to match observations on the propensity score of sample selection. Exploiting the survival variability induced by these pretreatment characteristics to control for attrition, we find similar results to those in Table IV.<sup>23</sup>

### *III.C. Direct versus Indirect Effects*

Beliefs may depend on variables that are, in turn, affected by property rights. It is then of interest to see if the estimates presented in Table IV represent a direct effect of property rights, or if they represent an indirect effect of property rights through other variables. Of primary interest is the role of income and wealth [Alesina et al. 2001]. As these variables are potentially endogenous, they were excluded as controls from Table IV, but these exclusions lead us to wonder if there is still variation in beliefs that is explained by property rights after the correlation with income and wealth is taken into account. A similar concern could apply to the education of the household head. The previous tables include the years of education of the original household head as a control, but the survey was answered by the current household head (or his/her spouse) and, when the original and the current head differ, the education of the current household head could also be potentially endogenous.<sup>24</sup> Table VI presents the results after including *Income*, *Wealth*, and

23. The results are available upon request.

24. As explained in footnote 14, the original and the current household head do not coincide for 23 percent of the sample. The original household head's education should be exogenous as they were already adults in 1981.

TABLE VI  
DIRECT VS. INDIRECT EFFECTS (INCOME, WEALTH, AND EDUCATION)

	(1) Success-Alone	(2) Money-Important	(3) Effort-Better	(4) Trust-Others	(5) Market Beliefs
Property Right	0.214*** (0.075)	0.144* (0.076)	0.021 (0.064)	0.136* (0.074)	0.516*** (0.145)
Income	0.0002 (0.0005)	-0.0003 (0.0005)	0.0004 (0.0004)	-0.0001 (0.0005)	0.0001 (0.001)
Wealth	-0.0001 (0.001)	0.001 (0.001)	-0.001 (0.001)	-0.0001 (0.001)	-0.001 (0.002)
HH Education	0.046*** (0.016)	0.034** (0.016)	-0.003 (0.013)	0.011 (0.016)	0.089*** (0.031)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	254	254	254	254	254

Notes: All columns present 2SLS regressions where *Property Right* is instrumented with *Property Right Availability*. Parcel controls include surface, distance to creek, distance to nearest non-squatted area, and a corner dummy. Household controls include age, gender, and nationality of the original household head, and nationality and years of education of her/his parents. All the variables are described in the Appendix. Values in parenthesis represent standard errors.

\* Significant at 10 percent level;

\*\* Significant at 5 percent level;

\*\*\* Significant at 1 percent level.

*Household Head Education* as controls.<sup>25</sup> The coefficient on property rights is largely unaffected by the inclusion of these variables, suggesting that the reported effect of property rights is direct.<sup>26</sup>

Property rights could also have improved the access to the media or to communications with others outside this area. We then wonder if our Table IV estimates represent an indirect effect through improved communication access.<sup>27</sup> Table VII presents results controlling for access to media (open-air and cable TV) and telephones (fixed and cellular). The coefficients on *Property Rights* are not significantly different to the corresponding ones in Table IV.

### III.D. Size and Limits

One way of evaluating the quantitative size of the effect of property rights on beliefs is to compare it to the effect of the years of education of the original household head, which has a positive and significant effect on the index of *Market Beliefs* in the regression reported in column (5b) of Table IV. The coefficient indicates that one additional year of education increases the belief index by 0.117 (s.e. 0.032). Given that the estimated effect of the *Property Right* dummy is 0.520, this suggests that the effect of property rights is comparable to 4.4 additional years of education. In other words, assuming that the relationship between education and beliefs reflects a causal link, we would need to give untitled squatters 4.4 additional years of education to have them declare the set of beliefs reported by the titled group. Note that this would imply a very large change in the education of these household heads, who have an average of six years of education (see Table II).

To provide additional background and study the size of the

25. Galiani and Schargrodsky [2006] show significant effects of land titling on housing investment and child education in this population, but no differences in labor market performance. Household wealth is proxied by total constructed surface, as the house is the primary asset of the families in this sample and house value is correlated with constructed surface. For areas with similar development in the Buenos Aires outskirts, Zavalía-Lagos [2005] estimates that the values of the constructed houses are about five times the parcel values.

26. Because we introduce the current household head's education, we exclude the original household head's education as a control in this table. The *Property Right* coefficients remain unaltered if the latter is also included. The sample drops to 254 due to limited income reporting. The results do not change if *Income* is excluded and these regressions are run on the full sample with only *Wealth* and *HH Education* as controls.

27. There are no statistical differences in possession of TV sets, and access to cable TV services, fixed line telephones, and cellular telephones between the treatment and the control groups.

TABLE VII  
DIRECT VS. INDIRECT EFFECTS (TV AND TELEPHONE LINES)

	(1) Success-Alone	(2) Money-Important	(3) Effort-Better	(4) Trust-Others	(5) Market Beliefs
Property Right	0.161** (0.067)	0.198*** (0.068)	0.020 (0.057)	0.148** (0.066)	0.528*** (0.133)
TV	-0.080 (0.101)	0.054 (0.103)	-0.004 (0.087)	0.111 (0.100)	0.082 (0.201)
Cable TV	0.042 (0.096)	-0.282*** (0.097)	-0.063 (0.082)	-0.083 (0.095)	-0.387** (0.190)
Home Telephone	-0.002 (0.071)	-0.019 (0.072)	-0.068 (0.060)	-0.045 (0.070)	-0.138 (0.141)
Cellular Telephone	0.224* (0.133)	0.032 (0.136)	-0.108 (0.114)	0.188 (0.132)	0.555** (0.265)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	311	311	312	312	311

Notes: All columns present 2SLS regressions where *Property Right* is instrumented with *Property Right Availability*. Parcels controls include surface, distance to creek, distance to nearest non-squatted area, and a corner dummy. Household controls include age, gender, nationality and years of education of the original household head, and nationality and years of education of her/his parents. All the variables are described in the Appendix. Values in parenthesis represent standard errors.

\*Significant at 10 percent level;

\*\*Significant at 5 percent level;

\*\*\*Significant at 1 percent level.

effects, we also use a short survey amongst a random sample of 438 respondents from the Buenos Aires metropolitan area using the same questions on beliefs employed in our survey of the squatter settlement. The comparison between the Buenos Aires metropolitan population and the Solano squatters is reported in Table VIII. With respect to individualistic beliefs, 44 percent of the general population answered "It is possible to be successful on your own." Instead, only 33 percent of squatters without titles in Solano chose this answer. The proportion amongst squatters with titles was 43 percent, almost the same proportion as in the general population. With respect to the materialist question, 67 percent of the metropolitan Buenos Aires population answered that money is important for happiness. In contrast, only 50 percent of untitled Solano squatters provided this answer. The proportion of titled squatters who considered money to be important was 67 percent.

The proportion of people reporting meritocratic beliefs in the general population is 73 percent. Amongst Solano squatters without titles it is also 73 percent while it is 79 percent amongst squatters with titles (difference not significant). Given that untitled squatters report meritocratic beliefs that are already similar to those of the general population, it is perhaps unsurprising that the treatment has little effect. Finally, 48 percent of the Buenos Aires population answered that one can trust other people. In contrast, only 33 percent of the Solano squatters without titles chose that answer, while this proportion increases to 39 percent for squatters with titles. We summarize our results using the index of *Market Beliefs*. The index for squatters without titles is 1.906. The average for Solano squatters receiving property rights is 2.294, which is comparable to the average of 2.342 exhibited by the Buenos Aires general population. Thus, ending up with titles in our natural experiment almost closes the belief gap between the average population and the squatters, in spite of the remarkable differences in the lives they lead.

The estimated effect of property rights on people's beliefs is large. A natural question concerns the limits of the mechanism under analysis. Indeed, it is conceivable that other aspects of the individual's mindset are affected, besides beliefs. An extreme possibility from the point of view of an economist is that it affects preferences. We do not have direct data on preferences. However, our survey of the Solano neighborhood includes four questions concerning values. These are normative statements as to how things

TABLE VIII  
BELIEFS AMONGST SOLANO SQUATTERS AND THE GENERAL POPULATION

	(1) Success-Alone	(2) Money-Important	(3) Effort-Better	(4) Trust-Others	(5) Market Beliefs
Average for:					
Buenos Aires General Population	0.440 (0.021)	0.671 (0.019)	0.726 (0.019)	0.476 (0.021)	2.342 (0.046)
Squatters with Property Right = 0	0.330 (0.040)	0.503 (0.042)	0.735 (0.037)	0.335 (0.040)	1.906 (0.086)
Squatters with Property Right = 1	0.433 (0.037)	0.676 (0.035)	0.791 (0.030)	0.393 (0.037)	2.294 (0.074)

Notes: *Property Right* equals 1 if the household has formal titles to the parcel. The Appendix describes the definition of the variables. Values in parenthesis represent standard errors.



should be (whereas beliefs can be regarded as positive statements as to how things actually are, see Bowles [1998] for a discussion). The results show that there are no differences across answers concerning values from individuals with and without property titles.<sup>28</sup>

#### IV. Interpretation

Our exercise identifies a large change in beliefs as a result of our natural experiment. The precise interpretation of this result, however, presents some difficulties. The first concerns the mechanism through which this change takes place. Broadly, there are two possible interpretations, which for simplicity we call *experience* versus *motivated beliefs*. Under the *experience* hypothesis, beliefs are formed as a by-product or consequence of an agent's activities and interaction with others in society. One example of this view is Piketty [1995], where learning is costly so in some cases a series of good (or bad) realizations of a shock lead individuals to settle on a particular belief.<sup>29</sup> Under *motivated beliefs* there is a purposeful actor trying to change the beliefs people hold. In one class of models, individuals themselves change their beliefs to fit their convenience. One example is Benabou and Tirole [2006] where individuals lack will power and benefit from distorting their beliefs in a way that makes them exert more effort.<sup>30</sup> In a second class of models, beliefs are shaped by others

28. The results are available upon request. One example of our questions concerning values is "Imagine two construction workers, of the same age, who work laying bricks in the same site. One of them is faster, more efficient and punctual, but the other has to support a larger family. The more efficient one is paid more than the one supporting the larger family. Do you think this is fair?" By and large, the economics literature has not focused on the distinction between values and beliefs. See Ben-Ner and Putterman [1998] and Hechter and Opp [2001].

29. Di Tella and MacCulloch [2002] present a related approach to belief formation where the observation of corruption offends citizens and informs them about how fair (or efficient) business people are before voting on a policy. They also report that people who perceive corruption report left wing views, while Alesina and Glaeser [2004] find left wing views to prevail in countries small in size or with electoral systems based on proportional representation. The common theme is that individuals are not actively seeking to change their beliefs, but instead end up with a set of beliefs as a product of their social and market interactions. Interestingly, Shiller et al. [1991, 1992] found that Soviet and American attitudes do not appear dissimilar in spite of the historical differences in these two countries, whereas Corneo and Gruner [2002] found large differences amongst the US and Europe versus those found in formerly socialist countries.

30. For example, in Rabin [1995] individuals self-servingly gather evidence in order to relax moral internal constraints. Babcock et al. [1996] reports that teacher contract negotiators in the US select "comparable" districts in a biased fashion and that this is correlated with strike activity. See also Akerlof and Dickens [1982], Roth and Murningham [1982], Loewenstein et al. [1993], Carrillo and Mariotti [2002], Jost et al. [2003], *inter alia*. A related explanation is *identi-*

as in the indoctrination model of Glaeser [2005] and the Marxist explanations where the capitalist class imposes on the poor a "false consciousness," full of unrealistic ideas of social mobility so that they do not revolt.<sup>31</sup>

Under the experience hypothesis, the differences in beliefs objectively reflect different realities. One possibility is that having lived owning property, they have observed a different reality in terms of probabilities of success across small and large groups, need for money in happiness, *etc.* The main conflicting evidence with this hypothesis is that, by design, our results compare individuals with access to very similar sets of information.<sup>32</sup> A weaker piece of evidence comes from the interpretation of the answers to the first two questions. With respect to *Success-Alone*, beliefs could change in the observed way if they respond to a self-serving mechanism. Indeed, it is well understood in these neighborhoods that the occupation was a coordinated, cooperative enterprise, and that they would have failed if there were only a few squatters [Céspedes 1984; CEUR 1984; Izaguirre and Ariztizabal 1988; Fara 1989]. After property rights are obtained, it is possible that there are fewer gains to group action so a family alone could undertake most future challenges (improving their houses, saving, *etc.*). In other words, lucky squatters may have higher incentives to distort their beliefs than unlucky squatters. Also, if experience was behind these results, it would be those

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*fication.* Coleman [1990] describes it: "If outcomes of events are benevolent to another actor, then one might find it possible to increase one's satisfaction by identification with that other", noting that fan clubs are typically for successful people. For this to be relevant in our experiment, identification should involve convergence of beliefs. Analogous effects, but amongst peers, are discussed in work on neighborhood effects. See Jencks and Mayer [1990], Katz et al. [2001], Sacerdote [2001], *inter alia*.

31. See also Piketty's [1998] self-fulfilling theory of status. More generally, it is possible that having property rights is necessary as a mental "key" which allows the poor to connect (perhaps emotionally) with the capitalist fictions pushed through the educational system and the media. See, for example, Bourdieu and Passeron [1970]. On symbols of meanings and cultural objects, see Geertz [1973], as well as Kertzer [1996] and Johnson [2002]. More generally, sociologists have emphasized that cognition (the process of making sense of the world) varies across different settings. See Goffman [1974] and Dobbin [2004].

32. Squatters in both groups are obviously aware that some of them obtained legal titles while others did not. Moreover, they live in very close proximity to each other and can communicate often. There are no differences across the two groups in their access to the media. Importantly, both groups are indistinguishable during interactions with people from outside the neighborhood, for example, in the labor and credit markets. Note, however, that empirical identification is hard if agents put a large weight to their own experience, so that even a small difference in their circumstances may give rise to large differences in reported beliefs.

with property rights that should remember the benefits of group action more vividly in their minds as they were the ones that benefited the most. Accordingly, people with titles should be more likely to say that a group is needed to be successful. Yet, the opposite is true. A similar interpretation is possible with *Money-Important*. Unlucky squatters would gain more from discounting the importance of material status for happiness, as this gives less salience to their misfortune.

A second difficulty in the interpretation of our results is that it could be argued that the treatment was not the government transfer of property rights to lucky squatters (see footnote 8 and Section III.C for discussions on the associated wealth transfer), but rather the frustration and uncertainty experienced by unlucky squatters. Under this interpretation, the similar beliefs reported by titled squatters and the metropolitan Buenos Aires population should be interpreted as a “high” baseline level from which the beliefs of unlucky squatters “fell” as a result of the long and unsuccessful judicial processes. One way to further explore this interpretation is to focus on the beliefs of the small sub-sample within the general Buenos Aires population that is most similar to the Solano squatters. As reported in Table II, household heads in Solano have an average educational level of six years (which is less than complete primary school). Moreover, as discussed in Section III.D, years of education and beliefs have a strong correlation in our sample. Splitting the metropolitan Buenos Aires sample into a group of individuals with incomplete primary school and a group with higher educational attainment, the uneducated group has a *Market Beliefs* index of 1.925 (s.e. 0.184), whereas the educated report 2.369 (s.e. 0.048).<sup>33</sup> Thus, the beliefs of unlucky Solano squatters are similar to those reported by the fraction of the general population that has comparable educational levels, suggesting that the untitled “started” at this low level of beliefs instead of having suffered a “drop” because of the uncertainty and frustration in obtaining property.

33. This difference in means is significant at the 2.2 percent level. For every beliefs variable, the uneducated report lower levels than the educated within the metropolitan Buenos Aires population. The means are 0.289 vs. 0.451 for *Success-Alone*, 0.595 vs. 0.676 for *Money-Important*, 0.555 vs. 0.738 for *Effort-Better*, and 0.363 vs. 0.483 for *Trust-Others*, for the uneducated and the educated, respectively. These differences are statistically significant at conventional levels for *Success-Alone* and *Effort-Better* (although the sub-sample of the Buenos Aires population with low education is relatively small).

## V. CONCLUSION

An important question is what determines the beliefs that people hold. In this paper we study a natural experiment involving a squatter settlement in the outskirts of Buenos Aires, Argentina. More than twenty years ago squatter families occupied a piece of land made up of different tracts, each with a different legal owner. When an expropriation law was passed, some of the legal owners surrendered the land while others are still contesting the expropriation compensation in the slow Argentine courts. Thus, only a group of squatters obtained property rights. Since the original owner's decision to challenge the expropriation was orthogonal to the characteristics of the squatters, the allocation of titles amongst squatters can be considered exogenous in equations describing their beliefs. A considerable advantage of the study's design is that it involves the comparison of individuals living in very close proximity, with largely similar life experiences and access to similar sets of information.

We find strong evidence in favor of the hypothesis that our experiment changed the way squatters see the world. Of the four measures of beliefs considered, there are significant differences between the titled and untitled groups in three of them. Individuals with titles are more likely to hold beliefs that we describe as individualist, materialist and beliefs consistent with social capital accumulation. There are no differences in terms of meritocratic beliefs, although we note that squatters without titles already have meritocratic beliefs that are no different from those of the metropolitan Buenos Aires population. The size of the effects appear large: almost all of the difference in beliefs between unlucky squatters without titles and the average metropolitan population of Buenos Aires (about 20 percentage points) is eliminated for squatters who obtained property, in spite of the still remarkable differences in their life circumstances. Our experiment, however, does not allow us to provide a full identification of the mechanisms through which this episode affected beliefs.

## APPENDIX: DATA DEFINITIONS

*Success-Alone:* A dummy variable taking the value 1 if the answer to the question "Do you believe that it is possible to be successful on your own or a large group that supports each other

is necessary?" was "It is possible to be successful on your own"; and 0 if the answer was "A large group is necessary to be successful."

*Money-Important:* A dummy variable taking the value 1 if the answer to the question "Do you believe that having money is important to be happy?" was either "Indispensable to be happy," "Very important to be happy" or "Important to be happy"; and 0 if the answer was "Not important to be happy."

*Effort-Better:* A dummy variable taking the value 1 if the answer to the question "In general, people who put effort working end up much better, better, worst or much worst than those who do not put an effort?" was "Much better than those that do not put an effort" or "Better than those that do not put an effort"; and 0 if the answer was "Worst than those that do not put an effort" or "Much worst than those that do not put an effort."

*Trust-Others:* A dummy variable taking the value 1 if the answer to the question "In general, in our country, would you say that one can trust other people or that people cannot be trusted?" was "You can trust others" and 0 if the answer was "You cannot trust others."

*Market Beliefs:* The individual's sum (ranging from 0 to 4) of the dummies *Success-Alone*, *Money-Important*, *Effort-Better*, and *Trust-Others*.

*Property Right:* A dummy variable taking the value 1 if the parcel has been legally titled to the occupant, and 0 otherwise.

*Property Right 1989:* A dummy variable taking the value 1 if the parcel was legally titled to the occupant in 1989, and 0 otherwise.

*Property Right 1998:* A dummy variable taking the value 1 if the parcel was legally titled to the occupant in 1998, and 0 otherwise.

*Property Right Availability:* A dummy variable taking the value 1 if land titles were available for the parcel, i.e. if the former owner surrendered the land to the State, and 0 otherwise.

*Property Right Availability 1989:* A dummy variable taking the value 1 if land titles were available for the parcel in 1989, and 0 otherwise.

*Property Right Availability 1998:* A dummy variable taking the value 1 if land titles were available for the parcel in 1998, and 0 otherwise.

*Income* equals the total household income divided by the number of household members.

*Wealth* equals the total number of constructed square meters of the house.

*HH Education* measures the years of education of the household head and equals: 4 if the maximum educational level of the household head is *Primary School-Incomplete*, 7 if *Primary School-Complete*, 9 if *High School-Incomplete*, 12 if *High School-Complete*; 13 if *Vocational School-Incomplete*; and 15 if *Vocational School-Complete*.

*TV*: A dummy variable taking the value 1 if the household owns a TV set, and 0 otherwise.

*Cable TV*: A dummy variable taking the value 1 if the household has cable TV service, and 0 otherwise.

*Home Telephone*: A dummy variable taking the value 1 if the household has a fixed telephone line, and 0 otherwise.

*Cellular Telephone*: A dummy variable taking the value 1 if the household has a cellular telephone, and 0 otherwise.

Other household data used as controls include: age of the original household head (dummy for age below 50, while the baseline is 50 and more), gender of the original household head, nationality of the original household head (dummy for Argentine nationality), years of education of the original household head, nationality of the father of the original household head (dummy for Argentine nationality), years of education of the father of the original household head, nationality of the mother of the original household head (dummy for Argentine nationality), and years of education of the mother of the original household head. For deceased original household heads, the age was calculated from year of death and age at death. For the calculation of the years of education of the original household head and her/his parents, see *HH Education*. We also include dummies for missing data on original household heads' age, and original household head parents' nationality and years of education (a total of ten observations). The original household head is the family member who was the household head at the time the family arrived to the parcel they are currently occupying.

Data on parcels used as controls include: Surface of the parcel (in m<sup>2</sup>), Distance to creek (in blocks), Distance to nearest non-squatted area (in blocks), and a dummy that equals 1 if the parcel is at the corner of the block and 0 otherwise.

HARVARD BUSINESS SCHOOL, BOSTON, MA

WASHINGTON UNIVERSITY, ST. LOUIS, MO

UNIVERSIDAD TORCUATO DI TELLA, BUENOS AIRES, ARGENTINA

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