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The benefits of land registration and titling: economic and social perspectives

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There is convincing evidence from around the world that land registration has led to better access to formal credit, higher land values, higher investments in land, and higher output/income. However, there are prerequisites for land registration to be economically viable, and social aspects which need to be considered when designing a land registration system. Further studies are warranted on some emerging issues.

Keywords: **land registration, land titling, tenure security, land rights**

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Land registration is only a means to an end. It is not an end in itself. Much time, money, and effort can be wasted if that elementary truth be forgotten. (Simpson, 1976)

Preoccupation with land, and with arrangements pertaining to land use and possession, has been common in most cultures since the dawn of history. It is thus appropriate to begin this paper, which deals with the rationale and implications of land registration and titling, with relevant references in one of mankind's most ancient documents: the Bible.

Some 3700 years ago, the patriarch Abraham, who was a wealthy livestock owner without land, needed to acquire a tract of land for the purpose of burying his departed wife. He identified a suitable site (which included a cave—a prized burial place in those days), and suggested to the owner, Efron the Hittite, that he should sell it to him. Abraham declined an offer from Efron of free use of the land, and insisted on paying for it, apparently because he wanted to establish, through the payment of money, his (and his heirs') unchallenged ownership. Furthermore, the actual payment took place at the city gate, a traditional public meeting place, in front of the city notables and with many citizens witnessing the transfer of possession (Genesis 23). The emphasis placed on witnesses and publicity stems from an issue which is still relevant in today's land transactions: the need to verify who owns land being sold, so that there will be no risk of future challenges which may cause the buyer costs or even loss of property.

While conducting transactions in the public domain resolves some of the risk, it is not an efficient arrangement, especially when the volume of transactions becomes large. It is thus not surprising that the next detailed description of a land transaction provided by the Bible, taking place more than a thousand years after the time of Abraham, refers to a much more sophisticated system of certifying land ownership and recording transactions. The Bible tells of the prophet Jeremiah (7th century B.C.), who bought a tract of land from his cousin. This time, in addition to the

presence of some witnesses, the transaction was recorded in two copies of a written deed, where all terms and conditions were specified. One deed was sealed, the other one was left open, and both copies were deposited with a certain priest of the central temple, who kept them in an earthen jar so 'that they may continue many days' (Jeremiah 32). Evidently, the earthen jar, under the care of the appointed priest, served as the repository of land records (in the form of deeds certified by witnesses).

The prophet Jeremiah, even though he bought land from a presumably trusted cousin, insisted on a written deed so that if any future challenge were to be brought against his ownership, he could document his ownership. Similarly, if he was ever to sell that tract of land, he would have a certification of ownership (guarded by a priest, apparently because priests were trusted not to allow tampering with documents as they would not take bribes).

The above references from the Bible provide testimony to the fact that demand for land registration has emerged in various societies as population growth, advances in land-use technology, and increased trade made it necessary for property rights on land to be documented and enforced (Binswanger *et al.*, 1995).

Many developing countries consider land registration to be a high priority in their quest to develop their economies. Transitional economies have been particularly interested in land registration, as they endeavor to become more market-based. It would be useful for decision-makers in developing countries to understand clearly the extent and nature of benefits which can reasonably be expected from land registration, since they must allocate their scarce resources across different uses based on their expected benefits. Answers to some fundamental questions on the economic benefits would be particularly useful, in making objective decisions about investing in land registration. For instance, what are the gains in agricultural productivity a country would obtain from land registration, and how would these gains measure up against benefits from extension services for example? As will be demonstrated in the empirical section of this paper, land registration systems can have large economic and social impacts, under the right set of circumstances, and should be considered as a key form of public investment.

However, for something which has been vigorously practiced for thousands of years around the world, there has been relatively little analytical work done on the economic benefits of land registration until the last decade. The aim of this paper is to revisit a conceptual framework for the economic benefits of land registration, take stock of the empirical work on the benefits of land registration, then list some policy implications in terms of when should land registration become a priority and what are the key considerations for a socially equitable land registration program.

Economics of land registration: a conceptual framework

It would be useful to start with a conceptual framework for economics of land registration. Such a framework was first developed in the context of a study on rural Thailand (Feder *et al.*, 1988). Two sources of linkage between titles and economic performance are highlighted, namely the effect of titles in enhancing tenure security, and the role of titles in collateral arrangements, facilitating access to institutional credit.

The productivity of land in any of its uses (whether agricultural or urban/commercial) is dependent on complementary investments in the

form of drainage, structures, clearing of stones and trees, and other improvements. By their nature, these investments yield benefits over time, while the expense of cost and effort is borne up-front. The incentive to undertake these investments is thus affected significantly by the expectations regarding the length of the horizon over which the investor might reap the benefits. These expectations, in turn, depend on the risk of challenges to the investor's possession of the land, whether through ownership disputes, eviction, or expropriation by government. These risks are referred to commonly as 'tenure insecurity'. Registration systems and land titles have emerged in mankind's history as an institutional arrangement to reduce such insecurity. With ownership officially documented and verified, the risk of challenges to ownership is reduced, and the likelihood of having to incur high costs in defending one's possession of land is lower, incentives to invest are enhanced, and land productivity is increased.

Credit transactions are inherently risky, as the lender provides cash in advance against a promise of repayment (with interest) over time. Lenders have typically less information than the borrower regarding the prospects of the loan being repaid in full and in a timely fashion, hence the emergence of collateral arrangements where fixed assets, most often land, are used as a guarantee for loan repayment. For land to serve as a collateral, the lender must be assured that the borrower is indeed the owner, and thus a secure title is needed to mortgage land, especially when borrowing from formal lending institutions which often have imperfect information on the borrower. While borrowers without a secure title can borrow from informal lenders without using land as collateral, such informal credit is typically much more expensive than formal credit, usually small in amount, and mostly limited to short-term loans. A farmer lacking a secure title therefore faces a constraint in increasing productivity and output. A major source of economic benefit from land registration could therefore be the removal of this constraint. In fact, in the Thai study referred to above, farmers expressed that the main benefit they perceived in secure titles was the access to credit that they would gain. By obtaining credit at a lower cost and higher amount, the newly titled farmer can now increase investment and input use, leading to higher productivity per unit of land. The higher productivity of land then leads to an increase in the unit price of land, as the price of land broadly reflects the capitalized value of the stream of incomes (or residential services) which it provides. The above conceptual framework for economics of land registration, confirmed through econometric analysis as described in the next section, is shown graphically in Figure 1.

While the above framework provides a rationale for land registration and titling arrangements based on the increases in the productivity per unit of land, there is another aspect by which such systems provide economic benefits to society. At any given point in time, the distribution of land ownership or possession does not necessarily coincide with the distribution of skills and means to make the best economic use of land. It is thus possible that the productivity of land under its present holder is lower than the productivity it would have under a different operator, who may have better skills, or the means to invest in complementary improvements. Land sales and rentals normally resolve these temporary inefficiencies in land allocation, as those with potentially higher-value uses for land are able to offer a price (or a rental income) which is higher than the capitalized value of the land to the present (low-value) user, thus inducing an exchange of ownership or possession, and ultimately an increase in productivity.

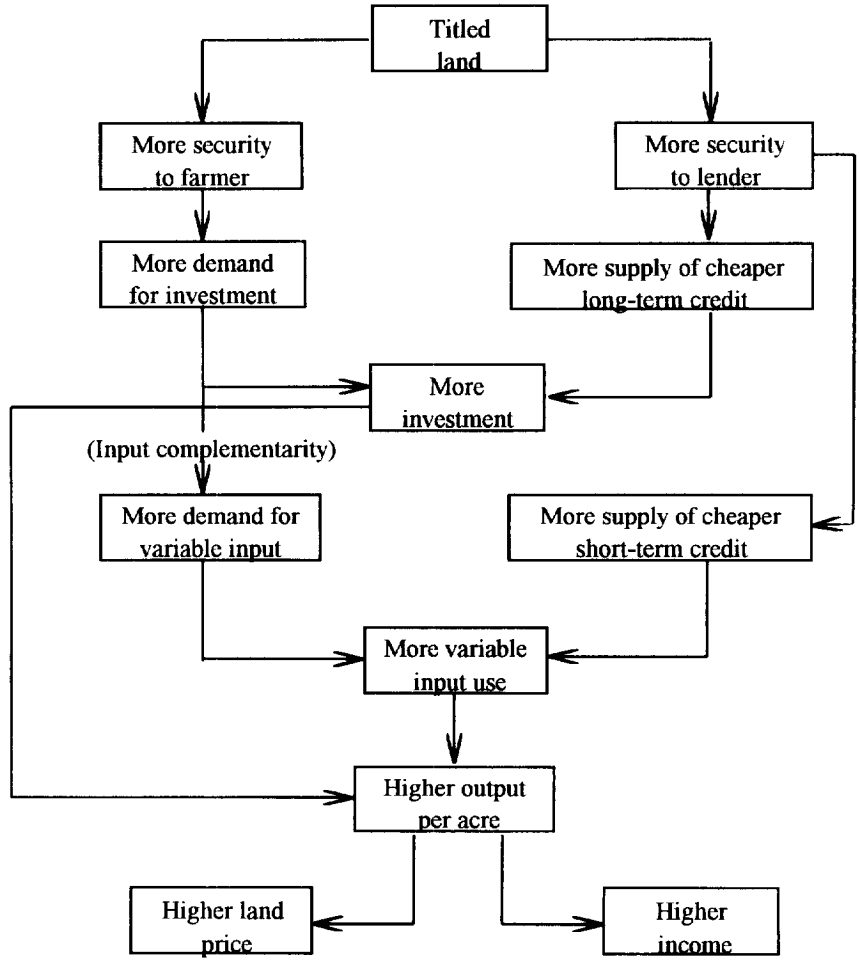

Figure 1. Land ownership security and farm productivity: a conceptual framework

Whereas land transactions have been taking place since the dawn of history, the extent of such transactions is affected by the asymmetry of information between buyers and sellers. As long as transactions are mostly between individuals who are members of the same community, information is quite symmetric and the buyer can easily establish whether the seller has indeed the right to sell. Customary systems usually evolve to handle transactions within the community, and they can function effectively. But as land markets expand and transactions increase between individuals who are not closely related, uncertainty over the entitlement of an owner to transfer land rights becomes increasingly relevant. One way to reduce or eliminate ownership uncertainty, and thereby improve market efficiency, is to provide landowners with titles, backed by a legal system capable of enforcing those property rights (Feder *et al.*, 1988). In the absence of such arrangements, the uncertainty faced by potential buyers reduces the volume of demand for land, and depresses the offer price of land. As registration systems and titling largely eliminate the uncertainty, they facilitate more transactions and ultimately induce a better allocation of land and a higher level of economic well-being.

It needs to be added, however, that the above model only provides a general framework, and the extent to which it applies to a given country depends largely on the policies, traditions, culture and other specific factors.

The above sources of land registration benefits, especially in terms of how they manifest themselves on the ground, are discussed further in the next section. The policy implications of land registration, including the prerequisites for its economic viability and the social aspects of land registration programs, are then discussed in the subsequent section.

Economics of land registration: empirical evidence

Literature on the economic benefits of land registration

The analytical discussion of the economic benefits of land titling and registration has evolved from earlier theoretical discussion and descriptive statistics to increasingly more rigorous quantitative analysis. The last decade, in particular, has seen a significant world-wide effort by many researchers to quantify the economic benefits of secure ownership in general, and land registration systems in particular. The quantification of economic impacts is of much importance to policy-makers, as there are various potentially worthy targets for public spending.

Some of the early literature highlighted the effect of land titling on access to formal credit, since a land title is often a mandatory precondition for commercial or official bank loans (Wai, 1957; Sacay, 1973; Dorner and Saliba, 1981; Collier, 1983; Aku, 1986). Panandikar (1956) illustrated the interest payment savings realized through land registration, through an example of lenders charging 8 to 16% on secured loans compared with 18 to 37.5% on unsecured loans, in some parts of India. However, until the late 1980s, there was little quantitative analysis on the link between secure land tenure and the use of credit.

The impact of land registration on investment has also been discussed. Salas *et al.* (1970) found that, in Costa Rica, positive correlations (in the range of 0.40 to 0.67) existed between the degree of ownership security and farm investment per unit of land. Villamizar (1984) found that, in three Brazilian states, investment per hectare is substantially greater on titled land than on undocumented or encroached land. Survey results from Jamaica indicate that the incidence of permanent and semi-permanent crops was substantially higher among titled farmers than among untitled farmers—almost twice as high. Indeed, a third of the recipients of titles under a government program reported that following the change in their status they planted more permanent and semi-permanent crops than they did before the initiation of the project (IDB, 1986).

Some studies have discussed the relationship between land registration and output or income. Mosher (1966) asserted that tenure insecurity is an important source of low productivity in agriculture. Salas *et al.* (1970) estimated a positive correlation of 0.53 between income per unit of land and security of ownership, in one province in Costa Rica. A study conducted by IDB (IDB, 1986) concluded that granting full legal ownership to squatters and undocumented occupiers in the state of Maranhão in Brazil increased their income by about 200%. The same study also found that income levels of titled farmers in Ecuador were twice those of untitled farmers, when the amount of land owned was held constant.

The level of econometric rigor of these earlier studies, however, was not adequate to support a firm conclusion on the magnitude of the economic impact generated by land registration systems, as the influence of other factors affecting economic performance was not fully controlled in the analyses. The above literature was therefore followed by a series of detailed, country-specific and empirical studies which were conducted from

the mid-1980s, where the economic benefits of land registration were analyzed using more rigorous quantitative methods. These are reviewed below.

The case of rural Thailand

One of the first detailed, empirical works on the economic benefits of land registration was the study on rural Thailand (Feder *et al.*, 1988). The study used econometric analysis to compare the economic performance of two groups of farmers: those without legal titles who operate in forest reserve areas, and another group of farmers with legal titles operating outside the forest reserve boundaries. Study sites were selected carefully in four provinces,[1] so that the two groups within a site operated in geographical proximity, and within a similar agroclimatic environment.

The effect of land registration on farmers' access to credit was clearly established, as shown in Table 1. It shows that, when taking into account both the direct effect of land being available as collateral and the indirect effect of greater land value resulting from a title, titled farmers who provide land as collateral are offered significantly more institutional credit than untitled farmers. Farmers with legal titles had access to 52–521% more institutional credit than those without.

Differences in economic performance between titled and untitle farmers were also clearly established, as summarized in Table 2. Per unit of land, titled farmers invested more in land, used more inputs, and generated higher output than untitled farmers. This translated into higher revenue (agricultural and non-agricultural) by 14.5 to 20.8%, and higher land price by 25.0 to 132.6%: these figures are roughly consistent with the availability of institutional credit depicted in Table 1.

Table 1. Thailand—effects of titled ownership on supply of institutional credit

Item	Province			
	Lop Buri	Nakhon Ratchasima	Koh-Kaen	Chaiyaphum
Percent difference between availability of institutional credit to titled farmers and to untitled farmers	52	171	148	521

Source: Feder *et al.* (1988).

Table 2. Thailand—differences in economic performance between untitled and titled farmers (ratios of the latter to the former)[a]

Indicator	Lop Buri	Nakhon Ratchasima	Koh-Kaen	Chaiyaphum
Capital stock per unit of land owned	1.044	2.050[b]	3.532[b]	1.559[b]
Probability of improving land by bunding	1.184	1.695[b]	1.411[b]	1.559[b]
Probability of improving land by stump clearing	1.123[b]	1.474[b]	1.293[b]	1.005
Labor days per unit of cropped land	1.147[b]	1.147[b]	1.052[b]	n.a.
Draft power expense per unit of cropped land	0.946	1.387[b]	1.269[b]	n.a.
Other input expenses per unit of cropped land	1.184	1.246[b]	1.348[b]	n.a.
Value of agricultural output per unit of cropped land	1.045	1.118[b]	1.267[b]	n.a.
Revenue from agricultural and non-agricultural activities	1.145[b]	1.127[b]	1.208[b]	n.a.
Value of land	1.250[b]	2.326[b]	2.128[b]	1.539[b]

[a]A ratio of 1 implies equal performance for titled and untitled farmers, a ratio of 2 implies a 100% difference. [b]Statistical significance at a 90% (one-tailed) confidence level. Source: Feder (1987).

[1]The province of Lop Buri on the fringe of the Central Plain, and the provinces of Nakhon Ratchasima, Khon-Kaen and Chaiyaphum in the northeast.

In order for the above analysis to be relevant for policy discussions, however, the benfits of land registration needed to be discussed in terms of social benefits, instead of benefits to individual farmers, and in comparison with the costs of land registration to be borne by the society. It was demonstrated in the study that, if the probability of eviction is higher than zero, the market price of untitled land is lower than its social value (the total discounted value of the gross social benefits to be generated from such land), since farmers are risk averse in the sense that they need incentives (price discounts) to buy *untitled* land. It was also demonstrated that the market price of *titled* land is higher than its social value, if there are distortions in financial markets which cause interest rates to be lower than the real cost of capital. The gross (percentage) increase in social welfare from registering land of a given quality was then calculated as a proportion of the market price of *untitled* land of the same quality, using the following formula:

$$\beta = (P_t/P_{nt})\theta - 1$$

where P_t and P_{nt} are the market prices of *titled* and *untitled* land respectively, and θ is a term less than 1 which summarizes various conversion factors needed to convert market prices into social prices by eliminating distortions.

By calculating θ (assuming that the real rate of interest is 12%) and using the estimated cost of land registration, the benefit/cost ratios of land registration in the four provinces were calculated to be as summarized in Table 3. These results indicate high rates of return to titling in the three northeastern provinces. The benefits would be much lower in the central province, for reasons explained earlier.

Land titling also stimulated land transactions. According to the Socio-Economic Valuation of the Land Titling Project, prepared by Kasetsart University in 1993 based on data collected in the four northern and northeastern provinces not covered under the above studies on rural Thailand, 3–4 years after the issuance of title deeds under the Land Titling Project, the land market was more active in the project area compared with the non-project area. The number of households engaged in land transactions after the project was 35–205% higher in the project area compared with the non-project area.

The case of urban Philippines

Jimenez (1984) compared unit housing prices between the non-squatter (formal) residential areas and the squatter (informal) areas in the city of Davao, the Philippines, to estimate the average premium for tenure security. Based on a sample of 3344 households, including 1505 in the informal sector and 1839 in the formal, the study concluded that unit housing prices in the formal sector are 58% higher than otherwise identical units in the informal sector. The difference in rent was lower at

Table 3 Thailand—net social benefits of ownership[a] (assuming risk aversion)

Province	Gross social benefit as % of P_{nt}	Social cost as % of P_{nt}	Net social benefit as % of P_{nt}	Mean price of untitled land (P_{nt})	Net social benefit (baht/rai)	Benefit/cost ratio
Nakhon Ratchasima	38.6	3.3	35.3	3448	1217	11.7
Khon-Kaen	42.1	3.5	38.6	3204	1237	12.0
Chaiyaphum	25.3	5.6	19.7	2014	397	4.5
Pooled northeast sample	35.1	4.1	31.0	2889	896	8.6

[a]1 rai = 0.16 hectare. Source: Feder (1987).

18%. These figures indicate that premia for tenure security do exist and are compatible with the results of the Thai study that focused on agricultural areas.

The case of urban Indonesia

A study by Dowall and Leaf (1990) analyzed the effect of, *inter alia*, tenure on residential plot prices, based on interviews with real estate brokers in Jakarta. Land prices were found to be affected strongly by the level of tenure security, as shown in Table 4. The security of tenure is classified into three categories: having a registered title; having no title but having a tax receipt (called *girik*) which is often used by the government as evidence of land right; and no title or tax receipt. Given the same level of infrastructure and the same distance from the city center, the higher the security of tenure, the higher the price. For instance, in areas classified as 'high infrastructure' and located 5.1–10 km from the city center, the parcels with registered titles carried prices 10.6% higher than those only with tax receipts, and 28.5% over those without either. The premium is higher for areas with generally higher price levels, i.e. areas with better infrastructure and areas closer to the city center.

The case of rural India

The econometric models used in Feder *et al.* (1988) were applied to measure the effects of transferable land rights on credit, land investment and land use in rural India (Pender and Kerr, 1994).

The study surveyed the poor rice-growing villages of Aurepalle and Dokur in Andra Pradesh, sampling 165 and 126 households respectively. To assess the benefits of land transferability, comparison was made between titled (transferable) land and 'assigned' land, which is land granted to the poor under the government's land distribution schemes (officially non-transferable, except to the heirs of the recipients). Econometric analysis showed that the land rights status, namely its transferability, has had little effect on investment or credit. In fact, differences between titled land and assigned land, in terms of credit use and investment, appear to be due mostly to differences in the quality of the land.

On the other hand, the study found that the land rights status affects land values significantly: assigned land is worth 15% less than titled land of comparable quality, owing to lack of transferability.

These results are thus not fully internally consistent, although the explanation offered by the paper is consistent with the conceptual model

Table 4. Indonesia—variation in residential plot prices in Jakarta according to title status, 1989 (index numbers)

Distance from city center (km)	Registered titles	Tax receipts	Unregistered titles without tax receipts
High infrastructure			
0–5	222	174	140
5.1–10	89	81	69
10.1–15	42	36	34
Over 15	21	17	18
Overall	**86**	**68**	**63**
Low infrastructure			
0–5	174	139	100
5.1–10	62	54	44
10.1–15	19	19	19
Over 15	12	9	8
Overall	**60**	**46**	**40**

FSource: Dowall and Leaf (1990), converted to index numbers.

put forth in Feder *et al.* (1988) and described in the section on economics of land registration. In a nutshell, the paper submits that transferable rights have had little effect on credit and investment because formal credit is rarely available in these areas (while informal credit is abundant), and consequently formal credit is largely irrelevant to marginal decisions about investment. This explanation is consistent with a specific finding in Feder *et al.* (1988), that the impact of title was relatively unimportant in one study area where informal lending was predominant. The difference in land values suggests, however, that there is a premium for the transferability, while the investment effect may be too small to be detected by the econometric work.

Experiences in Latin America and the Caribbean

Recently, studies on the effect of land registration on agricultural productivity have been conducted in three Latin American countries: Honduras (López, 1996) and Paraguay (Carter and Olinto, 1996), and Brazil (Alston *et al.*, 1996).

The Honduras paper is based on surveys of 450 farm households in the Departments of Santa Barbara and Comayogua, conducted first in 1983 and then in 1994, to see the difference in economic performance between those who had titles even in 1983, those who received titles under a USAID-financed land titling project after 1983, and those who were not titled by 1994. Its findings echo the Thailand report (Feder *et al.*, 1988).

First, the total average annual investment over the 1983–1993 for the USAID-titled farmers (Lps. 1730 or US$ 270)[2] was more than twice the level of the investment by the untitled farmers (Lps. 797 or US$ 124), as shown in Table 5. It is also worth noting that the difference in investment between the two types of farmer is more strongly significant for investments attached to land[3] (116.5% higher for those titled after 1983) than for non-attached investments.[4] The USAID-titled farmers invested more in attached investment than untitled farmers (significant at 5 and 1% levels), while the difference for non-attached investment was barely significant at 10%.

Second, USAID-titled farmers had far greater access to credit, both in terms of the proportion of farmers who received credit (30% compared with 22%) and the average amount of credit received (Lps. 4568 compared with Lps. 1008), as shown in Table 6. As was the case in the Thailand study, most of the difference was accounted for by the difference in the access to institutional credit: in fact 85.3% of the difference in the average credit amount of these two types of farmer was accounted for by the difference in the amount of institutional credit received.

[2]Lempira, the Honduran currency. Exchange rate: 6.4 Lempiras per US dollar.
[3]Attached investment includes trees, fences, concrete patio for coffee drying and sinks.
[4]Non-attached investment includes plows, pumps and trucks.

Table 5. Honduras—household investment by land security status, 1983–1993

	Land security status				
	Untitled $N = 186$	**TEST[a] H_0 = means of untitled and titled after 1983 are equal**	**Titled after 1983 $N = 193$**	**TEST[a] H_0 = means of titled after and before 1983 are equal**	**Titled before 1983 $N = 48$**
Total investment	797.2	**	1729.9	**	3619.8
Attached investment	486.9	**	1054.3	**	1860.0
Non-attached investment	310.4	**	675.6	**	1759.8
Total investment as proportion of income (%)	8.5		11.0		7.2

[a]Test of difference of means: *5% confidence level. **10% confidence level. Source: López (1996).

Table 6. Honduras—credit received in 1992 and 1993 by land security status

	Land security status				
	Untitled $N = 181$	**TEST[a] H_0 = means of untitled and titled after 1983 are equal**	**Titled after 1983** $N = 178$	**TEST[a] H_0 = means of untitled and titled after 1983 are equal**	**Titled before 1983** $N = 43$
Proportion of farmers receiving credit (%)	22.1	**	29.0		35.4
Credit per farmer (in 1993 Lempiras)					
From all sources	1008.1	**	4567.8	*	9217.1
Institutions	910.5	**	3946.6		7571.2
Informal money-lenders and merchants	55.6		466.8		1333.3
Informal family and friends	41.9	*	154.4		312.5

[a]Test of difference of means: *5% confidence level, **10% confidence level. Source: Lopez (1996).

To net out any bias which may have existed in selecting farmers under the USAID land titling project, the study also examined those farmers' characteristics which were statistically similar between the USAID-titled and untitled farmers in 1983, but became statistically different in 1993. It was found that yields and credit received belonged to such a category. While average yield differences were not statistically significant in 1983, the differences widened and became statistically significant at 5% in 1993. As for credit, untitled farmers did not experience any increase during 1983–1993, while the USAID-titled farmers received in 1993 more than twice the amount they got in 1983. The above statistical analysis strengthens the case for a causal relationship between land registration and yields/credit.

The study goes on to calculate rates of return from land registration, by defining the returns to be gains made in household income associated with improved efficiency in the use of purchased inputs, due to improved access to credit, and also in potential gains of increasing capital attached to land induced by land registration—similar to the economic benefits of land registration as defined in Feder *et al.* (1988). Assuming the land registration cost of US$ 600 per title, the rate of return was calculated to be 17%, which is significantly higher than the real lending rate in Honduras and also higher than the actual average rates of return of World Bank projects implemented over the last 15 years, which is 14%. These findings are consistent with the conceptual framework for the economic benefits of land registration, presented in Figure 1: improved access to institutional credit, more investment (particularly land-attached investment), more variable input use, higher yields and higher farm income.

The Paraguay study, based on surveys of 300 farm households conducted in 1991 and 1994, also found that land registration increased land-attached investment, and enhanced the supply of credit. The main empirical finding was the significant effect of land titles on the productivity with which the agricultural resource base is utilized, when controlling for both the observable and latent characteristics of farms and farmers with title. The study econometrically decomposed the gross economic effect of title, and established a pattern in which land title both enhanced the demand for investment in capital goods attached to land, and relaxed the credit constraint estimated to bind over 90% of the farms in the sample. The analysis thus confirms both the investment demand and credit supply effects of land titling. The paper also submits that land titling tends to enhance formal credit supply only for larger-scale producers—in other words, other factors (e.g. transaction costs, wealth-biased quantity rationing) appear to constrain credit access by small farmers.

The study in Brazil (Alston *et al.*, 1996) utilized a cross-section survey of 206 farm households in the Brazilian state of Para, as well as aggregate census data for the states of Para and Parana in the period 1940–1985, where the unit of observation is a *municipio* (district). The analysis sought, among other things, to establish the impact of formal titles on land values and on farm investment. The results of the household survey confirmed (with high level of statistical significance) that titled land is more valuable than untitled land, although the difference in value due to titles declines as the location of the farm is further away from the market center:[5] Titled land of a given agricultural quality at the market center has a 189% higher value than untitled land at the same location. At a distance of 40 km from the market center, the difference in value is 72%, and at a distance of 140 km the difference in value is 45%. Because the analysis controls for the impact of investments on land value, the title variable essentially reflects the gain in value due to increased exchange opportunities and lower costs of enforcing ownership.

The household data also confirm that the impact of secure title on farm investment is significant: titled land had a higher share (by 21–48%) of the area devoted to pastures and permanent crops (requiring fencing and land improvements). The authors thus conclude that 'title plays a very important role in promoting investments in land improvements' (Alston *et al.*, 1996, p. 51).

The results of the aggregate district data in Brazil are not uniformly conclusive for the two states over time but, by-and-large, they are compatible with the hypothesis that titles induce greater farm investment, and increase land value.

A study on Peru by De Soto (1989) illustrates the case of a widely used, but not very effective informal system. According to the study, 69% of houses built in Lima, Peru in 1985 were 'governed by the extra-legal system', due largely to the high costs of engaging the legal system. However, the 'extra-legal system' offers much less tenure security than the legal system: the same paper estimates that 13% of the lots recognized in informal settlements are in litigation. There is little wonder then as to why an average value of buildings on titled lots was nine times that of buildings on untitled lots. It would seem, therefore, that there is much to be gained, economically and socially, by increasing the coverage of the formal land registry.

The cases of rural Africa

Whereas the above studies in Asia, Latin America and the Caribbean make a clear and consistent case for land registration as an economic proposition, the picture emanating from various studies in Africa has been mixed. A comparative study of ten rainfed agriculture regions in Ghana, Rwanda and Kenya, based on farm surveys conducted during 1987–1988 (Migot-Adholla *et al.*, 1991), found that land registration did not have a clear impact on productivity, land improvements or credit access in these areas. The paper underlines the output constraints faced by these African regions in terms of physical infrastructure, effective credit systems and marketing institutions. The paper concludes that land registration is 'unlikely to be economically worthwhile for much of Sub-Saharan Africa at this stage of economic development', except in certain cases where indigenous tenure systems are weak, where the incidence of land disputes in high, or where major project interventions are planned and require full privatization of land rights for their success.

[5]The same pattern is observable in the data from the study in urban Indonesia reported above.

The work by Besley (1995) qualified the above conclusions, by reanalyzing some of the data collected for the above study by Migot-Adholla *et al.* (1991). Comparing data from two very different regions in Ghana, Wassa (largely agricultural and the most common form of land improvement is tree planting) and Anloga (where population density is higher and the economy is less dependent on agriculture), the study found that land improvements in Wassa (in the form of tree planting) were significantly related to land rights, whereas land improvements in Anloga (in terms of draining, continuous manuring, excavating land, irrigating, mulching and making shallot beds) had no such relationship with land rights.

This finding for Wassa was achieved by generating a variable representing the stock of past investment in trees (based on the number of times the owner has planted trees on the field), to 'pick up unmeasured field-specific characteristics and crudely capture a stock adjustment process'. Using this approach, it was found that an extra (new) right with approval from the lineage raised the probability of investing in trees by 2.5%, significant at 5% level. This relationship was robust controlling for farmer heterogeneity and instrumenting for land rights. The paper, therefore, underlines the need for 'careful empirical studies of land rights and investment in low-income environments'.

Another study on Africa which demonstrates a positive impact of land rights status on investment and productivity is a study based on a survey of 119 smallholder households in Manicaland Province, Zimbabwe (Moor, 1996). These samples comprised 40 households from the Small Scale Commercial Sector (where farmers could obtain long-term lease from the government, with an option to purchase which will result in a transferable freehold), 39 from the 'Model A' Resettlement Area (state-owned land established to deal with spontaneous settlements on unoccupied land, where settlers are issued an annual and conditional permit by the government) and 40 from the Communal Area (managed by traditional leaders, where land-use rights are conferred to individuals and legal ownership rests with the state). By estimating a simultaneous equation model based on a two-stage least squares regression analysis, the study concluded that tenure security has had a significant and positive effect on farmers' investments in long-term on-farm improvements and yield (both significant at the 99% confidence level). The impact on credit use could not be estimated, since credit use was too infrequent in the sample to enable statistical analysis.

Social aspects and policy implications

In the previous section we reviewed the economics of land registration and property rights in action, through empirical evidence from Asia, Latin America, and Africa. The net economic benefits of land registration can be substantial. However, some of the experiences indicate that land registration would not be economically worthwhile when certain key factors are missing. In this section, we will take stock of the policy implications, addressing two broad issues: first, what are the key prerequisites for economic viability of land registration; and second, if the time is ripe for land registration, what are the key factors in ensuring that the design and implementation of land registration programs are conducive to achieving equitable social outcomes? These questions would be particularly important for decision makers in developing countries as they contemplate the degree of priority that should be given to formalization of land ownership arrangements and land registration.

Prerequisites for economic viability of land registration

Let us start with the first question: what are the factors needed to enhance the economic viability of land registration? As discussed in the section on Economics of land registration, the economic impact is derived from higher income or services per unit of land, and from an enhanced level of land transactions, allowing higher-value uses for land.

The main sources of higher income and improved residential services are improved access to credit, higher land-attached investments, greater use of variable inputs, and more efficient land markets. Thus, there should be reasonably well-functioning financial markets, which can extend long-term credits when land is used as collateral (most likely through institutional channels). If various regulations restrict or disallow the enforcement of collateral or if the legal and enforcement administration for collateral contracts is too cumbersome to be effective, land registration systems will not provide benefits which are linked to the credit market.

There should also be clear incentive to increase output per unit area, through investment in land-attached investments and use of more variable inputs, in terms of existing economic opportunities: farmers may have little such incentive if markets for produce are too far away, land is infertile, distribution systems for agricultural inputs do not function well, labor shortage is persistent, etc. For example, the first major investment in Thailand's land registration system at the latter part of the 19th century became viable only when the country opened up to foreign trade, making rice production very profitable and thus inducing an expansion of land cultivation. Similarly, urban investors may not be inclined to itensify investments, even if land ownership security is enhanced through registration, when the general economic environment is not conducive to business. On the other hand, when general incentives for productive investment do exist, it is necessary to ascertain whether the existing tenure system provides insufficient tenure security (e.g. as indicated by the prevalence of land disputes). There are many situations where a customary land ownership system provides sufficient security to induce investments.

Benefits to land registration through greater efficiency of the land market cannot be taken for granted. The lack of a formal land registry will not constrain land markets if there is little demand for land transactions in a particular area, or if customary land rights systems are sufficient to facilitate the types and volumes of transaction that are typical in the area under consideration. It is well known that many customary tenure systems function quite well in supporting transfers of land rights from one person to the other, mostly within a specific group of people. For instance, much of the 5 million hectares of land in the province of West Sumatra, Indonesia, comes under a traditional system of communal rights (*hak ulayat*), even in some of the urban areas. The system has worked well in enabling transfers of land rights matrilineally, over centuries. However, it is clear that the tenure security provided by the traditional system is no longer sufficient to protect the local people's claims against outsiders, be they developers, golf course investors or squatters.

Even when there is a latent demand for land transactions which is constrained by the absence of land registry and title documents, there needs to be an enabling regulatory framework for land registration. One key area is the laws and regulations for land registration. These laws and regulations should have realistic and socially acceptable evidence requirements, incentives to register (e.g. according priority to registered parcels over unregistered parcels), and define clear procedures for dispute resolu-

tion. Another important point is that there should not be stringent regulatory restrictions which affect land transactions. Overly complicated procedures related to approval of land use tend to increase the transaction cost and limit land market activity. Some countries establish land committees or bureaus which are mandated to oversee that sale transactions do not harm social or cultural norms, and a myriad of other restrictions and prohibitions which limit land transactions and can nullify benefits envisaged from enhanced land market transactions under a formal land registration system.

If it is not clear whether the key factors for the economic viability of land registration systems are present, it may not be an opportune time for the government to invest in land registration. The society would benefit more from other types of investment, which address more binding constraints to its economic development.

Social aspects of land registration programs

The discussion has focused so far on economic aspects of the land registration system, but has not addressed social aspects such as equity and poverty alleviation. A consideration of these aspects is important, because investments in an improved or modern registration system, if not implemented properly, can produce undesirable and unintended outcomes. On the other hand, if the interventions are well thought through, a registration system can introduce better protection of the rights of socially weaker groups, and can provide better scope for poverty alleviation.

The introduction of a modern registration system to replace a customary (and typically less formal) system may provide opportunities for 'land grabbing' by those who are better informed, are more familiar with formal processes, and have better access to officials and financial means to undertake procedures for registration. Land grabbing can take the form of claiming exclusive rights to what was hitherto state, communal, or open access land, or even claiming ownership to land that was individually possessed or used by others who are less informed, or who do not have the funds to undertake the procedures for registration. A somewhat less nefarious, but unfair nonetheless, phenomenon is the acquisition at low price of untitled or unregistered land by wealthy individuals, with knowledge (not available to the original owners) that land registration will be feasible soon at relatively low cost.

A frequently mentioned argument by policy makers against formalization of land rights, and the lowering of the cost of land market transactions which they induce, is that in the resultant more active market, the smallholders and the poor will be tempted to sell their land to larger landowners, or to wealthier persons. This, it is argued, will lead to the emergence of a large landless class, with attendant social instability. While the theoretical underpinnings of these arguments are not necessarily well founded, one could conceive of circumstances where asymmetry of information and of opportunities could lead to socially undesirable land sales.

Anecdotal evidence frequently points to instances of abuses of the kind indicated above, in various countries, exacerbated by the incidence, sometimes, of officials who, by the temptations of greed or for political expedience, collaborate with wealthier and more powerful individuals. The potential for such undesirable outcomes is larger when registration and titling are sporadic (i.e. performed upon demand by individual landholders), and when the cost charged to the individual for registration is high. On the other hand, in situations where informal systems are under

pressure from changing economic circumstances, formal registration systems can have very positive equity implications, by providing a low-cost mechanism to the poor to protect themselves from challenges to their informal rights.

There are several principles that a government can pursue in order to reduce the risk of undesirable social impact of land registration initiatives.

First and foremost, the land registry should be administered on the basis of transparency principles. Whereas some governments tend to restrict access to the land registry, most often to contain land speculation, such a policy would facilitate abuses by certain people who have access, make land transactions uncertain, and reduce the reliability of land records. It should be made clear to the public, through various media, what are the administrative procedures for land registration and what are the fees involved.

Second, and related to the above, landholders should be closely involved in the registration process. Land registration can be difficult and unfair unless the potential beneficiaries and their neighbors are called upon to provide evidence and documents, preferably in an on-site situation together with neighbours, and are asked to discuss boundaries, give testimonies about other residents, etc. Consultation with the beneficiaries, reliance on communities and community-based organizations, simplicity of procedures and speed of delivery can be used to enhance landholder involvement and improve the prospects for equitable outcomes.

Third, key social issues which could affect the benefits of land registration should be examined before setting out on a land registration program. There may be two areas which merit particularly careful assessment: the impact on women; and policies towards customary land tenure. For women, land registration would not be beneficial if existing regulations make it difficult for women to benefit from land registration, or even affect women's rights adversely. Requirement for land to be registered only in men's names, for instance, can be a source of such adverse impact. On customary land tenure, it is important that the nature of the existing customary rights and the possible impact of registration are well understood by the society (including the government), before making a decision on whether or not to include customary areas in the land registration program. If the prospective impact on customary rights is negative or uncertain, customary areas should not be included in the land registration program, until provisions are made to enable benefits to customary right holders.

Fourth, there should be effective monitoring of developments on the ground. In Indonesia, initial results from field work in systematically-registered areas have not identified instances of land-grabbing or any other incidents with strong negative social impact. Conversely, the results have pointed to widespread coverage of the registration effort (including the poor) and relatively little rent-seeking.

Fifth, cost effectiveness should be a major factor in designing a land registration system, to maximize net social benefits and improve sustainability. Existing instruments should be deployed as much as possible—they may include existing base maps, cadastral maps and informal evidence of ownership. In the case of Thailand, the systematic (rather than sporadic) registration approach has contributed to keeping the registration cost down, by capitalizing on economies of scale. Systematic registration enables wider and more equal diffusion of information regarding the opportunities and procedures for registration. Cost should also be a major factor in choosing the technologies for such activities as mapping, control

densification and land records management. Recent technological breakthroughs such as the hand-held global positioning systems may offer even more cost-effective options. Large investments in sophisticated land records management systems should be weighed against the existing human resource base, the insitutional capacity of the executing agency, and potential returns from alternative land-related investments. Furthermore, the cost for first time registration should be kept low, so as to provide incentives for low income landholders to register their land. The strategy employed in Thailand, where first-time registration is subsidized and cost is recovered through registration fees on subsequent transfers, has been successful and is being widely studied.

While there may be other principles, adhering to these important ones above would be a tall order in many countries. In a large number of cases, this would amount to major changes in the way land registration is currently being operated and managed. However, let us remind ourselves that land registration was created to serve the people—the welfare of societies. We may have come a long way from the earthen jar which kept land documents for the prophet Jeremiah, but that fundamental objective has not and should not be changed.

Areas for further research

The above studies have compiled convincing empirical evidence on various types of economic benefit of land registration, from different corners of the world. There is evidence that land registration has led to better access to formal credit (Thailand), higher land values (Thailand, the Philippines, Indonesia, Honduras, Brazil, Peru), higher investments in land (Thailand, Costa Rica, Brazil, Honduras, Jamaica, Ghana) and higher output/income (Costa Rica, Brazil, Ecuador, Paraguay).

Despite the mounting volume of empirical evidence, the agenda for further research in this topic remains lengthy. The following may be some of the more important ones.

First, social and equity impact of the formalization of land registration. While an increasing body of literature is emerging on economic aspects of land registration systems, there has been very little rigorous documentation and analysis of the equity implications of the introduction of a more formal system. As indicated in the preceding section, there are *a priori* grounds to expect, under certain circumstances, increasing inequality and even abuse of the poor, while other circumstances would allow enhanced equity and poverty allevaiation. A clarification of the influence of various factors entailed in the design of registration systems, and the socio-economic environment in which they are implemented, would help in formulating better policies and program designs.

Second, impact of registration systems on transactions in the land market. As highlighted in earlier sections, the reduction of uncertainty regarding ownership is expected to enhance the level of activity in the land market, affording increase in the overall efficiency of land allocation. However, there has been a paucity of empirical research on the veracity of this proposition, and on the actual extent of land transactions under different levels of formality of the property rights system. The issues of equity discussed above would indeed require more detailed knowledge of the nature of increased land market activity in terms of who buys, who sells, and whether the sales are likely to increase productivity.

Third, more quantitative analysis is needed on the economic implica-

tions of customary land tenure, and the extent to which economic development is affecting the security that such systems entail. While conflict between customary and 'modern' rights have been reported in various countries, lack of accurate information has been one of the major constraints to a constructive dialogue towards mutually acceptable solutions. Given the very wide variety of customary tenure, such a study should be focused on a number of priority areas, for instance countries or localities where land registration programs are being contemplated. Such a study could recommend which policy action deserves priority: is it land registration, some other measure to improve tenure security, or not doing anything at all? Ultimately, when devising recommendations, the study should consider land tenure issues existing in the area, which may include encroachment by outsiders, conflicts within customary groups and the process of individualization.

Fourth, an assessment of the benefits of ongoing land registration and emerging land markets in some of the former Soviet bloc countries. The establishment of private ownership rights is considered to be of paramount importance in these countries, prompting many of these countries to start on land registration programs. The World Bank alone is assisting governments in eleven former Soviet bloc countries (as of June 1997), to develop and implement land registration programs of various scales. It would help the policymakers in these countries to make decisions on the scope, timing and approaches for land registration, if there is empirical evidence on the benfits of ongoing land registration and emerging land markets in those former Soviet bloc countries which are forerunners in these efforts. However, it should be emphasized that the objectives and nature of land registration in these countries are clearly different from those countries with long traditions of private land use. As stated in World Bank (1996), the immediate objective of land registration programs in the former Soviet bloc countries is 'to assist the creation of private ownership and transferability of assets. The main economic benefits will therefore be measurable only on a longer-term basis.' At this stage, it may be worthwhile examining the extent to which land registration, coupled with land privatization, has led to creation of land markets. This is currently possible only in a few countries, which may include the former East Germany and Estonia. In countries where land can now be used as collateral (e.g. Russia after the October 1993 decree (Brooks and Lerman, 1994)), it may be possible to go one step further and examine if there has been a significant increase in the value of titled private land. More practical issues which merit attention would be the usefulness of transitional certificates (issued prior to actual land distribution in countries like Romania) and least-cost options for issuing full certificates.

Fifth, more studies would be warranted on the costs of land registration, not only on its benefits. An empirical analysis of the costs of alternative land registration systems would provide useful lessons for policymakers in weighing land registration investment against other public investment needs. A well-founded estimate of costs in any cost/benefit analysis, and comparison between different land registration approaches in terms of their costs, would facilitate better decision-making on program design. In fact, even when benefits cannot be estimated reliably *a priori*, information regarding costs would allow least-cost analysis of government expenditures.

The above amounts to a lengthy agenda. However, advances in knowledge on these critical issues should contribute significantly to our understanding of land registration, and how it can better serve the people in various corners of the world.

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