

The Impact of “Market-friendly” Reforms on
Credit and Land Markets in Honduras and Nicaragua

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Abstract: This article explores the impacts on credit access and agrarian structure of land market liberalization policies undertaken in Honduras and Nicaragua during the 1990s. Like liberalization efforts pursued in many Latin American countries, these market-friendly reforms were designed to activate land transfers and enhance agricultural efficiency, in large part by improving the access of the rural poor to both credit and land markets. Panel data sets gathered in Honduras and Nicaragua are used to compare title, credit, and land access patterns before and after the reforms. Descriptive non-parametric regression analyses show that despite major gains in titling across the land size spectrum, and some increase in land market activity, the other hoped for improvements in credit and land access did not occur, and appear unlikely to occur without further policy attention to credit markets.

Keywords: Land markets, credit markets, agrarian structure, liberalization, Honduras, Nicaragua

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1. INTRODUCTION

The ever-evolving path of agrarian reform in Latin America has taken a dramatic turn. The original reforms—stretching from the Cardenas redistribution in 1930’s Mexico through the Sandinista agrarian reform in 1980’s Nicaragua—operated from a structuralist perspective and sought state-mandated redistribution of land ownership.¹ Renewed contemporary interest in egalitarian land access as part of both growth and poverty reduction strategies (Deininger, 2003a) has brought forth a new liberal perspective on land reform (see Carter, 2000). This liberal perspective relies on market-mediated redistribution of land and land access to achieve the productivity and income distribution desiderata of land reform. Using household panel data from Honduras and Nicaragua that spans recent liberal reforms, this article evaluates the effectiveness of market-friendly land policies in these two countries. Despite significant advances in promoting secure, private property rights, and some increase in land market transactions, we find that the first generation of liberal land market reforms have not yet generated the volume of land transfers that would be required to achieve the efficiency and equity gains hoped for from this policy approach.

The structuralist perspective of the original Latin American agrarian reforms saw agricultural performance and income distribution as inexorably influenced by the distribution of land ownership (Thiesenhusen, 1989). Because performance was viewed as inseparable from agrarian structure, Latin America’s original agrarian reforms employed state-mandated redistribution as the principal way to break the dualistic agrarian ownership structure inherited from the colonial era. The more recent generation of market-friendly policies, in contrast, seeks to enhance efficiency and equity in agriculture by subordinating the state to private markets.

Interestingly, the strongest pushes to use markets to separate agrarian performance from structure have occurred in countries—notably Mexico, Nicaragua, Peru, Chile, and Honduras—that initially carried out some of the most far-reaching redistributive reforms and extensively promoted collective forms of rural organization. Two legacies of the original reforms addressed by recent land market policy reforms are the incomplete assignment of property rights and state-imposed restrictions on land transactions, with the main aim being to eliminate or at least substantially reduce these constraints on the functioning of land market transactions.

This market-friendly perspective rests on three primary claims (Deininger, 2003a):

1. Land-poor households enjoy a fundamental competitiveness advantage over larger scale producers because of agency costs that raise the cost of labor to the latter.²
2. ‘Agricultural modernization’ and policy reforms³ that complete and secure individual private property rights to land, and ‘get prices right’ by eliminating distortions caused by state intervention in product and factor markets, will serve to activate the competitiveness advantage of small holders; and,
3. Once policy reform is in place, land market transactions can substantially weaken the link between ownership structure and land access and agricultural performance, thus enhancing the land access of the rural poor as well as efficiency and growth performance of the rural sector.⁴

The degree to which these claims are likely to be fulfilled of course depends on the functioning of other types of factor markets, especially credit markets. While the important role played by these complementary markets is widely recognized in research circles (Carter and Mesbah, 1993; Binswanger, Deininger and Feder, 1995; Carter and Barham, 1996; de Janvry et al., 2001; Deininger, 2003a, b), this recognition was arguably absent from the core measures of the first generation of Latin American agricultural modernization policies. Instead, these policies combined titling programs and legal reforms securing private property rights with a major reduction in state sponsored credit and technical assistance services, presumably with the

assumption that either market institutions would evolve to fill these gaps or that they were not essential to the success of the policies in achieving efficiency and equity goals.

Now is an auspicious time to evaluate and, as necessary, rethink the direction of market-friendly land policies. Already burdened by what Londoño and Székely (1997) call excess inequality, low economic growth in Latin America in the 1990s was frequently accompanied by worsening income distribution so that poverty levels—already highest in rural areas—have grown or remained very high (Birdsall and Székely, 2003). These trends are visible in Honduras and Nicaragua where rural poverty has remained persistently high. More than 70% of the rural population in both countries fell below standard poverty line measures as of the late 1990s, *prior* to Hurricane Mitch and the recent collapse of coffee prices (World Bank, 2001a,b). Perhaps not surprisingly then, the first generation of land market policy reforms are currently being re-evaluated in many Latin American countries, including the two countries analyzed in this paper. In Honduras, the government is expected to form by the end of 2004 an inter-agency Land Commission with the mandate to develop a new generation of land and rural market policies aimed at multiple goals including combating rural poverty. In Nicaragua it is widely anticipated that the government will put land access and rural poverty at the center of an ambitious economic development push sponsored by a U.S. Millennium Challenge Account grant. Thus, in an effort to contribute to a second generation of land market reforms, this article exploits recently collected data from Nicaragua and Honduras that permit analyses of the performance of the first generation of reforms in the credit and land markets. While the approach taken in this paper is primarily descriptive (relying on bivariate non-parametric regression to describe major trends), it provides a comprehensive view of the impacts of these reforms on land and credit markets and changes in operational and ownership distribution of land in these two countries.

The structure of the article is as follows. Section 2 describes the recent land and credit liberalization policies in the two countries. Section 3 develops the logic underlying the liberal reforms, with a special focus on the potential synergies between land and credit market liberalization. This section also suggests why imperfections and frictions in land, credit and insurance markets as well as continued institutional rigidities – similar to earlier structuralist concerns – may conspire to undermine the reforms both in terms of efficiency and equity outcomes. Section 4 describes the survey methodology and uses the data to present evidence on reform impacts, focusing attention on the degree to which credit access, land market activity, and the distribution of land operated and land owned have changed. Section 5 concludes by noting that while multiple explanations could explain the findings of the study, the policy implications unambiguously point toward the need to address imperfections in rural credit and insurance markets.

2. MARKET FRIENDLY REFORMS IN HONDURAS AND NICARAGUA

Honduras and Nicaragua, like most Latin American countries, undertook sweeping economic reforms in the 1990s that were aimed at increasing market orientation, openness, and competition. These efforts were especially dramatic in the agricultural sector, where land market liberalization initiatives were launched after three decades of heavy government intervention in support of land redistribution and rural credit provision in Honduras and more than a decade of land reform efforts under Sandinista rule in Nicaragua. In both countries, the market-oriented reforms were undertaken at the beginning of the 1990s, and emphasized strengthening individual property rights to land, extending titling efforts including the privatization of cooperative lands,

activating land rental markets and private credit markets, and removing the government from all forms of direct land redistribution efforts that did not involve market mechanisms.⁵

(a) Honduras

In Honduras, the Law for Modernization and Development of the Agricultural Sector (LMDSA) was enacted in 1992 and became operative in the middle of 1993⁶. It replaced the 1975 Agrarian Reform Law, rescinding several key statutes including the commitment to eliminate minifundios (5 hectares or less), the prohibition of land rentals by beneficiaries of land reform, and the prohibition on sale of land adjudicated to cooperatives or parcels controlled by individuals in the cooperative. The LMSDA also promoted the titling of land to individuals or couples holding “illegally occupied national lands” prior to 1989. It also strengthened women’s formal rights to hold and receive land (Deere and Leon, 2001) and obliged the government to facilitate land market transactions by improving the security of property rights and the titling and land registry process.

Measures were also taken by the Honduran government to rationalize the rural financial sector by strengthening incentives for the private sector to assume a leadership role. Specifically, rural interest rates were liberalized, and BANADESA, the state’s agricultural development bank and the main source of formal credit for small farmers, was restructured through a reduction in personnel, an increase in lending rates to market levels, and a limit of \$50,000 in the maximum loan size for a single borrower. The aim was to stimulate commercial bank lending by deregulating interest rates and by ensuring that BANADESA, the government development bank, would not crowd out or repress private sector participation in rural financial markets.⁷

A major thrust of the LMDSA has been to reinvigorate the Land Titling Project (PTT) that had been promoted strongly in the 1980s but had diminished in the early 1990s⁸. After initially operating in only seven of Honduras' eighteen departments, the National Agrarian Institute (INA) extended the PTT nationwide after the LMDSA. Approximately 50,000 titles with an average size of 11 hectares were granted between 1983 and 1993, while over 100,000 titles averaging 8 hectares were granted in the post reform years 1994 – 2000.⁹ In addition to extending the coverage of titling, INA also intensified efforts to collect the land debt from previous title recipients.¹⁰

(b) Nicaragua

The move in Nicaragua toward land market liberalization and a downsizing of the state's role in the agricultural sector began with the electoral defeat of the Sandinista National Liberation Front in 1990, and the implementation of a far-reaching structural adjustment program by the Chamorro regime (1990-1996). Most directly related to the agricultural sector was the privatization of state enterprises and agricultural cooperatives, a dramatic reduction in government credit and extension services especially by the state development bank BANADES, and a deregulation of the financial sector. Land titling programs were also advanced in an effort to deepen private property rights.¹¹

The Aleman administration (1996-2002) built on the efforts of the Chamorro government by introducing a package of policies aimed at modernizing the agricultural sector. Included in these measures was a law enacted in 1997, which secured the individual ownership rights to the majority of land reform beneficiaries (those with holdings less than 35 hectares) as well as an acceleration of other land titling efforts. While BANADES was closed, the government tried to activate rural financial markets through the provision of incentives to small, privately owned

financial intermediaries and the sale of some of the branches of BANADES. Overall, in the 1990s, the market-oriented reforms pursued in rural Nicaragua were quite parallel to those undertaken in Honduras, with perhaps the main difference being the more complete withdrawal of state support for technical and credit services in Nicaragua during the latter part of the decade.

3. A NEO-STRUCTURAL PERSPECTIVE ON MARKET FRIENDLY REFORMS

As a prelude to empirical analysis of the Honduran and Nicaraguan experiences, this section explores the potential impacts of titling, increased security of property rights and other market-friendly reforms on the functioning of credit, land rental and land sales markets. While these key factor markets may in theory operate in a way that realizes the win-win potential of the reforms, the reality of imperfect and costly information may distort their functioning. If these distortions are sufficiently severe, then the performance of the agrarian economy will remain linked to and constrained by the underlying structure of land ownership, even in the wake of market-friendly reforms. These considerations comprise a “neo-structural” perspective on the reforms. This neo-structural perspective suggests that the effectiveness of the reforms, and their ability to break the linkage between inegalitarian land ownership and economic performance, is likely to be constrained by the realities of imperfect information that leave key markets incomplete and biased against low wealth households.

(a) Credit markets

The success of the market-friendly reforms implemented in Honduras, Nicaragua and other countries hinges on a positive synergy between strengthened private property rights and credit markets. As numerous authors have noted (*e.g.*, Eswaran and Kotwal, 1986), access to capital across economic classes will have a major impact on land access, agricultural organization and productivity. A key question then becomes whether post-reform credit markets

do or do not work for the rural poor. If they do provide credit access to the poor, then the potential for activation of these markets in ways that benefit the land-poor seems quite high. But, if they do not provide credit access to the poor, indeed if the poor tend to face non-price rationing in credit markets,¹² then the potential benefits to the rural poor of land market liberalization will be limited largely to indirect effects of labor market opportunities. These, in turn, could be negative, if the capital-intensive bias of larger farms leads to a reduction in labor opportunities (Carter and Barham, 1996).

How then is the land titling emphasis of the agricultural modernization efforts likely to affect the credit access of rural households? According to at least one version of the liberal story, it is not the lack of land (or assets), but instead the lack of collateral assets that is the primary barrier impeding credit access of small farmers (De Soto, 2000). Formal lenders—who have limited local information and thus are not efficient at screening and monitoring borrowers—require collateral to provide incentives for borrowers to minimize the probability of default. In this view, one of the most destructive legacies of Latin America’s original land reforms was the inability of beneficiaries to establish clear property rights over land, which led to their inability to fully collateralize and exploit their primary productive asset.

This shortcoming is remedied in the liberal plan by granting and registering freehold titles. From this perspective, land titling should activate credit markets via both a supply and demand effect.¹³ On the supply side, land title increases a farmer’s ability to provide collateral. Tenure security also increases farmers’ willingness to undertake fixed investment, thereby increasing credit demand. There is thus a positive synergy between property rights and credit markets that leads to a win-win scenario of efficiency and equity gain. Indeed if, as we will show in the case of Honduras and Nicaragua, the distribution of private property rights prior to

reform were biased against small-holders, then the potential equity impacts of the reforms may be especially large.

While improving the ability of poor households to use their land as collateral is certainly a positive step, recent theory and empirical evidence suggest it might best be viewed as a necessary but not sufficient condition to alleviate non-price rationing outcomes in credit markets (Conning, 1999; Fields, 2003; Mushinksi, 1999; Carter and Olinto, 2003). Both supply and demand factors may leave land-poor households – even though they own some titled land – constrained in the credit market. On the supply side, formal lenders may not be willing to accept collateral under a certain minimum value because of the transaction costs associated with management of the loan and with foreclosure and resale in the event of a default. That minimum threshold creates the potential for quantity-rationed outcomes, where land-poor households would like a loan at the going interest rate but cannot secure the loan with sufficient collateral to generate a loan contract (Carter and Olinto, 2003).¹⁴

On the demand side, a land-poor household may have enough collateral to qualify for a loan but lack access to sufficient insurance to outweigh the risk of collateral loss associated with a bad outcome in the loan contract. As a result, they may be unwilling to take the loan contract because of the downside risk implied by collateral loss. This “risk-rationed” outcome is another form of non-price rationing that can hinder the operation of liberalized land markets (Boucher and Carter, 2002). It can be of particular concern on equity grounds because lower wealth households tend to be more sensitive to a given risk and have access to fewer formal insurance mechanisms.

If information based failures in credit and insurance markets are strong and wealth biased, then we would expect that the effect of market friendly reforms on credit market

activation will be uneven, more effective for medium and large scale farmers, while smaller-scale producers are likely to face quantity or risk-rationing that impinge on their credit access. It is important to stress that these optimistic and more cautious perspectives share the view that tenure security and credit access are essential to improving the situation of poor farmers in rural markets. What distinguishes the two visions is whether households must possess a minimum threshold of land before they can overcome intrinsic credit and insurance market imperfections.

(b) Land rental markets

From a liberal perspective, incomplete property rights over land combined with an imperfect labor market lead to inefficiency and suggest a clear policy remedy. While there are many dimensions to property rights over land, the liberal story pays special attention to rights of transfer—or alienability—that permit land to flow to its most efficient user. Until the recent reforms, the right to temporarily transfer land via rental was restricted in much of Latin America, either explicitly or implicitly by the threat of expropriation of land that was not owner-operated (de Janvry et al. 2001). Government policies that define full private property rights—including alienability—and defend them through legal means can close off this market failure in land, and allow rental markets to function effectively. Addressing this market failure in land is especially important if — as commonly asserted in agricultural household models – rural labor markets are also imperfect since simultaneous frictions in these markets can prevent the realization of gains from trade across heterogeneously endowed households (Feder 1985; De Janvry et. al. 1991).¹⁵ By making possible land rentals between larger and smaller producers, land market liberalization is expected to have salutary efficiency and equity effects, the former by moving land into the hands of more efficient small farmers (who avoid the agency costs associated with hiring in

wage-labor), and the latter by promoting a move to more equal operational farm sizes in the rural economy and increasing incomes earned by land-poor households.

Figure 1 here

This scenario is depicted in Figure 1, which portrays various potential relationships between operational farm size (T) and owned farm size (A).¹⁶ In the absence of rental markets, households' operational and owned areas are equal. The 45-degree line depicts this relationship, and thus represents the pre-reform period when rental transactions are thwarted by insecure property rights. If farm households have similar labor endowments and technologies but have different land holdings, then the introduction of a well-functioning rental market (and the assumption of no credit market problems) should give rise to an optimal operational farm size equal to T^* .¹⁷ In Figure 1, the effect of an activated land rental market is to rotate the 45 degree "pre-reform relationship" toward the horizontal "liberal relationship" at T^* , with land transfers being dominated by movements between landowners of disparate sizes. Note that under the extreme outcome of perfectly functioning land and credit markets, the actual operational distribution of farms becomes separable or independent from initial land ownership distribution. Under more plausible scenarios, we might expect to see the relationship between land owned and land operated lie between the two extremes depicted in Figure 1, with land-poor households operating substantially more land than they own and land-rich operating less than they own.

As suggested above, the optimistic scenario of substantial movement toward the horizontal line may be undermined by credit market failures and other imperfections in land markets. On the land market side, if the costs of finding transaction partners and enforcing rental contracts are high, then the types of inter-class rentals anticipated may not materialize (Carter and Chamorro, 2001). In addition, if credit market imperfections are prevalent then lack of

liquidity will constrain the effective land market participation of land-poor households (Olinto, Deininger and Davis, 2000).

The upward sloping dashed line in Figure 1 illustrates this second scenario where, because of land and credit market imperfections unrelated to the security of property rights, rentals will do little to weaken the link between land owned and land operated. Segmentation arises because the combination of transaction costs and credit market failures prevent significant rental transactions between land-rich and land-poor households. As a result, rental activity is limited because rentals will be based mostly on intra-class transactions that stem from differences in endowments (age, skill) and livelihood strategies (off-farm or on-farm labor choices) rather than inter-class differences in farm efficiency driven by differential access to family labor. Overall, operational farm size will remain much closer to the 45-degree line, perhaps with some local movement off of it within farm size classes, but without the significant transfers of land between land-rich and land-poor households that would create a move toward a common operational farm size.

Explanations of the type of minimal change in land access emanating from rental markets are not restricted to rigidities that prevent inter-class transfers. An alternative explanation consistent with this picture is that smallholder and landless households demand modest amounts of land only as a form of insurance on which they can fall back if they experience adverse shocks in labor or other markets (Conning et. al., 2001). Such a modest demand for land may occur either because limited credit access prevents households from pursuing more intensive agricultural livelihood strategy, or if households are unwilling to bear the risk of more fully investing in agriculture because of depressed prices or recent shocks. Whereas threat of expropriation may have previously prevented large landowners from supplying small parcels via

rental markets, increased certainty of recovering the parcel after property rights reform may facilitate this type of small inter-class transfer in the post-reform environment, thus enabling more land rentals but without much advance in the broader efficiency and equity objectives suggested by the full separation between land ownership and operation.

(c) Land ownership market

Property rights reform may also improve the efficiency and equity of agriculture via the activation of land sales markets. The logic is as follows. Defining freehold titles establishes clear, individual rights to a parcel, including the right to sell it. Establishing a property registry permits buyers to examine the history of a parcel—including the existence of competing claims and liens—and to defend their acquired rights. The overall effect is to reduce the costs associated with land sales. This, in turn, enhances efficiency via two routes. A first order effect of lower costs is to promote the flow of land to more efficient households, who are willing to pay more for it.¹⁸ There is also a second order or ‘gains from trade’ effect by which the greater ease of sales induces current owners to increase investment which they will be able to capitalize in a future sale (Besley 1995).

This liberal vision of the land sales market thus extends the basic logic of the story for rental markets. Stronger incentives to invest and greater ability to secure finance (via the collateral value of titled land) means that land-poor households who own some land can become more active in land sales markets and incrementally purchase the additional land they need to become more productive. This outcome complements the process of land rental market activation discussed above. Perhaps the land poor climb the agricultural ladder, first renting, building up equity, and finally purchasing land. Land purchases can also substitute for rental if rental transactions are limited by segmentation as discussed above, in the sense that each land

purchase may provide the basis for additional credit access that can over time be used to facilitate expansion of the operational farm size of the household.¹⁹ Together, these expectations suggest that market friendly policy reform will activate land sales markets and will over time generate a more egalitarian land ownership distribution of moderate size, family labor farms.

However, just as in the case of rental markets, imperfections in post-reform rural capital markets may greatly limit the scope for efficiency and equity enhancing land sales market activation. Non-price rationing or high transaction costs in credit markets could imply the existence of a minimum collateral wealth threshold for the activation of the credit access benefits outlined above. Households with a land endowment—even if titled—that do not raise them well above that threshold would be unable to use credit markets to finance fixed investment or purchase additional land. In the absence of insurance markets, a poorly performing market for consumption credit would also dampen poor households' willingness to pay for land since land is not well suited for consumption smoothing.²⁰ Unequal access to credit might completely offset the labor market advantages of land-poor households and make them less competitive in terms of their land use options than somewhat wealthier farmers who end up with better access to credit (Carter and Mesbah, 1993, Carter and Salgado, 2001). If credit imperfections are severe, activated land sales markets are unlikely to lead to more egalitarian land distributions and may even be regressive if they increase sales by land-scarce households to relatively land abundant households with better credit access. Depending on the underlying distribution of land, the critical threshold for credit market access, and the extent of credit access associated with collateralized land, the impact of titling could be to further polarize agrarian structure both in terms of land owned and land operated.

4. EMPIRICAL ANALYSIS OF HONDURAS AND NICARAGUA

As discussed above, rural credit and land market performance are crucial to the efficacy of liberal land market reforms. Before turning to the evidence, we briefly review the coordinated data collection procedures pursued in Honduras and Nicaragua.

(a) Data collection

In 2001, 850 producer households were surveyed in 5 departments in Honduras regarding the 2000 agricultural year.²¹ This sample can be broken into two distinct sub-samples: panel and cross section. The 500 panel households originate from a study conducted in 1994 (Lopez and Valdes, 2000) in which 450 farm households were interviewed to analyze the impacts of an initial land titling program. The 2001 survey attempted to follow both these baseline households and the land they cultivated. Of the original baseline households, 362 were resurveyed. In addition, 138 “new” panel households were added via parcel transactions. The remaining 350 cross-sectional households were added in regions that were not covered in the 1994 study. The stratification process for this sub-sample was as follows. First, nine municipalities in three departments were non-randomly identified.²² Within each municipality, three towns (*caserios*) were randomly selected. A census of each town was conducted and used to classify households into 5 farm size categories. To ensure coverage across farm size, households were randomly drawn from each category.

In 1996, the Nicaraguan Ministry of Agriculture and Forestry in collaboration with FAO carried out an in-depth socio-economic survey of the 1995 economic activity of 1450 rural households (Davis et. al., 1997). These households were identified as the cultivators of randomly selected plots drawn from an area-based sampling procedure that gave every piece of

land in Nicaragua (excluding the Atlantic Coast region) an equal probability of inclusion in the sample.²³ In 2000, efforts to interview these same 1450 households were undertaken, focusing this time on the 1999 crop year. It proved possible to locate 1350 of the original households. In most cases, the missing households had migrated, either to Managua or internationally. In those cases, households found using the land formerly cultivated by the migrant household were interviewed. In addition, new households were interviewed if they were found to be cultivating any of the area operated by one of the 1996 households, even if the original respondents were still resident and operating some of the land that they had cultivated in 1995. The final result was a year 2000 sample of 1553 households, all involved in the cultivation of the randomly selected sample of plots.

The household surveys in both countries included conventional modules on household demographics, farm and non-farm income, wealth, land holdings and participation in land markets during the previous agricultural year.²⁴ Two additional and unique features of the surveys are used extensively in the ensuing analysis. First, the credit modules included a section that details the terms of formal and informal loan contracts initiated during the previous year, as well as the reasons that non-borrowers did not participate in the credit market. These data permit the direct identification of each household's rationing mechanism (price versus non-price) in formal credit markets, and thus a means of exploring the relationship between credit and land market performance.²⁵

Second, land history modules were included in both surveys that asked households to reconstruct the evolution of their stock of owned land and their participation in rental and share transactions. The retrospective data allow the calculation of each household's land portfolio (*i.e.*, area under owner-operation, rental, share and lent) for each year since they began farming

and is used to compare the role of land markets before and after the reforms. These data thus allow us to see how effectively land rental and sales markets promote the transfer of land towards uniform operational sizes.

Table 1 here

Some basic characteristics of the sample households in the most recent survey are presented in Table 1. Compared to the Nicaragua sample, the Honduran sample has a larger proportion of smallholders, with half of the sample having less than 5 manzanas of land, and 35% having less than 2 manzanas. This difference reflects the distinctive origins of the samples, with the Honduran one stemming from an earlier study of land titling impacts. One surprising aspect of Table 1 is that despite the smaller average land holdings, the average household wealth in the Honduran sample is considerably greater than in the Nicaragua sample. This wealth difference is at least in part an artifact of the Nicaraguan survey's failure to gather information on the value of residential property. Finally, adult educational attainment is in general low, with about half of the adults in the Honduras sample and only a quarter of the Nicaragua sample having completed primary schooling.

(b) Credit market performance

As discussed in Section 3, synergies between land and credit markets are pivotal to achieving efficiency and equity objectives of land market liberalization. We begin by examining the expectation that the reform programs would first lead to greater and more equitably distributed legal tenure security, and then lead to increased access to formal credit markets. Figures 2a and 2b present non-parametric regressions of the probability of having a title versus owned farm size for 1993 and 2000 in Honduras and 1995 and 1999 in Nicaragua.²⁶ In both

countries, the titling program led to dramatic and statistically significant increases in access to title throughout the ownership distribution and, significantly, has led to a more equitable distribution of titles. The gaps between the 90% confidence intervals – the dotted and dashed lines around the bold, fitted relationships in the two figures – provide statistical evidence of the significant improvements in land titling that occurred during the recent reform efforts.

In part because of the much lower pre-reform title levels in Honduras, the improvements there have been the most dramatic. Note from Figure 2a that in 1993, the estimated probability of having a title for households with less than 10 manzanas was less than 20%. While the regression line indicates a positive relationship between farm size and title access, even rural households with about 100 manzanas had only about a 50% probability of having title in 1993.

Figures 2a and 2b here

The year 2000 regression line in Honduras shows major gains in titling probability throughout the ownership distribution. Households between 5 and 60 manzanas experienced a 40 percentage-point increase in the probability of having title. For households with 10 manzanas, for example, this jump from 20% to 60% represents a 300% increase in the estimated probability of having a title. The impact of the titling program on the two tails of the distribution merits comment also. Since most of the largest farms were already titled in 1993, the absolute and percentage change at the upper end of the distribution are relatively small. The absolute change at the lower end of the distribution is, however, also relatively small. For example, for households with 2 manzanas the probability of having title only increased from 18% to 42%. Given the prevalence of *minifundios* in Honduras, the continued exclusion of the majority of small farmers from titling is of potential concern.²⁷

Have the titling programs apparent successes been matched by significant increase in the participation of smallholders in formal credit markets? The answer is decidedly not. Figures 3a and 3b present non-parametric regression results of the probability of having a formal loan versus area of owned land pre- and post-reforms in Honduras and Nicaragua, respectively. These figures show that the major expansion in titling just described has not been accompanied by a statistically significant increase in formal credit market participation except among rural households in Nicaragua with more than 150 manzanas.

Figures 3a and 3b here

In the case of Honduras, the 2000 regression curve is actually lower than the 1993 curve for households with less than 3 manzanas, which means that the poorest 40% of the sample arguably has lower formal credit market participation in 2000 than they did in 1993 prior to the titling and liberalization push. In contrast, the biggest increase in participation occurs at about 45 manzanas, where the estimated probability of having a formal loan is double the estimated level of 1993.

Why has the increase in titling among smallholders in Honduras not translated into a corresponding increase in credit market participation? Figure 4 which depicts for 1993 and 2000 the probability of having access to a formal loan against the area of titled land owned by households provides an answer – specifically that the collateral effect of titled land does not appear to help smallholders. In Figure 4, access is defined as a binary variable which takes the value 1 if either the household had or believed it could have obtained a formal loan and zero otherwise. Conditional on title, the curves in this figure show that access has actually decreased for smallholders, i.e. those households with less than 2 manzanas of titled land. This result is consistent with the findings reported in Carter and Olinto (2003) that there is a threshold effect

above which titling improves credit access, while credit access for households below the threshold is not improved by title. In Honduras, the overall decline in access for smallholders results from a combination of the reduction in BANADESA and other government sponsored credit programs – which were the primary source of small farm access to formal credit in 1993 and the lack of a corresponding improvement in the provision of loans to titled smallholders by private banks. In other words, the void created by state withdrawal has not been filled by commercial banks for this cohort of borrowers.

Figure 4 here.

The most notable observation on Nicaragua's credit market evolution is how low overall credit access is in both time periods relative to Honduras. In Nicaragua, it is not until the 100-manzana holding level that the estimated probability of formal credit access in 1999 even reaches 10%. For Honduras, the 10% probability level occurs at about the 3 manzana holding level in 2000 and is higher than 20% by 10 manzanas for both time periods. Thus, for Nicaragua, very low levels of formal credit access suggest that rural financial markets have not evolved sufficiently to aid in the activation of land markets.

The evidence presented thus far on formal credit market participation and access begs the question of whether households without formal credit actually have demand for credit that could be used for a range of economic activities including acquiring land. Tables 2a and 2b address this question for the latter time period (2000 in Honduras, 1999 in Nicaragua) by depicting rationing outcomes in formal credit markets for different land-size categories, where rationing outcomes are determined by both household's demand for loans along with their potential to secure them. As described in section 3, quantity rationed refers to households who either had a loan application rejected or reported that they could not have obtained a formal loan if they had

applied, largely for reasons of insufficient collateral holdings. Risk-rationed refers to households who had access to a formal loan but did not demand it for fear of losing collateral, and price rationed refers to households who either secured formal loans or did not have demand for reasons other than those associated with contractual risk. The first two of these groups comprise the non-price rationed categories, and are those for whom imperfections in credit markets constrain their activity choices.

The tables show that among the poor there is indeed significant unmet demand and that there is a severe wealth bias to it. Specifically, 2% of the lowest wealth quintile in the Honduras and Nicaragua samples received formal loans, and in this lowest quintile almost 60% in Honduras and 80% in Nicaragua report being non-price rationed in formal credit markets, i.e. they wanted a loan but either lacked supply or insurance to back up their demand. The severity of the wealth bias is reflected by the fact that in both countries the percent of respondents reporting non-price rationing declines from well over half in the lowest quintile to around 13% in the top quintile in Honduras and 30% in the top quintile in Nicaragua. Clearly, the extent of credit rationing and its bias has the potential to undercut the potential for win-win equity and efficiency outcomes in land markets.

Tables 2a and 2b here

In considering these estimates of non-price rationing in formal credit markets, it should be stressed that households that preferred to fill their credit needs through informal sources or self-finance will appear as price rationed. In other words, the figures in Tables 2a and 2b do not presume that formal credit is preferred or desired by all households. They could have responded that they did not seek a formal loan because informal or semi-formal sources were meeting their credit needs. But, the fact that such a high proportion report being quantity rationed is revealing

of the severity of the constraints facing rural households. Indeed, a perusal of the Honduran survey data on the terms offered by informal and others sources of credit makes clear why many households might prefer formal credit especially for land market transactions. For example, while the average maturity of formal loans in the sample was 14 months, the average maturity of informal loans was 6 months and of semi-formal loans was 9 months.²⁸ Moreover, most of the informal loans were much smaller than the formal loans and were clearly for short-term working capital that was either tied to the buyer or supplier, or else provided by friends and family. These loan data underscore the difficulty land-poor households face if they rely on loans to finance land rentals over a year, let alone fixed investments, such as land purchases or the installation of permanent investments.

(c) Land rental markets and operational farm size

Land rental market activation is often viewed as a pragmatic and rapid means for capturing efficiency and equity gains associated with the oft observed inverse farm size-productivity relationship and other impediments to land transfers from less to more efficient producers (de Janvry et al., 2001). These potential gains are buttressed in Deininger and Zegarra (2003) and Chamorro (2003), both of which provide compelling evidence of higher productivity levels among smaller farms in Nicaragua, with the latter work using the same Nicaragua dataset as this article. The land rental data from the samples in Honduras and Nicaragua bolster the view that land rental markets have been activated by the reforms.

Tables 3a and 3b here

As shown in Tables 3a and 3b, the percent change in land rental market participation has been substantial across most farm-size categories and in the direction anticipated by the reforms, with larger land holders being more likely to rent out than rent in and small land holders being

more likely to rent in than rent out. Specifically, note that in Honduras the proportion of land owners with more than 50 manzanas who rented out some of their land increased dramatically from 16% in 1994 to 65% in 2001, while in both countries small land holders were more likely to rent-in land in 2000 than in 1993. A closer look at the land rental data shows not surprisingly a substantial increase in land rented out from large land holders to small land holders over this time period. For example, in the 2000 Honduras sample, while households owning more than 50 manzanas account for only 9% of the sample, they supplied over 22% of the parcels rented-out. On the receiving end, households with less than 5 manzanas - just under 50% of the sample - account for 80% of the parcels that were rented-in.

Unfortunately, the evidence from both Honduras and Nicaragua suggests that land rental markets,²⁹ though far more active than before the reforms, are having insignificant effects on the overall distribution of land operated. One of the main reasons behind this finding documented below is that the average size of land rentals actually decreased across the two time periods in Honduras, and remained relatively small in Nicaragua. In Honduras, conditional on renting, the average amount of land rented-in was just under 2 manzanas. While access to an additional 2 manzanas could have a significant impact on income for landless or near landless households, this feature of land rental transactions (small land amounts) explains why major increases in rental activity have not translated into a more significant shift in the operational farm sizes of the land poor.

Another indicator of the limited role of land rental markets in improving land access is the relatively small percentage of total operated farm area accounted for by land rentals. In the Honduras sample, the operated area under rental rose from 0.18% in 1994 to 3.4% in 2000, while in Nicaragua it rose from 2.1% in 1995 to 5.3% in 1999. Analysis of retrospective data in both

countries shows similar levels of land rentals in the late 1980s and the mid-1990s, so the recent changes in operated area under rental are indeed substantial in historical terms. At the same time, these percentages of land rentals relative to total operated area are very small when compared to many other parts of the world, where land rental can account for as much as 40-50% of total land in agriculture.³⁰ However, they are of the magnitude of rental rates in Mexico and Brazil, the former which still has more substantial restrictions in rental markets and the latter which has much more open land conflict. One argument may be that despite much policy effort in titling and legal reforms, property rights remain quite insecure in the eyes of landholders, who are thus reluctant to rent out significant amounts of land. Whatever the reason, the fact that over 95% of land operated remains in the hands of owners means that rental market to date have done little to break the structural link between land owned and land operated.

This tight connection is evident in Figures 5a and 5b, which depict non-parametric regressions of land owned on land operated in pre and post reform periods for the two countries.³¹ The main findings from these two figures are as follows:

1. Pre and post-reform estimates are statistically identical to each other for both countries³² as the relationship between land owned and operated has not changed significantly over the course of the reforms in either country; and,
2. The only point along the fitted curves where the estimated relationship between land owned and operated are significantly different than the 45 degree line is at a small interval around 15 manzanas in Nicaragua.

Thus, especially among the rural poor, rentals so far do not significantly overcome the hurdle that limited land ownership creates for land access.

Figures 5a and 5b here

Overall then, given the preponderance of very small transactions, it seems that transactions costs that might limit rentals between larger and smaller farmers are not the main barrier to breaking down the tight link between land ownership and land operation. Whether

credit market restrictions are critical to limiting the frequency and size of land rental transactions has not been proven here (and is under investigation), but it would certainly be consistent with the finding in the last section that major titling efforts have not yet succeeded in improving credit access for the rural poor. Another possibility worth exploring is whether the small land rentals are at least in part efforts by the land poor to insure themselves against labor market shocks and whether these transactions might also be linked to other exchanges – such as labor - between tenants and owners of land. This latter interpretation would be consistent both with the historic pattern of land-labor exchanges between latifundistas and minfundistas as well as with the fact that more than half of the “rental transactions” in the data take the form of land lending rather than fixed rentals.

(d) Land accumulation

Land accumulation trajectories of the study households, especially in the Honduras sample, are moving in a direction that limits the rural poor’s access to land and cuts against the hoped for gains in equity and efficiency from land market liberalization. Figure 6 depicts the changes in land owned during the 1990s based on non-parametric regressions of land owned in the post versus pre reform periods. In Honduras, the most significant move off of the 45 degree line between 1993 and 2000 occurred in the upper tail of the land ownership distribution, where households with greater than 55 manzanas in 1993 (those in the top decile) accumulated sufficient land to move them significantly away from the 45-degree line in 2000. At the very bottom of the land ownership distribution in Honduras, there is evidence of a small increase in land holdings over the same time period, but one that is not statistically significant. In Nicaragua, meanwhile, the main move off of the 45-degree line between 1995 and 2000 is in the 40-55 manzana range (which is in the top tercile of the land distribution).

Figure 6 here

A comparison of pre and post reform Gini coefficients provides further evidence of a stagnant ownership distribution. In both countries the Gini for owned area remained constant over time – at 0.76 and 0.72 for the Honduras and Nicaragua samples respectively. In Honduras, the increase in land rental activity – and especially the inter-class rental transfers – has led to a decrease in inequality of area operated. This decrease is minimal, however, as the Gini for operated land decreased from 0.76 to 0.74 in the Honduras sample. In Nicaragua, this Gini slightly increased from 0.71 to 0.72 over the 1995 to 1999 period.

Overall, land sales markets appear to have been most active in the early years of the reform. These transactions were characterized by sales that have not altered the agrarian structure of these countries. Given the relatively large changes in land titling and the relatively minor changes in credit market access that occurred in the two countries, this result is consistent with the concerns raised earlier about the limitations of titling and land market liberalization programs in the face of ongoing credit market constraints for small farmers (Carter and Mesbah, 1993; Binswanger et. al. 1995). The first generation of land market reforms thus do not appear to be leading to the kinds of changes in land access for the rural poor that might proffer the efficiency and equity outcomes hoped for by policymakers.

5. CONCLUSIONS

This paper has examined the likely impacts of recent land tenure and credit policy reforms associated with liberalization policies in Latin America. Using newly assembled panel data sets that span the pre- to post-reform eras in Honduras and Nicaragua in the 1990s, this paper has taken a first look at the operation of credit, land rental, and land sales markets, the three arenas where the impacts of the reform on land access are being played out. It is clear from

this analysis that the hoped for synergies of more productive and more egalitarian economies associated with liberalization have not occurred. While titling has advanced substantially (except perhaps among very small landholders) and land rental markets especially have become more active in the wake of reforms, formal credit access has not improved for the majority of rural households, formal credit remains strongly skewed against low-wealth households, land rentals are still a very small percentage of total land area, and the dualistic agrarian structures of these two countries remain essentially unaltered by the reforms. Thus, the first generation of market-friendly land policies has fallen short of hoped for gains in equity and efficiency.

One explanation for these limited results of land market liberalization policies is that the reforms simply need more time before their full effects will be felt. It may also be that despite major investments in titling and national land administration initiatives, the reforms remain incomplete or non-credible. Indeed, land rights remain contested in both countries. In Nicaragua, much of the newly titled land is subject to competing claims—particularly since the courts continue to process claims by large landowners that were expropriated by the Sandinistas in the 1980's. More generally, receipt of a private land title may not provide the type of tenure security that was anticipated. Jansen and Roquas (1998) provide evidence that the titling program in Honduras unintentionally exacerbated land conflicts by creating multiple claims to land and by undermining existing institutions for conflict resolution. These real-world complexities are reinforced by the highly dualistic nature of agrarian structure in both countries which make the struggle for land access so crucial for so many rural households.

While the argument can always be made that reforms need more time and need to be more extensive, pragmatically any policy regime has a limited time to produce results that can be used to support the approach or buttress further moves in the same direction. Moreover, the

current policy environment in both Honduras and Nicaragua point explicitly toward a second generation of land market and broader rural reform measures, which means that the limited gains of the past few years are likely to become the basis from which a serious reconsideration of the overall policy approach is undertaken. The findings provided in this study suggest that the failure of credit markets to perform as might have been hoped is reason for concern that land market activation policies need to be buttressed by policies that aim more at ensuring the efficacy of complementary factor markets. While no evidence was proffered here about other factor markets, surely they could also warrant parallel attention to ensure the availability of insurance and access to human capital and market information to the land-poor if they are to be able to take full advantage of improved land markets. What is clear from this paper is that the vast majority of poor rural households do perceive themselves as constrained in formal credit markets, and these measures control for demand, indicating therefore that whether or not they would use that credit for land or other types of economic transactions that their options are surely constrained.

While this paper has not provided the type of formal analysis that would be useful to discuss policy options in detail, it is worth noting that several development agencies have begun to contemplate a reengaging with rural finance. Both the Inter-American Development Bank and USAID have recently undertaken major analyses for the prospect of a new generation of rural finance policies (Wenner et. al. 2003; Carter et al., 2004) In addition to attacking the problem of financial markets directly, innovative efforts are underway in several countries to link programs to improve land access directly with enhanced access to capital (e.g., PACTA in Honduras, <http://www.pacta.hn>). While it is too early to judge the efficacy of these new efforts, policies to connect the rural poor to financial efforts are almost surely a necessary condition to success if a

next generation of reforms is to deliver on the growth-with-equity promise of the prior round of liberal agricultural reforms.

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Table 1. Sample Descriptive Statistics

	Honduras 2001	Nicaragua 2000
Sample Size	850	1553
Household Land Ownership Distribution (% of Sample)		
Landless	4%	7%
0-2 Manzanas	31%	8%
2-5 Manzanas	16%	11%
5-10 Manzanas	14%	12%
10-50 Manzanas	26%	36%
More than 50 Manzanas	9%	26%
Sample Means for All Households		
Owned Area (manzanas)	21.1	50.9
Household Wealth (\$US)	42,000	18,874
Household Size	5.8	6.3
% Literate Adults	83%	71%
% Adults with primary complete	48%	24%
% Adults with secondary complete	10%	6%
Age of Household Head	52	52

Table 2a. Formal sector credit rationing mechanism, Honduras, 2000

Total Wealth Quintile	Price Rationed			Non-Price Rationed		
	<i>With loan</i>	<i>Without loan</i>	<i>Total</i>	<i>Quantity</i>	<i>Risk</i>	<i>Total</i>
1	2%	38%	40%	40%	20%	60%
2	18%	40%	58%	22%	20%	42%
3	20%	40%	60%	22%	18%	40%
4	27%	43%	70%	12%	18%	30%
5	45%	42%	87%	5%	8%	13%
All Households	21%	40%	61%	22%	17%	39%

Table 2b. Formal sector credit rationing mechanism, Nicaragua 1999

Total Wealth Quintile	Price Rationed			Non-Price Rationed		
	<i>With loan</i>	<i>Without loan</i>	<i>Total</i>	<i>Quantity</i>	<i>Risk</i>	<i>Total</i>
1	1.9%	17.9%	19.8%	73.9%	6.3%	80.2%
2	1.4%	23.0%	24.4%	66.2%	9.4%	75.6%
3	3.3%	36.8%	40.1%	48.6%	11.3%	59.9%
4	4.6%	47.9%	52.5%	36.5%	11.0%	47.5%
5	13.7%	56.2%	69.9%	22.6%	7.5%	30.1%
All Households	5.0%	36.6%	41.6%	49.2%	9.2%	58.4%

Table 3a. Household participation in temporary* land marketing Honduras

Household Land Ownership	% that rented-in land		% that rented-out land	
	1993	2000	1993	2000
Landless	76%	89%	0%	0%
0-2 Manzanas	52%	60%	0%	5%
2-5 Manzanas	30%	47%	2%	16%
5-10 Manzanas	19%	28%	5%	33%
10-50 Manzanas	13%	23%	14%	43%
More than 50 Manzanas	15%	6%	16%	65%
All Households	34%	40%	6%	26%

*Temporary transactions include: Fixed rentals, sharecropping, and land lending (*tierra prestada*)

Table 3b. Household participation in temporary* land market in Nicaragua

Household Land Ownership	% that rented-in land		% that rented-out land	
	1995	1999	1995	1999
Landless	81%	52%	0%	0%
0-2 Manzanas	19%	26%	11%	2%
2-5 Manzanas	11%	16%	2%	6%
5-10 Manzanas	9%	20%	4%	7
10-50 Manzanas	2%	9%	1%	11%
More than 50 Manzanas	1%	6%	0%	14%
All Households	9%	14%	1%	10%

*Temporary transactions include: Fixed rentals, sharecropping, and land lending (*tierra prestada*). The sample sizes for 1995 and 1999 respectively were 1219 and 1550.

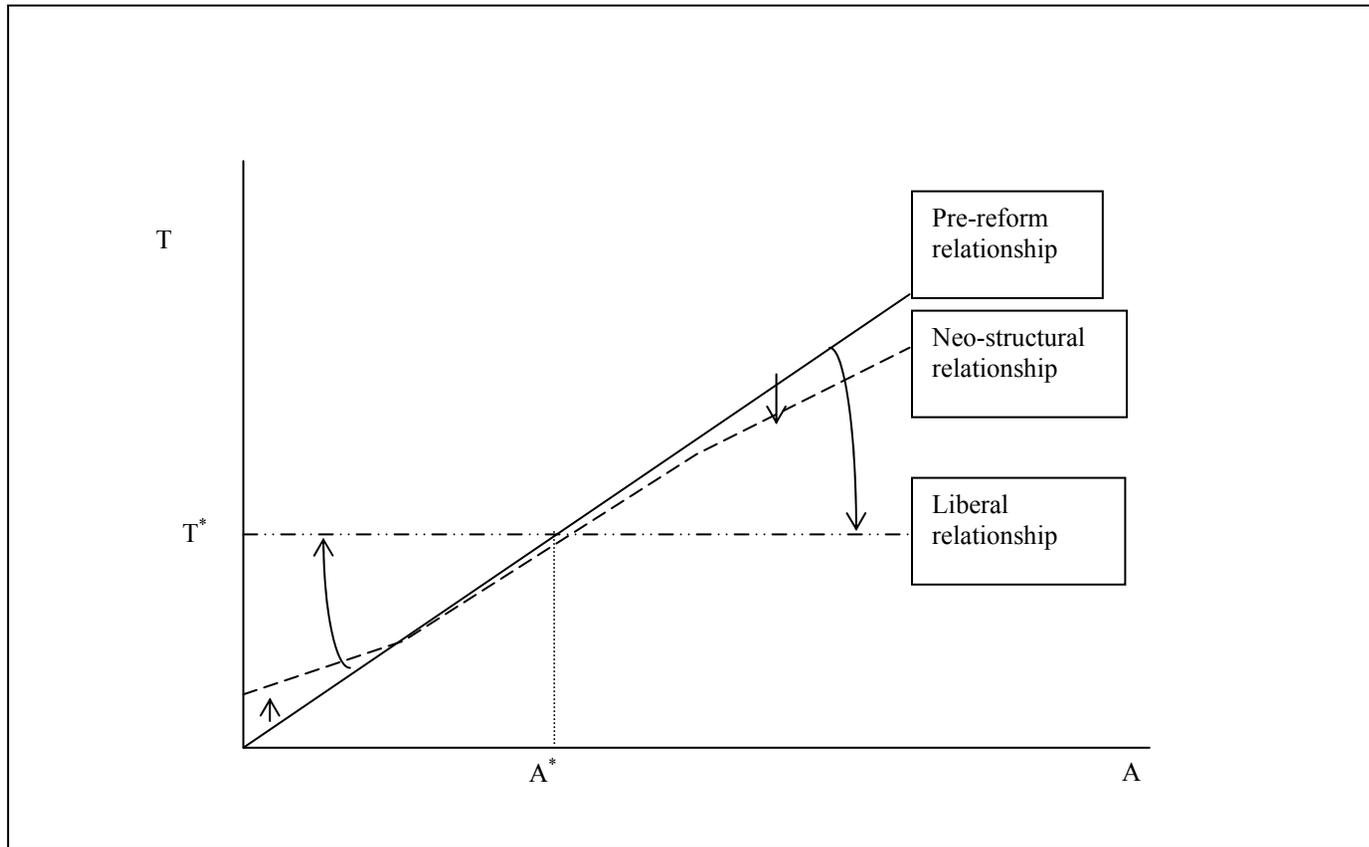


Figure 1. *Two views of land rental markets after liberalization*

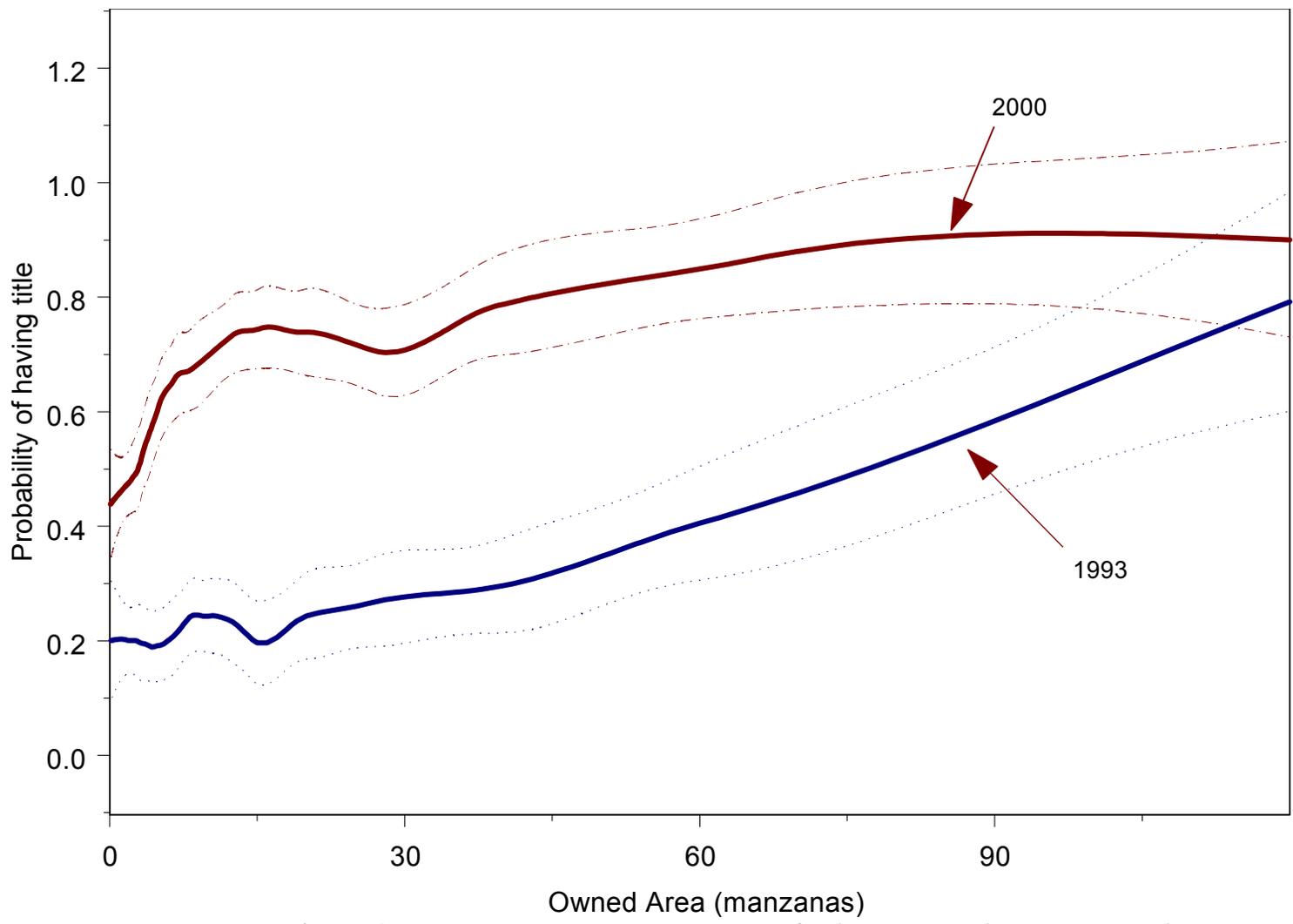


Figure 2a. *Nonparametric regression of title on owned area in Honduras*

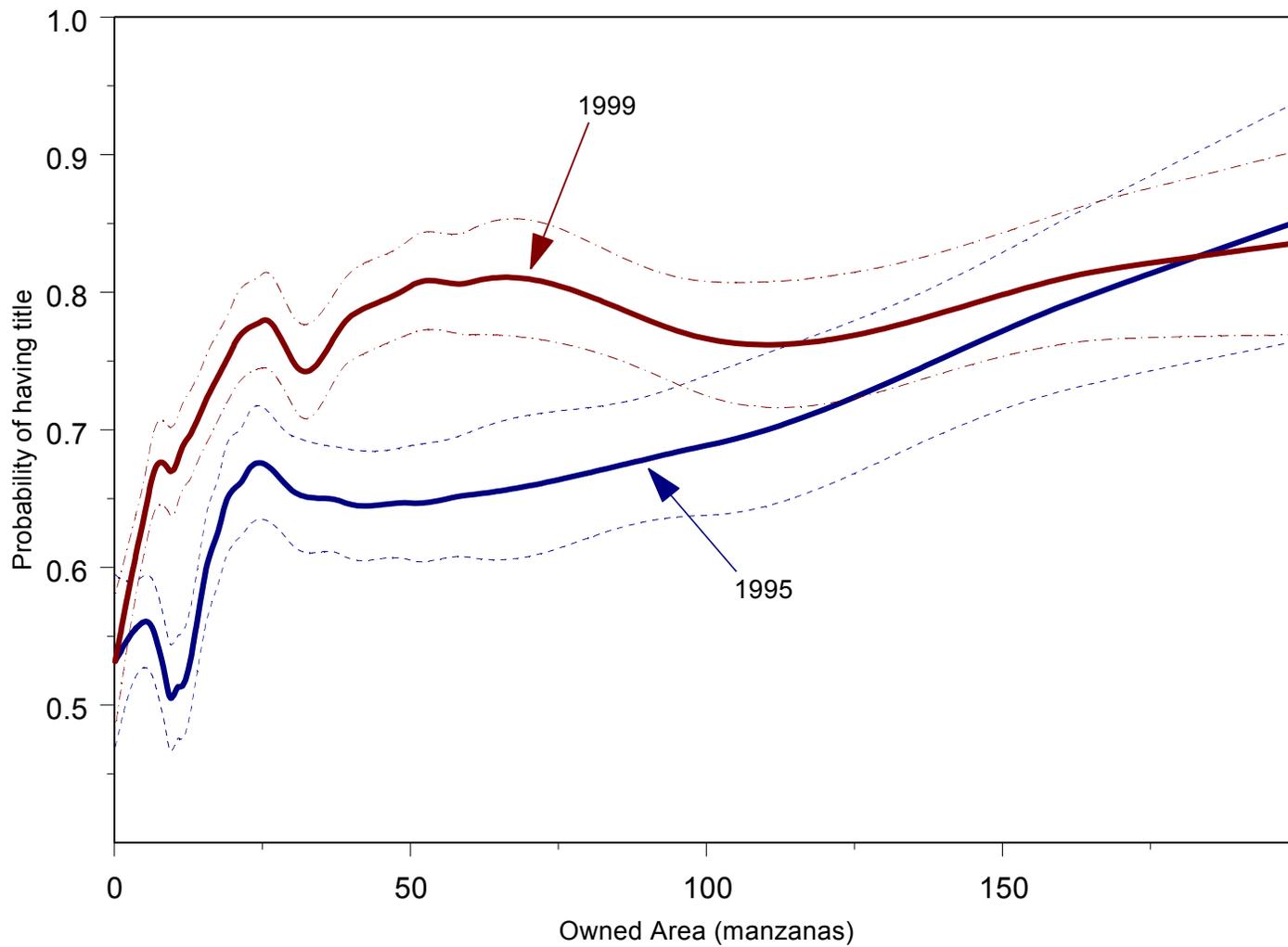


Figure 2b. *Nonparametric regression of title on owned area in Nicaragua*

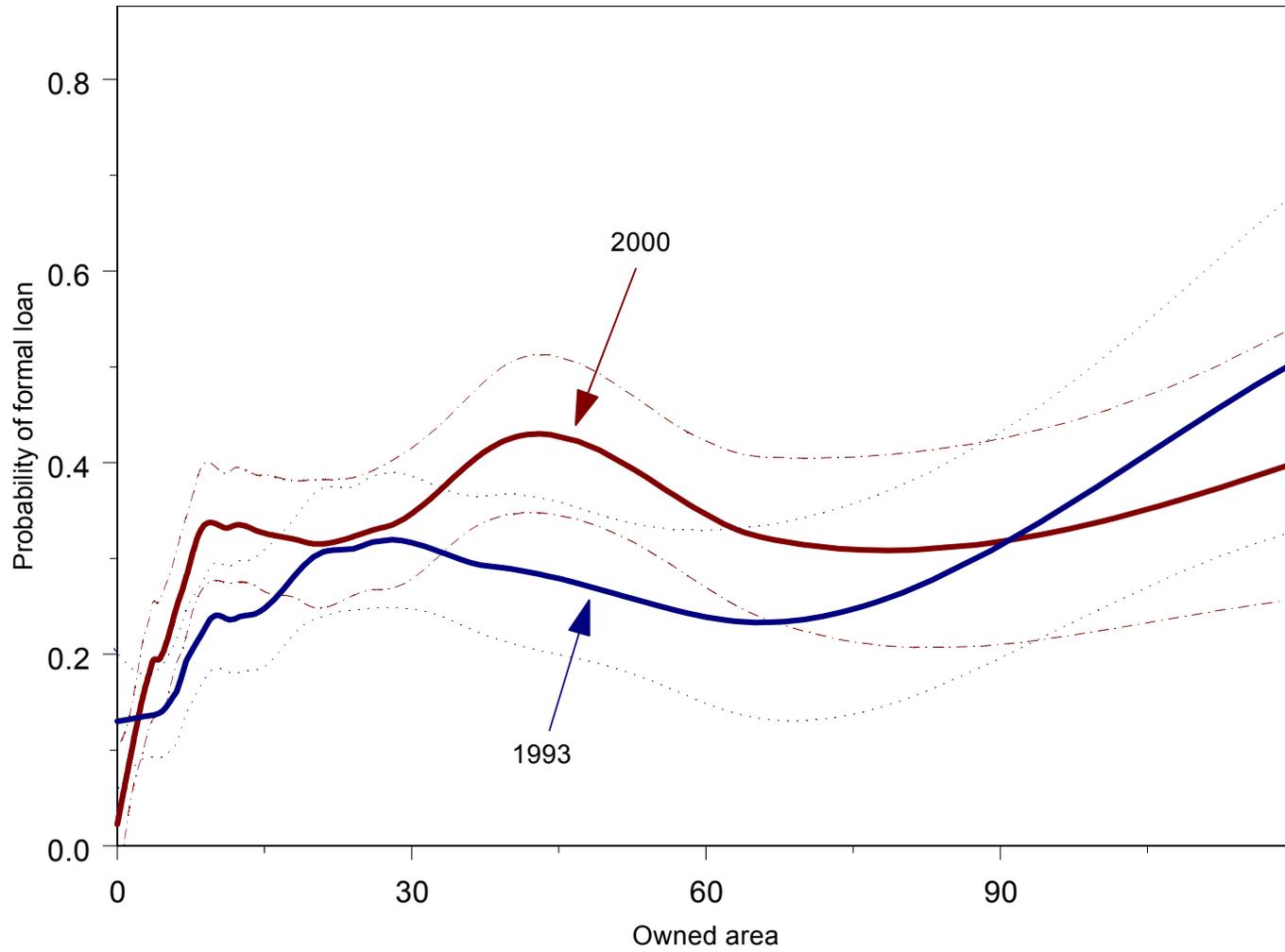


Figure 3a. *Nonparametric regression of formal loan on owned area: Honduras*

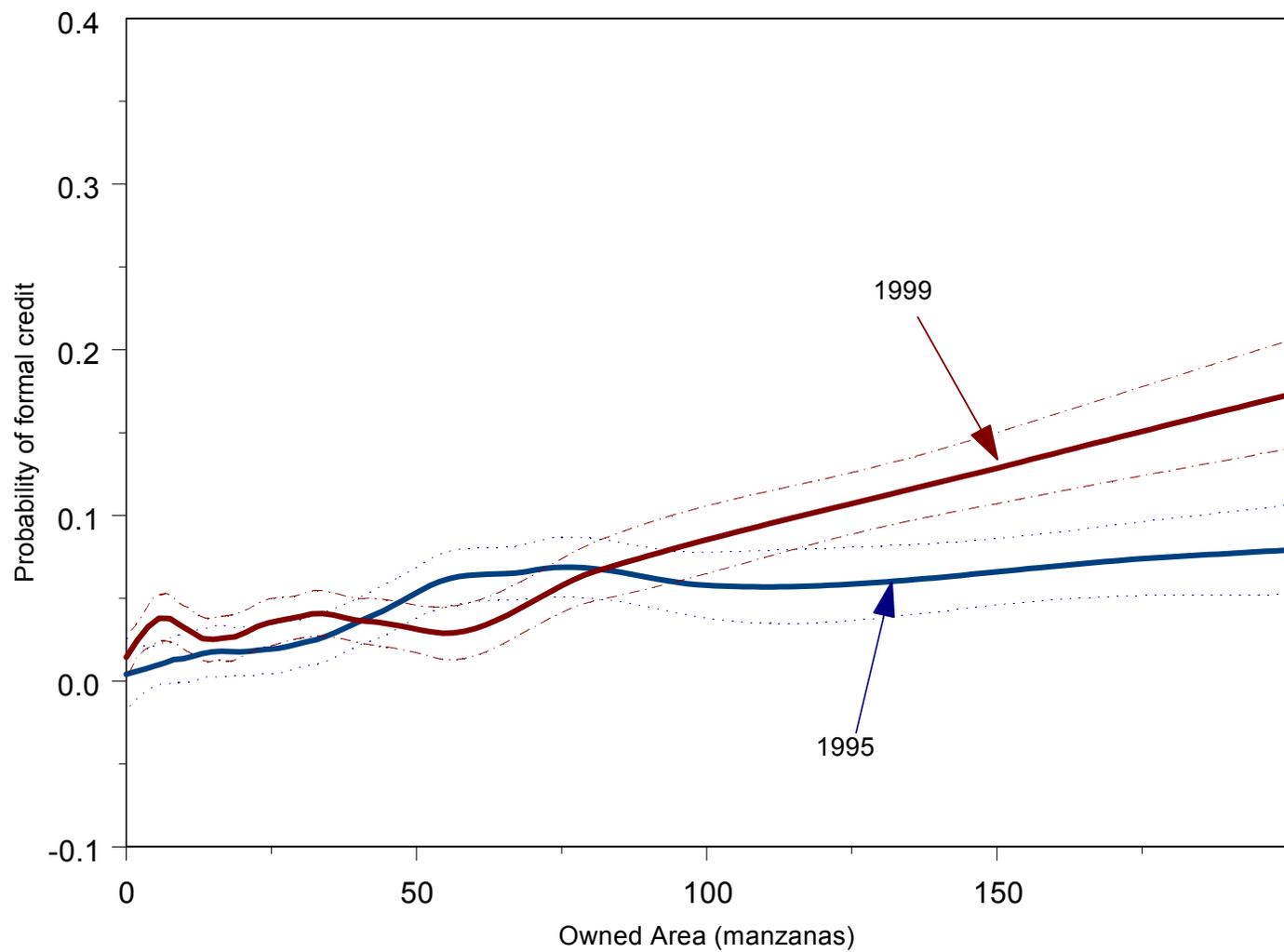


Figure 3b. *Nonparametric regression of formal loan on owned area in Nicaragua*

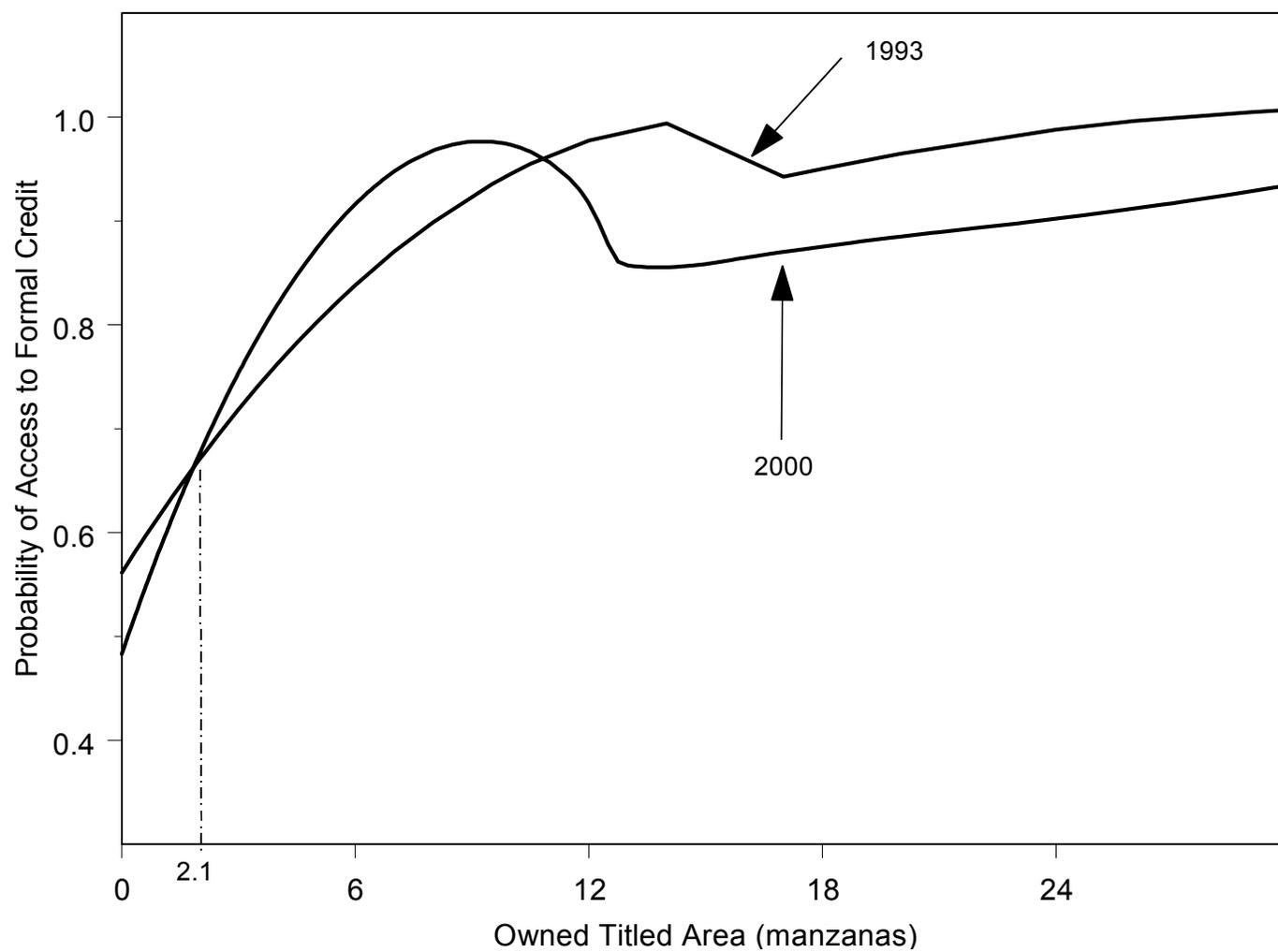


Figure 4. *Nonparametric regression of formal credit access on owned titled area in Honduras*

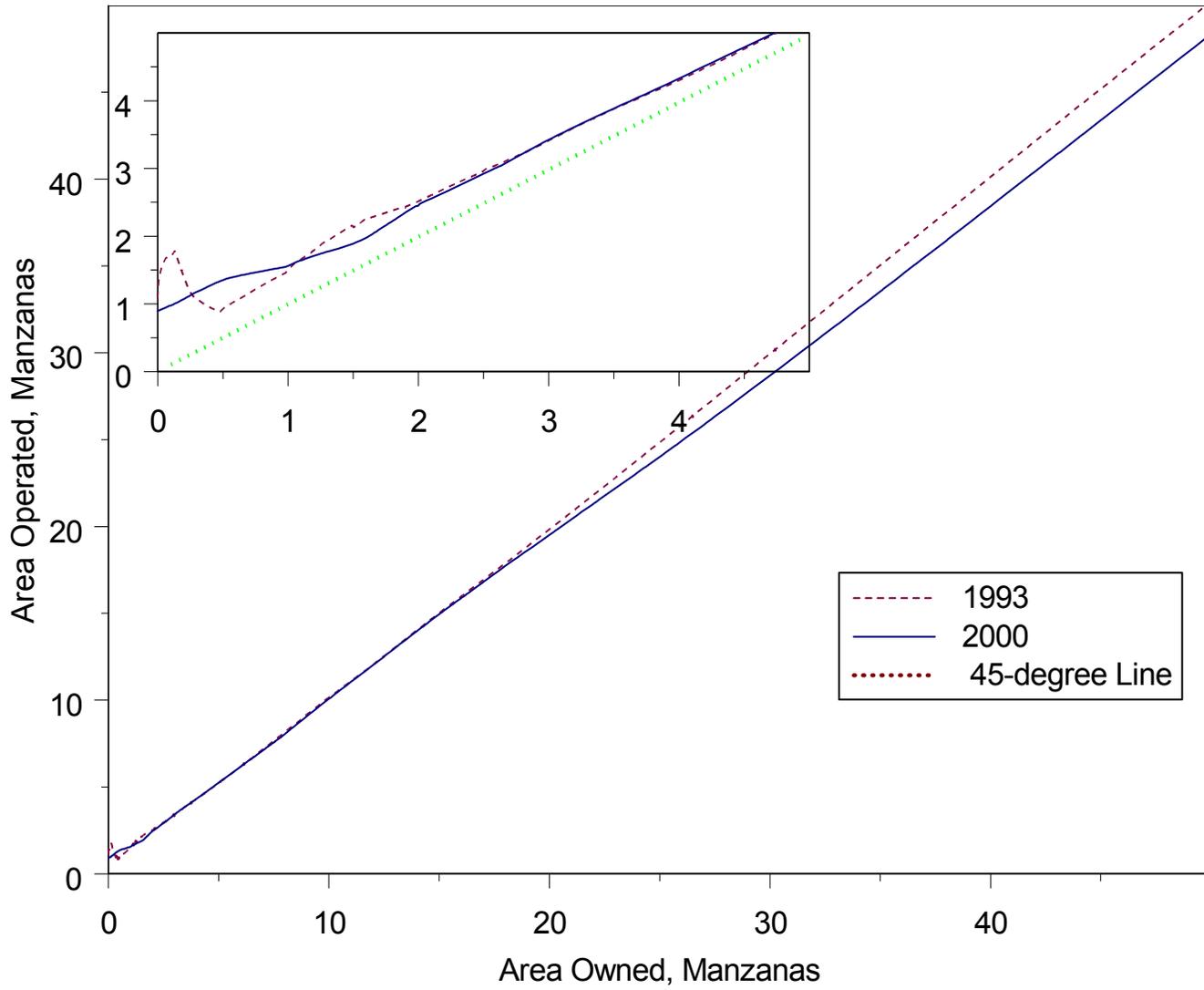


Figure 5a. *Land rental markets in Honduras*

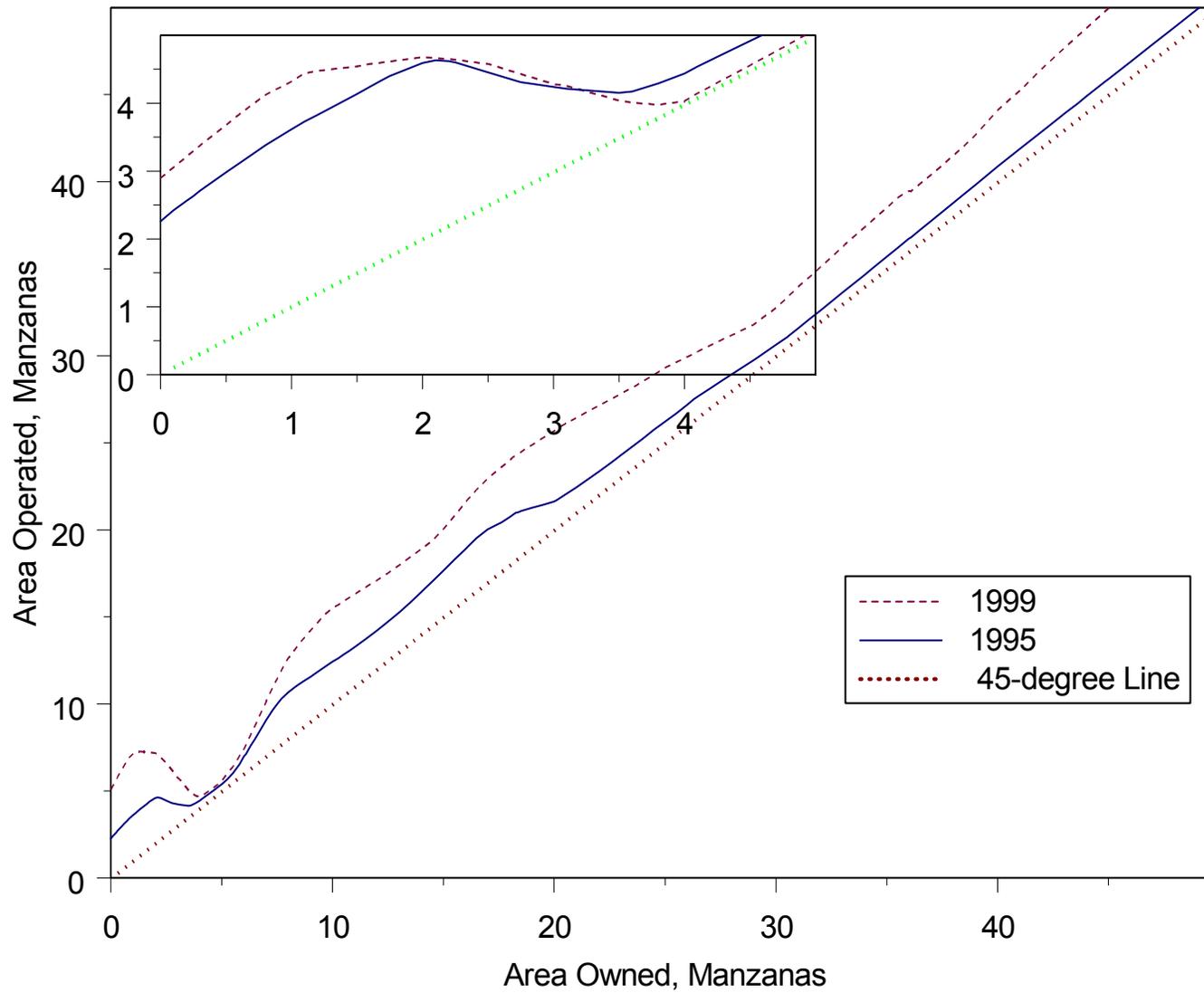
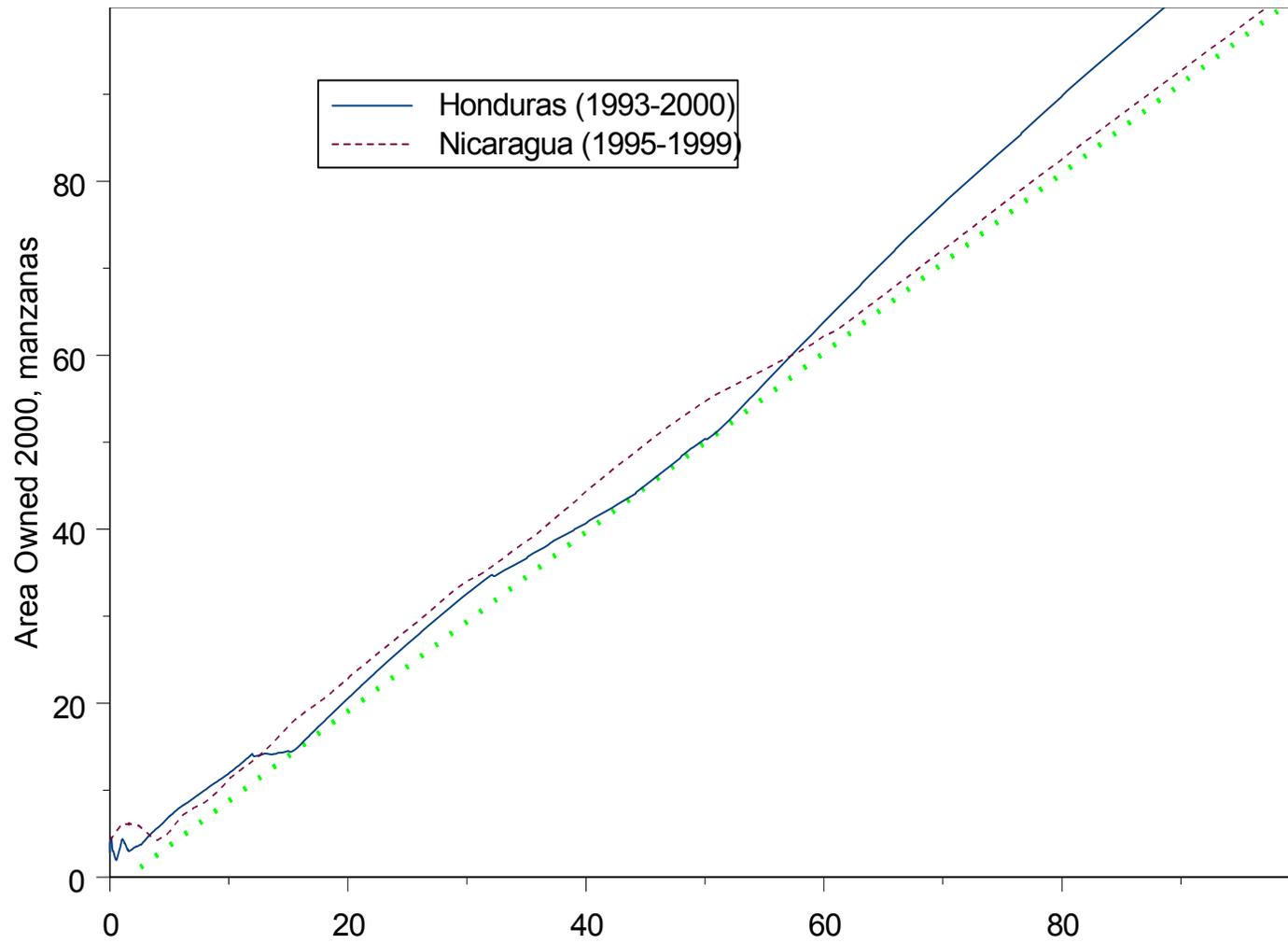


Figure 5b. *Land rental markets in Nicaragua*



Area Owned mid-1990s, manzanas
 Figure 6. *Evolution in area owned*

¹ By structuralist, we refer specifically to agrarian structuralism, which was important in much of the second half of the 20th century and which stressed the need for state led expropriation and redistribution of agricultural land in order to break the bi-modal agrarian structure inherited from the colonial period in Latin America. For an original exposition see Hirschman (1961). Reviews and evaluations of agrarian structuralism are given by Dorner (1991) and Thiesenhusen (1989).

² Eswaran and Kotwal (1985) provide an important theoretical treatment of the role of labor market failures in determining agrarian structure. Deininger and Binswanger (1999) and Banerjee (2000) provide intuitive discussions of these issues, while Frisvold (1994) provides empirical evidence on the magnitude of supervision-induced inefficiency.

³ These reforms were designed to appeal to both those who think land access is key to the improving the lot of the rural poor and those who do not. While our views match the former, we do not formally address the value of land to the rural poor in this work. See López and Valdés (2000) and Finan et. al. (2002) for more on this issue.

⁴ While the land rents would still go to owners, in a competitive land market the infra-marginal rents associated with family management of farm operations could be captured by the renters.

⁵ For both countries, the early 1990's represent what de Janvry et al (2001) call "Phase III" of agrarian reform whereby land policy promotes land access of small-holders and landless households via market mechanisms.

⁶ See Thorpe (2000) for a more in-depth description of the LMSDA in Honduras.

⁷ While the Honduran government acknowledged the potential for credit market failures for small farmers and thus established the legal base for a rural credit fund and land bank, these two financial institutions have not yet materialized. The World Bank and the European Community

are currently operating pilot land bank programs to finance land purchase for small and landless farmers.

⁸ The initial funding for PTT was provided by USAID. See Nesman and Seligson (1989) for a description of the initial project.

⁹ Data on titles granted in the pre-reform period are from Salgado et. al. (1994). Data for the post reform period were collected in interviews with INA officials in Tegucigalpa.

¹⁰ The recipients of title to national lands paid two separate fees: a land purchase fee and a separate fee to cover administrative costs of the title. Initially, recipients were offered the option of debt-finance, whereby they would repay the costs of the land and title over a 10-year period.

¹¹ Deininger and Chamorro (2001) give more details on important aspects of the reform process.

¹² Non-price rationing occurs when the structure of capital markets prevents an entrepreneur from undertaking an expected-income enhancing investment. As explained shortly, non-price rationing includes conventional quantity rationing (e.g. Stiglitz and Weiss 1981) and risk rationing (Boucher and Carter 2002).

¹³ Formal treatments of the impact of titling on credit supply and demand are given in Feder (1985), Besley (1995), and Carter and Olinto (2003). De Soto (2000) provides a general discussion of the potential for property rights reform to “activate” poor households’ assets.

¹⁴ In work in Paraguay, Carter and Olinto (2003) find that the probability of facing a credit supply constraint is above 90% for households with a land to labor ratio of less than 2 hectares per family worker – independent of whether or not the land was titled. The anticipated credit supply effect of land title only kicks in above a ratio of about 4 hectares per family worker.

¹⁵ A commonly asserted source of labor market imperfection—often cited as a cause of the inverse farm size relationship—is the imperfect substitutability between family and hired labor

(Eswaran and Kotwal (1985), Frisvold (1994)). Transaction costs of hiring and monitoring labor create the competitiveness advantage for labor scarce households mentioned in the introduction above.

¹⁶ Formal models underlying the types of relationships depicted in Figure 1 include Sadoulet et. al. (2001) and Carter and Salgado (2001).

¹⁷ Consistent with much of the literature in this area, we assume that agency costs—which make family labor cheaper in efficiency terms than hired labor—creates an optimal farm size that balances the ratio of family labor to land across farms.

¹⁸ Higher willingness to pay for land does not necessarily imply greater efficiency since land purchases may be driven by non-productivity incentives such as hedging inflation and avoiding taxes (Binswanger et. al. 1995). Neoliberal reforms acknowledge this and aim to correct distortionary policies that ultimately are capitalized into land values.

¹⁹ In a formal model that ignores risk and subsistence considerations, Carter and Zimmerman (2001) show that it can be dynamically optimal for land poor households to scrimp on consumption and slowly build up their land base even in the absence of well-functioning capital markets.

²⁰ There are two reasons that land may not function well as a consumption smoothing asset: 1) land is a “lumpy” investment in that high transaction costs make it costly to subdivide and sell and 2) land values are positively correlated with aggregate or covariate shocks so that households would typically have to sell low and buy high (see Zimmerman and Carter (2003)).

²¹ A criterion for selection was that the household either owned or cultivated a parcel in the previous agricultural year. Households were selected from the departments of Colón, Intibucá, Ocotepeque, Santa Bárbara, and Yoro.

²² The municipalities were those identified as future areas of operation by the European Community's Land Bank pilot project.

²³ The original area-based sample was drawn as the basis for national crop estimates. Unfortunately, the in-depth 1996 survey excluded all production units larger than 500 manzanas.

²⁴ Copies of the survey instruments and data sets can be obtained by request from the authors.

²⁵ See Feder et al. (1990) and Barham et al. (1996) for applications of this direct solicitation of credit constraint approach.

²⁶ All non parametric regressions are carried out in Axum and use a Loess smoother. The 1993 regression line is computed only on the households surveyed in the 1994 baseline study. In order to control for potentially different credit supply conditions across regions, the 2000 regression line includes all households surveyed in 2001 that were in the same municipalities as the 1994 baseline households.

²⁷ The relative lack of benefit from the titling program received by minifundistas in Honduras is not surprising. In the initial program period in the mid-1980's, the government explicitly excluded farms under 5 manzanas from the titling program. An exception was made for coffee growers who could receive title if they had at least 1 manzana.

²⁸ Informal lenders include input supply stores, product traders, moneylenders, other farmers, and family and friends. Semi-formal lenders include producer organizations and micro-finance institutions.

²⁹ The term land rental here is meant to include three main types of temporary land transactions, land rentals, share-cropping, and land loans. Land lending is more common than land rental in the Honduran data, and actually increased its share over the time period under study.

³⁰ For example, according to the FAO's Ag World Census Program the ratio of rented to total operated area in the U.S. and Canada was 41% and 23% respectively. In Pakistan and Bangladesh the ratios were 35% and 41%. Rental rates in other areas of Latin America are much lower. For example only 2% and 3% of the land area is rented in Mexico and Brazil respectively.

³¹ Because the sampling techniques of surveying rural households do not include absentee owners who rent out their entire holdings, the curves are inherently biased to lie somewhat above the 45-degree line. Nonetheless, this bias is insufficient to alter the findings that the estimated relationships between owned and operated land in the two countries are statistically indistinguishable from the 45-degree line except in one instance noted in the text.

³² Confidence intervals are not shown in Figures 4 and 5, because they make the pre and post reform estimates of owned and operated land too hard to distinguish.