

Land Rights and Economic Development: Evidence from Vietnam ^{*}

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Abstract

This paper examines the impact of the 1993 Land Law of Vietnam which gave households the power to exchange, transfer, lease, inherit and mortgage their land-use rights. We expect this change to increase the incentives as well as the ability to undertake long-term investments on the part of households. We use the variation across provinces in the issuance of land use certificates to identify the impact of this law. Our results indicate that the additional land rights led to significant increases in the share of total area devoted to long-term crops, but formal land titles do not appear to increase households' access to credit.

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1 Introduction

Land rights are an important issue in developing countries where land is a major asset for most people and the product of agriculture accounts for a large share of national income. There is a certain amount of consensus among economists that better property rights institutions lead to improved economic outcomes (see Knack and Keefer (1995), North and Thomas (1973) or Acemoglu et. al. (2001) for analysis of general property rights institutions). Economists such as de Soto (2000) have argued that the major barrier to prosperity in developing countries is the inability to convert property into usable assets, because of a lack of clear-cut legally recognized rights. However, the empirical evidence on the importance of formal property rights in land is inconclusive, both on the overall effect of having property titles and on which dimensions of land rights are crucial. Alston et. al.(1996) find that investments in land as well as land values are positively associated with possession of formal titles in Brazil; an analysis of land titling in Indonesia reached similar conclusions (SMERU (2002)). Field and Torero (2002) find that possession of legal titles leads to greater credit access for the poor in Peru; however, Boucher et. al.(2002) show that access to credit remains very low even after land reforms have been implemented in Nicaragua and Honduras. Braselle et. al. (2002) review a number of studies in African countries which show very little impact of land titling on investment. In many countries, property rights in land are not formally granted by the government and are established through custom or informal mechanisms. In such situations, it is often the case that households undertake investments in land to safeguard their property rights, as shown in work by Besley(1995) on Ghana and Braselle et. al. (2002) on Burkina Faso. We thus do not have complete answers to several questions: is ownership of land the most important, or is it the ability to transform land into working capital that matters? How effective is government legislation in providing better land rights, or is everything determined by local conditions?

This paper investigates the impact of a specific legal change to land rights implemented in 1993 in Vietnam. Since 1986 and the “Doi Moi” policy, Vietnam has progressively moved towards a market economy. As far as land rights are concerned, the regulatory environment witnessed two major changes. In 1988, agricultural land was decollectivized and use rights to land were assigned to individuals and households for a period of up to fifteen years. However, such rights were not tradable. In 1993, a new land law was enacted and in addition to an increased lease term, land-use rights could now be inherited, transferred, exchanged, leased and mortgaged. The law of 1993 is therefore seen as setting the foundations of a formal market for land. This paper investigates the

incremental impact of the 1993 land reform on economic outcomes. Since the law was implemented through the issuance of Land Use Certificates (LUCs), and the issuance of LUCs was not uniform across the country, our empirical strategy relies on such heterogeneity to identify the effect of formal land rights on economic decisions and outcomes.

We briefly outline how the 1993 land law might have a positive impact on efficiency. First, an increased lease term together with the right to bequeath LUCs makes farmers less liable to expropriation from the State. More generally, the 1993 land law is perceived as an additional signal from a government that wants to commit to secure property rights. Households are therefore expected to have a greater incentive to undertake long-term investments. Second, the right to mortgage land rights can be expected to make access to credit easier, especially from formal sources such as State-owned banks. The impact is then twofold: on the one hand, the ability to borrow ex-ante induces agents to invest more; on the other hand, the ability to borrow ex-post allows individuals to smooth consumption, and hence avoid costly income smoothing. Third, making land use rights tradable is likely to translate into allocative efficiency gains. This is very relevant to Vietnam: as the initial allocation after decollectivization in 1988 was made on a fairness basis, farmers happened to receive up to twenty small plots each, often far from one another. We then expect to observe land consolidation aimed at realizing economies of scale. These three channels suggest that land rights should increase economic efficiency.

In order to assess the impact of the 1993 land law, we use pre-reform and post-reform household-level data. Although we do not have individual-level information on LUC issuance, provincial-level status of land titling is available. Hence, individuals will be assigned the percentage of LUCs granted in the province they live in, interpreted as the likelihood that they benefited from the reform. We argue that between-province heterogeneity is probably due to bureaucratic performance and not correlated with other factors which might simultaneously influence the outcomes we are interested in. A differences-in-differences estimation strategy then allows us to observe whether households more exposed to the reform are more willing and able to undertake long-term investments. We find that farmers in highly-registered provinces devote a greater proportion of their cultivated area to multi-year crops, but there is no significant increase in the level of short-term investments in agriculture such as fertilizer usage. We do not find any significant increases in access to credit or in the amount a household is able to borrow; in fact, some of our specifications indicate a negative effect. Analysis of land market transactions is hampered by severe under-reporting of these transactions. We do find that the overall volume of transactions increases after the reform,

but the increase is not significantly different in high-issuance provinces.

The paper is structured as follows: sections 2 describe the process of reform and land policies in Vietnam and section 3 discusses the possible impacts of the land law. Section 4 describe our data and empirical strategy and and section 5 describes the variation in the implementation of the land reform across provinces Our main results are discussed in section 6 and some further remarks are given in section 7. Section 8 concludes.

2 Land Rights in Vietnam

The history of Vietnam in the second half of the twentieth century is punctuated by three key dates: 1954 marked the independence of the country from the French and its division into two parts, North and South; in 1975, the so-called “Vietnam war” ended with the reunification of North and South Vietnam, and 1986 corresponds to the implementation of sweeping economic reforms (the “Doi Moi” policy) and a move towards a market-oriented economy, which continues to the present day.¹

2.1 The institutional framework until 1988

Before the Geneva Accord of 1954, Vietnam was under French control. During the Colonial period, most farmland in Vietnam was owned either by French plantation owners or by large Vietnamese landlords: 52 percent of the land was owned by only 3 percent of the indigenous population and more than 60 percent of farmers across the country were landless in the mid-1940s.

After independence in the North, a major land reform was carried out. As a reward for their war efforts, land and ownership rights were distributed to farmers and a rapid increase in agricultural output and productivity followed. However, the policy was reversed and land began to be collectivized in the late 1950s, as Communist ideology gained strength. As a result, 86 percent of all peasant households and 68 percent of total farmland, were brought into cooperatives by 1960. Despite significant declines in output, the collectivization process continued so that 90 percent of all peasant households in the North were working in cooperatives by the mid-1960s. An illuminating stylized fact illustrates the impact of such an incentive system: while individual rural households were privately allocated 5 percent of farmland, they derived 60 to 70 percent of their earnings from this small plot.

¹This material in this section is largely based on Boothroyd and Pham (2000), Pingali and Vo-Tong (1992), and Wiegersma (1988)

Land institutions in the South during that same period were driven by political conflicts. At times where the government sought support from the local elites, pro-landowner policies were adopted. When the war against North Vietnam began, the government tried to gain popular support by adopting the Land-to-the-Tiller law in 1970. Tillers of the soil were to enjoy all the benefits of their work, and this would be accomplished by providing ownership rights to cultivators and putting a retention limit on landlords as low as 20 hectares. However, the law found opposition from landlords and the lack of independence of the bureaucracy made enforcement uneven throughout South Vietnam.

In 1975, when the war ended and the country was reunified, land collectivization started in the South but was implemented with little success: as late as 1986, only 5.9 percent of farmers in the Mekong Delta and 20 percent in the Southeastern region were part of cooperatives, while this figure amounted to 85 percent in the Central Lowlands region (Pingali and Vo-Tong 1992). Under the collective system, all households were paid a share of output according to their recorded labor hours on the communal land. In 1981, the first changes were made to these arrangements: workers were now allowed to keep all of the surplus they produced over a contracted output. However, this policy was later modified and quotas were constantly renegotiated, resulting in a decline of public confidence. Agricultural yields were extremely low in this period and even as late as 1985, Vietnam was a net importer of rice.

Faced with a worsening economic crisis, the government announced the program of “Doi Moi” (literally “change and newness”) in 1986 and began a gradual movement towards a market economy. As part of a major structural adjustment program, production and consumption subsidies were eliminated from the State budget, government spending was reduced to 6 percent of Gross Domestic Product (GDP), the government work force was reduced by 15 percent, 500 000 soldiers were demobilized, interest rates on loans to State-owned firms were raised and central bank credit was no longer used to finance the budget deficit. The economy started opening up to trade, and the central bank undertook a massive devaluation of the currency to the prevailing black market rate bringing inflation rates from 400 percent in 1986-87 down to 10 percent in 1993. Financial markets were partly deregulated, foreign banks are now allowed to operate in Vietnam and a stock exchange was opened in 2000. In the agricultural sector, Resolution 10 of 1988 granted land-use rights to individual households, while the land law of 1993 made these rights pledgeable and tradable. These two changes are described in detail in following sections.

These reforms have had a dramatic impact on the economy. Government revenue and spend-

ing began increasing after 1991. Agricultural production increased rapidly after 1988, and Vietnam is currently a major exporter of rice, as well as cash crops like coffee, pepper and cashew. Exports accounted for 79 percent of GDP by 1995, and the economy has experienced a growth rate of above 8 percent in the 1990's. Agriculture now accounts for only 25 percent of GDP, down from 40 percent in 1989. The benefits from growth have been fairly widespread: poverty rates are estimated to have declined from 75 percent in 1984 to 55 percent in 1993.²

2.2 The 1988 Land Law - Resolution 10

A reform undertaken in 1981 allowed households to keep any surplus above a quota level. Such reform was a failure partly because the government did not manage to commit not to raise quotas, always extracting more surplus from farmers. The lack of commitment from the authorities eventually destroyed individual incentives. Then came Resolution 10 of the 1988 land law, aimed at recovering credibility by further liberalizing the agricultural sector in Vietnam. The reform consisted of transferring control and cash-flow rights from the cooperative to the individual household. Land was allocated to households with a fifteen-year security of tenure and tacit renewal, output markets were privatized and investment decisions were decentralized and left to households. Private property was virtually instituted. However, as land-use rights were given to families without the possibility to trade such rights, a proper land market did not develop despite some informal transactions.

Land allocation to individual households was conducted by the commune authorities, and encountered some difficulties across the country. In the North and in some regions of the South, land was distributed on a fairness basis, taking into account soil and socio-demographic characteristics of the region. Comparing the realized land allocation process with a simulated market-based outcome, Ravallion and van de Walle (2001) conclude that the realized process generated lower inequality and made the poorest better off. However, the process sometimes relies on arbitrary considerations, leading to favoritism and disputes. For instance, Hayami (1993) reports that “a farmer (...) in Hai Hung Province complained that he received too small a land allocation because his eldest son was in military service and his other children were so young that they received only one-third of an adult's allocation at a time. Thus, he expects that his unfavorable allocation will be corrected at the end of the ten-year tenure period” (pp 13). The situation in the South was complicated by the fact that Resolution 10 stipulated that farmers should be assigned the land they owned prior

²See Dollar and Litvack (1998)

to 1975 and this generated disagreement between farmers and former landlords, although a 1989 ordinance gave rights to farmers. The allocation was thus not immune to controversy and disputes were still being settled in July 2001, as land allocation was being brought to completion in rural areas.

To many Vietnamese, Resolution 10 is perceived as the major land reform undertaken since 1975 and some scholars attributed Vietnam's agricultural output growth to such liberalization (see e.g. Pingali and Vo-Tong (1992)). There is no denying that newly assigned property rights must have unleashed farmers' incentives to invest and put effort, but much remained to be done to achieve further economic efficiency. The 1993 land law is an additional step towards this end.

2.3 The 1993 Land Law and the Issuance of Land Use Certificates

The main focus of this paper is the 1993 land law. The spirit of the law is in continuation of the reforms undertaken by the government since 1988. Despite the allocation of land and its corresponding use-rights, no transaction could yet be made officially. The 1993 land law made up for this deficiency. It granted five rights to the household: the right to transfer, exchange, inherit, rent and mortgage.³ The implementation of the land law consisted of provision of LUCs. As the actual procedure has some interest for our empirical strategy, it is worth going into some details.

The issuance of LUCs is done as follows: individuals have first to apply for a Land Use Certificate (alternatively known as Land Tenure Certificate or the Red Book) through the commune-level People's Committee. The district Bureau of Land Administration then does the groundwork, which includes making a list of all land users, training the staff, purchasing materials, checking and updating the documents related to land such as cadastral maps, land survey records etc. In the meantime, a Land Registration Committee is set up, which includes members from the District Bureau of Land Administration, as well as officials from the commune-level, district-level and sometimes province-level People's Committees. This process takes about four or five weeks. Application forms for land registration are then given out to all the land-users in the commune, who are asked to list all the plots of land owned or allocated to them. This form has finally to be signed, not only by the land user himself, but also by all neighboring households in order to certify the absence of dispute regarding claims on the land.

³There were further modifications to the land law in 1998 and in July 2001. The 1998 revisions granted further rights by making it possible to sub-lease land and they moreover allowed Vietnamese entrepreneurs to use such rights as contribution in a joint venture with a foreign company. The 2001 additions simplified procedures in urban areas.

The Land Registration Committee scrutinizes all these forms and then decides whether a given land-user is eligible or not. Land-users are classified as ineligible if (i) they obtain the land through an illegal land transfer i.e. without registering the transaction, without paying transfer taxes, or without a legal contract, (ii) they inherit the land from parents without a formal inheritance letter, so that old documents are still in the parents' names, (iii) they have no legal documents to prove their claim to the land, (iv) they are illegally occupying unallocated land, (v) they have not paid all their land taxes in the past, or (vi) there are disputes regarding their ownership or the boundaries of the land they claim. Within 10 days of sending these application forms, a public meeting is held where information regarding eligibility is made public. At this time, the land administration also tries to resolve these disputes. The list of land users who are eligible for receiving the LUC is then sent to the district-level People's Committee. Unresolved disputes are referred to a special working group within the Department of Land Administration. After approval at the district-level, work begins on making the actual LUC for the land-user. This stage is estimated to take about 1500-2000 man days per commune in urban areas, and this figure is unlikely to be much different in rural areas.

Similarly to previous land reforms, the 1993 land law was unevenly implemented throughout the country. Because province-level differences in the level of registration, i.e. the percentage of households registered, is the keystone of our empirical strategy, we investigate the sources of such heterogeneity. According to Vo (1997), district Bureaus of Land Administration have on average five members and most communes have only one land officer, which makes registration a lengthy process. Haque and Montesi (1996) also report the major reasons for this slow progress to be “a lack of adequate finances, a lack of trained cadres, a lack of interest and enthusiasm on the part of officials, a lack of proper direction and supervision and disputes among the cadres”, which is consistent with the information given to us by the General Department of Land Administration (henceforth GDLA). As we mentioned earlier, a phenomenon which is likely to slow down the process is the number of disputes that can emerge in villages. The way allocation was made, the existence of pre-existing property rights, the personality of the head of the village are as many determinants that can cause one region to achieve faster registration than another one. An additional reason for delay may also be due to the fees related to registration and the backlog of taxes that some households may be required to pay to become eligible. However fees are not very high, below VND 20 000 (less than USD 1.50) in most areas. Besides, in an effort to increase land registration rates, the government has even made it free for people residing in remote and mountainous areas, and

the payment of overdue taxes was no longer a prerequisite for the issuance of LUCs.

Some aspects of this large land titling program give rise to concern regarding the long-term sustainability of this reform. The guidelines for implementation of the five rights was formulated and approved by GDLA in late 1998. In the meantime, substantial volumes of transactions had not been reported to the commune authorities, raising the concern that commune-level land registries would be outdated in a few years' time (ADB Report 1998). The certificates are issued at the household level rather than a plot level, which can cause problems in updating the land use certificate in the event of a land transaction. Further, several of the 15 year leases granted during the initial decollectivization of 1988 will be coming up for renewal soon. Procedures regarding LUC issuance or re-issuance in such cases have not been clarified.

3 Potential impact of improved land rights

What is likely to be the impact of the land law and more specifically the issuance of LUCs? Rights to transfer, exchange, lease, inherit, and mortgage LUCs are expected to improve economic efficiency through different channels. This section reviews briefly the potential impacts of each of the rights, borrowing intuition and exhaustiveness from Besley(1995).

Tradable Land-Use Certificates: The rights to transfer, exchange, lease, and then sublease LUCs create a formal market for land. Land transactions are now possible at a larger scale. We then expect a better allocation of land and the realization of economies of scale, which translate into higher yields. Indeed, a market for land should induce consolidation of highly fragmented ownership of land, as we saw earlier on, as well as transfers of land from less productive to more productive farmers.

Secure Land-Use Certificates: The longer lease term and the right to inherit (and thus bequeath) that came with LUCs might decrease the likelihood that an individual and her offspring will be expropriated by the State. However, with Resolution 10, though tenure was given for 10 years, tacit renewal and transfer within the family were the rule. In that respect, the 1993 Land Law is an incremental improvement of ownership security vis-à-vis Resolution 10, as it makes such provision formal and constitutes an additional signal sent by a government which seeks to build a reputation of enforcing private ownership. Thus, we expect the land law of 1993 to increase farmers' willingness to undertake long-term investments. Furthermore, it is worth noticing that if we look

only at the potential impact of the reform on, say, annual crop yields, the effect of secure land rights on the intensive margin is ambiguous as it depends on the consequences on the extensive margin: land rights give farmers the incentive to undertake long-term investments, therefore focusing on perennial crops at the expense of annual crops.

Pledgeable Land-Use Certificates: In a world with imperfect credit markets, property rights are, as stated by De Soto (2000), a way to transform illiquid assets into money. We expect that possession of a certificate that can be pledged against a loan enables households to access credit at lower costs, using formal channels such as banks. While security of tenure increases the willingness to invest, pledgeable rights boost the ability to do so. The credit channel has moreover a second dimension. LUCs can be pledged as collateral ex-post, i.e. to smooth consumption in case of a bad shock. Individuals are now able to smooth consumption directly and hence avoid costly income smoothing strategies. Depending on risk-aversion, wealth levels and local credit market conditions, the ability to pledge rights may decrease or increase the extent to which individuals are diversifying their activities. More diversification would suggest that farmers have a higher ability to self-insure, while less diversification suggests that the ability to smooth consumption ex-post allows agents to specialize in the more productive technology available to them. The overall observed impact of pledgeable land-rights becomes an empirical issue.

4 Data and Empirical Strategy

4.1 Data

Our major source of data is the two rounds of the Vietnam Living Standards Survey (VLSS), conducted by the General Statistical Office (GSO) of the Government of Vietnam and funded by the United Nations Development Program (UNDP) and the World Bank under the Living Standards Measurement Study (LSMS). The first round of the survey was conducted in 1992-93 (henceforth VNLSS-93) and the second round was conducted in 1997-98 (henceforth VNLSS-98). We take the former as our pre-reform baseline data and the latter as our post-reform outcomes. The surveys used multi-stage stratified sampling techniques to select 4800 households in the first round. 4285 of these households were re-interviewed in 1998, and replacement households were chosen to bring the sample size to 6000.⁴ The surveys followed established LSMS practices and are considered

⁴The attrition rate is higher for smaller, urban, more educated and richer households. The overall attrition is around 7% in rural areas.

high-quality data. They contain detailed information on household size and composition, educational attainment, health, employment, fertility, migration, household expenditures, agricultural activities, non-farm economic activities and borrowing and lending activities. Table 1 presents some basic characteristics of the rural households in the surveys, broken down into whether they were re-interviewed (“panel”) households or replacement households. We note the large increase in real household expenditure between 1993 and 1998, consistent with the high growth rates enjoyed by the Vietnamese economy in this period.

Province-level data on progress of LUC issuance (number of households and communes with LUC), as well as the number of land department officials in each province, come from the records of the General Department of Land Administration (GDLA) in Hanoi.⁵ We also have data on province-level population, agricultural yields, urbanization etc. from the annual Statistical Yearbooks published by the General Statistical Office (GSO). We also use some information on infrastructure facilities in rural areas from the 1994 Agricultural and Rural Census conducted by the Ministry of Agriculture and Rural Development (MARD).

4.2 Empirical Strategy

Ideally we would like to compare investment and productivity across two households that differ only in the quality of land rights possessed by them. In our setting, we take the possession of a land-use certificate as an indicator of having good land rights. However we do not have household level data on land registration, since the VNLSS does not ask this question. We therefore use the province-level proportion of households with LUC as a measure of the probability that a given household would have a LUC. We will thus be using the differences in the level of LUC issuance across provinces to identify the impact of the Land Law. We will also use an alternative measure (“speed of registration”) which captures how quickly the province issues LUC to at least 50% of the households, which takes into account the whole process of LUC issuance over time.

Our major focus will be on measures of long-term agricultural investment. We will use the farmers’ decision to switch crops away from food crops to more valuable cash crops to measure longer-term investments, since many of these crops (coffee, pepper, fruit trees etc.) require large initial investments and a longer time before returns are realized. We will also look at more short-term measures of agricultural investment such as fertilizer and pesticide use as well as irrigation (which could be either long-term or short-term). Consistent with the potential effects of the land

⁵GDLA is now a part of the Ministry of Natural Resources and Environment (MONRE).

reform discussed in section 3, we will also present results on access to credit, as well as on land market transactions.

We estimate the impact of the land reform using a differences-in-differences strategy, by comparing the difference between 1993 and 1998 (before and after reform) for the high-issuance provinces as compared to the low-issuance provinces. The regression equation we use is:

$$y_{ijt} = \beta_0 + \beta_1 T_t + \beta_2 R_j + \beta_3 (T_t \times R_j) + X_{it} \gamma + \epsilon_{it} \quad (1)$$

where y_{ijt} represents the outcome of household i of province j at time t (1993 or 1998), T_t represents the time dummy (equal to 0 for 1993, and 1 for 1998), R_j is the measure of land reform implementation in province j (proportion of households with LUC in 1998 or number of years since LUC issuance crossed 50 percent threshold (speed measure)) and X_{it} are other household characteristics. The coefficient β_1 represents the change between 1993 and 1998 for a province which had zero LUC issuance, while β_2 represents the difference between high-issuance and low-issuance provinces in 1993 (pre-existing difference). Our coefficient of interest is β_3 , which tells us how much the high-issuance provinces have increased investment, compared to the low-issuance provinces over the period 1993-1998. We will be controlling for household characteristics like age, gender and education of the household head, total household size, ethnicity and total area cultivated. All our regressions are for households in rural areas only, since our land reform figures are for rural sector. Since our main explanatory variable, the LUC issuance measure, is measured at the province level, we will also cluster all our standard errors at the province level.⁶

4.3 Endogeneity

Our strategy is likely to give biased results if the province-level registration levels are correlated with other unobserved variables, that also affect our dependent variables. This could be due to both “supply” and “demand” factors for land registration. For instance, more productive farmers may be registering their land earlier (demand side effect), or a higher registration level might be indicative of a more efficient local bureaucracy, which might have a direct effect on any outcomes we examine, irrespective of the impact of the Land Law itself. The next section examines whether the progress of LUC issuance across provinces is systematically related to any province-level characteristics.

⁶Bertrand et. al. (2002) suggest clustering as one way to obtain correct standard errors in a difference-in-differences framework.

5 Implementation of the 1993 Land Law

Table 2 documents the progress of LUC issuance in Vietnam. About 24 percent of households had been issued land-use certificates at the end of 1994; by the end of 2000, this proportion had increased to 90 percent, consistent with the target of issuing certificates to more than 11 million rural households by the end of 2001. Table 2 also shows considerable variation across provinces in the speed of implementing this process. For instance, An Giang province had issued LUCs to 91 percent of households in 1994, at which time Lai Chau and Lang Son had made negligible progress. Similarly the proportion of households with LUCs varied from 12 percent to 100 percent in 1998. Another way of seeing this is the variation in the years it took for a province to increase the level of LUC issuance to 25 percent, 50 percent and 75 percent of the households (Table 2, Panel B). 21 provinces crossed the 25 percent threshold in 1994, while 4 provinces attained this in 1998 or later. 16 provinces had issued LUCs to 50 percent or more of households by 1995, while 13 provinces took till 2000 to attain this level. As of 2000, five provinces had yet to attain the 75 percent level of LUC issuance.

We also obtained (from GDLA) data on land department manpower at the province level in different years. Consistent with the lack of manpower cited by the GDLA, we find that most provinces had less than two land officials per commune in these years. Most provinces also had less than two land officials per 1000 agricultural households in the province. As we would expect, the number of land officials per commune (or per 1000 agricultural households) is somewhat positively correlated with measures of the speed of LUC issuance (Table 2, Panel C). However, these correlations are not very large and none of them are statistically significant.

The finding of a positive but low correlation between manpower measures and LUC issuance also shows up in the regressions reported in Table 3. Our two major measures of the prevalence of land rights due to the reform are the proportion of households with LUC in 1998,⁷ and the “speed of registration” measure which we compute as 2001 minus the year in which LUC issuance reached 50 percent of households. While the first measure captures the status of issuance at a point of time, the second measure is based on the whole process of land titling over all the years. These two measures are highly correlated ($\rho=0.83$). Table 3 further shows that land registration is not strongly correlated with any other province characteristics such as population density, urbanization, proportion of communes having a market, mean level of education or per capita household

⁷We choose 1998 because our household survey data are from this year; see section 4.

expenditure.⁸ The results are qualitatively similar when we use land officials per 1000 agricultural households instead of land officials per commune; when we include paddy yields as an additional explanatory variable; and when we use proportion of households with LUC in years other than 1998 as a measure of the progress of land reform. We also tried specifications including weather variables (rainfall and sunshine hours recorded in 1993), as well as a dummy for whether the province was already reporting coffee production in 1996: these variables do not have much explanatory power for our dependent variable; in particular, the coefficient on the coffee dummy is negative and insignificant. We also note that there is no significant difference in the implementation of the reform in the North and the South, despite the North's longer history of collectivization.⁹ This can also be seen in the maps in Figure 1, where each province is categorized as low, middle-low, middle-high or high depending on the quartile it belongs to, quartiles being obtained from the distribution of registration levels across provinces.

The other major factor cited by the GDLA to explain widely varying levels of LUC issuance is the number of disputes. We are unable to obtain any quantitative information on this; however, there have been incidents of peasant unrest in Vietnam during the 1990s.¹⁰ While Table 3 still leaves open the question of why the progress of land reform is so different across different provinces, it serves as a preliminary, though certainly not conclusive, check on the exogeneity of our main explanatory variable. For the time being therefore, we take the registration levels in a province to be exogenously determined in our regression analysis.

6 Impact of land reform on agriculture

6.1 Crop choice

As discussed earlier, the additional land rights conferred by the 1993 law might induce households to undertake more long-term investments on their land. One way of measuring this is by looking at

⁸Variables used in these regressions have been obtained from Statistical Yearbooks published by the General Statistical Office. Mean age, education, household size and per capita expenditure are from the 1993 Living Standards Survey. The significant coefficient for proportion of communes having a highway is driven by one outlier (old Minh Hai province). The significant coefficient for proportion under perennial crops is also due to one outlier (old Song Be province).

⁹In 1994, provinces in the North had on average 24 percent of households registered, while provinces in the South had a registration level of 23 percent. The corresponding figures for 1998 were 74 percent and 69 percent.

¹⁰It is interesting that Thai Binh province, which witnessed large scale unrest in 1997 (related partly to corruption by land officials) has the lowest level of LUC issuance in 2000.

the allocation of land between annual crops and multi-year industrial or fruit crops, which typically require large investments up-front and yield returns only after a few years. Table 4 shows that the land reform led to a large and statistically significant increase in the proportion of total cultivated area devoted to multi-year crops: a household in a province where everybody had a LUC would increase this proportion by 7.5 percentage points over the period 1993-98, compared to a household in a province where nobody was issued LUC. This means that if the proportion of households registered goes up by one standard deviation, the proportional area devoted to long-term crops will increase by 0.09 standard deviations. This increase comes at the expense of annual crops, which show a decrease of 6.5 percentage points in their share of total cultivated area (regressions not shown). We control for household characteristics like age, education, gender, household size and ethnicity while obtaining these estimates.¹¹ The coefficients are robust to the addition of region fixed effects (column (3)), to adding the household controls interacted with the time dummy, and to adding household income in 1993 or province-level mean per-capita income as additional regressors (last two specifications not shown in the table). Further, the coefficients are similar, though a little smaller, when we restrict our sample to only the “panel” households, who are interviewed in both 1993 and 1998, and use household fixed effects to control for any time-invariant household characteristics (column (4)).

We get very similar results when we use our speed of LUC issuance measure instead of the level of issuance in 1998 as the main explanatory variable (columns (5)-(8)). These results indicate that if a province were to reach the 50 percent issuance level one year earlier, households in that province would on average increase the proportional area devoted to long-term crops by 1.3 percentage points (0.06 standard deviations).¹²

We might be concerned that our results are driven by other government policies regarding the promotion of long-term crops such as coffee. We should note that table 3 shows that the area under long-term crops in 1993 is negatively related to the land reform progress; provinces which were growing coffee in 1996 also have slightly lower levels of LUC issuance than other provinces. Any bias in the estimates is thus likely to be downward, rather than in the upward direction.

We can conduct a similar analysis of the area devoted to long-term crops, using province-level

¹¹We should note that in the household surveys, some respondents answer questions about long-term crops by mentioning the number of trees they have, rather than the area devoted to them. Our results are robust to several ways of converting trees to areas.

¹²We get similar results if we break up the sample into early and late issuers (based on 1994 issuance) and use the first measure: coefficients are much larger and strongly significant for early issuers and smaller for late issuers.

aggregate data from the Statistical Yearbooks of various years. However, the results of the household level surveys are not replicated in these data. In both a difference-in-differences specification (replicating the regression for the survey data) and a specification with province and time fixed effects, we get a negative (though statistically insignificant) coefficient on the measures of LUC issuance (regressions not shown). However, this is subject to the caveat that we are not quite sure how the data for the Statistical Yearbooks is collected; the province-level aggregate figures are somewhat different from the figures obtained by aggregating the household survey data.

6.2 Agricultural inputs

Table 6 shows that households in provinces with greater land rights increase the proportion of irrigated annual crop area by about 12 percentage points as compared to those in provinces with lesser extent of formal land rights.¹³ However, this figure is not statistically significant. Regressions using the speed of land reform variable also do not yield a significant coefficient. We also do not see much impact of the land reform on other measures of short-term agricultural investments such as fertilizer or pesticide usage (results not shown).

7 Impact on credit and land markets

In this section, we check whether the land law has an impact on credit markets. Recall that having a pledgeable land use certificate was expected to increase a household's access to credit, especially from formal sources like banks and credit cooperative. Table 6, however, shows that the issuance of LUCs leads to households being less likely to have an outstanding loan. Approximately half of all households have outstanding loans (51% in 1993 and 54% in 1998): the probability of having a loan goes down by 11 percentage points when a province implements the land reform fully. Households in highly-registered provinces also have lower amounts borrowed (as a fraction of total household expenditure). These results hold overall (statistically significant with a tobit specification) and within the sample of borrowers only (statistically insignificant). Further, we see that there is no change in the fraction of loans from formal sources.

Overall, these results do not suggest a positive impact of the LUC on households' ability to borrow in the post-reform period. This is not because households in high-issuance provinces

¹³We are unable to get a measure of how much of the perennial crop land was irrigated, since the 1993 survey asks this question only for annual crop land.

are richer than households in low-issuance provinces: Table 7 shows that households in high-issuance provinces show a smaller increase in real household expenditure than those in low-issuance provinces. The lack of an impact on the credit market could be because lenders perceive that land is hard to seize in case of a default; or because households are restricted in their borrowings once they have an LUC (because they need to give this to the first lender and cannot pledge the same land as collateral for another loan); or because credit market institutions are not fully developed to take advantage of these new rights in land (the major lender in rural areas is the state-owned Vietnam Bank for Agriculture and Rural Development). We are in the process of investigating these hypotheses further.

We would also like to investigate whether the land law facilitated land transfers, thereby making the land market more efficient. Unfortunately, evidence on land market transactions is hard to come by because of substantial underreporting by respondents. This is mainly because of the high tax imposed on land transactions. Nevertheless, there seems to be an increase in land market transactions between 1993 and 1998: the proportion of households who report receiving land increases ten-fold from 2.5 percent in 1993 to 25 percent in 1998, a similar ten-fold increase is seen for households reporting sales of land (from 1 percent to 10 percent). This could however simply reflect less under-reporting after the law was passed. The increase does not seem to be very different across high issuance vs. low issuance provinces (see Table 8). The participation of households in the land rental market also increases between 1993 and 1998, but again, is not systematically related to the progress of land certificate issuance.¹⁴

A preliminary analysis of land distribution suggests that there has not been much change over time. In particular, there is not much evidence that formalizing land rights creates increasing landlessness (because people are now able to sell land in times of need). The proportion of landless households decreases from 11.4% to about 7%. High-issuance provinces have slightly lower levels of landlessness in 1993 itself, but the changes are similar across high-issuance and low-issuance provinces. Further, province-level Gini coefficients of land ownership also decline over time.¹⁵ The decrease is mainly for provinces in the South (from 0.58 to 0.50) which started at much higher levels of inequality than the North, where the Gini remains constant at around 0.37. There is no

¹⁴The data on renting are not fully comparable across the two surveys: the 1993 survey asks separately about land rented in and land sharecropped, while the 1998 survey does not ask about sharecropping. Figures reported in the table include sharecropping in 1993.

¹⁵This might indicate that the increase in land transactions mentioned earlier may be primarily driven by an increase in reporting, rather than an increase in the actual volume of transactions.

difference in the change in Gini by province registration levels.

8 Conclusion

We study a land reform which makes land rights secure, pledgeable and tradable and show that it has a statistically significant impact on the decisions of households to undertake long-term agricultural investments. However, we do not find any significant impact on the intensive margin on measures of short-term investments. Contrary to results obtained in some other countries, we find no evidence that land titles increase access to credit on the part of poor households; neither are they significant determinants of land market activity. However, we cannot rule out the possibility that the reform might lead to significant changes in the functioning of the land and credit markets over time.

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TABLE 1: CHARACTERISTICS OF SURVEY HOUSEHOLDS

Sample: Rural households

	1993 survey	1998 survey	
		Panel hhs	Replacement hhs
# households	3840	3375	894
Age of household head	44.85 (14.79)	47.47 (13.81)	45.63 (14.07)
Household size	4.97 (2.12)	4.79 (1.90)	4.84 (1.85)
Sex of household head (1=Male)	0.77 (0.42)	0.77 (0.42)	0.84 (0.37)
Ethnicity (1=Kinh)	0.86 (0.35)	0.84 (0.36)	0.82 (0.38)
Literate household head (1=literate)	0.88 (0.33)	0.88 (0.33)	0.86 (0.34)
Years of education of household head	5.96 (4.07)	6.48 (3.90)	6.03 (3.85)
Real household expenditure ('000 dong)	5541.00 (3856.02)	10189.95 (6426.11)	11487.02 (7278.54)
Farming as main occupation	0.83 (0.38)	0.78 (0.42)	0.76 (0.43)

Source: Viet Nam Living Standards Surveys 1993 and 1998
All means weighted by sampling weights.

TABLE 2: MEASURES OF LAND RIGHTS

Panel A	Proportion of households registered				
	Mean	North	South	Min	Max
1994	0.237	0.246	0.227	0.001	0.914
1995	0.367	0.345	0.391	0.040	0.960
1996	0.435	0.404	0.469	0.074	0.952
1997	0.632	0.597	0.667	0.111	1.000
1998	0.713	0.687	0.740	0.119	1.000
2000	0.902	0.893	0.911	0.533	1.000

Panel B				
Year	# provinces where LUC issuance exceeds 25%	50%	75%	
1994	21	8	4	
1995	12	8	2	
1996	11	9	8	
1997	13	18	14	
1998	3	5	10	
2000	1	13	18	
	61	61	56	

Panel C				
	Correlation among registration measures and manpower measures			
% hh registered 1998	1.000			
% hhs registered 1996	0.644	1.000		
% hhs registered 1994	0.376	0.595	1.000	
Years since reg> 25%	0.492	0.691	0.697	1.000
Years since reg> 50%	0.828	0.799	0.648	0.619
Officials/commune 1994	0.102	-0.033	-0.050	-0.016
Officials/commune 1998	0.113	0.250	-0.087	0.136
Officials/1000 hhs 1994	0.081	-0.118	0.077	-0.016
Officials/1000 hhs 1998	-0.007	-0.051	0.110	0.076

Notes: Figures computed by authors from data provided by General Department of Land Administration, Hanoi.

Proportion of households registered in Panel A refers to the number of households who possess a Land Use Certificate as a fraction of the total number of households. For 1996, 1998 and 2000, GDLA provided the total number of households. For the remaining years, total number of households is estimated by authors based on total number of agricultural households.

The entries in Panel B are the number of provinces in which the proportion of households registered crosses the specified threshold (25%, 50%, 75%). E.g. 21 provinces crossed the 25% threshold in 1994, 12 provinces crossed it in 1995 etc.

"Years since reg> 25%" is 2001 minus the year in which LUC issuance in the province exceeded 25%.

"Officials/commune" is the number of land department officials in the province divided by the total number of communes in the province.

"Officials/1000 hhs" is the number of land department officials in the province divided by the total number of agricultural households.

TABLE 3: WHAT DETERMINES IMPLEMENTATION OF LAND REFORM ?

Sample: Provinces

	% HHs registered 1998				Speed of registration			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Land officials/commune (1994)		0.063 (0.072)	0.069 (0.065)	0.055 (0.052)		0.886 (0.726)	0.675 (0.531)	0.523 (0.524)
Population density 1993	-0.012 (0.015)	-0.012 (0.015)			-0.109 (0.116)	-0.099 (0.115)		
Total area of province ('000 sq km)	-0.128 (0.123)	-0.099 (0.132)			-0.178 (0.968)	0.341 (1.088)		
Proportion urban 1993	0.343 (0.310)	0.230 (0.318)			0.318 (2.368)	-0.471 (2.366)		
Proportion under perennial crops 1993	-0.137 (0.191)	-0.170 (0.210)			-2.746* (1.396)	-3.337** (1.553)		
Dummy for North	-0.030 (0.071)	-0.012 (0.071)	0.033 (0.074)	0.113 (0.120)	-0.649 (0.662)	-0.589 (0.670)	0.160 (0.594)	0.527 (0.997)
Prop. Communes having market			0.142 (0.207)				1.499 (1.644)	
Prop. Communes having highway			-0.184 (0.159)				-3.088** (1.292)	
Prop. Communes having clinic			0.400 (0.368)				0.505 (2.577)	
Mean age of HH head (1993)				0.022** (0.009)				0.088 (0.086)
Mean HH size (1993)				0.049 (0.060)				0.914 (0.561)
Mean years of education (1993)				0.019 (0.026)				0.157 (0.262)
Log per capita expenditure (1993)				0.204 (0.166)				1.672 (1.398)
Observations	59	57	57	54	59	57	57	54
R-squared	0.06	0.07	0.11	0.18	0.05	0.08	0.11	0.14

Notes: Robust standard errors in parantheses.

Registration level is the proportion of households in the province who have a Land Use Certificate.

Speed of registration is 2001 minus the year when province registration level crossed 50%.

Regressions exclude Hanoi and Ho Chi Minh City, which are outliers in terms of population density and urbanization rates.

Significant coefficient for proportion of communes having highway is driven by one outlier (old Minh Hai province).

Significant coefficient for proportion under perennial crops is also mainly due to one outlier (old Song Be province).

TABLE 4 : IMPACT OF LAND REFORM ON CROP CHOICE

Sample: Rural households

Dependent variable = Proportion of total cultivated area devoted to perennial industrial crops and fruit crops

Mean (s.d.) of dep. var. in 1993 = 0.0938 (0.2049) in 1993; 0.1185 (0.2565) in 1998

	% hhs registered 1998				Speed of registration			
	No controls (1)	HH chars. (2)	Region FE (3)	Panel hhs (4)	No controls (5)	HH chars. (6)	Region FE (7)	Panel hhs (8)
Land rights*Year=1998	0.080*** (0.025)	0.075*** (0.024)	0.075*** (0.025)	0.053* (0.031)	0.012*** (0.005)	0.013*** (0.005)	0.013** (0.005)	0.009* (0.005)
Year=1998	-0.033 (0.020)	-0.033* (0.017)	-0.033* (0.017)	-0.014 (0.020)	-0.022 (0.017)	-0.028* (0.016)	-0.029* (0.017)	-0.010 (0.017)
Land rights	0.038 (0.047)	-0.012 (0.037)	-0.011 (0.027)		0.006 (0.006)	-0.005 (0.005)	-0.010* (0.006)	
Age of household head		0.001*** (0.000)	0.002*** (0.000)			0.001*** (0.000)	0.002*** (0.000)	
Male household head		-0.019* (0.011)	-0.020** (0.010)			-0.019* (0.011)	-0.021** (0.010)	
Years of education of head		0.008*** (0.002)	0.008*** (0.002)			0.008*** (0.002)	0.008*** (0.002)	
Household size		-0.001 (0.002)	-0.002 (0.002)			-0.001 (0.003)	-0.003 (0.002)	
Majority ethnic group dummy		-0.006 (0.030)	0.003 (0.030)			-0.005 (0.029)	0.003 (0.029)	
Dummy for north		-0.195*** (0.039)	-0.195*** (0.039)			-0.195*** (0.042)	-0.195*** (0.042)	
Total area cultivated (*10 ⁻⁵)		-0.148* (0.088)	-0.208** (0.090)			-0.154 (0.094)	-0.214** (0.095)	
Region fixed effects	no	no	yes	no	no	no	yes	no
Household fixed effects	no	no	no	yes	no	no	no	yes
No. of observations	7469	7469	7469	6012	7469	7469	7469	6012
No. of provinces	59	59	59	59	59	59	59	59
R-squared	0.01	0.15	0.22	0.80	0.01	0.16	0.22	0.80

Standard errors in parentheses, corrected for province-level clustering. * significant at 10%; ** significant at 5%; *** significant at 1%

All regressions weighted by sampling weights

TABLE 5 : IMPACT OF LAND REFORM ON PROPORTION OF ANNUAL LAND IRRIGATED

Sample: Rural households
 Dependent variable= Proportion of annual land irrigated; Mean (s.d.) = 0.255 (0.397) in 1993; = 0.683 (0.416) in 1998

	% hhs registered 1998				Speed of registration			
	No controls (1)	HH chars. (2)	Region FE (3)	Panel hhs (4)	No controls (5)	HH chars. (6)	Region FE (7)	Panel hhs (8)
Land rights*Year=1998	0.124 (0.223)	0.121 (0.220)	0.137 (0.218)	0.155 (0.313)	-0.006 (0.029)	-0.005 (0.028)	-0.005 (0.028)	0.001 (0.040)
Year=1998	0.339** (0.168)	0.349** (0.165)	0.340** (0.165)	0.335 (0.239)	0.451*** (0.126)	0.457*** (0.125)	0.458*** (0.124)	0.442 (0.180)
Land rights	0.058 (0.131)	0.009 (0.112)	0.021 (0.104)		0.025 (0.020)	0.017 (0.018)	0.020 (0.014)	
Age of household head		-0.000 (0.001)	0.000 (0.001)			-0.000 (0.001)	0.000 (0.001)	
Male household head		0.025 (0.018)	0.021 (0.015)			0.026 (0.018)	0.022 (0.015)	
Years of education of head		-0.005* (0.003)	-0.003 (0.003)			-0.005* (0.003)	-0.003 (0.003)	
Household size		0.006* (0.003)	0.008*** (0.003)			0.006* (0.003)	0.008*** (0.003)	
Majority ethnic group dummy		0.144** (0.055)	0.113** (0.053)			0.147** (0.056)	0.116** (0.054)	
Dummy for north		-0.120** (0.049)				-0.112** (0.048)		
Region fixed effects	no	no	yes	no	no	no	yes	no
HH fixed effects	no	no	no	yes	no	no	no	yes
No. of provinces	59	59	59	59	59	59	59	59
No. of observations	7438	7438	7438	5974	7438	7438	7438	5974
R-squared	0.22	0.26	0.34	0.64	0.23	0.26	0.34	0.64

Standard errors in parentheses, corrected for province-level clustering. * significant at 10%; ** significant at 5%; *** significant at 1%.
 All regressions weighted by sampling weights

TABLE 6: CREDIT MARKET OUTCOMES

PANEL A: Dependent variable =1 if household has outstanding loans

Independent variable:	% hhs registered 1998				Speed of registration			
	No controls (1)	HH chars. (2)	Region FE (3)	Panel hhs (4)	No controls (5)	HH chars. (6)	Region FE (7)	Panel hhs (8)
Land rights * Year=1998	-0.111 (0.071)	-0.104 (0.073)	-0.107 (0.073)	-0.087 (0.093)	-0.018 (0.009)**	-0.017 (0.009)*	-0.018 (0.009)*	-0.012 (0.012)
Land rights	0.035 (0.070)	0.046 (0.066)	-0.002 (0.061)	-	0.021 (0.009)***	0.021 (0.009)**	0.013 (0.008)	-
Year=1998	0.110 (0.054)**	0.128 (0.0539)**	0.125 (0.055)**	0.091 (0.071)	0.096 (0.039)**	0.117 (0.039)**	0.115 (0.040)**	-0.015 (0.012)
household characteristics	no	yes	yes	no	no	yes	yes	yes
region fixed effects	no	no	yes	no	no	no	yes	no
household fixed effects	no	no	no	yes				
Observations	8108	8108	8108	6684	8108	8108	8108	6684
R-squared	0.00	0.05	0.06	0.24	0.00	0.05	0.06	0.24

PANEL B: Dependent variable = Amount borrowed/total expenditure

Independent variable:	% hh with LUC 1998				Speed of LUC issuance			
	Borrowers only (linear) (1)	Borrowers only (linear) (2)	All hh (tobit) (3)	All hh (tobit) (4)	Borrowers only (linear) (5)	Borrowers only (linear) (6)	All hh (tobit) (7)	All hh (tobit) (8)
Land rights * time	-0.080 (0.073)	-0.091 (0.071)	-0.150 (0.053)**	-0.146 (0.052)***	-0.009 (0.010)	-0.010 (0.010)	-0.021 (0.007)**	-0.021 (0.007)***
Land rights	0.010 (0.042)	-0.012 (0.034)	0.036 (0.038)	-0.013 (0.039)	0.002 (0.007)	-0.002 (0.006)	0.019 (0.005)**	0.010 (0.005)**
Year=1998	0.208 (0.061)***	0.211 (0.059)**	0.217 (0.041)**	0.230 (0.040)***	0.186 (0.047)**	0.187 (0.045)**	0.188 (0.028)**	0.205 (0.028)***
household controls	no	yes	no	yes	no	yes	no	yes
region fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	4319	4319	8109	8109	4319	4319	8109	8109
R-squared	0.03	0.04	0.03	0.04	0.03	0.04	0.04	0.04

Standard errors in parantheses, clustered at province level.

Household controls include age, gender, education, ethnic origin of household head, household size

Panel B: Columns 1-2 and 5-6: linear model restricted to borrowers. Columns 3-4 and 7-8: tobit model.

TABLE 6 (CONTD.): CREDIT MARKET

PANEL C: Dependent variable = Proportion of loans borrowed from formal sources

Independent variable:	% hh with LUC 1998				Speed of LUC issuance			
	Borrowers only (linear) (1)	(2)	All hh (tobit) (3)	(4)	Borrowers only (linear) (5)	(6)	All hh (tobit) (7)	(8)
Land rights * Year=1998	0.009 (0.048)	0.009 (0.052)	-0.036 (0.114)	-0.022 (0.112)	0.006 (0.006)	0.007 (0.007)	-0.019 (0.014)	-0.019 (0.014)
Land rights	-0.009 (0.061)	-0.026 (0.056)	-0.064 (0.085)	-0.242 (0.087)***	-0.006 (0.007)	-0.010 (0.008)	0.025 (0.011)	-0.006 (0.011)
Year=1998	0.073 (0.036)**	0.058 (0.039)	0.475 (0.087)**	0.475 (0.086)***	0.056 (0.028)**	0.036 (0.311)	0.523 (0.063)**	0.530 (0.061)***
household controls	no	yes	no	yes	no	yes	no	yes
region fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	2388	2388	8109	8109	2388	2388	8109	8109
R-squared	0.02	0.06	0.02	0.04	0.02	0.06	0.02	0.04

Columns 1-2 and 5-6: linear model restricted to borrowers (standard errors clustered at province level)

Columns 3-4 and 7-8: tobit model

Household controls include age, gender, education, ethnic origin of household head, household size

TABLE 7: TOTAL HOUSEHOLD EXPENDITURE

Dependent variable = Log (real household expenditure)	% hhs registered 1998			Speed of registration		
	No controls (1)	Region FE (2)	Panel hhs (3)	No controls (4)	Region FE (5)	Panel hhs (6)
Independent variable:						
Land rights * Year=1998	-0.0671 (0.0796)	-0.0222 (0.0756)	-0.0302 (0.1102)	-0.0209* (0.0114)	-0.0157 (0.0105)	-0.0190 (0.0169)
Year=1998	0.7109*** (0.0573)	0.6807*** (0.0574)	0.6841*** (0.0790)	0.7461*** (0.0485)	0.7280*** (0.0452)	0.7389*** (0.0695)
Land rights	0.2395* (0.1378)	0.1401 (0.0972)		0.0467** (0.0223)	0.0221 (0.0129)	
household characteristics	no	yes	no	no	yes	yes
region fixed effects	no	yes	no	no	yes	no
household fixed effects	no	no	yes			
Observations	8108	8108	6684	8108	8108	6684
R-squared	0.00	0.06	0.24	0.00	0.06	0.24

Notes: standard errors in parenthesis, clustered at the province level.

Household controls include age, gender, education, ethnic origin of household head, household size

TABLE 8: LAND TRANSACTIONS AND LAND DISTRIBUTION**Panel A: Buying and selling land**

Proportion of hhs who report buying land

Year	% hhs with LUC	
	<80%	>80%
1993	0.0230	0.0200
1998	0.1771	0.2188

DD estimate: 0.0447

Proportion of hhs who report selling land

Year	% hhs with LUC	
	<80%	>80%
1993	0.0091	0.0084
1998	0.0863	0.0811

DD estimate: -0.0045

Panel B: Land rental market

Prop. of hhs who report renting in land

Year	% hhs with LUC	
	<80%	>80%
1993	0.2015	0.1627
1998	0.1264	0.1703

DD estimate: 0.0827

Proportion of hhs who report renting out land

Year	% hhs with LUC	
	<80%	>80%
1993	0.0352	0.0308
1998	0.0863	0.0811

DD estimate: -0.0008

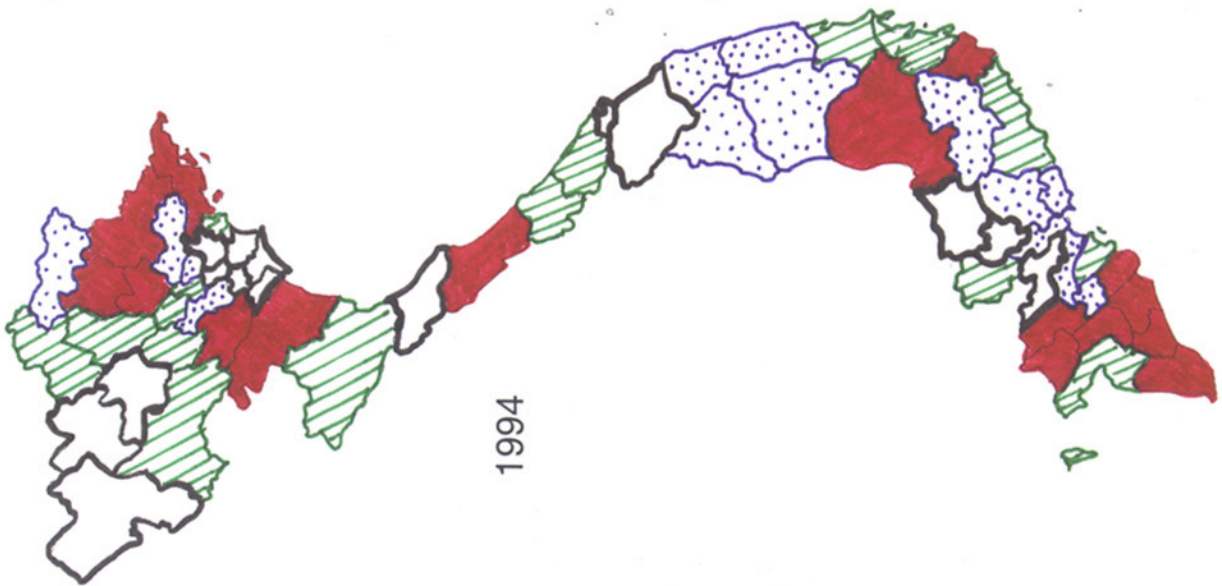
Panel C: Land distribution

Proportion landless

Year	% hhs with LUC	
	<80%	>80%
1993	0.1211	0.1136
1998	0.0718	0.0681

Gini coefficient in province

Year	% hhs with LUC	
	<80%	>80%
1993	0.4820	0.4674
1998	0.4424	0.4382



1994



1998

Geographical Distribution of Registration Levels (1994 - 1998)

