

Proceedings of the 2008 Land Policy Conference

PROPERTY RIGHTS
AND LAND POLICIES

Edited by Gregory K. Ingram and Yu-Hung Hong

Property Rights and Land Policies

Edited by

Gregory K. Ingram and Yu-Hung Hong

 LINCOLN INSTITUTE
OF LAND POLICY
CAMBRIDGE, MASSACHUSETTS

© 2009 by the Lincoln Institute of Land Policy

All rights reserved.

Library of Congress Cataloging-in-Publication Data

Property rights and land policies /
edited by Gregory K. Ingram and Yu-Hung Hong.
p. cm.

Includes index.

ISBN 978-1-55844-188-0

1. Land tenure. 2. Land use. 3. Real property. 4. Eminent domain.

I. Ingram, Gregory K. II. Hong, Yu-Hung. III. Lincoln Institute of Land Policy.

HD1251.P77 2008


333.3—dc22

2009002563

Designed by Vern Associates

Composed in Sabon by Achorn International in Bolton, Massachusetts.

Printed and bound by Puritan Press Inc., in Hollis, New Hampshire.

 The paper is Rolland Enviro100, an acid-free, 100 percent PCW recycled sheet.

MANUFACTURED IN THE UNITED STATES OF AMERICA

CONTENTS

<i>List of Illustrations</i>	<i>ix</i>
<i>Preface</i>	<i>xi</i>
Introduction	1
1. <i>Examining Land Policies from a Property Rights Perspective</i> Gregory K. Ingram and Yu-Hung Hong	3
The Design and Evolution of Property Rights Institutions	23
2. <i>Design Principles of Robust Property Rights Institutions: What Have We Learned?</i> Elinor Ostrom	25
3. <i>U.S. Private Property Rights in International Perspective</i> Harvey M. Jacobs	52
4. <i>China's Land System: Past, Present, and Future</i> Dwight H. Perkins	70
COMMENTARY Scott Rozelle	93
5. <i>Property Rights and Real Estate Privatization in Russia: A Work in Progress</i> Bertrand Renaud, Joseph K. Eckert, and R. Jerome Anderson	96
COMMENTARY Robert M. Buckley	134
6. <i>Developing Land Markets Within the Constraint of State Ownership in Vietnam</i> Stephen B. Butler	137
COMMENTARY Annette M. Kim	175

Public Compensations for Takings	179
7. <i>The Use of Eminent Domain in São Paulo, Bogotá, and Mexico City</i>	181
Antonio Azuela	
COMMENTARY	200
Vicki Been	
8. <i>The Myth and Reality of Eminent Domain for Economic Development</i>	206
Jerold S. Kayden	
COMMENTARY	214
John D. Echeverria	
9. <i>Property Rights Protection and Spatial Planning in European Countries</i>	216
Vincent Renard	
COMMENTARY	230
Barrie Needham	
10. <i>Should Decreases in Property Value Caused by Regulations Be Compensated?</i>	232
Abraham Bell	
COMMENTARY	251
Perry Shapiro	
Property Rights Approaches to Achieving Land Policy Goals	255
11. <i>Land Registration, Economic Development, and Poverty Reduction</i>	257
Klaus Deininger and Gershon Feder	
COMMENTARY	292
Alain Durand-Lasserre	

12. <i>Looking Beyond Land Titling and Credit Accessibility for the Urban Poor</i>	296
Edésio Fernandes	
COMMENTARY	314
Ernesto Schargrodsky	
13. <i>Property Rights Created Under a Federalist Approach to Tradable Emissions Policy</i>	317
Dallas Burtraw and Richard Sweeney	
COMMENTARY	355
Wallace E. Oates	
14. <i>Private Conservation Easements: Balancing Private Initiative and the Public Interest</i>	358
Gerald Korngold	
COMMENTARY	378
Nancy A. McLaughlin	
15. <i>The Role of Private-Sector Developers in Challenges to Local Land Use Regulations</i>	384
Keri-Nicole Dillman and Lynn M. Fisher	
COMMENTARY	413
Alexander von Hoffman	
16. <i>The Mediocrity of Government Subsidies to Mixed-Income Housing Projects</i>	418
Robert C. Ellickson	
COMMENTARY	449
Ingrid Gould Ellen	
 <i>Contributors</i>	 453
<i>Index</i>	457
<i>About the Lincoln Institute of Land Policy</i>	485

11

Land Registration, Economic Development, and Poverty Reduction

Klaus Deininger and Gershon Feder

While early theories of development focused on accumulation of capital, macroeconomic policies, and natural endowments as key determinants of performance in terms of growth and poverty reduction, an influential strand of literature has postulated a central role of institutions as a precondition of economic growth. A growing body of evidence based on cross-country data (Acemoglu and Johnson 2005; Acemoglu, Johnson, and Robinson 2001), country-level studies (Acemoglu, Johnson, and Robinson 2004; Banerjee and Iyer 2004; Nugent and Robinson 2002), and firm-level analysis (Johnson, McMillan, and Woodruff 2002) emphasized the overarching importance of good institutions for economic development.¹ Specifically, institutions guaranteeing property rights were found to be far more important for growth than were contracting institutions (Acemoglu and Johnson 2005).

In developing as well as developed economies, land and real estate are a key part of households' wealth. The extent to which such assets are used to leverage credit that can be used for investment and other economic pursuits varies widely. For example, in 2002 the ratio of mortgage debt to GDP in the United States was 58 percent as compared to at most 14 percent in any Latin American country, 11 percent in any Middle Eastern country (with the exception of Israel),

1. An influential paper defines good institutions as follows: "There must be enforcement of property rights for a broad cross-section of society so that all individuals have an incentive to invest. There must also be some degree of equality of opportunity in society, including such things as equality before the law, so that those with good investment opportunities can take advantage of them" (Acemoglu, Johnson, and Robinson 2004, 12).

and 22 percent in any South or East Asian country except Japan, Taiwan, Singapore, and Hong Kong (Besley and Ghatak 2008). This striking difference has led influential thinkers to suggest that a main reason for low growth in developing countries is their relatively undeveloped system of property rights and, in particular, the extent to which land and real estate are registered, restricting the ability to transform “dead assets” into “live capital” (de Soto 2000).

Attention to property rights institutions is hardly a recent phenomenon. Throughout history the social and economic benefits from secure and well-defined land rights and from public recording and notice of transactions have led many societies to develop customs and pass laws to define the nature of such rights; to establish public institutions, such as courts and police, to enforce the laws; and to establish registries to record land rights or transactions, often with the goal of obtaining tax revenue. A key element in the enforcement of land rights that evolved over history is a system of land records that provides evidence of individuals’ or groups’ property rights. As early as 2350 B.C. evidence from Egypt indicates that “ownership of land would be transferred by a ‘house document’ drawn up on papyrus by sellers, signed by three witnesses, and stamped by an official seal which indicated the end of the document so that nothing could be added. . . . All lands were accounted for centrally, being registered in the office of the visier, the Pharaoh’s prime minister. Wills were recorded, and new titles issued there” (Powelson 1988, 17). Similar systems are reported for the Assyrian Empire centered in Mesopotamia (c. 1200–750 B.C.) and its successor Babylonian and Sassanian empires (500 B.C.–A.D. 651) (Powelson 1988).

In modern times demarcation and survey of land boundaries, registration and record keeping, adjudication of rights, resolution of conflicts, and land management are normally referred to as “land administration” (UNECE 1996). In many developing countries the absence of such institutions and the supporting legal framework have prompted bilateral and multilateral institutions to support interventions to establish them or improve their functioning, with the expectation that they will enhance the security of property rights. Such programs, often referred to as land titling projects, normally include elements of legal and institutional reform, upgrading of land registries, and large-scale adjudication of individual land rights together with publicity campaigns and mechanisms (such as mobile tribunals) to resolve disputes quickly and at low cost. This is normally followed by issuance and registration of individual and in some cases group rights to land (not always in the form of titles).

The objective of this piece is to review existing evidence on the effectiveness of arrangements for land administration and related interventions in improving economic outcomes. In cases where evidence is weak or controversial, we sketch ways in which research to evaluate the impact of ongoing programs, possibly with minor additions or changes in their design, could help to provide insights to guide policy. To set the stage, the following section reviews the justification for public involvement in adjudication of property rights and the main possible channels through which well-defined property rights will affect economic and

social outcomes under ideal conditions. This is followed by a discussion of obstacles that may undermine the effectiveness or sustainability of such interventions or may even result in undesirable outcomes: specifically, highly unequal preexisting power relationships and poor governance, imperfections in markets for credit and insurance, high transaction costs, and low land values due to relative land abundance. The next section presents available evidence on the impact of land policy interventions in terms of improving administrative efficiency, reducing the need for households to engage in costly property rights protection, fostering land-related investment, increasing land values and land market participation, and improving credit access. The chapter concludes by highlighting implications for development practitioners as well as researchers.

Conceptual Framework

JUSTIFICATION FOR GOVERNMENT INTERVENTION TO IMPROVE TENURE SECURITY

Property rights are social conventions backed by the enforcement power of the state (at various levels) or the community that allow individuals or groups to lay “a claim to a benefit or income stream that the state will agree to protect through the assignment of duty to others who may covet, or somehow interfere with, the benefit stream” (Sjaastad and Bromley 2000). By defining who is entitled to reap the benefit streams that flow from a resource, the way in which land rights are distributed is a key element of the power structure and social fabric of society. Moreover, by establishing a correspondence between the effort expended in increasing resource values and the rewards from such activity, land rights are also a key determinant of investment, the scope for efficiency-enhancing land transfers, and economic growth. In this section we first discuss the reasons underlying public provision and enforcement of property rights to land, the ways in which this is normally accomplished, and the economic implications expected to arise from doing so in an ideal setting. Real-world circumstances differ, of course, from the ideal world assumed in the conceptual discussion, an issue that is taken up in subsequent sections.

The justification for public interventions to secure property rights is three-fold: (1) the public good nature of property rights enforcement; (2) the cost savings from having reliable information on land ownership available publicly; and (3) the scope for providing other public goods and infrastructure at least cost. The broad distribution of the benefits associated with providing information about the assignment of property rights to land and the enforcement of such rights provide a strong rationale for government involvement. Well-defined property rights reduce the need to expend economically valuable resources in defending claims and allow the resources to be used for productive investment instead (Grossman and Mendoza 2001). If property rights are incomplete or ill-defined, the entrepreneurs and households who hold property rights to land will need to spend resources to maintain their rights. Investments such as guards and fences

to defend rights against possible intruders and challengers often have little direct social or productive value, lead to dissipation of rents, and divert resources from more productive uses (Allen and Lueck 1992). The privately optimal amount of spending on protection will often be excessive from a social point of view (De Meza and Gould 1992; Feder and Feeny 1991; Malik and Schwab 1991), while economies of scale in protection add another argument for public sector involvement. The poor may not be able to afford the associated costs at all and, without the ability to enlist the power of the state to protect their property rights, may end up in otherwise avoidable poverty traps. Public enforcement of property rights to land clearly has benefits that extend beyond individual landowners and that are to a large extent nonrival, that is, one person's enjoyment will not reduce others' ability to benefit from them, although some of them allow exclusion of others, characteristics generally associated with a club good, arguing for public provision (Lueck and Miceli 2006; Shavell 2003).

Having reliable information on land rights available publicly, such as in a deeds registry or a title registration system, will also reduce the need for individual agents to conduct costly searches to verify the true owner of a tract of land and at the same time reduce the risk of illegitimate challenges to an owner's right. This can encourage temporary land transfers to more efficient producers through land rental arrangements and reduce inefficiencies from the presence of asymmetric information. Such informational asymmetries are less of an issue as long as potential transactions are limited to members of the same community who have good and symmetric information on the identity of the possessors of rights and the legitimacy of their claims, even if no formal titles or officially sanctioned deeds exist. In such cases public conduct of land transactions in front of witnesses is often sufficient to prevent fraudulent outcomes.² In more complex settings where greater mobility of agents implies opportunities for land transactions among individuals and groups beyond the community, the scope for asymmetric information is much higher; the would-be buyer cannot be certain that the seller is indeed the legitimate possessor of the rights and is entitled to convey them further.

Finally, availability of land information also provides an opportunity to effectively reduce externalities and supply public goods, in particular infrastructure, in a cost-effective way. Even in the most individualistic system, the rights enjoyed by individuals are never unrestricted, but are instead limited by the need to have rights holders contribute to broader public goods. Individuals can come together in user groups and other formal or informal associations to establish voluntarily norms and restrictions on owners' ability to exercise their rights. Such rules can set limits on externalities and provide public goods such as en-

2. An early example of such a practice is reported in Genesis, where a land purchase by Abraham took place in public in front of notables and elders who served as witnesses.

vironmental amenities and green spaces. Authorities can also use land information to restrict land use decisions by individuals to avoid socially and environmentally harmful outcomes and internalize externalities, such as by using zoning regulations to prevent undesirable externalities or by passing planning laws to ensure minimum standards based on consensus reflecting their social value (Ellickson 1993).

CHANNELS FOR IMPACTS

If property rights are secure and well-defined and public institutions can be relied upon for enforcement, the risk of expropriation is low (Clark 2003). There will be less need for individuals to exert effort—for example, by spending time or resources to physically guard land or to secure or clarify land rights, often in the context of conflicts. To the extent that the time freed up this way can be used more productively, land registration programs provide net social gains. The magnitude of these gains depends on the extent to which the land registration system induces higher levels of tenure security and the nature, magnitude, and opportunity cost of the resources thus freed up as compared to the cost of the land administration apparatus.

The ability to verify boundaries at low cost and the legal measures to remove reasons for conflicts or allow dealing with conflicts in a more expeditious manner can reduce the incidence of conflict. Programs to establish land administration systems often include low-cost means for expedited conflict resolution. These not only reduce the amount of time and resources spent in unproductive activities, but they can also increase peace and social stability and allow land that had been “frozen” due to conflict to be developed and brought to more productive uses. To the extent that land-related conflicts in many developing countries clog up the courts and reduce the effectiveness of the judicial system, avoiding such conflicts can also enhance the overall effectiveness of the judicial system.

While most of the literature implicitly relies on a unitary household model, women’s ability to own land is often severely constrained. Even in countries where the constitution outlaws gender discrimination, females can often access land only through male relatives, and their ability to inherit land or hold on to it in case of divorce is severely limited.³ This affects their bargaining power within the household, the allocation of household spending among alternative uses, the efficiency with which land is used (Udry 1996), and participation in

3. In many monogamous African countries, land rights at death remain in the husband’s lineage. Even though such arrangements are under pressure to change from a number of directions, including high levels of mortality in the context of HIV/AIDS, they still expose a woman to the risk of losing access to assets, in addition to family labor, in case of the death of her spouse and, in a number of cases, have led to female land being registered in the name of male relatives. Also, in Uganda land conflict has been shown to affect women disproportionately (Deininger and Castagnini 2006).

nonfarm opportunities (Quisumbing and Maluccio 2003). Legal changes as well as interventions to register land can provide a basis for better enforcement of existing provisions in favor of gender equality or enhance women's awareness of their rights and their ability to demand compliance, such as by issuing joint certificates. Land registration that takes into account local realities and enforcement capacity can contribute to women's social and economic empowerment (Joireman 2008).

In addition, programs that increase tenure security or reduce the threat of expropriation, such as titling programs under appropriate circumstances, encourage land-related investment unless such factors as a severely depressed economic environment prevent these impacts from materializing. If institutions to enforce them are effective, secure property rights provide land users with assurance that they will be able to enjoy the fruits of their labor, encouraging them to make long-term investments and manage land sustainably (Besley 1995).

Adding the right to transfer land to others, through either rental or sale, encourages investment by making it easier to liquidate and recoup the full value in case of exogenous shocks (Ayalew, Dercon, and Gautam 2005; Deininger and Jin 2006). Transferability is also necessary to allow land to move toward more efficient users, thereby maximizing allocative efficiency and output. Furthermore, the ability to rent land allows labor to move from agricultural to nonagricultural work in the context of economic development by enabling landowners to participate in the rural nonfarm economy without closing off the possibility of returning to farming, while enabling those remaining in farming to increase their income by cultivating larger areas (Carter and Yao 2002; Deininger 2003; Kung 2002). However, unless land rights are sufficiently secure, landowners may not want to rent land out because the land may be taken away from them (Holden and Yohannes 2002; Yang 1997) or out of fear that renters will claim land ownership and refuse to return the land upon expiry of the contract, possibly leading to large efficiency losses (Benjamin and Brandt 2002). Land registration can do much to remove the perceived risk of land rental transactions by strengthening property rights and providing documentation that will allow enforcement at lower cost. Such a reduction of perceived risk will allow more rental transactions, possibly at lower rental prices. The magnitude and economic impact will depend on the extent to which productivity-enhancing land rentals were inhibited by lack of security without land registration and the size of the productivity differential between the parties involved. In rural settings the latter will be higher in a more-developed nonagricultural economy. For example, land rental in China has been shown to contribute to the diversification of the rural economy (Deininger and Jin 2008b).

Low-cost access to reliable information on land ownership will also reduce the transaction cost of exchanging land in sales markets by eliminating uncertainty as would-be buyers reflect the risk to their future ability to enjoy the benefits from the land by offering lower prices than in situations where no uncertainty exists. The would-be seller, when comparing the proceeds from a sale

transaction to the revenues that can be generated by operating the land, will be less inclined to sell even though there may be no uncertainty about the property rights and no real reason for a lower price for the land. There is thus asymmetry in the information available to the buyer and to the seller. If it is assumed that transactions in a well-functioning economy normally take place when the would-be buyer has a higher stream of benefits from the land than the would-be seller, and is therefore able to offer a price that reflects those higher benefits, it can be intuitively concluded that economic efficiency is lost when some transactions do not take place due to asymmetric information. The possession of land rights documented by a state-sanctioned document can eliminate the asymmetry of information and facilitate more efficiency-enhancing transactions in which land rights are transferred through sale from individuals or groups with lower benefit streams to those who can obtain higher benefits from the same land.

Finally, a formal and low-cost way to unambiguously identify land ownership without physical inspection, inquiry of neighbors, or interaction with an extensive bureaucracy will allow the use of land as collateral, thereby reducing the transaction cost of access to credit. In the absence of other obstacles to the operation of financial markets and the effective exercise of land rights, formalizing land tenure and establishment of registries can encourage development of financial markets and the associated sophisticated financial instruments that draw on the abstract representation of property rights provided by formal titles (de Soto 2000). Even where there is limited activity in land sales markets, the ability to sell land has important implications through the scope of using land as a collateral for credit (Besley and Ghatak 2008). As a large literature discusses, lending entails the provision of resources at present against a promise of repayment with interest in the future. Lenders face risk due to the uncertain nature of the borrower's future ability or willingness to repay. The borrower has better information than the lender about his own prospects of being able to repay, and it is intuitively apparent that this leads to the delivery of a lower volume of credit, in particular since interest cannot be adjusted fully to reflect the risk, necessitating credit rationing (Stiglitz and Weiss 1981). With less credit than in a world with symmetric information, efficiency is lost; at the margin, some investments that would be remunerative even after accounting for the current opportunity costs of loanable funds are not undertaken.

To reduce the presence of asymmetric information, credit markets developed the procedure of collateral, with land as a universally common form of collateral due to its immobility and relative indestructibility (Binswanger and Rosenzweig 1986). The usefulness of land as a collateral depends on the absence of uncertainty and asymmetric information regarding the ability of the borrower who offers the collateral to convey the rights over land to the lender in the case of default on the loan (Feder and Feeny 1991). Thus, in the same way in which titles can facilitate a larger volume of land transactions, they can contribute to a larger volume of credit transactions. This can increase the efficiency of credit markets by facilitating loans whose true risk is less than that perceived by lenders

in the absence of collateral. To the extent that this allows more investments that are worthwhile, there will be an improvement in overall economic efficiency.

The formal work on the impact of risk and uncertainty provides much of the theoretical underpinnings of the discussion on the hypothesized impacts of titling that were outlined rather heuristically above. But some specific formal models address the role of titled land rights (Feder et al. 1988). Within a farming context, the models perceived two types of land—titled and untitled—and three types of credit: institutional short- and long-term credit available only with titled land as a collateral, and short-term informal credit that depends on the value of land regardless of whether it is or is not titled. Owners of untitled land face a risk of loss of land, with a given probability. Maximizing a utility function of terminal wealth (exhibiting risk aversion) by choosing the amount of land and capital to acquire and variable inputs to use in farming provides the characterization of optimal decisions by farmers, while land price determination is driven by a condition that the optimal value of the farmer's utility be equal on titled or untitled land. The model yields results that are compatible with the intuitive propositions suggested. In particular, in equilibrium the price of titled land will be higher than the price of untitled land, and capital as well as output per unit of land will be higher on titled land. Furthermore, the equilibrium price of untitled land is negatively related to the probability of land loss. The policy implication is that, at the margin, moving untitled land to titled status increases investment and output and thus improves social welfare. An important insight from the model is a proof that the difference between the prices of titled and untitled land can provide a measure of the social welfare gains of titling hitherto untitled land, if appropriate adjustments are made for the distorting effects of risk and imperfections in capital markets. A variant of this model demonstrates that individual willingness to pay for titling is higher than the true social benefits of titles (Feder and Feeny 1991).

Realities That Can Prevent Beneficial Effects from Materializing —

The above discussion suggests that the magnitude of the impact of systems of land registration will vary with circumstances and will be negatively affected by market imperfections. This section discusses situations in which one would not expect the successful introduction and operation of land registration systems, in particular: (1) unequal distribution of power, bad or ineffective governance, and absence of the necessary checks and balances that will undermine the impartiality or credibility of the registration system; (2) limitations of credit markets that can limit the supply of or demand for credit and the scope for use of land as collateral; (3) low efficiency of land administration systems that prevents them from delivering value-added services in a cost-effective manner; and (4) relative land abundance that can reduce the scarcity value of land and lead to adoption of alternative arrangements to secure rights. In each case, we aim to draw conclusions regarding the design and implementation of effective registration systems.

POWER RELATIONS AND DEFICIENCIES IN GOVERNANCE

Land has historically been a key source of social and economic power. While the tendency to monopolize land access was particularly strong in colonial contexts (Binswanger, Deininger, and Feder 1995; Conning and Robinson 2007), it did not disappear thereafter in situations with highly unequal land access (Baland and Robinson 2003) or in African countries, which often established state monopolies over land, resulting in high levels of mismanagement and corruption (Durand-Lasserve and Royston 2002; Mabogunje 1992). This implies that considerable efficiency gains may be achieved from better management or privatization of state land (Kaganova and McKelar 2006). At the same time, it is evident that the assumption underpinning our conceptual discussion—of an honest, efficient, and effective government and a social system in which checks and balances preclude abuse of power—may not always hold. The state's monopoly on the exercise of legitimate power, which is a precondition for the functioning of advanced societies and secure property rights, can be abused to appropriate property or to assist unfair acquisition of land by elites, thus undermining the security of property rights. Increased land values and demand for land by outside investors increase the potential rent-seeking gains from bureaucratic interference. The politically motivated award of state land to political cronies has been a concern in Kenya, Cambodia, and Nicaragua.⁴ In such situations, land registration programs risk becoming a way of *ex post* formalizing land grabs. Even if abuse of power is not widespread, weak and ineffective government can render a land registration system (and other public services) ineffective and not worth the cost of setting up.

An unbalanced power structure within society exacerbates the inadequacies of a titling system under ineffective governments, as the combination of these deficiencies provides opportunities for abuses and utilization of the titling system to provide advantages to the powerful (Feder and Nishio 1999; Jansen and Roquas 1998). If corruption is endemic, individuals and groups cannot rely on state-issued documents, which could have been altered fraudulently with the assistance of corrupt officials and legal personnel to benefit challengers who

4. The Ndungu commission in Kenya notes that land grabbing by public officials that had reached systemic proportions during 1980–2005 was “one of the most pronounced manifestations of corruption and moral decadence in our society” (Government of Kenya 2004, 192). In Cambodia, concessions were often of a speculative nature as indicated by the fact that fewer than half had even demarcated their boundaries and few started production. As they were often established without following proper processes such as community consultation and investigation in the field, protests or encroachment on concession land by local people was reported in two-thirds of the cases. However, the cadastral commission and courts were often unable to rectify problems against physical violence and intimidation by concession holders (Kato 1998; Leuprecht 2004). The economic impact was limited by the fact that fewer than one-third of concessionaires paid the required deposit, very few made the rather low rent payments, and tax payment was virtually nonexistent (McKenny and Tola 2002).

can pay higher bribes. This creates uncertainty and risks, the elimination of which paradoxically was a key reason for introducing land registration in the first place. Not surprisingly, the weaker and poorer segments of society suffer the negative consequences of land titling in situations of ineffective or dishonest government. Without effective enforcement, including impartial courts and police forces, the rights presumably protected by titles may exist on paper but not be enforceable. For titling programs to have the desired effects, good governance is thus essential.

When titling of land is introduced in replacement of customary or less formal systems of land rights allocation and verification, information regarding the procedures to be undertaken may not be easily available to all affected. In fact, in Uganda, where the law was changed but little implementation occurred, legal knowledge, as ascertained by an “objective” test, had a significant impact on productivity of land use, but cannot be assumed as given (Deininger, Ali, and Yamano 2008), suggesting that the potential for systematic dissemination and awareness campaigns may have been underestimated. Wealthier segments of society often have better access to information and, if they are able to influence or bribe officials, may utilize the opportunities opened by the new system to acquire and document rights that did not fully belong to them. A less nefarious, yet still unfair, form of taking advantage of access to information is the ability to buy up untitled land before it becomes eligible for titling. Since the price of untitled land can be significantly lower than the price of the same land once it is titled, the possession of information on lands that will be served by titling and the knowledge of how to obtain title provide opportunities for capital gains for the better informed. There are, of course, measures to reduce opportunities for abuses and for taking advantage at the expense of the weaker segments. The effectiveness of such measures depends on the efficiency and quality of governance. Thus, while it is important for land administration institutions to provide high-quality service in a cost-effective way, an appropriate and broader policy, legal, and institutional environment needs to exist as well.

LIMITATIONS OF CREDIT MARKETS

The discussion thus far has abstracted from imperfections in markets for credit and insurance that are widespread in most developing countries. The existence of such imperfections and their interactions with other markets affects the potential benefits from land market interventions. The credit market effects of formally documented land rights may differ in rural and urban areas; within urban areas they may differ for residential land and commercial land. Rural credit markets in developing countries are typically less developed in that their dependence on weather and other natural phenomena (for example, pest attacks) introduce risks that are correlated across large numbers of would-be borrowers, limiting the ability of lenders to diversify and increasing the risk of rural lending. Consequently, the utility of collateral is lessened in rural areas; a bad outcome will imply default by many borrowers at once, flooding the land market with

foreclosed properties whose value may be much diminished. While long-term credit markets in rural areas of developing countries are limited and tend to be dominated by state entities, short-term credit markets are more prevalent, and there is a significant presence of informal lenders. The transaction costs of collateral registration may often exceed the benefit it generates for the relatively small loans undertaken for seasonal (short-term) purposes. However, informal, and even formal, lenders sometimes invoke a procedure that is not fully formal, whereby they demand physical possession of the title document. This does not entail formal recording of collateral encumbrances, but it prevents the borrower from selling the land under favorable (formal) terms to others without respecting first the obligations to the creditor (Siamwalla 1990).

Urban credit markets have different characteristics. They are typically more developed than credit markets in rural areas and entail greater participation of private (nonstate) lending institutions. Residential credit often relies on collateralized long-term loans to finance housing acquisition, and documented land ownership is important in facilitating such transactions. The use of residential property to finance business investments is less common. Commercial land property is often used as collateral for business-oriented investments. There is said to be a high potential of credit expansion to informal (undocumented) landowners in urban areas (many of them illegal squatters in poor slums) once their possession is formalized and legitimized (de Soto 2000). This has been disputed based on banks' difficulty in repossessing or liquidating low-quality dwellings in poor neighborhoods (Benjaminsen 2002; de Soto 2002; Mathieu 2002). Credit market effects will also be less than expected if there is "risk rationing," that is, if potential borrowers who would be creditworthy are unwilling to use titles for fear of losing them in a risky environment (Boucher, Carter, and Guirkingner 2008).

AFFORDABILITY AND COST-EFFECTIVENESS

An often-neglected issue with important consequences for cost-effectiveness and sustainability of land registration relates to the way in which liability for defects in registry information is assigned. This differs markedly between systems for registration of deeds and title registration systems, the two most common forms of land registration. A deeds registration system is a public repository in which documents to provide evidence of land transactions are lodged, numbered, dated, indexed, and archived. Recording gives public notice of a transaction, serves as evidence for it, and may assign priority to the right claimed in the document in the sense that, in most contexts, registered deeds take priority over unregistered ones or deeds registered subsequently. However, registration of a deed does not imply an inference about the legal validity of the transaction. By contrast, in registration of titles, the register itself serves as the primary evidence of ownership as commonly identified by three attributes: (1) the mirror principle, indicating that the situation in the registry is an exact reflection of reality; (2) the curtain principle, implying that anybody interested in inquiring about the title status of a given property will not have to engage in a lengthy search of

documents, but can rely on the evidence from the title registry as definitive; and (3) the assurance principle, according to which the government will indemnify parties for damages incurred as a consequence of errors in the registry.⁵

Put simply, a deeds system is cheaper to operate but provides a less-comprehensive service because the residual risk of verifying ownership information remains with the transacting parties, who incur the cost of due diligence. By contrast, to be able to assume responsibility for the accuracy of information in the registry, the state will have to assume responsibility, which implies higher setup as well as operating costs.⁶ As landowners fail to register transactions if the cost of doing so is too high compared to the benefit (the reduction in residual risk), a title registration system will be socially optimal if land values are high, whereas for lower land values a deeds system is more appropriate (Arrunada 2003). While most land registration projects funded by multilateral agencies recommend adoption of a title registration system—and in some cases even the conversion from a system based on deeds toward one based on title—this has rarely been substantiated by rigorous analysis of the associated costs and benefits and, possibly as a result, has not always led to the desired outcome.⁷ This is

5. To illustrate, if, under title registration, person A fraudulently sells land (which actually belongs to C) to B, who purchases it in good faith, B becomes the rightful owner, and any claims by C are extinguished as soon as the sale is registered. The only recourse open to C is to demand compensation, but not restitution of the property, from the state, which in turn has the option to sue A. The need to ensure that the responsibility taken up by the state can be met is one of the reasons that title registration systems are normally associated with a guarantee fund to facilitate payment of such compensation. By contrast, under a deeds system, it is B's responsibility to investigate the veracity of A's ownership claims, and C will be able to demand restitution of the property from B, implying that B will incur the loss.

6. The specific historical circumstances of the United States, which operates under a deeds system, have given rise to a system of title insurance in which private companies, rather than the state, have developed a comprehensive record of all land transactions that enables them to examine the legal validity of transactions and insure against defects. Given the long time it took to assemble the required information, this is not an option for developing countries (Arrunada and Garoupa 2005).

7. While a number of well-functioning systems with high land values (Hong Kong, Britain, Scotland, various Canadian provinces) have successfully made the transition from a deeds to a titling system, though often over a long period of time, attempts to shift from a deeds system to one of title registration in developing countries do not have a good record. A project in Sri Lanka failed to put in place the legal, regulatory, and institutional framework for systematic adjudication of land parcels and instead accomplished only very limited survey and titling of parcels, with limited economic benefits (World Bank 2007). In St. Lucia households received provisional documents that were supposed to be replaced by full titles after 12 years, but 75 percent of titles were never collected by their owners (Griffith-Charles 2004). In Ghana, where a new title registration system has been introduced, fewer than 1,000 titles were issued per year, and the rate at which titles entered the system was below that of new transactions to be registered, implying a widening gap between the registry and reality and increasing levels of informality (Nettle 2006).

particularly relevant as measures that include standardization of deeds, parcel-based indexing, compulsory registration, and a requirement for registrars to perform basic checks on deeds and the persons presenting them before accepting them for registration all offer opportunities to strengthen deeds systems. With access to computerized information about the chain of deeds and other instruments pertaining to a given parcel, differences between the deeds and title registration systems have narrowed significantly. From an applied perspective, deeds systems are also more robust, and good systems, as in The Netherlands and South Africa, offer most if not all of the features of well-run titling systems. Even in titling systems, a regulatory framework that fails to disclose relevant rights or encumbrances in the registry can put the integrity and usefulness of a land registration system in question. Where the failure to register potentially long-standing rights allows them to be ignored in practice, there have been very negative social impacts.⁸ This suggests that, in addition to the type of recording, close scrutiny of the information actually captured by the land registration system is warranted.

While establishment of land registries is an important investment in infrastructure, the resources required for first-time registration can be increased by the fact that the cost of mapping increases exponentially with precision. A widespread confusion between tenure security and precision of measurement, together with lobbying by survey professionals, has often led countries to impose survey standards that exceed local implementation capacity and impose costs with no reasonable relationship to land values. As a consequence, in many of the early projects financed by bilateral or multilateral institutions, the cost of first-time registration was high, possibly in excess of land values, with costs ranging on average from between US\$20 to US\$60 per parcel, and in some cases significantly above US\$100 (Burns 2007). Not surprisingly, this has often limited the speed with which such programs could be implemented and the coverage they were able to achieve. Where first-time registration was heavily subsidized by the state, landowners often failed to register subsequent transactions.

As most of the benefits from land registries accrue to users, observers generally agree that it is desirable for registries to recover their cost through user fees, although in most countries fees from urban areas with higher frequency and value of transactions are used to cross-subsidize rural areas. In addition to

8. The case of tenants on *mailo* land in Uganda is a particularly striking example. Although many of the tenants had been on the land for more than a generation, their presence was not indicated on landlords' titles. Banks that lent against such titles discovered that liquidation was impossible because of the presence of tenants with far-reaching rights on the land they had accepted as collateral, making it difficult even for owners of unencumbered land to use it as collateral, thereby undermining the value of existing titles and making the state guarantee (which extends to ownership only) worthless from their point of view (Deininger and Ali 2008).

operational inefficiencies, costs are normally increased by three factors: (1) unreasonably high precision requirements for surveys; (2) a need to involve lawyers in transactions; and (3) stamp duties levied on land transfers. To the extent that the costs exceed the benefits (in terms of increased security) that users obtain from registering, high cost can lead to reemergence of informal practices up to a point where “de-formalization” undermines the sustainability of a land registry system that was established at high cost (Barnes and Griffith-Charles 2007). In practice, the costs associated with registering property are by no means trivial. Despite reforms to reduce costs significantly, the mean in 173 countries included in the World Bank’s “Doing Business 2008” amounts to 6.6 percent of the property values and 81 days of waiting time.⁹ Informal fees can further increase these costs, with possibly far-reaching consequences for users’ ability to access information and their confidence in the land registry. For example, in India the costs of registering even inheritances is exorbitant, and a recent study estimated bribes paid annually on land administration to amount to US\$700 million (Transparency International India 2005), three-quarters of India’s total public spending on science, technology, and environment. The dramatic improvements achieved in Eastern Europe by making registries financially independent and their information publicly available on the Internet, involving private surveyors, reducing staff, and increasing salaries highlight the scope for improving efficiency and governance of land registries (Dabrundashvili 2006).

As it will be critical for both the feasibility and continued viability of property rights institutions, the cost of establishing and running the land registry system requires more attention to the system’s design, especially in the African context, where resources are limited. Failure to take into account the cost of the institutional infrastructure that was to be established is one of the reasons that implementation of the 1998 Land Act in Uganda stalled (Hunt 2004); almost a decade after its passage, not a single certificate of customary ownership has been issued. By contrast, in Ethiopia a low-cost method of certification with

9. The World Bank’s “Doing Business” survey has rightly identified the cost of registering property as a key impediment to private sector activity by including it as one of the indicator variables in its global survey. Because these figures are based on expert opinion for an unencumbered property in the capital city, they should be used with care (Arrunada 2007) and are likely to constitute a lower boundary for the cost of registration faced by the average landholder. For example, a field-based study in St. Lucia found the transaction cost for what was considered a typical transaction by the local population to be almost three times the 7 percent given in the “Doing Business” survey (Griffith-Charles 2004). Also, the cost of registering property is highly bimodal; while it is 2 percent or less of property value in 32 cases, it amounts to 5 percent or 10 percent and more of property values in 92 (53 percent) and 41 (24 percent) of the cases, respectively (World Bank 2007). To make such figures more representative and bring them closer to the cost of service provision, the World Bank is undertaking efforts to link this to administrative data. Doing so is likely to provide a more precise measure that could be used to track changes over time.

high levels of community participation that involved field measurement, but not creation of a graphical record, managed to register more than 20 million plots at a cost of less than US\$1 per parcel in less than three years. While a system for updating has not yet been implemented, a modest fee of US\$0.65, in line with users' willingness to pay, would be enough to finance a partly computerized system that could be self-financing. Options for adding at least a cadastral index map at a cost that is sustainable are being explored as well (Deininger et al. 2008).¹⁰

VARIATION IN LAND SCARCITY

It has often been argued that, in situations where land is relatively abundant, households will undertake investments and expenditures designed chiefly to enhance their tenure security over the land being used. The direction of causality in such circumstances is therefore from investments to more secure tenure, rather than from improved tenure security to more investment. This implies (according to this line of argument) that even if interventions to improve tenure security were feasible, they may have little impact in terms of bringing forth new investment (Brasselle, Gaspart, and Platteau 2002; Sjaastad and Bromley 1997). In particular, land-abundant areas in West Africa such as the Ivory Coast have a long tradition of migrants' planting trees to establish property rights over all or part of the land (Colin and Ayouz 2006). The literature notes that, in such contexts, efforts at land registration need to confront four issues. First, especially in situations where traditional institutions still work relatively well, introducing a system to register land may lead to speculative land acquisition on a large scale and set off a "race for the prize" that can polarize the land ownership structure (Benjaminsen and Sjaastad 2002; Peters 2004) as powerful individuals use their informational and other advantages to grab land. Second, by introducing an additional institution that is intended to replace traditional actors—though an institution with limited state presence is often not capable of doing so—such interventions may create a parallel system. Instead of complementing each other, traditional and modern systems may compete with each other, as was the case in Kenya (Atwood 1990), thereby increasing transaction costs, giving those who are better off or better informed an opportunity to resort to "institutional shopping" by, for example, pursuing conflicts in parallel through a variety of channels (Firmin-Sellers 2000), and increasing conflict (Berry 1997; Fred-Mensah 1999). Third, traditional registration programs have often paid little attention to secondary or communal land rights, such as the right of temporary use of arable land after the crop harvest for grazing pastoralists'

10. In Ethiopia 95 percent of households that do not have certificates would like to get them, and 99 percent of those with certificates would be willing to pay an average of B12 (US\$1.50) to replace a lost certificate, while 90 percent of those willing to pay would like to add a sketch map (Deininger et al. 2008).

animals or for firewood collection by the poor. Unless measures are taken to recognize, and if necessary record, such rights, they may intentionally or unintentionally be curtailed, with negative consequences for those who benefited from them (Meinzen-Dick and Mwangi 2009). Also, if land is not the scarcest factor, land registration will be effective only if it is combined with establishment of secure rights to other resources (for example, water) that may limit the ability to make productive use of the land. Fourth, especially but not only in high-risk environments, individualization of communal land rights that neglects the important safety-net function of such arrangements may entail loss of the flexibility essential for risk management and insurance, thus leaving everybody worse off (Baland and Francois 2005). This is consistent with the importance of open fields in Europe for long periods of time (Bekar and Reed 2003; Fenoaltea 1976; McCloskey 1975).

These issues will have to be taken seriously in the design of any intervention on land registration, but they also need to be put in perspective. While their specific manifestations will depend on the conditions at hand, secular trends such as population growth, urbanization, and increased land demand for nonagricultural purposes, including by outsiders, are unlikely to be reversed. Increasing land scarcity can reinforce preexisting inequalities along lines of gender, ethnicity, and wealth and set in motion a spiral of conflict, resource degradation, and social strife that can spread beyond the narrow realm of land and have negative social and economic consequences. For example, if, as in much of West Africa, the descendants of migrants can be easily identified as outsiders, increased land values provide a strong incentive for locals to renege on earlier sales contracts. In the case of the Ivory Coast, land access is interlinked with questions of nationality and the fact that only nationals may own land, which can give rise to conflicts that extend far beyond the land (Lavigne-Delville et al. 2002). In Rwanda, where extreme land scarcity coincided with accumulation of land by individuals with access to nonagricultural incomes, land conflict was one of the principal causes of the civil war in 1994 (Andre and Platteau 1998).

Traditional land institutions may offer considerable flexibility, but they may also have limitations and be eroded through a trickle of transactions (Chimhowu and Woodhouse 2006). For example, especially with weak governance, land sales by chiefs who reinterpret their trusteeship role as ownership and pocket the receipts are common, and they risk undermining traditional social safety nets (Lavigne-Delville 2000). Also, customary systems are well suited to resolving conflicts within a community, but they face much greater difficulty in reducing conflicts across groups, ethnicities, and type of land use, such as between pastoralists and sedentary agriculturalists (Van den Brink, Bromley, and Chavas 1995). Finally, under traditional systems, women are often severely disadvantaged, and access to institutions for land administration are biased by gender and wealth (Henrysson and Joireman 2007). It will thus be important that analyses of the impacts of changes in land administration systems construct a proper counter-

factual and do not mistakenly attribute positive or negative developments that would have happened even without changes in the land system.

Given its spatial extension, defining property rights to land or writing contracts regarding their exchange is costly. Therefore, in traditionally settled areas at low levels of population density, boundaries may be defined only loosely; transfers will normally involve only usufruct rather than ownership and will often be confined to community members. This allows much of the content of land rights and associated transactions to be defined informally by unwritten custom. Changing economic and social conditions that make land more valuable and increase the benefits to be obtained from land transfers imply that the value of attributes that have previously been left undelineated may increase sufficiently to offset the transaction costs associated with more precise delineation of land rights. Thus, even in land-abundant settings, appropriate ways of registering individual and communal land can have significant benefits, provided that adequate mechanisms for accountability and good governance are in place, that there is a menu of options from which communities can choose to suit their requirements, and that registry information is maintained in a coherent format so as to prevent the emergence of parallel and potentially contradictory systems and to allow flexibility to facilitate individualization if the need arises.

A large number of jurisdictions now include provisions for registration of communal land (Alden-Wily 2003) that provide opportunities to delimit community boundaries while leaving registration and management of individual plots to community institutions.¹¹ This is not only more cost-effective than individual titling, but it also allows covering much larger areas very quickly. Doing so can avert threats of large-scale land alienation to outside investors who neglect community rights (Alden-Wily 2008). Moreover, if it is combined with a mechanism, and possibly training, for communities to directly negotiate with investors, possibly establishing joint ventures, this may reduce bureaucratic bottlenecks and corrupt dealings that often slow such investment. While transparent mechanisms for allocation and transfer of land rights within the community will have to be established, rules that regulate land alienation to outsiders can help to reduce undesirable social effects and keep them from driving some people into destitution (Andolfatto 2002) and can also reduce the potential benefits of land grabs. As long as such rules are the product of a conscious choice by the group and the group has clear and transparent mechanisms for changing the land tenure regime, they are less likely to be harmful. As traditional social ties loosen or the efficiency loss from the sales restriction becomes too high, groups are likely to move toward a gradual individualization and sales to outsiders. The recent

11. For a discussion of institutional options, see Fitzpatrick (2005), and for a detailed example of legislative arrangements to put this in practice, see Government of Mexico (2000).

constitutional reform of the land rights system in Mexico is an example, with the fact that the transition toward individual rights can only be made by a 75 percent majority of the whole group, providing a safeguard against land grabs. The fact that less than 15 percent of *ejidos*—mostly those in peri-urban areas where land had already been de facto individualized—made use of this opportunity suggests that, even at relatively high levels of per capita income, the spatial reach of insurance mechanisms to replace the safety net function of communal land ownership remains more limited than is often thought (Zepeda 2000).

Evidence on Impacts

The above implies that well-implemented land registration programs can help improve governance and administrative efficiency, reduce the need to expend resources to enforce land rights and enhance gender equality, increase land-related investment, and enhance operation of land markets as well as credit access. However, these effects are by no means automatic, and in many instances they cannot materialize. A review of empirical evidence suggests that, while there is strong evidence that land registration systems have reduced the need to expend effort in enforcing rights and have enhanced land-related investment, this experience is not uniform. Furthermore, evidence that interventions have improved credit access is less strong and in general suggests that a direct positive impact on the poor has been limited.

IMPROVED GOVERNANCE AND ADMINISTRATIVE EFFICIENCY

The earlier discussion suggests that land registration interventions and associated legal reforms will be more effective in a context of good governance, although legal and policy changes can also contribute to improvements. The case of land rights reform in China, where property rights to land have traditionally been insecure and where increased pressure on land in peri-urban areas has given rise to well-publicized conflicts, provides a basis for understanding these interactions. Officials' ability to apply eminent domain principles with little public scrutiny and to rely on readjustment (land reallocation) to acquire large tracts of land without cash outlays further implies extensive use of land taking not only as a source of income by local government but reportedly also for individual enrichment and corruption.

The 2003 Rural Land Contracting Law includes a number of measures that aim to significantly change the cost of acquiring land. It does so by increasing the security of individual land use rights and enhancing individuals' ability to lodge appeals against violation of such rights. Data from a representative nationwide survey suggest that legal reform had a significant and quantitatively important impact on increasing the security of property rights in terms of reducing the probability of illegal land reallocation and increasing the amount of compensation received by those who were affected by legitimate land takings. The impact was significant only in villages where the leadership was elected, suggesting that,

for legal reform to be effective, means to hold the state accountable are needed, an interpretation supported by the fact that village leaders' knowledge of the law had an independent impact on reducing the probability of illegal reallocation. Availability of land use certificates did not significantly reduce the risk of unauthorized land reallocation, suggesting that such certificates will be useful only within an appropriate institutional framework (Deininger and Jin 2008b).

A natural experiment in Buenos Aires allows assessment of the impact of land registration not only on economic outcomes but also on attitudes and beliefs. Title was given to some but not to other urban squatters, all of whom had started out in exactly the same conditions. Some 14 years later, those who, by chance, had benefited had significantly more individualistic and materialistic attitudes, a result that is very robust.¹² The effect was equivalent to an additional 4.4 years of education by the household head. Despite their much inferior socioeconomic situation, beneficiaries' beliefs are virtually indistinguishable from the population average. By comparison, attitudes by those who did not get regularized are consistent with what one would expect based on their socioeconomic characteristics (Di Tella, Galiani, and Schargrofsky 2007).

Land registration can also have a major impact on local government's ability to generate resources, governance, and efficient service provision. In the Indian state of Karnataka, computerization of textual records is estimated to have saved users US\$16 million in bribes annually (Lobo and Balakrishnan 2002). By using this figure as a basis to automate registration and the associated valuation, stamp duty could be cut from 14 percent to 8 percent and tax revenue quadrupled from US\$120 million to US\$480 million, thus illustrating the scope for land registries to be self-financing.¹³ In Mexico before reforms were initiated in 1992, the *ejido* sector was subject to numerous restrictions on land rights; the rural economy was characterized by clientelism, inefficient land use, and low levels of investment; and peri-urban areas were subject to chaotic informal settlement (Gordillo, de Janvry, and Sadoulet 1998). In qualitative interviews, beneficiaries of a program to establish more secure and better administered land rights indicated that the most important aspects of the reforms were their impact on reducing conflicts and on increasing transparency, with an associated reduction of political influence in the *ejido* sector (World Bank 2002). Based on promising results from earlier pilot programs, Ethiopia embarked on a large-scale and highly participatory registration of landholdings by 6 million

12. Among other attitudes, they were more likely to believe that people can succeed economically on their own, that having money is important to be happy, and that others can be trusted. No significant differences emerged regarding the belief that those who put in effort will do better economically.

13. In Thailand a program of land titling provided the basis for a substantial increase in the total amount of land revenue collected, from US\$300 million in 1984 to US\$1.2 billion in 1995 (Burns 2007).

households in 2003–2005. Although land remains state-owned and many restrictions on land transfers continue to exist, more than 80 percent of respondents in a nationwide survey indicated that certification increased the chance of getting compensation when land was acquired for nonagricultural uses, helped to reduce conflicts, and improved bargaining power by females, especially in regions where women's pictures were included on the land certificate (Deininger et al. 2008).

REDUCED ENFORCEMENT EFFORT AND INCREASED GENDER EQUALITY

In Peru a significant land titling effort was carried out in rural and urban areas. Estimates indicate that, in urban areas, having received a title resulted in a significantly increased perception of tenure security. Recipients of titles increased their participation in the formal labor market when they were no longer required to invest in a multitude of informal activities to maintain tenure security (Field 2007). The magnitude of these effects is large. Initially labor supply is estimated to have increased by about 13.5 hours per week, rising about 50 percent to 45 hours after four years. This is in marked contrast to other welfare programs, which generally reduced labor force participation. Since adults have an advantage over children in protective activity, a reduction in the need for home protection could also reduce the demand for child labor. To the extent that changes in tenure security can bring about an independent reduction in the productive value of children (for example, as a result of better old-age insurance, better credit access, or increased bargaining power of females), they could also prompt a reduction in childbearing.

The program's requirement that titles be issued jointly in the names of husband and wife provides an opportunity to test for gender-specific effects. If the titling program led to a redistribution of household assets in favor of females that shifted intra-household bargaining power, one would expect other outcomes more favorable to the women.¹⁴ This is consistent with a 22 percent reduction of fertility for squatters who received property titles and twice the reduction in the probability of having a child among females who received joint titles compared to those where the title was in the husband's name only (Field 2003).

A study in Nepal found not only a positive association between higher levels of women's land rights and their socioeconomic empowerment and the health of their children, but also an impact comparable in magnitude to the effect of increased education and employment, two areas that have received much more attention in the policy debate (Allendorf 2007). This is in line with evidence

14. A positive nutritional effect on children's weight, but not height, was found in another study using the same data (Vogl 2007).

from India, where access to land allows women to escape significant gender discrimination by choosing self-employment on their land instead (Deininger, Jin, and Nagarajan 2006), and in line with earlier qualitative evidence on the importance of land for women's social status (Panda and Agarwal 2005). In the Indian state of Punjab, joint titling made women significantly more assertive of their rights, increased attachment to their homes, and enabled them to use formal means (courts) rather than informal ones to counter (hypothetical) sales of land by their husbands (Datta 2006). In Gujarat land ownership was found to be a key determinant of women's empowerment that increased self-stated propensity to invest in land (Baruah 2007). All of these studies point to potentially important gendered impacts of land titling.

In the long term, land registration could affect household size by allowing members of the extended family to separate their inheritance, move out, and start independent enterprises. In Buenos Aires a study found reduced family size—via less presence of extended family members—and lower fertility, as well as improved educational outcomes of children among titled squatters as compared to untitled squatters (Galiani and Schargrotsky 2005). While there were no differences in the number of children born before titling, untitled households were much larger than the titled households due to the presence of extended family members and larger numbers of children born after the time of titling. If household resources for education are fixed, the decreased number of children provides opportunities for investment in human capital. Children of titled squatters attended school 0.4 days per week more than did children of the control group, and their level of school achievement was higher by 0.42 years. This is roughly equivalent to the estimated impact of a program (Progresan Mexico) that provides cash transfers to households with school-age children conditional on these children attending school, suggesting that land registration can have potentially large effects. Also, teenage pregnancy rates and children's short-term nutritional indicators (weight for height, but not height for age) are better on titled than on untitled parcels, suggesting that titling allows families to improve investment in human capital (Galiani and Schargrotsky 2004).

LAND-RELATED INVESTMENT AND LAND VALUES

The hypothesis of positive tenure security effects on economic incentives is hardly controversial and has been quantitatively demonstrated by numerous recent studies, such as in China (Jacoby, Li, and Rozelle 2002), Latin America (Bandiera 2007; Kazianga and Masters 2006), Africa (Deininger and Jin 2006; Goldstein and Udry 2006), and Eastern Europe (Rozelle and Swinnen 2004). What is still debated is whether and under what circumstances land registration programs are an effective way to enhance tenure security, especially in relatively land-abundant settings, and how to design them to be most effective.

Evidence about the potential gains from titles is not uniform. A study in a rice-growing area in Madagascar suggests that formal titles had no effect on

plot-specific investment and little impact on productivity. Land values are estimated to have increased by 6 percentage points at most due to titling, implying that the cost of land titling would have to be very low to be justified economically (Jacoby and Minten 2007). By contrast, within-household analysis of new investments on owned as compared to merely occupied (*mailo*) plots by owner-cum-occupants in Uganda points to significant and quantitatively large investment effects of full ownership: the shift from *mailo* occupancy to ownership is predicted to double the likelihood of soil conservation and increase tree investment fivefold. Tenant registration is estimated to have no investment effect, while measures to strengthen occupancy rights attenuate, but fail to fully eliminate, investment disincentives originating in overlapping rights (Deininger and Ali 2008). In Ghana tenure insecurity is shown to lead to reduced investment in the form of fallowing, reducing output by about one-third and leading to very large aggregate efficiency losses, according to estimates (Pande and Udry 2005). While this supports the importance of secure land tenure as a precondition for growth, it suggests that the magnitude of possible impacts can vary widely and that interventions aiming to increase tenure security need to be context-specific to be effective.

In urban settings a first indicator of the effectiveness of titling programs would be housing investment. In Buenos Aires regularized squatters have a 40 percent higher probability of having good walls and a similar increase in the probability of having good overall housing quality. Apparently, the shift from use to ownership increased the incentive to invest, but failed to make households richer or increase the transferability of their assets (Galiani and Schargrodsky 2005). In Peru evidence on improvements in housing between 1994–1995 and 1999–2000 suggests that, for titled households, rates of house renovation increased more than two-thirds above baseline levels, though most of the increase was financed out of pocket rather than through credit (Field 2005).

The same methodology was applied to analyze the impact of a program that provided duly registered titles to rural households in Peru. The analysis distinguished between households with pre-program high levels of tenure security (due to possession of an agrarian reform title, a notarized sales contract, or a judicial resolution) and households that lacked such documents and thus had low levels of security before the program was implemented. Levels of investment were found to have increased significantly due to the program, particularly for the latter, whose propensity to invest in land almost quadrupled due to the increment in tenure security. This is consistent with findings for a smaller region in Peru, where registration was found to increase the probability of terrace investment by 6.6 percent (Antle et al. 2003). Since 97 percent of such investments were financed out of pocket, a big credit impact is improbable (Fort 2007). Externalities are suggested by the fact that the titling density within a district has a significant effect on infrastructure investment. Use of a linear probability model of export crop adoption suggests that receipt of title had a highly significant and positive effect on its own and that it appeared to make households more responsive to price changes, leading the authors to conclude that market liberalization

helps only when conducted in an appropriate institutional environment (Field, Field, and Torero 2006).

In Nicaragua full registration of a plot after the 1990 revolution resulted in an increased propensity to invest of between 8 and 9 percent. By contrast, award of agrarian reform title without registration had insignificant investment impacts. At about 29 percent, marginal returns to land-attached investment are much higher than those from investment in mobile capital, pointing toward scope for gains in overall economic efficiency by shifting resources from the latter to the former. This suggests that, in addition to enhancing overall levels of investment, the higher level of tenure security brought about by land titling in Nicaragua can lead to a more appropriate balance in the investment mix between movable and fixed capital. Land values for plots with registered title are higher by 30 percent (Deininger and Chamorro 2004). Reduced form regressions from Nicaragua lead to similar conclusions regarding the superiority of full as compared to reform title in terms of enhanced land values, investment in perennials, and higher crop yields (Broegaard 2005).

The presence of an investment incentive effect independent from credit is also highlighted by evidence from a land settlement program in Guatemala that started in 1986. A 1993 survey suggests that, while all the sample households had benefited from credit provided under the program, those that had exogenously received titles to their property took greater care of their parcels and, most likely as a result of past and recurrent investment, had higher yields than did those that had not received titles (Schweigert 2007).

In Vietnam, in addition to awarding about 11 million land use certificates (LUCs) through land registration efforts between 1993 and 2000, legal changes expanded users' rights to include transfer, inheritance, exchange, lease, and mortgage (Do and Iyer 2008). While the magnitude of new registration was comparable to the Ethiopian case, it was much larger and more rapid than that achieved by other interventions, including the 8.7 million titles distributed in Thailand since the 1980s, the 1.8 million titles in Indonesia from 1996, and the 1.2 million urban and 1.5 million rural titles in Peru between 1992 and 2005. A difference in the district-level estimation strategy in Vietnam suggests that provinces in which certification made more progress have devoted more of their land to perennials and have expanded nonfarm activities. In any given province, introducing complete coverage of the farming population by LUCs is estimated to induce an increase of 7.5 percentage points in the proportion of land under perennials as compared to a situation of no coverage at all. Since restrictions on crop choice that require households to keep land in rice remained in effect, this is likely to be a lower bound estimate of the true effect. Of equal interest, the supply of labor to nonagricultural employment is estimated to increase by 11 to 12 weeks compared to the situation without the LUCs, an outcome that is more pronounced for the poor than for the rich. Much of this effect comes through diversification of income portfolios within households rather than specialization in different types of activities by households. There is, however, no evidence of either a credit

effect or a measurable impact on income or expenditure, which is consistent with the notion that without complementary changes in banking and rules for land transactions, titling alone is unlikely to set off big changes in economic structure.

In Ethiopia's nationwide program, which is too recent to have had a longer-term effect, plots in villages where land certificates were distributed were 5 percent more likely to receive new investment than were controls (Deininger et al. 2008). This is consistent with evidence on the impact of the predecessor to the national program in the Tigray region, which had led to significantly higher levels of investment (Holden, Deininger, and Ghebru 2008a).

In Thailand land ownership titles induced greater investment in farming capital (attached investments and other capital), and titled land had significantly higher market values and higher productivity per unit. Output was 14 to 25 percent higher on titled land than on untitled land of equal quality (Feder et al. 1988). Housing prices in the nonsquatter formal residential areas of the city of Davao in the Philippines were 58 percent higher than in the informal areas, and rents were 18 percent higher (Friedman, Jimenez, and Mayo 1988). In Jakarta registered land was up to 73 percent more valuable than similar land held by weak claims (Dowall and Leaf 1992).

Self-assessed land values provide an upper boundary on the gain in utility from property registration. In Ecuadorian slums title increases the expected market value of a plot by 23 percent (based on responses by the same household for hypothetical changes), an effect that increases to more than 50 percent in situations where, because the settlement was recently invaded and has no organizer to provide political protection, tenure security is very low. Comparing the hypothetical benefits to the cost of such a program suggests a positive return, even taking into account the tendency for people to overvalue the possible gains from title. Particularly large benefits to women-only households are interpreted as indicating a need for interventions to incorporate gender concerns (Lanjouw and Levy 2002).

OPERATION OF LAND MARKETS

In the Dominican Republic insecure property rights not only reduce the level of activity on the land rental market, but also induce market segmentation. Landlords who have reasons to fear losing their land restrict renting to narrow local circles of confidence. This segmentation further reduces rental activity by limiting opportunities to find suitable tenants. Simulations show that improved security of property rights through title registration can lead to efficiency and equity gains; improving tenure security would increase total area rented by the poor by 63 percent (Macours, de Janvry, and Sadoulet 2004). Similarly, in Nicaragua producers who have title are significantly more likely to rent out their land, providing an opportunity for more effective producers to increase their cultivated area (Deininger, Zegarra, and Lavadenz 2003). In contrast, descriptive statistics from Peru suggest that perceived rights to rent, sell, or exclude others

(in contrast with rights to use, invest, and inherit) are not significantly different between titled and nontitled households (Fort 2007).

In Vietnam within-household regressions as well as cross-sectional estimates suggest that having long-term use rights secured through registration will increase the tendency to rent out to nonrelatives, but does not affect the propensity to rent out to relatives, consistent with the notion that land registration can substitute for informal enforcement through social capital. Moreover, and in line with the expectation that, in the case of informal transactions with friends and relatives, the smaller number of potential partners reduces the scope for efficiency-enhancing transactions, rental transactions among nonrelatives—but not among relatives—contribute to a significant increase in efficiency (Deininger and Jin 2008a). In Tigray land certification contributed to higher levels of land rental market participation, especially by female-headed households (Holden, Deininger, and Ghebru 2008b) and considerably enhanced opportunities for women to benefit from land rental (Bezabih and Holden 2006). Drawing out tenure-induced increases in land rental market activity and their impact on diversification of economic activity, especially in rural areas, is an important topic for future research.

Evidence on potential impacts of land registration on sales markets mostly compares before and after situations in a descriptive way. In Eastern Europe recent interventions to register land rights were generally followed by considerable and often rapid growth in land market transactions and, in the case of urban land and real estate, in mortgages, but construction of a counterfactual is difficult, so the evidence is suggestive only. In St. Lucia sales market activity and the number of registered mortgages increased immediately after introducing the title system (and remained high in peri-urban areas). However, the marginal increase in formal land market activity after introduction of the system was not sustained over time (Barnes and Griffith-Charles 2007), suggesting limited impacts. Descriptive evidence suggests that titling of frontier land in Guatemala, while helping to reduce conflict and the perceived danger of land invasion, has little effect on investment and credit access and fails to prevent informal sales, implying that the registry is becoming outdated (Gould 2006).

CREDIT ACCESS

Early study of the impact of titling in Thailand, where informal credit markets had already operated and land markets functioned relatively well before the intervention, points to significant impacts on credit access (Feder et al. 1988). In Paraguay a significant credit supply effect was demonstrated, but accrued only to medium and large landowners, whereas producers with less than 20 hectares remained rationed out of the credit market, something that could set in motion worrisome longer-term dynamics in terms of equity (Carter and Olinto 2003), similar to what was found in Guatemala (Mushinski 1999).

However, if land markets are illiquid or nonexistent, or if the cost of registering mortgages or foreclosing on them is very high, one would not expect

land registration to have an immediate impact on credit access. For example, in Peru land registration increased the likelihood of obtaining a loan (by between 9 and 10 percentage points) only for credit through a state bank, but not through the private sector. One explanation is that, due to the political nature of the application process, the likelihood of foreclosure is actually lower (or the transaction costs higher) for those with titles. There is reason to believe that the politicized nature of the titling process may have reduced rather than increased banks' ability to foreclose. This is in line with evidence suggesting that, even after land registration, more than one-third of households remained completely rationed out of formal credit markets (Field and Torero 2006). While interest rates charged by the private sector are lower (by about 9 points) for titled than for untitled households, this appears to be due to signaling rather than the ability to collateralize debt. This is similar to what was found in Indonesia, where land registration was contingent on demand, and significant payment by owners and possession of a title could be used as a proxy for entrepreneurial drive (Dower and Potamites 2005). Evidence from rural areas in Peru points in the same direction (Field, Field, and Torero 2006; Fort 2007). Similarly, in Buenos Aires, despite significant effects on house-related investment and other variables, no credit effect was found, implying that even with titles, households will be unable to fully ensure their consumption or use their talents more efficiently in entrepreneurial activity, and suggesting that growth implications of titling programs may be overstated (Galiani and Schargrodsky 2005). This is consistent with what was found by a recent comprehensive descriptive review of urban titling (Payne, Durand-Lasserve, and Rakodi 2008).

Implications for Policy and Research —————

The main objective of this chapter is to assess whether the assertion of a positive impact of land registration on a range of economic and social outcomes is supported by empirical evidence. Where it is or is not, we are interested in the underlying reasons, the magnitude of estimated effects, and the implications for policy. Where existing evidence is weak, we are also interested in areas and scope for research to answer open questions.

Our review allows a number of conclusions. First, there is ample but not uniform evidence of positive tenure security effects of land registration in a variety of circumstances. These manifest themselves in higher levels of investment, less need for activities to protect land rights, and—especially if female rights are enhanced or made more visible—gender empowerment. Second, while there is some evidence that land registration has helped to activate land rental markets, its impact on off-farm labor market participation is underresearched, especially in rural areas of developing countries, where occupational diversification is likely to be one of the key drivers of growth. Third, even though land registration has helped to improve credit access in a number of situations, the effect

is contingent on a number of other factors, not all of which can be taken for granted in developing countries. Even if there are credit effects, direct benefits to the poor are often limited. Fourth, few quantitative studies have explored the interaction of land registration with other initiatives or with the broader social and economic environment, even though these might be relevant to the nature and magnitude of expected effects. Few studies assessed the cost-effectiveness, long-term sustainability, and longer-term impact of land administration interventions. Fifth, even though one would expect impacts of systematic land registration to be more pronounced in urban environs, quantitative studies tended to focus more on interventions in rural areas and understood land regularization almost exclusively in terms of allocation of individual rights, neglecting both group rights and state land management. Related to this, key governance aspects did not receive the attention they deserve in this context.

In view of the above, there would be merit in using the large number of recent and ongoing interventions introducing or upscaling land registration to derive relevant conclusions on the magnitude and incidence of benefits, circumstances of unintended negative outcomes, and ways to increase benefits, target them more effectively to the poor, and enhance sustainability and cost-effectiveness. The scope for retrospective analysis to yield forward-looking and operationally relevant insights will often be limited by data quality and designs that may not have incorporated recent thinking. Using the significant number of projects under implementation or preparation could help provide more specific insights on key research questions with respect to both the economic and governance aspects of land registration.

Concerning economic effects, it will be important to complement evidence from rural areas with insights from urban interventions where, at least in such settings as middle-income residential neighborhoods that remain informal, credit effects can more reasonably be expected. This would also require accounting for the interaction of land-related interventions with other interventions and for characteristics of the environment such as access to the banking system, beneficiaries' interest in acquiring credit, their ability to make productive use of such credit, and the extent to which credit access can be enhanced. In this context, interaction between land regularization and infrastructure upgrading would be of particular interest so as to compare the effects of land rights with and without upgrading to the effects of upgrading itself. Individuals' demand and willingness to pay for a continuum of land certificates could provide a first descriptive approach with clear implications for ways for local governments to finance the upfront cost of such programs and recover the cost thereafter, such as through land taxation. With much of the population ignorant about applicable legal provisions, exploring how these and other issues may be affected by information campaigns or legal assistance could be appropriate. While the effect on establishment and expansion of microenterprises in urban areas will be of great interest, investment impacts in rural areas should be complemented by assessing the impact

of land registration on productivity and diversification of the occupational structure, including the extent to which it facilitates rural to urban migration.

With respect to governance, important issues include the need for a more detailed explanation of the impacts and cost-effectiveness of registering group rights, including the extent to which such intervention improves access to and productive use of land by outside investors. This would include whether such interventions trigger land grabbing and the extent to which there is scope for replacing traditional safeguards (land sales restrictions) with more effective ones, such as a requirement of systematic community-level registration on demand. This is linked to the need for evidence on the most effective institutional and decision-making arrangements to manage land at the local level in an equitable and flexible way and the impact of land use planning and its possible interaction with, or substitution for, land registration. Finally, two areas that have not been much researched are the establishment or reconstitution of land records in postconflict and postdisaster environments and the impact of legal and institutional reforms on management of state land.

Many of these issues lend themselves to an experimental setting that could be included in ongoing interventions. If combined with regular and standardized administrative information that can be compared over time and, with proper precautions, across countries, this research could help to better appreciate the potential positive effects and risks of land registration, the adequacy of different actions in specific circumstances, and the links to other policies. Given the complexity of the issues, these will be of great relevance not only to depoliticize the issue, but also to guard against potential negative effects.

REFERENCES

- Acemoglu, Daron, and Simn Johnson. 2005. Unbundling institutions. *Journal of Political Economy* 113(5):949–995.
- Acemoglu, Daron, Simn Johnson, and James A. Robinson. 2001. The colonial origins of comparative development: An empirical investigation. *American Economic Review* 91(5):1369–1401.
- . 2004. Institutions as the fundamental cause of long-run growth. NBER Working Paper 10481, National Bureau of Economic Research, Cambridge, MA.
- Alden-Wily, Liz. 2003. Governance and land relations. A review of decentralization of land administration and management in Africa. IIED Issues Paper 120, International Institute for Environment and Development, London.
- . 2008. Custom and commonage in Africa: Rethinking the orthodoxies. *Land Use Policy* 25(1):43–52.
- Allen, Douglas, and Dean Lueck. 1992. Contract choice in modern agriculture: Cash rent versus cropshare. *Journal of Law and Economics* 35(2):397–426.
- Allendorf, Keera. 2007. Do women's land rights promote empowerment and child health in Nepal? *World Development* 35(11):1975–1988.

- Andolfatto, David. 2002. A theory of inalienable property rights. *Journal of Political Economy* 110(2):382–393.
- Andre, Catherine, and Jean Philippe Platteau. 1998. Land relations under unbearable stress: Rwanda caught in the Malthusian trap. *Journal of Economic Behavior and Organization* 34(1):1–47.
- Antle, John M., David Yanggen, Roberto Valdivia, and Charles Crissman. 2003. Endogeneity of land titling and farm investments: Evidence from the Peruvian Andes. Working paper, Montana State University, Bozeman, MT.
- Arrunada, Benito. 2003. Property enforcement as organized consent. *Journal of Law, Economics, and Organization* 19(2):401–444.
- . 2007. Pitfalls to avoid when measuring institutions: Is doing business damaging business? *Journal of Comparative Economics* 35(4):729–747.
- Arrunada, Benito, and Nuno Garoupa. 2005. The choice of titling system in land. *Journal of Law and Economics* 48(2):709–727.
- Atwood, David A. 1990. Land registration in Africa: The impact on agricultural production. *World Development* 18(5):659–671.
- Ayalew, Daniel, Stefan Dercon, and Madhur Gautam. 2005. Property rights in a very poor country: Tenure insecurity and investment in Ethiopia. Global Poverty Research Group Working Paper Series, GPRG-WPS-021, Oxford University, Oxford, England.
- Baland, Jean M., and Patrick Francois. 2005. Commons as insurance and the welfare impact of privatization. *Journal of Public Economics* 89(2–3):211–231.
- Baland, Jean M., and James A. Robinson. 2003. Land and power. Discussion Paper 3800, Centre for Economic Policy Research, London, England.
- Bandiera, Oriana. 2007. Land tenure, investment incentives, and the choice of techniques: Evidence from Nicaragua. *World Bank Economic Review* 21(3):487–508.
- Banerjee, Abhijit V., and Lakshmi Iyer. 2004. History, institutions, and economic performance: The legacy of colonial land tenure systems in India. MIT Working Paper 02-27, Cambridge, MA.
- Barnes, Grenville, and Charise Griffith-Charles. 2007. Assessing the formal land market and delegalization of property in St. Lucia. *Land Use Policy* 24(2):494–501.
- Baruah, Bipasa. 2007. Gendered realities: Exploring property ownership and tenancy relationships in urban India. *World Development* 35(12):2096–2109.
- Bekar, Cliff T., and Clyde G. Reed. 2003. Open fields, risk, and land divisibility. *Explorations in Economic History* 40(3):308–325.
- Benjamin, Dwayne, and Loren Brandt. 2002. Property rights, labour markets, and efficiency in a transition economy: The case of rural China. *Canadian Journal of Economics* 35(4):689–716.
- Benjaminsen, Tor A. 2002. Formalising land tenure in rural Africa. *Forum for Development Studies* 29(2):362–366.
- Benjaminsen, Tor A., and Espen Sjaastad. 2002. Race for the prize: Land transactions and rent appropriation in the Malian cotton zone. *European Journal of Development Research* 14(2):129–152.
- Berry, Sara. 1997. Tomatoes, land and hearsay: Property and history in Asante in the time of structural adjustment. *World Development* 25(8):1225–1241.
- Besley, Tim. 1995. Property rights and investment incentives: Theory and evidence from Ghana. *Journal of Political Economy* 103(5):903–937.

- Besley, Tim, and Maitreesh Ghatak. 2008. Creating collateral: The de Soto effect and the political economy of legal reform. Working paper, London School of Economics, London, England.
- Bezabih, Mintewab, and Stein Holden. 2006. Tenure insecurity, transaction costs in the land lease market and their implications for gendered productivity differentials, mimeo. Norwegian University of Life Sciences, Aas, Norway.
- Binswanger, Hans P., Klaus Deininger, and Gershon Feder. 1995. Power, distortions, revolt and reform in agricultural land relations. *Handbook of Development Economics* 3B:2659–2772.
- Binswanger, Hans P., and Mark R. Rosenzweig. 1986. Behavioural and material determinants of production relations in agriculture. *Journal of Development Studies* 22(3):503–539.
- Boucher, Steven, Michael R. Carter, and Catherine Guirkinger. 2008. Risk rationing and wealth effects in credit markets: Theory and implications for agricultural development. *American Journal of Agricultural Economics* 90(2):409–423.
- Brasselle, Anne S., Frederick Gaspard, and Jean Philippe Platteau. 2002. Land tenure security and investment incentives: Puzzling evidence from Burkina Faso. *Journal of Development Economics* 67(2):373–418.
- Brink, van den, Rogier, Daniel W. Bromley, and J. P. Chavas. 1995. The economics of Cain and Abel: Agro-pastoral property rights in the Sahel. *Journal of Development Studies* 31(3):373–399.
- Broegaard, Riike J. 2005. Land tenure insecurity and inequality in Nicaragua. *Development and Change* 36(5):845–864.
- Burns, Tony A. 2007. Land administration: Indicators of success and future challenges. Washington, DC: World Bank Agriculture and Rural Development Department.
- Carter, Michael R., and Pedro Olinto. 2003. Getting institutions “right” for whom? Credit constraints and the impact of property rights on the quantity and composition of investment. *American Journal of Agricultural Economics* 85(1):173–186.
- Carter, Michael R., and Yang Yao. 2002. Local versus global separability in agricultural household models: The factor price equalization effect of land transfer rights. *American Journal of Agricultural Economics* 84(3):702–715.
- Chimhowu, Admos, and Philip Woodhouse. 2006. Customary vs. private property rights? Dynamics and trajectories of vernacular land markets in sub-Saharan Africa. *Journal of Agrarian Change* 6(3):346–371.
- Clark, Ephraim. 2003. Pricing the cost of expropriation risk. *Review of International Economics* 11(2):412–422.
- Colin, Jean Philippe, and Mourad Ayouz. 2006. The development of a land market? Insights from Côte d’Ivoire. *Land Economics* 82(3):404–423.
- Conning, Jonathan H., and James A. Robinson. 2007. Property rights and the political organization of agriculture. *Journal of Development Economics* 82(2):416–447.
- Dabrundashvili, Tea. 2006. Rights registration system reform in Georgia. Paper presented at the Expert Meeting on Good Governance in Land Tenure and Administration. Rome: Food and Agriculture Organization of the United Nations.
- Datta, Namita. 2006. Joint titling—A win-win policy? Gender and property rights in urban informal settlements in Chandigarh, India. *Feminist Economics*:271–298.
- Deininger, Klaus. 2003. *Land policies for growth and poverty reduction*. Oxford and New York: World Bank and Oxford University Press.

- Deininger, Klaus, and Daniel A. Ali. 2008. Do overlapping property rights reduce agricultural investment? Evidence from Uganda. *American Journal of Agricultural Economics* 90(4):869–884.
- Deininger, Klaus, Daniel A. Ali, Stein Holden, and Jaap Zevenbergen. 2008. Rural land certification in Ethiopia: Process, initial impact, and implications for other African countries. *World Development* 36(10):1786–1812.
- Deininger, Klaus, Daniel A. Ali, and Takashi Yamano. 2008. Legal knowledge and economic development: The case of land rights in Uganda. *Land Economics* 84(4):593–619.
- Deininger, Klaus, and Raffaella Castagnini. 2006. Incidence and impact of land conflict in Uganda. *Journal of Economic Behavior and Organization* 60(3):321–345.
- Deininger, Klaus, and Juan Sebastian Chamorro. 2004. Investment and income effects of land regularization: The case of Nicaragua. *Agricultural Economics* 30(2):101–116.
- Deininger, Klaus, and Songqing Jin. 2006. Tenure security and land-related investment: Evidence from Ethiopia. *European Economic Review* 50(5):1245–1277.
- . 2008a. Land sales and rental markets in transition: Evidence from rural Vietnam. *Oxford Bulletin of Economics and Statistics* 70(1):67–101.
- . 2008b. Securing property rights in transition: Lessons from implementation of China's rural land contracting law. *Journal of Economic Behavior and Organization*, forthcoming.
- Deininger, Klaus, Songqing Jin, and Hari K. Nagarajan. 2006. Gender discrimination and the returns to self employment: Evidence from rural India. World Bank Policy Research Working Paper, Washington, DC.
- Deininger, Klaus, Eduardo Zegarra, and Isabel Lavadenz. 2003. Determinants and impacts of rural land market activity: Evidence from Nicaragua. *World Development* 31(8):1385–1404.
- De Meza, David, and John P. Gould. 1992. The social efficiency of private decisions to enforce property rights. *Journal of Political Economy* 100(3):561–580.
- de Soto, Hernando. 2000. *The mystery of capital: Why capitalism triumphs in the West and fails everywhere else*. New York: Basic Books.
- . 2002. Rejoinder to Mathieu. *Forum for Development Studies* 29(2):376–388.
- Di Tella, Rafael, Sebastián Galiani, and Ernesto Schargrotsky. 2007. The formation of beliefs: Evidence from the allocation of land titles to squatters. *Quarterly Journal of Economics* 122(1):209–241.
- Do, Quy Toan, and Lakshmi Iyer. 2008. Land titling and rural transition in Vietnam. *Economic Development and Cultural Change* 56(3):531–579.
- Dowall, David E., and Michael Leaf. 1992. The price of land for housing in Jakarta. In *Spatial development in Indonesia, review and prospects*, ed. K. A. Kim. Avebury, England: Aldershot.
- Dower, Paul, and Elizabeth Potamites. 2005. Signaling credit-worthiness: Land titles, banking practices and access to formal credit in Indonesia, mimeo.
- Durand-Lasserve, Alain, and Lauren Royston. 2002. *Holding their ground: Secure land tenure for the urban poor in developing countries*. London: Earthscan Publications.
- Ellickson, Robert C. 1993. Property in land. *Yale Law Journal* 102(6):1315–1400.
- Feder, Gershon, Yongladaron Chalamwong, Tongroj Onchan, and Chiwa Hongladarom. 1988. *Land policies and farm productivity in Thailand*. Baltimore and London: Johns Hopkins University Press.

- Feder, Gershon, and David Feeny. 1991. Land tenure and property rights: Theory and implications for development policy. *World Bank Economic Review* 5(1):135–153.
- Feder, Gershon, and Akihiko Nishio. 1999. The benefits of land registration and titling: Economic and social perspectives. *Land Use Policy* 15(1):143–169.
- Fenoaltea, Stefano. 1976. Risk, transaction costs, and the organization of medieval agriculture. *Explorations in Economic History* 13(2):129–151.
- Field, A. J., Erica Field, and Maximo Torero. 2006. Property rights and crop choice in rural Peru, 1994–2004. MTID Discussion Paper 100, International Food Policy Research Institute, Washington, DC.
- Field, Erica M. 2003. Fertility responses to land titling: The roles of ownership security and the distribution of household assets, mimeo. Cambridge, MA: Harvard University.
- . 2005. Property rights and investment in urban slums. *Journal of the European Economic Association* 3(2–3):279–290.
- . 2007. Entitled to work: Urban property rights and labor supply in Peru. *Quarterly Journal of Economics* 122(4):1561–1602.
- Field, Erica, and Maximo Torero. 2006. Do property titles increase credit access among the urban poor? Evidence from a nationwide titling program, mimeo. Cambridge, MA: Harvard University.
- Firmin-Sellers, Kathryn. 2000. Custom, capitalism, and the state: The origins of insecure land tenure in West Africa. *Journal of Institutional and Theoretical Economics* 156(3):513–530.
- Fitzpatrick, Daniel. 2005. “Best practice” options for the recognition of customary tenure. *Development and Change* 36(3):449–475.
- Fort, Ricardo. 2007. *Property rights after market liberalization reforms: Land titling and investments in rural Peru*. Wageningen, NL: University of Wageningen.
- Fred-Mensah, Ben K. 1999. Capturing ambiguities: Communal conflict management alternative in Ghana. *World Development* 27(6):951–965.
- Friedman, Joseph, Emmanuel Jimenez, and Stephen K. Mayo. 1988. The demand for tenure security in developing countries. *Journal of Development Economics* 29(2):185–198.
- Galiani, Sebastian, and Ernesto Schargrotsky. 2004. Effects of land titling on child health. *Economics and Human Biology* 2(3):353–372.
- . 2005. Property rights for the poor: Effects of land titling. Documento de Trabajo 06/2005, Universidad Torcuato Di Tella, Centro de Investigación en Finanzas, Buenos Aires, Argentina.
- Goldstein, Markus, and Christopher Udry. 2006. The profits of power: Land rights and agricultural investment in Ghana. Economic Growth Center Working Paper 929, Yale University, New Haven, CT.
- Gordillo, Gustavo de Anda, Alain de Janvry, and Elisabeth Sadoulet. 1998. Between political control and efficiency gains: The evolution of agrarian property rights in Mexico. *CEPAL Review* 66:151–169.
- Gould, Kevin. 2006. Land regularization on agricultural frontiers: The case of North-western Peten, Guatemala. *Land Use Policy* 23(2):395–407.
- Government of Kenya. 2004. *Report of the Commission of Inquiry into the Illegal/Irregular Allocation of Public Land*. Nairobi: Government Printer.
- Government of Mexico. 2000. *Marco legal agrario. Edición conmemorativa—reforma agraria 1915–2000*. Mexico, D.F.: Procuraduría Agraria.

- Griffith-Charles, Charise. 2004. The impact of land titling on land transaction activity and registration system sustainability: A case study of St. Lucia. Ph.D. diss., University of Florida.
- Grossman, Herschel I., and Juan Mendoza. 2001. Butter and guns: Complementarity between economic and military competition. *Economics of Governance* 2(1):25–33.
- Henrysson, Elin, and Sandra F. Joireman. 2007. On the edge of the law: The cost of informal property rights adjudication in Kisii, Kenya. Working paper, Wheaton College, Wheaton, IL.
- Holden, Stein, Klaus Deininger, and Hosaena Ghebru. 2008a. Land certification, land related investment, and productivity in Tigray, Ethiopia. Working paper, Norwegian University of Life Sciences, Aas, Norway.
- . 2008b. Low-cost land certification and land rental market participation in Tigray, Ethiopia. Working paper, Norwegian University of Life Sciences, Aas, Norway.
- Holden, Stein, and Hailu Yohannes. 2002. Land redistribution, tenure insecurity, and intensity of production: A study of farm households in southern Ethiopia. *Land Economics* 78(4):573–590.
- Hunt, Diana. 2004. Unintended consequences of land rights reform: The case of the 1998 Uganda Land Act. *Development Policy Review* 22(2):173–191.
- Jacoby, Hanan, Guo G. Li, and Scott Rozelle. 2002. Hazards of expropriation: Tenure insecurity and investment in rural China. *American Economic Review* 92(5):1420–1447.
- Jacoby, Hanan, and Bart Minten. 2007. Is land titling in sub-Saharan Africa cost effective? Evidence from Madagascar. *World Bank Economic Review* 21(3):461–485.
- Jansen, Kees, and Esther Roquas. 1998. Modernizing insecurity: The land titling project in Honduras. *Development and Change* 29(1):81–106.
- Johnson, Simon, John McMillan, and Christopher Woodruff. 2002. Property rights and finance. *American Economic Review* 92(5):1335–1356.
- Joireman, Sandra F. 2008. The mystery of capital formation in sub-Saharan Africa: Women, property rights and customary law. *World Development* 36(7):1233–1246.
- Kaganova, Olga, and James McKelar. 2006. *Managing government property assets: International experiences*. Washington, DC: Urban Institute Press.
- Kato, Elisabeth 1998. *We have rights, they have power. A case study of land expropriation in northwest Cambodia*. Phnom Penh: Oxfam Land Study Project.
- Kazianga, Haroun, and William A. Masters. 2006. Property rights, production technology, and deforestation: Cocoa in Cameroon. *Agricultural Economics* 35(1):19–26.
- Kung, James Kai-Sing. 2002. Off-farm labor markets and the emergence of land rental markets in rural China. *Journal of Comparative Economics* 30(2):395–414.
- Lanjouw, Jean O., and Philip I. Levy. 2002. Untitled: A study of formal and informal property rights in urban Ecuador. *Economic Journal* 112(482):986–1019.
- Lavigne-Delville, Philippe. 2000. Harmonising formal law and customary land rights in French-speaking West Africa. In *Evolving land rights, policy and tenure in Africa*, ed. C. Toulmin and J. Quan. London: DFID/IIED/NRI.
- Lavigne-Delville, P., Camilla Toulmin, Jean-Philippe Colin, and Jean-Paul Chauveau. 2002. *Negotiating access to land in West Africa: A synthesis of findings from research on derived rights to land*. London: IIED/GRET.

- Leuprecht, Peter. 2004. Land concessions for economic purposes in Cambodia: A human rights perspective. Report by the Special Representative of the Secretary General for Human Rights in Cambodia. Phnom Penh: United Nations, Cambodia Office of the High Commissioner for Human Rights.
- Lobo, Albert, and Surseh Balakrishnan. 2002. Report card on service of bhoomi kiosks: An assessment of benefits by users of the computerized land records system in Karnataka. Working paper, Public Affairs Centre, Bangalore.
- Lueck, Dean, and Thomas Miceli. 2006. Property law. Discussion Paper 06-19, Arizona Legal Studies, University of Arizona, Tucson.
- Mabogunje, Akin L. 1992. Perspective on urban land and urban management policies in sub-Saharan Africa. World Bank Technical Paper No. 196, Africa Technical Department Series, Washington, DC.
- Macours, Karen, Alain de Janvry, and Elisabeth Sadoulet. 2004. Insecurity of property rights and matching in the tenancy market. Working Paper 992, Berkeley: Department of Agricultural and Resource Economics, University of California, Berkeley.
- Malik, Arun, and Robert M. Schwab. 1991. Optimal investments to establish property rights in land. *Journal of Urban Economics* 29(295):309.
- Mathieu, Paul. 2002. Security of land tenure papers and unleashing grass-root investment for rural development in Africa: Some comments. *Forum for Development Studies* 29(2):367–372.
- McCloskey, David N. 1975. *The persistence of English common fields*. Princeton, NJ: Princeton University Press.
- McKenny, Bruce, and Prom Tola. 2002. Natural resources and rural livelihoods in Cambodia: A baseline assessment. Working Paper 23, Cambodia Development Resource Institute, Phnom Penh.
- Meinzen-Dick, Ruth, and Ester Mwangi. 2009. Cutting the web of interests: Pitfalls of formalizing property rights. *Land Use Policy* 26(1):36–43.
- Mushinski, David W. 1999. An analysis of offer functions of banks and credit unions in Guatemala. *Journal of Development Studies* 36(2):88–112.
- Nettle, Kevin. 2006. Titles vs. deeds: International experience and implications for India. Paper presented at the MoRD/World Bank Workshop on Land Policies for Accelerated Growth and Poverty Reduction in India, New Delhi.
- Nugent, Jeffrey B., and James A. Robinson. 2002. Are endowments fate? CEPR Working Paper 3206, London.
- Panda, Pradeep, and Bina Agarwal. 2005. Marital violence, human development and women's property status in India. *World Development* 33(5):823–850.
- Pande, Rohini, and Christopher Udry. 2005. Institutions and development: A view from below. Working Paper 928, Yale University, Economic Growth Center, New Haven, CT.
- Payne, Geoffrey, Alain Durand-Lasserve, and Carol Rakodi. 2008. *Social and economic impacts of land titling programmes in urban and peri-urban areas: International experience and case studies of Senegal and South Africa*. Oslo and Stockholm: SIDA and Norwegian Ministry of Foreign Affairs.
- Peters, Pauline. 2004. Inequality and social conflict over land in Africa. *Journal of Agrarian Change* 4(3):269–314.
- Powelson, John P. 1988. *The story of land: A world history of land tenure and agrarian reform*. Cambridge, MA: Lincoln Institute of Land Policy.

- Quisumbing, Aagnes R., and John A. Maluccio. 2003. Resources at marriage and intra-household allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistics* 65(3):283–327.
- Rozelle, Scott, and Johan F. M. Swinnen. 2004. Success and failure of reform: Insights from the transition of agriculture. *Journal of Economic Literature* 42(2):404–456.
- Schweigert, Thomas E. 2007. Land title, tenure security, investment and farm output: Evidence from Guatemala. *Journal of Developing Areas* 40(1):115–126.
- Shavell, Steven. 2003. Economic analysis of property law. NBER Working Paper 9695, National Bureau of Economic Research.
- Siamwalla, Ammar. 1990. The Thai rural credit system: Public subsidies, private information, and segmented markets. *World Bank Economic Review* 4(3):271–295.
- Sjaastad, Espen, and Daniel W. Bromley. 1997. Indigenous land rights in sub-Saharan Africa: Appropriation, security and investment demand. *World Development* 25(4):549–562.
- . 2000. The prejudices of property rights: On individualism, specificity, and security in property regimes. *Development Policy Review* 18(4):365–389.
- Stiglitz, Joseph E., and Andrew Weiss. 1981. Credit rationing in markets with imperfect information. *American Economic Review* 71(3):393–410.
- Transparency International India. 2005. India corruption study 2005. New Delhi: Transparency International.
- Udry, Christopher. 1996. Gender, agricultural production, and the theory of the household. *Journal of Political Economy* 104(5):1010–1046.
- UNECE. 1996. *Land administration guidelines, with special references to countries in transition*. ECE/HBP/96. New York and Geneva: United Nations Economic Commission for Europe.
- Vogl, Tom S. 2007. Urban land rights and child nutritional status in Peru, 2004. *Economics and Human Biology* 5(2):302–321.
- World Bank. 2002. *Mexico—land policy: A decade after the ejido reforms*. Washington, DC: The World Bank, Rural Development and Natural Resources Sector Unit.
- . 2007. *Doing business 2008*. Washington, DC: World Bank, International Finance Corporation, and Oxford University Press.
- Yang, Dennis T. 1997. China's land arrangements and rural labor mobility. *China Economic Review* 8(2):101–115.
- Zepeda, Guillermo. 2000. *Transformación agraria. Los derechos de propiedad en el campo Mexicano bajo el Nuevo Marco Institucional*. CIOAC, Mexico, Mexico City.