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*The work of economics:
how a discipline makes its world*

LIKE ALL SCIENCES, economics faces the task of persuading people that what it says is true. To strengthen its arguments, it must sometimes try and put them to the test. But compared to laboratory sciences, it faces a particular difficulty in establishing empirical evidence. The socio-technical world that economics describes cannot easily be rendered testable. For this reason, compared to many other sciences, economics attaches less importance to having clear tests and often seems to pride itself on not needing them. The manipulation of statistical data provides the most common way around this difficulty, while experimental economics offers a more specialized approach. Occasionally, however, academic economics employs another method for advancing and testing its arguments. It is sometimes able to use the world as a laboratory.

When academic economics conducts experiments in the world-as-laboratory, it encounters an interesting situation. The world is already full of economic experiments. These occur on a variety of scales, from the trial of a new commercial product to the design of an entire market mechanism (Guala 2001; Muniesa and Callon 2004). Among the most ambitious forms of economic experiment in recent decades have been the attempts in numerous countries to reformat the economy as a whole, in programs of neoliberal economic restructuring. The scale of these experiments offers unusual opportunities for putting economic arguments to the test. Such tests are interesting, not so much for the facts they confirm – the evidence never seems complete enough to establish conclusive arguments – as for what they tell us about how facts about the economy are produced. They illuminate the relationship between economics and the object it studies.

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I have argued elsewhere that the idea of “the economy” is a surprisingly recent product of socio-technical practice, emerging only in the mid-twentieth century (Mitchell 1998, 2002, 2005). Before then, economists did not use the word “economy” in its modern sense. From around the 1930s, new forms of consumption, marketing, business management, government planning, financial flows, colonial administration, and statistical work brought into being a world that for the first time could be measured and calculated as though it were a free-standing object, the economy. Economics claimed only to describe this object, but in fact it participated in producing it. Its contribution was to help devise the forms of calculation in terms of which socio-technical practice was increasingly organized. Economics, it follows, is important not just for what it says but for what it does.

To understand the work of economics, we need to expand our conception of its reach. Economics takes place not just as an academic discipline, but in the design and marketing of goods, in the calculations and forecasting of reserve banks and investment houses, in the case studies of business schools and law schools, in the programs of political think tanks, and in the policies of international development organizations. These and many other agencies are involved in the design and deployment of economic arguments and calculations. Michel Callon calls the wider forms of economics “economics in the wild”, to distinguish them from what one might call the “caged economics” of the university (Callon et al. 2002, 196). The wider kinds of economics typically try to organize agents, goods, information, and other things into economic projects and experiments. They try to draw others into their calculative arrangements, setting them in play as producers, consumers, owners, or investors. Academic economics can then report and describe these arrangements, and occasionally even use them as a test site for new forms of calculation.

What is the relationship between these two forms of economic knowledge? Does academic calculation depend upon the spread of these wider calculative projects? If so, how does the unfolding of experiments in the wild interact with the experimental knowledge of the academy?

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In December 2004 the World Bank reported the completion of an ambitious and widely discussed economic experiment, the Urban Property Rights Project in Peru (World Bank 2004). The project addressed an issue found in almost every country of the global south. Large

populations migrating from the countryside to the city have housed themselves by building neighborhoods that are not planned or regulated by the state. In many countries these informal neighborhoods contain a majority of the urban population, most living without adequate municipal services or sufficient access to employment and income. The World Bank supported a crash program in Peru to transform the country's informal urban neighborhoods into legal, state-regulated housing. The plan was to set up a simple procedure for registering the ownership of property and thereby turn millions of people into the formal owners of the homes they had built.

The plan promised much more than the regularization of property rights. The government and the World Bank believed that creating property owners offered a simple and inexpensive means to end widespread poverty. Holding formal title would enable ordinary people to use their homes as collateral for loans. The loans would provide capital for starting small enterprises, enabling all households to produce potential entrepreneurs. Formalization would also increase the value of the property, in the case of Peru perhaps doubling the price of the average 100 square meter lot. By spending only \$66 million (\$38 million borrowed from the World Bank, and the balance from its own revenues), the government would create \$1.75 billion in economic benefits (World Bank 1998, p. 9).

The plan was developed from the work of the internationally known Peruvian entrepreneur and development economist Hernando de Soto. Founder of the Instituto Libertad y Democracia (Institute for Liberty and Democracy) in Lima, de Soto became the country's leading advocate of neoliberal reorganization in the 1980s and 1990s. He argued that informal housing and other forms of unregulated and illegal economic activity were a symptom not of economic backwardness but of over regulation by the state. Simplifying the process of registering property ownership would turn dead assets into live capital, and transform every home owner into a capitalist entrepreneur (de Soto 1989, 2000).

The Institute for Liberty and Democracy carried out a pilot property-registration program in Lima in 1992-94, building on an earlier U.S.-funded scheme it had introduced in the 1980s. The 1992-94 program gave formal title to about 200,000 households. Two years later, the government launched a comprehensive urban titling program, targeting the capital and seven other cities, which together accounted for about 90 percent of the country's informal housing (World Bank 1998, p. 5). It later extended the program to another six

urban areas. When completed in 2004, the program had registered a further 1.2 million households and issued 920,000 property titles (World Bank 2004, p. 8).

The program appeared to have a remarkable effect, although not the one anticipated. A number of studies of the Peruvian experiment found that property titles had no significant effect on access among the poor to business credit (Cockburn 2000; Field and Torero 2002; and other studies cited there) (1). Mortgage lending did eventually increase, but only after a new government abandoned de Soto's neoliberal prescriptions and began to subsidize low-income mortgages (2). However, another study found an unexpected change in the economic lives of those who became formal property owners: they began to work harder.

Obtaining title to their property seemed to increase the average number of hours that members of a household worked by 17 per cent. The data suggested that over time, as the effect of titling intensified, the total number of hours worked might increase by 40 per cent. There was also a redistribution of labor from work within the home to employment outside, and from children to adults. Property titling was associated with a 47 per cent decrease in the number of hours worked inside the house, and a 28 per cent reduction in the use of child labor (Field 2003, pp. 3, 37).

To explain these findings, the author of the study, Erica Field, hypothesized that acquiring formal title freed members of the household to spend more time outside the home, based upon the intuition that in the absence of a formal title people had to stay home to protect their property from being seized by others. A further intuition suggested that adults had a comparative advantage over children in defending the home, so in the absence of secure property rights children were more

(1) For a further discussion of the assumptions at work in de Soto's schemes see Mitchell (2004). A former Peruvian banker (who was subsequently an official in an international development agency) offered the following explanation for the unwillingness of the banks to lend to the poor: "If you lend money to someone who has spent years getting \$10,000 together to build a home, and then they mortgage it to start a business and it fails, are you going to foreclose and send three kids out in the street? You stick with the middle class instead, where the worst that happens is you take away their TV" (Kleiner 2004).

(2) The government of Alejandro

Toledo, elected in 2001, introduced an emergency economic program, the centerpiece of which was the creation of the Fondo MiVivienda, a state subsidy for low-income mortgages from commercial banks and finance companies, designed to create jobs in construction and simultaneously support the country's ailing commercial banks and construction industry (see International Finance Corporation 2005 and Fondo MiViviendo n.d.). The World Bank (2004, p. 10) was then able to report, without explanation, a sudden increase in mortgage lending to the poor as though it were a consequence of its property titling program.

likely to be sent out to work. Once the property was secured with a formal title, children could stay home and adults could take over children's jobs outside the household (Field 2003, pp. 7-8, 12).

The reports of this unexpected but remarkable consequence of property ownership were widely circulated. Alan Krueger, a senior economist at Princeton University, devoted a column in the business section of the *New York Times* to the paper's findings (Krueger 2003). Another well known economist, Bradford DeLong at the University of California, Berkeley, singled out the same paper on his widely read weblog for making him "extremely hopeful about the future of economics" (DeLong 2003) (3).

For reasons I will explain, the paper's findings concerning the impact of property titling seem to me implausible. I will suggest a number of features of Peruvian politics and urban settlement that offer alternative explanations for the apparent increase in hours worked explanations more closely linked to the implementation of the titling program.

There were particular reasons why the research on the Peruvian experiment was able to reach such extraordinary conclusions. The research experiment was made possible by the political experiment that it studied. The agencies and arrangements that framed the property rights experiment framed the conclusions reached in the experiment on the experiment. Uncovering how this happened will enable us to understand the relationship between the experimental process of making economies and the making of economics.

There were also particular reasons for the popularity of the paper, despite the implausibility of its findings. First, it suggested that the Peruvian property rights experiment confirmed in an unexpected fashion the tenets of neoliberal economic theory: that the right of private property is the fundamental requirement for economic development and that securing this right and reaping its benefits can be achieved by establishing the proper rules and institutions (North 1981). The paper's findings echoed the arguments of neoliberal opponents of development planning. Peter Bauer (1984), the leading neoliberal critic of state-led development, had been arguing since the 1950s that the citizen of the third world is a natural entrepreneur, whose capitalist spirit is stifled by the policies of the colonial and developmental state. The main reason why people in the south are poor, Bauer and his followers argued, is that the state's bureaucratic regulations and its

(3) The paper was the main part of a research, its author subsequently accepted a faculty appointment in the sign of the positive reception of the Department of Economics at Harvard.

failure to protect property rights discourage people's natural propensity to work hard and make a profit. As we will see, organizations within the neoliberal movement subsequently made use of the paper on Peru as an important source of evidence for these claims.

Second, the sponsors of the project in Peru used the discovery that poor people given title to their property seemed to work harder as evidence of its success. The World Bank had to face the failure of the project to produce its intended result, an increase in lending to the poor. It seized upon the fact that the project's beneficiaries appeared to be working longer hours as an unexpected but welcome outcome (World Bank 2004, p. 11). Meanwhile, the Peruvian organization responsible for the original scheme, de Soto's Institute for Liberty and Democracy, had fallen out of favor in Lima and was pursuing opportunities to design and implement similar experiments in other countries, including Mexico, the Philippines, and Egypt. Unable to point to evidence that the original project achieved its promised outcome, the ILD cited the apparent increase in working hours in its efforts to win funding for further projects abroad (Institute for Liberty and Democracy s.d.).

Among academic economists, including those not associated with the neoliberal movement, there was a third reason for the popularity of the research paper. It seemed to offer a solution not only to the problems of the world's poor but to the problems of economists.

Like all scientists, as I have suggested, economists face the problem of how to persuade people that what they say is true. The abstract quality of many economic models can sometimes make them useful as political blueprints but difficult in practice to put to the test. Setting up experiments using human subjects is expensive, complex, and unreliable. The alternative is to use what actually happens in economic life as information against which to test an explanatory model. But this too presents difficulties. Economists readily admit that not everything is observable or measurable. The changes in a variable whose effect one is studying may be due to a factor outside the model. And the agents whose actions one is studying come with different preferences and abilities, which can affect the outcome – for example, in the Peruvian case, those planning to work outside the home might be more inclined to seek property rights, resulting in a process of self-selection (Rosenzweig and Wolpin 2000; Angrist and Krueger 2001).

One answer to these problems is the set up known as a natural experiment. This refers to a situation in which the socio-technical arrangements whose effect one wants to study are altered as a result of some event or circumstance “beyond the immediate control of the investiga-

tor” (McGinnis 1964). The typical case is where a change in government policy or legislation affects some members of a population but not others, creating a variation in the data that is random; or, if not random, is at least unconnected or “orthogonal” to any unobservable factors that might be affecting the outcome one is trying to explain (Rosenzweig and Wolpin 2000, p. 828).

Economists who praised and publicized the study of the effects of the property titling program in Peru found it valuable not only for what it discovered about property rights but for the way in which it made the discovery: by using the titling program to carry out a sophisticated natural experiment (Krueger 2003). A study that merely compared the hours worked by people who had formal ownership of their houses with those who had not received title could not produce convincing evidence of the effect of formal ownership on employment. The extra hours that formal owners worked might be due to any number of unobserved factors.

To avoid this problem, the study exploited the variation created by the fact that the titling program was carried out in different stages. It began in certain neighborhoods in Lima and then spread in subsequent years in a staggered pattern into other neighborhoods of the capital and other cities. Rather than compare those households that obtained property titles with those that did not, the study compared the number of hours worked in the year 2000 by households eligible to obtain title (whether or not they actually obtained it) in neighborhoods already reached by the program, with hours worked by those eligible in neighborhoods the program had not yet reached. As a precaution, the author also compared the difference in working hours between those *ineligible* to obtain title (because they possessed formal title before the program began) in neighborhoods reached by the program and those ineligible in neighborhoods not yet reached, and subtracted this difference from the first.

This was an elegant construction of a natural experiment. It made clever use not just of the household survey data collected by the Peruvian agency responsible for the titling program, but of the staggered timing and other features of the program itself (4). Among those who

(4) The data consisted of 2,750 households distributed across all eight cities where the titling program was introduced. The survey randomly sampled cluster units of ten households at the neighborhood level within each city. The number of clusters from each city was

based on the city’s share of residents eligible to receive title. The survey did not record whether households had actually obtained title under the program (Field 2003, pp. 15-16). This may be because the survey was carried out in response to the failure of property titling to increase

singled out the research for praise were scholars such as Krueger and DeLong who were interested in promoting not a neoliberal political agenda but more empirically supported arguments in the discipline, and in the case of Krueger, strong advocates of the use of natural experiments.

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A natural experiment in economics is not an experiment carried out in nature. It is an establishing of facts carried out in a world that has been organized to make it possible for economic knowledge to be made. Latour refers to this organizing work as “metrology”, meaning “the gigantic enterprise to make of the outside a world inside which facts... can survive” (Latour 1987, p. 251; see also Mitchell 2002, chapter 3). Experiments to establish the facts of economics depend upon projects carried out in the wider world to create sites where economic knowledge can gain a purchase. These sites, although larger than an ordinary laboratory, are nevertheless quite closely defined spaces – specific neighborhoods in particular cities of Peru, the local offices of a development organization and a think tank, the text of a survey questionnaire and its administrators, the offices of a parent organization in Washington that provides the funds. As Latour points out, to provide a secure site for establishing facts, these locations must be well connected to one another. The interconnections establish the routes along which facts can travel and be confirmed. They also shape what kinds of facts can survive. To understand the outcome of the academic experiment in Peru, we must understand these routes created by the larger political experiment. This requires us to trace the wider story of the Peruvian reforms and the political and intellectual arrangements of which they form a part.

The Peruvian property titling experiment was the outcome of political forces at work in Peru, but also of the efforts of a small but well organized postwar political movement in the West, neoliberalism. The movement can be traced back to the Free Market Project created in the fall of 1946 at the University of Chicago Law School, out of which the Chicago School of economics was formed, and the Mont Pelerin Society, the association of neoliberal intellectuals created the following April, closely related to the Chicago group and named after the village in

the supply of credit to the poor. Its primary purpose was to promote lending by commercial banks and finance companies by collecting information that would reduce the cost of assessing the creditworthiness of potential borrowers (World Bank 2004, pp. 12-13).

Switzerland where they first met (Mirowski and Van Horn 2005). The Chicago School and the Mont Pelerin Society organized the transformation of neoliberalism from a minor intellectual philosophy into a set of effective political tools. The Free Market project provided a prototype for the distinctive organizational basis of this effectiveness, the think tank – the combination of core ideas and practical proposals for legislation, supported by “research” and backed with corporate funds channeled through foundations. The Chicago model was later copied outside the Law School by the Heritage Foundation, the American Enterprise Institute, the Hudson Institute and many other neoliberal organizations established in North America and Europe from the 1950s onward.

Friedrich Hayek, who played the leading role in creating and developing both the Free Market Project and the Mont Pelerin Society, met Hernando de Soto on a visit to Lima in 1979 (Frost 2002, cited Chaufen 2004). By that time what had begun as a fringe right-wing intellectual current had become the most powerful political orthodoxy in the West. The neoliberal movement was now trying to extend its network to other parts of the world. In 1981, a close collaborator of Hayek, Antony Fisher, established the Atlas Foundation for Economic Research. Its goal was to coordinate activities and corporate funding among the network of European and American think tanks, and to extend it by developing and financing a group of neoliberal organizations outside Western Europe and the United States. De Soto was to be the first and most successful outcome of this initiative.

After their meeting in Lima, Hayek put de Soto in touch with Fisher. The Atlas Foundation helped set up and fund de Soto’s Institute for Liberty and Democracy, one of the first neoliberal think tanks in the south. “Antony gave us enormous amounts of information and advice on how to get organized”, de Soto later recalled. “It was on the basis of his vision that we designed the structure of the ILD. He then came to Lima and told us how to structure the statutes, how to plan our goals, how to build the foundation, what to expect in the short and long term” (Frost 2002, cited Chaufen 2004).

Although described as a third worlder “discovered” by Hayek in Lima, de Soto already had links with the neoliberal movement and a long professional experience in organizations involved in international trade and development. He had grown up in Geneva, where his family moved when he was seven after his father took up a post at the International Labour Organization (Clift 2003, Kleiner 2004). De Soto worked in Geneva, first, briefly, for the General Agreement on Tariffs and Trade, an organization whose leadership included prominent neoliber-

rals, and then as executive head of the International Council of Copper Exporting Countries (CIPEC), the cartel organization formed in 1967 by the governments of Peru, Chile, Zaire, and Zambia. His supporters later included the billionaire Swiss industrialist Stephan Schmidheiny, who was active in neoliberal organizations (5).

De Soto's meeting with Hayek took place in the year he moved back to Lima, as an entrepreneur representing investors who had purchased the rights to gold placer deposits. The mining enterprise failed after they went to review their concessions in the rain forest and found hundreds of local people already panning for gold without concessions (Berlau 2003). De Soto had discovered the problem of informal property claims. His contacts in the European and North American neoliberal movement offered an answer to the problem.

De Soto's European background was seldom mentioned by his neoliberal supporters. His credibility and growing authority as a popular development economist came to depend on his identity as a neoliberal from the third world, willing to describe the poverty of the global south as a self-inflicted injury unconnected to its relationship to the north (6). "Instead of seeing the developing world as victims of capitalism, Hernando argues, 'We're inflicting our own wounds'", reported Andrew Natsios, the Administrator of the U.S. Agency for International Development. "Since he is Peruvian, he can make this argument credibly" (quoted in Kleiner 2004). The credibility transformed de Soto into a very useful asset for the neoliberal movement: "During the years I spent with Antony [Fisher] at Atlas", wrote Alex Chaufen (2004), who succeeded Fisher as the organization's president, "I couldn't recall any conversation, any speech about think tanks, or any fundraising letter where he did *not* mention Hernando".

Atlas schooled de Soto in the advocacy and research tactics of the think tank. Further support and training came from related official sources in Washington. In 1983 neoliberals in the Reagan administration set up the Center for International Private Enterprise, housed within the new National Endowment for Democracy, to support organizations in the developing world advocating neoliberal political programs. CIPE developed a "toolkit" that spelled out the tactics to be

(5) Schmidheiny later funded the publication of a German translation of *The Other Path* (de Soto 1992) through the FUNDES Foundation, of which he was president.

(6) The point here is not that de Soto's cosmopolitan background disqualifies

his views. It is that his return to Lima and presentation as a third worlder gave his opinions a credibility and a usefulness to the neoliberal movement that they could not have had coming from Geneva.

used: create an advocacy team, identify key issues relevant to the target audience, research the issues, establish a goal, create a message and an advertising campaign, form grassroots advocates, work with the media, and become part of the governmental process (Center for International Private Enterprise, 2003). The following year CIPE gave its first grant – to support de Soto’s Institute for Liberty and Democracy. To build popular support for neoliberalism the ILD identified its political issue not as property rights in general, nor as the property rights of mining companies or other corporations, but as the problem of informal housing. It began studying informal communities in Lima and contracted with the Lima municipal government to run a scheme to register informal housing. This was the start of the twenty-year program that culminated in the \$66 million program financed by the World Bank. In 2003, reviewing two decades of efforts to support neoliberal organizations in developing countries, CIPE in Washington described this first project in Peru as still being its most successful initiative (Center for International Private Enterprise, 2003).

Supported from abroad, de Soto’s institute grew in size, developed its advocacy campaign, and inserted itself into the processes of government. During the administration of Alan Garcia, in the second half of the 1980s, it became directly involved in policy making. ILD lawyers drew up proposals for property-rights legislation and administrative reforms. To promote the legislation, the ILD produced television commercials that, borrowing from American state lottery commercials, invited people to dream: “What would you do if you had capital?” By 1991, the institute had a staff of one hundred. Victor Endo, an ILD lawyer who later worked at the World Bank, claimed that the think tank became “a kind of school for the country. Most of the important ministers, lawyers, journalists, and economists in Peru are ILD alumni” (Kleiner 2004).

In 1987 the ILD published a book based on its research and reform programs, under the title *El Otro Sendero* (“The Other Path”), subtitled “The Economic Answer to Terrorism”. Its authors were de Soto and two of his collaborators, Enrique Ghersi Silva, a lawyer-economist influenced by the Chicago law and economics movement and subsequently a member of the Mont Pelèrin Society, and Mario Ghibellini, a writer. In 1989 the book was published in English in the United States, with a new subtitle, “The Invisible Revolution in the Third World” (7).

(7) De Soto alone was listed as the author of the U.S. edition. “My contribution was that of the businessman”, he explains in the preface, where he acknowledged the contributions of his co-authors. “I set my goals, identified

It received a foreword from the Peruvian novelist Mario Vargas Llosa, an ex-leftist converted to neoliberalism by de Soto, it is said, and about to become the U.S.-backed candidate in the 1990 Peruvian presidential election (Rothbard 1995, pp. 323-333). The book carried endorsements from President George H.W. Bush, Richard Nixon, and several others, and received the Atlas Foundation's first Sir Antony Fisher Award, a prize named after de Soto's recently deceased patron. Promoted with prizes, reviews, and endorsements from the network of European and American neoliberal think tanks and foundations, it quickly became a bestseller.

In 1990 Alberto Fujimori was elected president of Peru. De Soto, who had abandoned Vargas Llosa's candidacy in favor of the populist rival, became his principal political advisor. The new government instituted one of the most drastic neoliberal financial stabilization plans yet seen, and the country fell into recession (8). In 1992 de Soto resigned from the government, after a dispute over Fujimori's refusal to challenge the armed forces. De Soto pursued his pilot titling program in Lima, with Japanese funds; but by 1994 the breakdown of the relationship between the government and the ILD stalled the project. He looked abroad and embarked on work advocating programs to end world poverty through property titling in Egypt and several other countries (Mitchell 2004). He used this work as the material for his second book, *The Mystery of Capital* (De Soto 2000). With endorsements from Margaret Thatcher, Milton Friedman, and other prominent neoliberals and prizes from neoliberal organizations, the book became another worldwide best seller.

In March 1996 the Peruvian government passed a law on property formalization and established an agency, COFOPRI (Comisión de Formalización de la Propiedad Informal), to take over the ILD program and turn it into a national scheme, recruiting members of the ILD team. In 1998 the World Bank stepped in with a loan for the completion of the program. Research funded by the bank showed that the program had failed to achieve its goal: property titling had produced no increase in credit to the poor. Concerned by the failure, in 2000 the World Bank

my limitations, and obtained the resources to achieve the first and offset the second" (De Soto 1989, p. xxix). A new U.S. edition, published in 2002 in the aftermath of the terrorist attacks of September 11, 2001, reverted to the original subtitle.

(8) Following the 1990 "Fujishock",

the proportion of Peruvians living in poverty increased to 54 percent; the percentage of the workforce underemployed or unemployed rose from 81.4 in 1990 to 87.3 in 1993; and real wages fell by 40 percent between 1990 and 1992 (Roberts 1996, p. 97).

carried out a survey of informal neighborhoods. The survey's primary purpose was to encourage commercial banks to lend money to the neighborhoods, by providing them with data that would reduce the cost of assessing the creditworthiness of low-income households. It was this survey that became the basis for the "natural experiment" whose extraordinary results attracted such attention.

This outline of the history of neoliberal experiments in Peru indicates the extensive work involved in reorganizing the country in ways that made the subsequent research experiment possible. Contacts were made, advocacy training was organized, funding was arranged, field work was undertaken, goals were established, political alliances were formed, elections were won, technologies were put in place to survey properties and record their ownership, and questionnaires were distributed and returned. All this experimentation and programming belongs to the work of economics. It organizes the world in ways that provided economists with the opportunity to produce its facts.

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We can now return to the natural experiment and consider an alternative interpretation of its results, one more closely related to the implementation of economic experiments whose wider history I have just outlined. This alternative account will follow the work of economics, examining the processes that make some facts possible and not others.

There are a number of reasons for questioning the reliability of the experiment's findings. First, no plausible evidence is offered to support the author's intuition that households without a formal ownership document have to keep people at home to defend the property from being seized by others, or that gaining this document suddenly removes the alleged need for self-defense. The intuition is backed only by an anecdote from a World Bank report and the writings of Hernando de Soto. Evidence available in the same World Bank documents suggests a contrary view: Peru's informal urban communities are described as having very strong collective organizations and a great variety of neighborhood mutual-help arrangements. Typically a squatter neighborhood was formed by a single village, whose members would plan their relocation collectively in advance, allocate each family a building plot, and reproduce the communal associations of the village in the new location. None of this indicates a situation in which people feel so threatened they must stay home to guard their individual properties.

(The World Bank also reports that titling programs tend to weaken these neighborhood associations.) Evidence from other studies suggests that the security of informal households depends on a wide range of factors and is not necessarily dependent on possession of formal title (Gilbert 2002).

What makes the intuition plausible is that it resonates with the work of neo-institutionalist economists like Douglas North and neoliberal theorists of development like Peter Bauer. It assumes that a world without formal property rights is anarchic, and that once the proper rules are in place a natural spirit of self-interested endeavor will be set free. It derives its plausibility more from the reader's familiarity with certain texts in economics than from any knowledge of informal communities.

Second, even if it were the case that giving people a title document frees them from the need to defend their houses and enables them to go elsewhere to work, there must be some source of all the new jobs. Yet the paper offers no explanation of the source of the demand for the dramatic increase in employment and no aggregate data to suggest it occurred. It would be difficult to find such data, as the 17 to 40 percent increase in hours worked outside the home was alleged to take place during the second half of the 1990s, a period of sharp economic decline (9).

Third, the paper's argument depends on the assumption that the informal neighborhoods of different Peruvian cities are similar to one another and that the sequence in which the titling program entered different cities and neighborhoods was random. The staggered implementation that made a natural experiment possible must be unrelated to any local differences that might influence the extent to which people in different neighborhoods work outside the home. The paper claims to resolve the possibility of non-random city timing by including city-level fixed effects in the regression estimates. However, more than half the survey neighborhoods already reached by the titling program were located in one city, Lima. Different neighborhoods of the capital were reached by the program at different times. If there were significant reasons for introducing the program in some neighborhoods of Lima before others, and for later extending it to certain neighborhoods of certain provincial cities before others, and significant differences among these neighborhoods, this might offer a more reasonable explanation for the outcome of the experiment. Simply allowing for city-level fixed

(9) Peru's per capita gross domestic product actually decreased in 1998 and 1999, by 2.2% and 0.8% (United Nations Economic Commission for Latin America and the Caribbean 2001, p. 69, table 55).

effects would not be able to capture the possible interaction among this range of differences.

The experiment was unable to test whether differences among neighborhoods were affecting the rate of employment outside the home. The author claims such differences can be ignored, on the grounds that eight district-level poverty indicators (rates of chronic malnutrition, illiteracy, fraction of school-aged children not in school, residential crowding, adequacy of roofing, and the proportion of the population without access to water, sewerage, and electricity) were similar for program and non-program neighborhoods (Field 2003, p. 16 and table 1). The author also claims that detailed information on the sequencing of the program in Lima supports this interpretation (Field 2003, p. 53, figure 1).

There are two problems with these claims. First, indirect indicators of poverty levels, such as residential crowding or access to electricity, may be unable to capture major differences between different kinds of neighborhoods with different patterns of employment. I illustrate below significant differences in the case of one city that played an important role in the survey results. Second, the detailed evidence on the sequencing of the program shows the opposite of what is claimed. There was nothing random about the order in which the political experiment was carried out.

Information in the paper itself shows that the first wave of titling (1992-1995) occurred only in the center of Lima (where squatters would be more established and employment outside the home more accessible), while most of the later titling occurred in outlying districts. The first wave also focused on the wealthiest informal neighborhoods – seventeen out of nineteen program sites were in districts of poverty level four, the level of least poverty, and the other two in poverty level three (Field 2003, p. 53, figure 1) (10). The World Bank also says that the order was not random, but was based on “ease of entry” to the neighborhood. The bank’s Peruvian program office reported that the order depended on “geographical situation, feasibility to become regularized, dwellers’ requests, existing legal and technical documents, and linkages with other institutions involved in the existing obstacles” (Field 2003, p. 16, note 31, citing Yi Yang 1999). The paper places this information in a footnote.

This evidence suggests a number of alternative explanations for the fact that households in neighborhoods titled early worked more hours, and were more likely to be employed outside the home, than those that

(10) The paper wrongly states that the first wave “covers districts spanning poverty levels 2-4” (none are shown in level two districts) (Field 2003, p. 17).

the titling program had not yet reached. The first wave of titling took place in the center of the country's largest city, and in its least impoverished informal district. The location of the district and the relative lack of impoverishment provide several possible reasons why its inhabitants would find more opportunities for work, especially for work outside the home. The fact that the accessibility of neighborhoods and other aspects of feasibility of titling influenced the choice of subsequent areas to be titled offers a further reason for the employment pattern.

It is also significant that the first wave was a pilot project, run by de Soto's Institute for Liberty and Democracy rather than the government. It was intended to demonstrate the feasibility of a rapid formalization program, the centerpiece of the neoliberal reforms adopted by the new government of Alberto Fujimori, whom de Soto initially served as a principal advisor. Anxious to raise both domestic political support and international development funds for the program, there would have been clear incentives to choose the right kinds of neighborhoods for the demonstration. (De Soto's resignation from his position in the Fujimori government, in protest at the president's acquiescence in the alleged involvement of the Peruvian armed forces in the narcotics trade, occurred as the program began. So the pilot titling project had to push forward de Soto's political agenda against a particularly strong current.) As we will see, this was only one possible way in which the project's need to demonstrate the truth of neoliberal economic theory entered into the kinds of economic knowledge it later helped produce.

There is a further way in which the political implementation of the titling program affected the sequence in which cities and neighborhoods entered into it. The regularization of property rights was described by de Soto as *El otro sendero*, "The Other Path", or as his book's subtitle explained, "the economic answer to terrorism". The reference was to the Sendero Luminoso, the Shining Path, the Maoist revolutionary movement that in the 1980s controlled large areas of the central Andean highlands of Peru. The populism of de Soto's neoliberal program, emphasizing the virtues of property rights for the poor, was intended as an answer to the more radical property redistribution programs of the revolutionaries – as well as to the problems of large-scale urban migration caused by years of warfare in the countryside between the rebels and the Peruvian armed forces (11). The war against the Sendero Luminoso and its effect on one particular city shaped both the

(11) After the Peruvian government began to adopt de Soto's plans, a series of attacks carried out against the ILD were attributed to Sendero Luminoso, including a car bombing of its offices on July 20, 1992 (de Soto 2002, p. xi).

property rights experiment and the research experiment to which it gave rise.

The table below lists the cities in the order in which they entered into the program, and indicates for each city the number of survey households located in neighborhoods that the program had reached (“program”) and the number in districts not yet reached (“no program”).

Distribution of Households in Survey Sample

City	<i>No program</i>	<i>Program</i>	<i>Total</i>
Lima	209	501	710
Arequipa	11	150	160
Trujillo	108	52	160
Chiclayo	131	49	180
Piura	149	51	200
Chimbote	480	120	600
Huancayo	600	0	600
Iquitos	120	20	140
<i>Total</i>	1808	942	2750

Note: Cities listed in order of timing of program entry
Source: Field 2003, Appendix C

The table shows that, after starting as a pilot project in Lima (in 1992-1994), and continuing as a full-scale program initially in Lima and Arequipa (1995-1996 and 1996-1997), the program spread first to the other coastal cities (Trujillo, Chiclayo, Piura, and Chimbote). Only towards the end of the project was it extended to two locations in the interior of the country, Huancayo in the central mountains and Iquitos in the tropical lowlands of the Amazon. As a result, two-thirds of the households not yet reached by the program when the survey was carried out (1200 out of 1808) were located in Chimbote and the two inland towns, and half of these (600) in just one place, Huancayo (12).

Huancayo is a city with a different recent history from the other cities of Peru. Located in the central highlands, it is the regional capital of an

(12) When the program ended in 2004, Huancayo accounted for only two percent of the property titles it had awarded; Lima and Arequipa accounted for 67 percent (World Bank 2004, p. 5, Map 1).

area of rich farmland and impoverished, mostly Quechua-speaking farmers, which in the 1960s gave birth to both the Sendero Luminoso and Túpac Amaru revolutionary movements. By the 1980s the region had become a continuous battle zone in the war between government forces and the rebels. Tens of thousands were killed or disappeared and hundreds of thousands fled the countryside and settled in new informal neighborhoods in Huancayo and other towns (13).

Lima and the other coastal cities, traditionally centers of the country's creole elite, had attracted rural migrants over a longer period, since the 1940s and especially the late 1960s. In many cases the migrants were drawn by opportunities for employment offered by industrialization and the service economy. Huancayo had previously enjoyed a somewhat mobile population dependent on seasonal agricultural labor, but by the 1990s was flooded with impoverished refugees, cut off from the countryside, living in neighborhoods subject to frequent military raids but beyond the day-to-day control of government forces (Stepputat and Sørensen 2001). While refugees also fled to outlying neighborhoods of Lima and other coastal cities, in the informal neighborhoods of Huancayo they constituted a large majority of the population.

After the war ended in 1992, two kinds of projects were launched to address the problems in Huancayo (14). First, international humanitarian organizations set up well-funded aid programs in the city, offering neighborhood soup kitchens, medical services, and other basic relief, and then job-creation schemes based on street-vending, artisanal labor, and other household-based income generation. Second, the government, anxious to draw the refugees back into the countryside, offered an alternative assistance program to support the regeneration of agriculture. The refugees took advantage of these rural incentives, but typically without moving back to the countryside. As the economic shock caused by Fujimoro's neoliberal reforms made waged employment in the city increasingly difficult to find, a majority of migrants began looking to

(13) Peru's Truth and Reconciliation Commission, which published its final report in 2003, estimated that in the fighting from 1980 to 2000 between 600,000 and one million people were displaced and more than 69,000 killed or disappeared. The Fujimori government was accused of using death squads and of other crimes against humanity. The Sendero Luminosa, which originally struggled for land reform and other social rights, became increasingly totali-

tarian, driving populations from their villages and creating prison camps that used forced labor (Norwegian Refugee Council 2004).

(14) The U.S. Agency for International Development helped plan and fund both initiatives, as part of a \$58 million program (1995-2002) for "Increased Incomes of the Poor" (United States Agency for International Development 1999).

the countryside as a source of urban incomes. Households developed distinctive “mobile livelihoods”, traveling to the villages to sow and harvest and for other occasional tasks, sometimes leaving behind one or two members of the household to mind the fields and animals, but the rest returning to the city (Stepputat and Sørensen 2001, pp. 783-786).

The informal urban neighborhoods of Peru are not, it turns out, similar to one another. The migrant communities of Huancayo, the city that provided one-third of the survey sample of households in neighborhoods waiting to be titled (and zero percent of those already reached by the titling program), had a quite distinctive political economy. Impoverished by war and isolation, they had relatively few opportunities for daily employment outside the household. But in the 1990s a plethora of international NGOs supplied food rations and healthcare along with opportunities for home-based income generation, while farming provided urban households with an occasional but significant income. These arrangements suggest a more plausible explanation for how households of similar basic levels of nutrition, literacy, access to municipal services and other indicators of relative wellbeing might have very different levels of regular employment outside the home. Taken together with the evidence regarding Lima – that the choice of neighborhoods and the sequence in which the program reached them was not random – and similar evidence for other neighborhoods in other cities, this evidence indicates the variety of explanations that arise from following carefully the implementation of the larger experiment. They are explanations that have nothing to do with the impact of formal ownership on an imagined need to stay home and defend one’s property.

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The Peruvian urban property titling program indicates some of the difficulties in constructing natural experiments. I have explored these difficulties in detail, not to fault a particular piece of research but because there is more we can learn from them.

First, the possibility of the natural experiment depended on a prior and larger economic experiment. The attempt to test the impact of property ownership on the propensity to work was possible because Peru had become the site of a large-scale experiment in the formalization of property rights and the formation of entrepreneurial subjects. Millions of citizens and hundreds of thousands of households had been

drawn into an experiment designed to demonstrate that a simple procedure for acquiring property rights would lead to a transformation in economic action and a dramatic improvement in wellbeing.

The idea of a “natural” experiment is misleading (15). The so-called natural experiment typically depends upon some prior political intervention, in other words a project or experiment of some sort, which arranges the socio-technical world in a way that offers further opportunities for experimentation. This intervention must be beyond the direct control of the investigator. But that does not insulate the second experiment from the effects of the first.

Second, there is seldom only one big experiment going on. The details of the Peruvian case suggest that problems may have arisen from the intersection of a number of related experiments. On the one hand there was the difference between de Soto’s original pilot project, intended to achieve certain local and international effects by demonstrating not so much the long-term benefits of property rights as the immediate viability of a high-speed, low-cost, titling program. Such concerns may have shaped the selection of neighborhoods for the pilot program, in ways that affected the later study. On the other hand, there was the intersection of different government and NGO programs to deal with the threat and after effects of a revolutionary attempt to introduce a very different kind of property experiment. The government and the World Bank justified the titling program in part because the regulation of informal housing offered the state a way to assert its political authority over neighborhoods that had often been beyond its control during the years of attempted revolution. But in Huancayo, the city at the center of the region of insurrection, this project intersected in unpredictable ways with other more urgent interventions. The research experiment, in ways I have indicated, was unable to keep these intersecting experiments from shaping its results.

The property titling program in Peru, moreover, was not just a local experiment in neoliberalism. It was the outcome of a much longer project for the expansion of neoliberal economic arrangements, a project in which Peru and Hernando de Soto, as we have seen, became important relay points.

The outcome of the academic experiment, moreover, does not end with the publication and circulation of its findings. These were now

(15) Rosenzweig and Wolpin (2000) supposedly more natural arrangements, acknowledge the problem with the label such as the differences among twins by introducing the phrase “natural separated at birth – never merely a ‘natural experiments’” to distinguish a natural event.

available to be folded back into further projects and experiments of neoliberalism, helping to secure the facts of economics.

The Foundation for Teaching Economics is an organization offering summer courses and other programs to promote the teaching of neoliberal versions of economics in colleges and high schools. It belongs to the same network of political organizations as the groups that first funded and helped to organize de Soto and the ILD. Its chairman, William Hume, is a member of the Heritage Foundation and it is funded by groups such as the John Templeton Foundation and the Scaife Foundation, which have close ties to Heritage, the Mont Pelerin Society, and many other organizations within the neoliberal movement.

In 2004 the foundation published on its website a complete teaching unit with ready-made lectures for use in high school classrooms, entitled “Is Capitalism Good for the Poor?” (Foundation for Teaching Economics 2004). The lectures were written by academic economists and reviewed for publication by two of the foundation’s advisors, Douglas North and Milton Friedman. After an introductory lecture on concepts and terms, the first substantive lecture is entitled “Property Rights and the Rule of Law”. The lecture begins by proposing that in developing countries the most significant obstacle to improving the lives of the poor is the absence of clear property rights. The rest of the lecture supports this claim by making three arguments: that property rights create incentives to invest, that they create the means of investing by providing collateral for loans, and that they further promote development by freeing people from protective activities so that they can engage in productive activities. As evidence for the first two points it cites the work of Hernando de Soto, and for the third point the paper on urban property titling in Peru by Field.

The results of the natural experiment made possible by the programs of neoliberalism were written into further neoliberal projects. The organization of experiments, both caged and in the wild, would continue.

Michel Callon (1998) suggests that economics should be approached not as a form of knowledge that pictures the world but as a performative activity. Economics participates in the per-formation of the worlds to which it belongs, by helping to set up socio-technical agencies/arrangements (*agencements*). These agents and arrangements can be thought of as instances of a wider process of experimentation (Muniesa and Callon 2004). The socio-technical worlds we inhabit are shaped by a continuous series of experiments. The experiments sometimes bring together the caged economics of the academy and the broader projects

of economics in the wild – the economics of think tanks, foundations, corporations, development programs, government agencies, NGOs, and others outside the confines of academic economics. The economy itself, I have argued (Mitchell 2005), came into being in the mid-twentieth century as the outcome of such projects of experimentation and calculation.

What happens when caged economics meets economics in the wild? One discovers that the world outside is not really a wilderness. It is more like a reservation. This should not be surprising. A “natural experiment” in economics is not an experiment that takes place in nature. It is an experiment that typically takes advantage of certain programs, policies, or political-economic processes that have arranged the socio-technical world in a way that makes experimentation possible. The investigator does not control these wider experiments, but she relies upon them. While the forms of this reliance will be different in different cases, the possibility of economic experimentation depends upon the larger programs, which constitute what we call the economy. The experiment works upon prior experiments.

This dependence has important consequences. The outcome of the experiment will be shaped by the earlier experiments that made it possible. Not every research project will produce facts as improbable as those examined here. But the prior experiments will make some kinds of data available and not others; will provoke certain intuitions that appear to make sense of them and not others; will suggest one set of arguments derived from these intuitions and not others; will give them the plausibility they need to circulate when other arguments would fail to impress; will provide academic economics with material to promote a more empirical approach to the discipline; and will offer routes to feed the conclusions back into further political projects and programs.

Academic economics often appears extraordinarily abstract and almost indifferent to the practical world of everyday economic calculation. My argument that the work of economics contributes to the making of the economy might appear to attribute excessive influence to such a discipline. The question of what economics does, however, can only be addressed by following it at work. Taking a particular experiment and tracing the narrow but well signposted paths that connect it to other projects offers the way to a more expansive understanding of the work of economics.

THE WORK OF ECONOMICS

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