Abstract: Using a pair of data sets gathered in 2001, this paper provides an initial empirical assessment of the impact of the 1993 Agricultural Modernization Law (LAM) on the equality of land distribution in Honduras. We use a Gini decomposition framework to see how land access both in terms of land owned and operated is evolving among various size classes of producers as well as among entrants, exiters, and continuing farmers. The impact of Hurricane Mitch on land holdings is also considered for its contribution to changes in the structure of land ownership and the pace of land market activity. Taken together, the results of this empirical assessment of changes in Honduras’ agrarian structure set the stage for a more comprehensive examination of the ways in which land and credit markets are interacting under the LAM to create agricultural ladders for the rural poor in Honduras.
I. Introduction

Poverty is pervasive in rural Honduras. In 1994, the World Bank estimated that 67% of the rural population lived in extreme poverty and that 40% were illiterate (World Bank, 1994). Recent estimates of poverty at the national level suggest at best only limited improvement over the past few years (Fernandez-Trillo, 2001), and the damage wrought by Hurricane Mitch in 1998 may have made the situation worse. At the core of rural poverty in Honduras (and throughout Central America) is a highly dualistic and inequalitarian agrarian structure, where the secular trends over the past half-century have been, on one hand, increasing minifundization and rural landlessness, and, on the other hand, growing concentration of large holdings.

Agrarian policy in Honduras took a soft right turn in the 1990s after nearly two decades of halting agrarian reforms, state support for cooperatives and rural development banks, and, in effect, sanctioned land invasions by the rural poor (Salgado et al., 1994). Passage of the Law of Agricultural Modernization (LAM) at the end of 1991 was central to this policy shift. The main elements of the LAM were to secure private property rights through titling and legal protection of landholders, to stimulate technology transfer mostly through market institutions rather than public extension, and to promote national and international trade again via market institutions as well as public-private joint initiatives to stimulate agro-export and agro-industrial promotion activities (Fernandez-Trillo, 2001). These elements were aimed at encouraging private investment in agriculture and enhancing the performance of land rentals and sales markets so as to allow its ready transfer into the hands of more efficient operators (which in the eyes of some policy analysts were the smaller farms and in the eyes of others the larger farms). While the policy shift was a fundamental move away from an emphasis on state-led agrarian reform and rural development, it was a soft one in the sense that implementation of the LAM in Honduras has been gradual, indeed halting at times, focusing mostly on securing property rights and removing government institutions that presumably limit the development of rural market institutions.
Under the LAM, the optimistic scenario for Honduras’ rural poor goes something like the following: Increased tenure security would activate land and credit markets in such a way that some, presumably the more efficient and hard-working, landless and *minifundio* households gain access to an agricultural ladder. Initial steps on the ladder are likely to involve land rentals and later land purchases, both made more possible by the increased security of these types of land transactions (Olinto et al., 2000). These improvements in land access and accumulation would be facilitated by and also enhance the functioning of private credit markets, because with the collateral of secure land holdings as well as rising agricultural incomes poor rural households would be able to secure the liquidity needed to enhance their investment activity in production, new technologies, and more assets.

A less optimistic scenario for Honduras’ rural poor is that the emphasis on securing private property rights in land is, in fact, accompanied by a set of factor markets, especially for credit, that for reasons related to the economies of information do not serve them well (Stiglitz, 199x, Carter and Barham, 1996; Carter and Olinto, 199x). As a result, the ability of the rural poor to take advantage of more active land markets would, in that case, be restricted by lack of access to credit and other inputs needed to be “competitive” in the price they can afford to pay for the land. Moreover, this same lack of credit access creates, in essence, missing rungs in the ladder, which may well prevent them from being able to finance land purchases and other key investments that would improve their agricultural performance. In a muddling-through scenario, the rural poor might find themselves more able to rent land but in relatively small quantities and without much of an accompanying land purchase trajectory. In a worst-case scenario, the activation of land markets without accompanying improvements in how rural credit and other input markets serve the poor could lead to a rapid consolidation of land in the hands of large holders whose competitive advantage in land markets might rest not on their inherent productivity but on their ability to mobilize the investment necessary to put land into more productive uses.

Using a pair of data sets gathered in the first trimester of 2001, this paper provides an initial empirical assessment of recent turns in Honduras’ long and grinding road of agrarian structure by examining changes between 1993 and 2000 in land distribution and land market activity. The land
distribution analysis utilizes what amounts to structural change accounting to see how land access both in terms of land owned and operated is evolving among various size classes of producers as well as among entrants, exiters, and continuing farmers. The land market activity analysis is complementary in that it identifies time trends in the pace and level of activity in land sales and rental markets, again for various size classes and types of producers. The impact of Hurricane Mitch on land holdings is also considered for its contribution to changes in the structure of land ownership and the pace of land market activity. Taken together, the results of this empirical assessment of changes in Honduras’ agrarian structure set the stage for a more comprehensive examination of the ways in which land and credit markets are interacting under the LAM to create agricultural ladders for the rural poor in Honduras.

The next section of the paper explores in some detail the data sets used, including their spatial and temporal scope, their distinctive characteristics, and their value for doing dynamic analysis of agrarian structural changes. The third section explains the basic methods used for evaluating land distribution and land market changes. The rest of the paper presents the empirical results and the conclusions.

II. Panel and Retrospective Data on Agrarian Structure in Honduras

Two primary data sources provide the basis for this study of the evolution of agrarian structure in Honduras. The first is a panel data set that spans the 1983 – 2001 time period. The other is a cross-sectional data set that uses recall methods to construct a history for each respondent of land owned and operated over the life of the farm. Taken together, these two data sets span six of sixteen departments of Honduras and offer about 900 household observations on changes in agrarian structure and related issues since the passage of the LAM. Of the two, the panel data study offers the potential for a more comprehensive view of changes in agrarian structure for reasons that will be explained further below. The ensuing discussion explains the salient characteristics of each data set in terms of their coverage of regions and time, the underlying sample frame, and their strengths and weaknesses for studying the dynamics of agrarian change. Before doing that, however, we briefly explore the tradeoffs of sampling
methods for studies of agrarian change to help set the context for the explanation and use of the two data sets.

**A. Sampling methods and land distributions in highly inegalitarian contexts**

In a full census of households or land parcels, the underlying land distribution of the rural population is constructed either by fully enumerating the land holdings of all households or connecting all land parcels to individual households. Either way, in a relatively egalitarian or inegalitarian setting, the land distribution of the region can be obtained as long as the relevant population can be identified, and interviewed about their holdings, or linked to all of their parcel holdings in some fashion. That is why regular agricultural censuses which cover all parcels or rural households are likely to offer highly reliable portrayals of land distribution if they ask the right questions regarding total land owned and operated of the respondents.

Sample-based methods of studying patterns and determinants of agrarian structure face fundamental challenges in highly inegalitarian settings, if a population list of households and their land holdings is not available to enable stratification. If the sampling scheme is based on rural households and done randomly, then the sample is likely to over-sample households with relatively small land holdings and under-sample households with large holdings. For example, of the 465,600 rural households registered in the 1993 Honduran agricultural census, 97% of them held less than 50 hectares of land, 80% of them held less than 5 hectares of land, and 27% of them held no land. If a random sample of, say, 500 households were undertaken, on average only 15 households with more than 50 hectares of land would be included in the sample. Because the tail of the distribution of households with more than 50 hectares is long and thin, it is likely that no households with more than, say, 200 hectares might get included in the sample. Yet, it is quite possible that this category, the less than 1% of households with more than 200 hectares of land, could account for upwards of 30% of the land holdings in the country. Thus, the land distribution that would be created by a random sample of rural households would be likely to understate substantially the degree of inequality.
Household-based sample selection can be further biased by what we might call the “other side of the tracks” problem. Households with large land holdings may not live particularly close to their holdings. Indeed, it is quite common in Latin America for households with large landholdings to live in urban areas, often quite far from the area being studied. Thus, in a random draw of rural households in the region of study, there is a high likelihood that the sample will miss entirely these large landholders, who live elsewhere, leading to a systematic downward bias in the reported measures of inequality.

Conversely, if a random sample were to be land-based and derived by randomly picking out areas of land and studying the characteristics of who owns the land (including other parcels they own), then the underlying distribution will be biased toward large landholders. They will have a disproportionately higher chance of being selected in on the basis of the land coverage they own. Thus, a land-based sampling method, if not derived explicitly from a list of parcels, has the opposite problem of the random selection of households in a rural area. Large landholders will tend to be over-counted, and the resulting land distribution created from such a sample will overstate average farm size holdings and probably understate the degree of inequality by under-representing the large proportion of households with very small land holdings.

In between these two extremes is a sampling scheme based on a land parcel list that identifies household land holdings on a parcel-by-parcel level. If the list is complete for a region, and includes parcel size, then it is, in effect, a census that can be used in and of itself to construct a representative size distribution except for the omission of rural households who own no land. If the list includes names but not parcel sizes, then in a highly egalitarian land distribution setting, choosing a sample randomly from the parcel list would provide a good representation of the underlying distribution, because there would be relatively few outliers to distort the size distribution of the sample from the population. In a highly inequalitarian setting, however, where most households have no land or very small parcels, and a few households have very large parcels, then a stratified sampling scheme based on land is essential to avoid reproducing the problems associated with the random sample of households discussed above, i.e. the under-sampling of larger farms, the over sampling of smaller farms relative to the underlying land
distribution, and the omission of households with no land. Of course, stratification requires knowing something about the proportions of parcels (farms) in different size categories, which brings the data requirements essentially back to a census (minus the landless households) if stratification is to be effective.

The bottom line is that sampling methods for reconstructing representative land distributions in highly inegalitarian settings demand a lot of initial information to avoid choosing samples that are biased either in their under-representation of large landholders (the household method) or in their under-representation of small landholders and omission of the landless (the land method).Parcel level data with information about size is necessary to avoid this problem, but is essentially census data, if the holders of the parcels are identified. So, then, the sample selection can be closely linked to the underlying land distribution, because except for the count of landless households the land distribution is essentially already known.

**B. The Panel Dataset**

This study of changes in agrarian structure pivots on a panel data set that follows land and households over time. The original baseline study was undertaken in 1983-84 by the Land Tenure Center at the University of Wisconsin and extended in 1988-89 by the same research team. A large sub-sample (450) of the original panel was then resurveyed in 1994 by Ramón Lopez and the World Bank, and then again most recently in the spring of 2001 as part of a project sponsored by the the European Community, U.S. AID, and the World Bank.

The current round of the panel data set consists of observations on 658 continuing, entering, and exiting farm households from four departments in the Northwestern region of Honduras (namely, Comayagua, Ocotepeque, Santa Barbara, and Yoro). Perhaps the most important characteristic of this particular panel data set is that between 1994 and 2001 it follows the evolution of both previously identified specific land parcels and households. By following parcels and households, the 1994 land
distribution using the panel observation from that year can be compared with the 2001 land distribution in a systematic and comprehensive fashion, one that describes how the holdings of continuing farmers have changed including the disposal of the key parcel, what were the holdings of farmers who have disposed of their identifying parcel and left farming, and how the holdings of new entrants (those who now hold an identifying parcel and entered farming since 1994) compare with the other two groups. These three facets of change in agrarian structure (continuing farmers, exiting farmers, and entering farmers) provide a comprehensive picture of how agarian structure has changed in these areas over that time period.

The original sample frame design of the panel has one decided advantage for studying the evolution of land distribution. Namely, the original sample frame was based on selecting at random land parcels from a cadastral list prepared by the government for a titling program and then interviewing the households who owned or operated that parcel. Subsequent interviews have tracked that land parcel and incorporated new holders of the parcel into the sample. In that sense, changes in the characteristics of who holds the land are being tracked systematically over time. This approach captures the changes in the characteristics of who holds the land by anchoring the panel around specific land parcels and then surveying the households who are using those parcels. It is this feature of the panel that allows a dynamic analysis of agrarian structure to be undertaken in a systematic and representative fashion.

That said, the original sample frame design can also be criticized as being not truly representative of the rural population of Honduras. The most obvious problem is that it only covers limited regions of four departments out of sixteen in the country. The more troubling problem is that the original sample frame design was aimed at helping to evaluate titling programs that were undertaken in the 1980s in small-scale, coffee growing regions of Honduras. Thus, the sample frame was not based on all land parcels in the regions at question, but instead was one based on government program lists of untitled lands.

1 The lead investigators during this time period were Mitchell A. Seligson and Edgar Nesman. See Seligson et al. (1983), Nesman and Seligson (1988), and Seligson and Nesman (1989) for more details on the two rounds of survey work undertaken.
To be on the list, the parcels had to be a minimum of either 1 hectare in size with coffee or 5 hectares without coffee. Thus, the population list of untitled lands did not accurately reflect the full distribution of land parcels in these regions, because it was likely to both truncate some parcels at the small end of the spectrum (those under 1 hectare with coffee and under 5 hectares without coffee) as well as those already titled lands that were, in all likelihood, disproportionately larger in size. In other words, the original population of parcels was almost surely drawn disproportionately from the lower-middle span of the size spectrum (not too small by rules of the program and not too large by the low likelihood that they were, in fact, untitled). Moreover, because of their untitled status, these parcels may have been more likely to be in the possession of households without other major land holdings, on the presumption that larger land holders will be more likely to hold title to all of their lands than households will smaller total land holdings. One conclusion seems safe. Because the original sample is likely to have undercounted both rural households without land or with relatively small holdings, and households that have large holdings, it seems likely that inequality in land distribution was underestimated.

The strength of this panel data set is not its representativeness of the original underlying land distribution in Honduras or even in the four study regions. Only a sample derived from a full rural census could achieve that outcome. Instead, the strength of this data set is the fact that it is anchored to specific land parcels and then tracks households involved with those parcels over time. This approach allows a relatively representative portrait of the dynamics of structural change, because a given parcel can be held over time by a household, but it can also be sold, subdivided, and so forth. Through those land holding changes and the ability to study households on both sides of the transaction, the data set evolves in such a way that includes entrants, exiters, and continuing farmers. The evolution of their overall land holdings can then be used to construct a revealing if not fully representative portrayal of the dynamics of land distribution changes in the region.

C. The European Community Baseline Dataset with Land Recall Information

The second data set, referred to below as the EC data, is a baseline study also gathered in the spring of 2001 to assist in the design and evaluation of a food security and land tenure project sponsored
by the European Community. It includes 324 households from three departments (Colon, Intibuca, and Ocotepeque), and the survey utilized recall methods to create a retrospective data set for land owned and operated over the life of the household. In particular, households were asked to reconstruct the evolution of their land holdings and land operated by identifying their current holdings of land owned and operated, their initial holdings of the same, and then changes in land owned and operated that occurred over the years. From these recall data on changes over time, the evolution of household land holdings can be reconstructed. In a separate paper, the reliability of this type of recall data is under examination using the panel data and a similar set of recall questions that were asked of those respondents.

The sample frame of the EC data was selected from population lists that included land holdings. Efforts were made to sample from households with larger holdings by including municipal centers surrounding the farming areas. Nonetheless, it is probable (and indeed seems borne out by the data) that this sample is biased toward the smaller end of the land distribution spectrum for reasons elaborated in section A. above. Thus, the EC data are also likely to understate rural land inequality and probably more so than the panel data which has had time to evolve through its anchor on specific parcels toward a more broadly-based land sampling scheme than it was in its original design in 1983-85.

Use of the EC data to study the dynamics of structural change is also limited by the fact that only households currently engaged in agriculture are included in the household sampling scheme. In other words, households who exited (sold off land or stopped renting since 1993) are inherently excluded, and as such the household sample using recall data only offers the dynamics of land evolution for continuing farmers and those who have entered since 1993. Thus, the EC data offer an incomplete portrayal of the dynamics of structural change. However, by including samples from two additional regions, Intibuca and Colon, it adds more coverage to this portrayal of land distribution dynamics for Honduras during this time period.

III. Accounting for the Dynamics of Structural Change

Of primary interest in the analysis below are the evolution of the distribution of land owned and land operated in the study areas. These measures describe the evolution of land wealth holdings and the
opportunities to generate agricultural income from land. Obviously, these measures need not be entirely coincident, especially if tenure security reforms have the effect of encouraging more land rentals than were occurring previously. In that case, rentals may provide access to agricultural opportunities for the land poor and in the best of cases also provide a crucial rung that allows them to move up an agricultural ladder by renting and then buying.

There are various ways to look at the evolution of these measures. We use a standard concentration measure, the Gini coefficient, that ranges between 0 for perfect equality and 1 for perfect inequality. We also present tables broken down by farm size categories on land holdings, land operated, and land transactions. Changes in these measures between 1993 and 2001 are used to describe the trends in agrarian structure in Honduras following the LAM.

The only one of these measures that is not commonplace is the method used for decomposing changes in the Gini coefficient over time. As indicated by equation 1, changes in the Gini coefficient ($G_t$) of land distribution between the 1994 panel and the 2001 panel can be decomposed into three effects, (1) the share of the change associated with continuing farmers; (2) the share of the change associated with entering farmers; and, (3) the share of the change associated with exiting farmers.

\[
\]

The three types of variables on the right-hand side are:

i.) $R_{k,t}$, which is the Gini correlation of land ($y_k$) held by land holder type (e.g. continuing farmer) with total land ($y_o$) in time $t$. In mathematical terms, $R_{k,t} = \frac{\text{cov}(y_{k,t}, F(y_{o,t}))}{\text{cov}(y_k, t, F(y_k, t))}$, where $F(y_{o,t})$ is the cumulative distribution of total land and $F(y_{k,t})$ is the cumulative distribution of land held by type $k$;

ii.) $G_{k,t}$ is the Gini coefficient in time $t$ corresponding to land holder type (C is continuing farmer, E is entering farmer, and X is exiting farmer; and,

iii.) $S_{k,t}$ is the share of land type $k$ in total household land.
This Gini decomposition method allows for an explicit accounting of the sources of structural change, i.e. the extent to which distinctive land distribution trends among continuing farmers, entering farmers, and exiting farmers are contributing to the overall process of structural change. As such, this approach can help to identify not only which of the sources may be driving the overall process, but also the extent to which the other sources are reinforcing or balancing out the aggregate pattern of structural change.

Underlying these processes will, of course, be land transfers, permanent ones for land holdings as well as temporary ones for land operated. Thus, once we have identified the main trends in land distribution between 1993 and 2001 using Gini measures for land owned and operated in both of our data sets, we look in more detail at the role of sales and other permanent land transfers as well as rentals and other temporary land transactions in shaping these changes. We also attempt to account for one major contingent factor, the impact of Hurricane Mitch to see the extent to which the overall changes since 1993 relate to the direct impacts of land losses associated with Hurricane Mitch. We do this in two ways:

1. By looking at how land distribution might have differed if all land holdings lost to the Hurricane were included in the current holdings of households in 2001; and,
2. By examining the sales and rental data in the two years following the Hurricane, 1999 and 2000, for evidence of important shifts in the pattern of land transfers.

It is important to note that any indirect effects of Mitch on household wealth holdings and household portfolio choices beyond changes in land rentals or sales are not yet accounted for in this analysis.

IV. Changes in Agrarian Structure in Honduras 1994-2001

Inequality in agrarian structure deepened in the regions covered by the panel data set. Table 1 shows the evolution of the Gini coefficient for land owned and operated for the entire panel and the four regions. Overall, the Gini for land owned (and operated) increased from 0.71 in 1994 to 0.76 in 2001. Only one of the regions, Santa Barbara, experienced a decrease in inequality in land owned and operated.

---

2 Ray (1998) provides a textbook account of the Gini coefficient and compares it to other inequality measures.
during that period as measured by the Gini coefficient, while Comayagua experienced the largest increase from 0.69 to 0.79. Perhaps most noteworthy is the observation that the increase in inequality in land ownership was, in these four regions, not mitigated by rental markets or other temporary land transactions.

The high level of concentration of land holdings is more fully described by Table 2 which uses the panel data to compare the percent of farms and the percent of land held by different farm size categories in 1994 and 2001. In 1994, 40% of the farms in the panel were under 5 manzanas, and they accounted for 3.3% of the land holdings. In 2001, almost 45% of the farms were under 5 manzanas, and they accounted for 3.1% of the land holdings. This comparison illustrates the fragmentation of small holdings that characterizes one end of the dualistic agrarian structure of Honduras. At the other end of the inequality spectrum, Table 2 also shows the significant growth in the land share of the farms over 200 manzanas, which in 1994 accounted for 1.3% of the farms and 22.3% of the land but by 2001 accounted for 1.7% of the farms and 32.7% of the land. A close appraisal of the farms in the middle-sized categories, those between 5 manzanas and up to 200 manzanas shows that their share of land held also decreased between 1994 and 2001. In other words, the only farm size category that experienced an increase in its share of holdings were those farms over 200 manzanas. Recalling the discussion of the previous two sections that explained that this panel data sample may under-represent larger farms because of its original sample scheme and omits landless rural households (those with no land owned or rented), it seems highly likely that the change in inequality found in these data probably understates the increase in inequality in land distribution since the passage of LAM.

The decomposition of the change in the Gini coefficient for land owned is partially described at the bottom of Table 1. Specifically, the relevant Gini coefficients are presented for continuing farmers, entering farmers and exiting farmers. Because the Gini measures were the same for exiting and entering farmers (0.74), and their relative shares of the overall population are rather similar, most of the increase in
the overall Gini measure is accounted for by the increase in the Gini among continuing farmers. What this decomposition adds to the story of inequality is that further attention to expansion and contractions by continuing farmers is at the heart of the story of growing inequality in agrarian structure in the panel sample.

The EC data offers a less complete but somewhat distinctive picture of land distribution trends. Table 3 reports the 2001 Gini coefficients for land owned and operated for the entire sample and for the three study regions. Recall that this sample is based on households rather than land, so as discussed above we might expect lower Gini values than we would from a land-based sample. In fact, the overall Gini measure of land owned (0.72) is somewhat less than the 0.76 overall measure in the panel data and also less in the Ocotopeque region, where the two data sets overlap. The more notable difference across the two data sets is that in the case of the EC land operated is significantly less concentrated at 0.67 than is land owned at 0.72. Thus, in the EC sample, land rentals and other temporary transactions have the effect of reducing inequality in land access, while they do not do so in the panel sample. This result is strongest for the region of Colon, where the Gini coefficient in land operated is 0.67 vs a Gini coefficient of 0.76 in land owned, but this basic result of lower inequality in land operated holds in all three regions of the EC sample.

The differences between land operated and land owned for different farm size categories are quite evident in Table 4. For example, the proportion of farms in the less than 1 manzana category is 37% in the land owned distribution but only 21% of in the land operated distribution. That 16% difference is exactly reversed in the 1-5 manzana category, where the proportion of farms in the land owned distribution is 24% compared with 40% in the land operated distribution. The fact that the bottom two land size categories accounts for 61% of the sample in both land owned and land operated means that we can combine them to look at the ratio of land operated to land owned. This ratio turns out to be 1.5:1 which means that, on average, households in these bottom two categories, on average, are increasing their access to land by about 50% through rentals and other transactions. How much of an impact that land

---

3 This statement also assumes that the Gini correlation coefficient of the two is relatively similar.
access is making in terms of improving their current welfare and providing them the potential for further wealth accumulation is a topic for future analysis, but the fact that less than 5 manzanas is still quite a small farm (less than 7.5 acres) means that they would have to be using the land quite intensively to generate significant incomes from these operations.

Finally, the EC household data set does not allow a full decomposition of the Gini coefficient across time because exiters are not accounted for in a baseline sample. However, when the role of entrants and continuing farmers is disaggregated for the 2001 Gini measure, the results are very similar to those obtained above for the panel data. That is, continuing farmers and entrants both have Gini coefficients of land owned around 0.72 and about 0.67 for land operated. As in the panel data, then, it may be the case that much of the interesting structural change activity is occurring among continuing farmers. The EC recall data could enable such an analysis, once the validation study of the recall data in the panel data set is completed.

V. Pace and Structural Patterns of Land Market Activity in Honduras

One of the fundamental goals of the Law of Agricultural Modernization (LAM) was to improve the security of property rights and deepen ongoing titling initiatives, with the aims of activating what were widely viewed as poorly developed land markets and to help move land into the hands of more efficient producers. This section presents evidence from the two data sets on the pace of land market activity during 1993-2000 for both sales and rental transactions. The section also offers an initial look at the structural patterns of land market activity. On the land sales side, this is done by examining the share of purchases, sales, and net purchases accounted for by farms of different farm size categories (at the time of purchase). On the land rental side, we examine the volume of land rented by farm-size categories (broken down by land owned at the time of rental). These comparisons provide a clear picture of which size strata from our samples are active in, and in which types of, land markets.
Annual land sales data for the Panel and EC data sets are presented in Figures 1 and 2. Both data sets show a high level of land sales activity in the mid-1990s\(^4\), with the three peak years for sales in the panel data set being 1995-1997, with three of the peak years in the EC data set being 1994, 1995, and 1998. Both data sets show considerably lower land sales activity in 1999 and 2000 than in the previously mentioned years. Those two years follow immediately after Hurricane Mitch, which occurred at the end of October of 1998. While it is certainly possible that the relatively low sales of 1999 and 2000 could be a result of the slow recovery period that followed Hurricane Mitch, it is also possible that the high volumes of land sales in the earlier years resulted from “pent-up” transactions that were made easier by the passage of LAM. Nonetheless, it is somewhat surprising that Hurricane Mitch does not appear to have been more of a catalyst for land sales given the widespread perception that rural-urban and rural-international migration accelerated after Mitch.

Over the entire 1993-2000 time-period, net purchases accounted for about 15% of the land held as of 2000, which means that this additional land had the potential to make a significant difference in the overall land distribution. Accordingly, net acquisitions of land by farm-size category at the time of purchase are reported for both the Panel data and the EC data in Figure 3. The patterns are remarkably distinctive across the two data sets. In the case of the panel data, more than 60% of the net land acquisitions during the 1993-2000 time-period are accounted for by farms over 50 manzanas in size at the time of purchase. Farms under 10 manzanas in size only account for 22% of the total land acquired in the panel data set. These land sales results are consistent with the earlier findings that inequality in land ownership in the panel data set increased over this time period. Still, they underscore the key question of why larger farms dominate in the land market purchases in these areas.

\(^4\) A quick perusal of the net purchases data show that in all years except for one in the EC data that net purchases are positive, and usually at levels quite close to land bought. In the EC data, this outcome is almost guaranteed by the fact that households are only included in the data set if they are still living in the rural area. So, households that have exited and sold off their land are implicitly excluded from the sample. In the panel data, a fuller picture of land transactions could be developed by including data from households who sold off the parcela muestral and exited farming using the 1994 panel. Those data are not included in Figure 1 or Figure 3 either.
In the case of the EC data, the distribution of net acquisitions is concentrated in two farm-size categories, farms under 1 manzana at the time of purchase and farms between 10 and 50 manzanas, with farms under 1 manzana accounting for about 40% of the positive net acquisitions. Interestingly, in this sample, farms over 50 manzanas were net sellers during the 1993-2000 time period. A closer look at the acquisition data does not reveal any outliers that explain the high share of land acquired by the smallest farm-size category, as they are spread over the years and across many transactions. A closer look also shows that some of these small farms acquiring land move significantly up the farm-size distribution into the 10-50 and even the over 50 manzana farm-size category. Thus, the EC data offer a distinctive pattern of land sales markets to those found in the panel data, and exhibit the potential for considerable land mobility among the initially land-poor. While it seems worth pointing out once more that the lack of farms at the top end of the farm size distribution in Honduras in the EC sample may be biasing these results to some extent, a more complete sample would not eliminate the differences found between these two samples in terms of the EC sample showing a more inclusive pattern of land sales activity than the panel sample.

Changes in the level of land rental market activity for both data sets over the 1994-2000 time period are depicted in Figure 4. While land rental activity levels increased by at least a factor of ten for both samples during this time period, still by the peak year of 2000 they amount to about 3% of the total land owned in the panel data set and 6% in the EC data set. In other words, land rental activities have grown rapidly in recent years but apparently from very low initial levels. It is also worth noting that in the panel dataset, net land rentals (rented-in less rented-out) are negative for 1999 and 2000, while they are strongly positive in those years for the EC sample.

The structural pattern of land rental market activity for the two data sets is summarized in Figure 5. As in the sales data, the farm-size categories are based on land owned but in this case in the year of rental. The totals for each farm-size category cover the entire period of 1994-2000. The two data sets offer quite contrasting patterns of land rental market activity. In the panel dataset, it is again the large land holders that dominate the land rental markets, as they are responsible for over two-thirds of the land
rentals, and their net rental levels are more than the other four categories put together. Interestingly, in the panel sample, the farm-size category of 10-50 manzanas rents out more than it rents in, with a deficit equal to the total amount rented-in. The farm-size category with the least rental activity for both data sets is the 5-10 manzana group.

The EC rental data matches more closely with the EC sales data. The largest share of land rental goes to the farm-size category of under 1 manzana of land owned. Thus, as shown above in section IV, land rentals are enabling them to operate much more land than they own, thereby decreasing inequality in land access. The 1-5 manzana group is also renting in considerably more land than they rent out and thereby improving their land access relative to the other farm-size groups. Farms over 50 manzanas are very inactive in rental markets in the EC dataset, as they rented-in almost no land and rented out a very small amount. Hence, for both land sales and land rental markets, the panel and the EC data provide a striking contrast in the role of the large farm-size category, with them dominating these markets in the former and being the least active in the latter. This outcome suggests the need for further attention to both the underlying sample frames (in search of artifacts of the data) and then to the dynamics of these markets to see how and why they might differ.

VI. Direct and Indirect Effects of Hurricane Mitch on Agrarian Structure in Honduras

The direct effects of Hurricane Mitch on agrarian structure in the regions studied turns out to be quite negligible. First, it is worth pointing out that the total land lost to Hurricane Mitch represents 2% of total land in each of the panel and EC data sets. Second, most of the land lost to the effects of Mitch comes from the upper-middle of the land distribution holdings. In fact, in the two regions where respondents lost the highest proportion of their land holdings to Mitch (about 4%), the bulk of the land lost came from farms with more than 50 manzanas. As a result, the only notable impacts on land distribution that resulted from Hurricane Mitch were slight reductions in land inequality in those two

---

5 Santa Barbara in the panel data set and Ocotepeque in the EC data set are the two with the largest absolute and proportional losses of land reported.
locales. This effect can be seen in the slight decreases in the Gini coefficients in Table 5 between a no loss of land to Mitch scenario and actual land distribution in 2001. Notice that the Gini measure does not vary in the counterfactual scenario for the panel data set, is .01 higher under the counterfactual scenario for the EC data set, and increases by .01-.02 in three of the regions under the counterfactual scenario of no land lost to Hurricane Mitch.

It does not seem likely that the aftermath of Hurricane Mitch could account for much of the recent growth in inequality in land ownership in the regions studied either. As shown in the land sales data Figures presented in the previous section, land sales in 1999 and 2000 were considerably lower than in any other years during the period studied. Moreover, a closer look at the data of land purchases and sales by farm-size category reveals only a very small net-land sales outcome for farmers in the 1-5 manzana range, with all of the others showing net-land purchases volumes at lower levels than was otherwise typical during the period studied. Thus, there is no compelling evidence of a post-Mitch land distress sale in these two data sets, making it highly unlikely that either the direct or indirect effects of Mitch on the distribution of land owned can account for the growth in inequality that occurred during this time period.

The land rental data after Hurricane Mitch and especially for 2000 offer an interesting potential twist to the account. In 2000, the volume of rented land was considerably higher than in any other year in the period, almost twice the previous peak in each of the data sets. Moreover, in both samples, the vast majority of the positive net rentals were accounted for by the farm size categories of under 5 manzanas. Indeed, farms over 5 manzanas tended to be renting out more than they were renting in. Overall, then, land access distribution trends look better after Mitch because of the increased volume of land rented-in by smaller farmers. What accounts for this change will need to be further explored in subsequent analyses.

VII. The Dynamics of Structural Change and Land Market Activity in Honduras

Like most of Central and South America, Honduras has experienced a long and grinding road of inegalitarian agrarian structure, characterized by persistent rural poverty and halting but highly contested
agarian reform measures. This study provides an assessment of the patterns of structural change in several regions of rural Honduras following a neoliberal policy shift in the early 1990s, the Law of Agricultural Modernization, which attempted to promote more secure property rights and call to a close further land redistribution or invasions. The analysis also accounts for a major natural disaster, Hurricane Mitch in 1998, in order to be sure that the patterns of change are not driven by this “exogenous” shock. The dynamics of structural change and particularly the extent to which the LAM might be associated with an increase in activity in land rental and sales markets are examined using two data sets gathered in 2001 as part of a collaborative research project on land market liberalization in Central America. The two samples draw on rural households in 6 of Honduras’ 16 regions in distinctive ways that may help to explain the disparities that emerge in this initial empirical analysis. In particular, one of data sets is a panel that has tracked land parcels and more recently both households and land parcels, while the other is a cross-sectional data set that was built on a rural population list sample frame. The panel sample is more inclusive of larger farms and, in that sense, more representative of the full range of the underlying agrarian structure, while the cross-sectional sample (called the EC sample) is likely to under-represent the population and impact of large farms.

The results of the empirical analysis are usefully broken down into similarities and contrasts across the two samples. The similarities in the two samples are: (1) land ownership remains highly concentrated (at similar levels), and demonstrates the persistent dualistic pattern of agrarian structure. This involves the vast majority of rural households being land poor with very small holdings and a miniscule percentage of the total agricultural land under their ownership, and a small minority of large land holders with the vast majority of the land in their hands; (2) land sales were especially active in the 1994-97 period leading up to Mitch and then less active in the years following Hurricane Mitch; (3) land rental market activity grew explosively over the seven year time period (increasing by a factor of ten), with a dramatic increase in the years following Hurricane Mitch. But, they also grew from a very small base, such that they represent only a small percentage of the land in production even after the period of
rapid growth; and, (4) Hurricane Mitch had a negligible impact on agrarian structure, if anything, slightly reducing the degree of inequality in some regions.

Only the panel data set allows a full portrayal of changes in agrarian structure over the time period, because it accounts for exiters, entrants, and continuing farmers through its link to specific land parcels. The empirical analysis of the panel data shows a sizable increase in the degree of inequality in both land ownership and land operated over the 1994-2001 time period. Decomposition of this increase in inequality shows that increases in inequality among continuing farmers is central to this process, and the land sales data show that the largest farm size strata have been dominant buyers in the panel sample. Land rental markets have not been sufficiently active or dominated by small farm size strata to compensate for the consolidation in land ownership that occurred over this time period. In these ways, the panel sample offer one more grinding turn in the direction of inequality in the evolution of Honduran agrarian structure.

The EC data suggest a less pessimistic scenario. In particular, land rental markets in this sample are sufficiently active and dominated by households with small land holdings that the two smaller size strata are able to increase their overall land access by about 50% via rentals. In terms of the Gini coefficient measures, this activity translates into a .05 reduction when comparing land owned with land operated, which is equivalent to the increase in the Gini coefficient that occurred in the panel sample in both land owned and operated over the 1994-2001 time period. It is worth recalling from Table 3 that in one of the three study regions, Colón, the decrease in the Gini coefficient was 0.1, and thus much of the difference across the samples may be specific to this locale, a more recently settled region of Honduras. Land sales markets in the EC sample, although less active than in the panel sample, were also dominated by households with small or medium size holdings. And, the movement of some very small farm households up to the larger farm size strata suggest the possibility of a significant agricultural ladder. However, the absence of sufficient observations of households with large holdings may mean that the share of land sales accorded to these groups is substantially overstated in the study regions. Nonetheless,
the EC data offer a more promising picture in terms of the potential for some market-led movement of land into the hands of the rural poor than do the panel data.

The disparities revealed in the empirical analysis of these two data sets raise perhaps more questions than they answer. To what extent are they real, reflecting differences in the way that land markets are working for the rural poor across distinctive locations, or are they merely artifacts of distinctive sampling methods (household vs land)? Further analysis of the factors influencing the competitiveness of farm households in land markets are likely to be helpful in exploring these issues, as will attention to the specific details of the land transactions that are occurring, especially the size class of the other party in the transaction. A more careful look at the land market dynamics of the region of Colon may also be in order. In any case, the next steps in the analysis require more careful attention to the role of credit markets, labor markets, land transaction costs, and other factors that might influence the land allocation decisions of rural households. In other words, a structural model and its subsequent empirical estimation will be critical ingredients to a further unpacking of the processes underlying changes (and perhaps quite disparate ones) in agrarian structure in Honduras. Answers to those questions should also help to point toward the conditions under which the long and grinding road of agrarian structure in Honduras could take a turn for the better for the rural poor.
References


## Appendix A: Tables and Figures

### Table 1. Change in Land Concentration in Honduras: 1994 – 2000*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land Owned</td>
<td>Land Operated</td>
<td>Land Owned</td>
<td>Land Operated</td>
</tr>
<tr>
<td>All Regions</td>
<td>0.76</td>
<td>0.75</td>
<td>0.71</td>
<td>0.71</td>
</tr>
<tr>
<td>Comayagua</td>
<td>0.79</td>
<td>0.79</td>
<td>0.69</td>
<td>0.69</td>
</tr>
<tr>
<td>Ocotepeque</td>
<td>0.76</td>
<td>0.74</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>0.69</td>
<td>0.68</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>Yoro</td>
<td>0.69</td>
<td>0.68</td>
<td>0.62</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Gini by Type of Panel Respondent

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing Farmers</td>
<td>0.75</td>
<td>0.71</td>
</tr>
<tr>
<td>Entering Farmers</td>
<td>0.74</td>
<td>NA</td>
</tr>
<tr>
<td>Exiting Farmers</td>
<td>NA</td>
<td>0.74</td>
</tr>
</tbody>
</table>

*aFigures are based on panel households. EC households are excluded.

### Table 2. Land Ownership Shares by Size Class: 1994-2001*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 mz</td>
<td>15.78%</td>
<td>0.26%</td>
<td>16.40%</td>
<td>0.30%</td>
</tr>
<tr>
<td>1 - 5 mz</td>
<td>28.90%</td>
<td>2.75%</td>
<td>23.56%</td>
<td>3.03%</td>
</tr>
<tr>
<td>5 - 10 mz</td>
<td>13.30%</td>
<td>3.47%</td>
<td>16.89%</td>
<td>5.20%</td>
</tr>
<tr>
<td>10 -20 mz</td>
<td>15.59%</td>
<td>8.16%</td>
<td>17.78%</td>
<td>10.62%</td>
</tr>
<tr>
<td>20 - 50 mz</td>
<td>14.45%</td>
<td>16.36%</td>
<td>14.44%</td>
<td>19.57%</td>
</tr>
<tr>
<td>50 - 100 mz</td>
<td>6.09%</td>
<td>15.62%</td>
<td>6.00%</td>
<td>17.53%</td>
</tr>
<tr>
<td>100 - 200 mz</td>
<td>4.18%</td>
<td>20.72%</td>
<td>3.56%</td>
<td>21.47%</td>
</tr>
<tr>
<td>200 - 500 mz</td>
<td>1.14%</td>
<td>12.32%</td>
<td>0.89%</td>
<td>10.95%</td>
</tr>
<tr>
<td>More than 500 mz</td>
<td>0.57%</td>
<td>20.34%</td>
<td>0.44%</td>
<td>11.33%</td>
</tr>
</tbody>
</table>

*aFigures are based on panel households. EC households are excluded.
### Table 3. Gini Coefficient for EC Households: 2001

<table>
<thead>
<tr>
<th>Region</th>
<th>Land Owned</th>
<th>Land Operated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon</td>
<td>0.76</td>
<td>0.67</td>
</tr>
<tr>
<td>Intibuca</td>
<td>0.71</td>
<td>0.69</td>
</tr>
<tr>
<td>Ocotepeque</td>
<td>0.7</td>
<td>0.65</td>
</tr>
<tr>
<td>All Regions</td>
<td>0.72</td>
<td>0.67</td>
</tr>
</tbody>
</table>

### Table 4. Land Ownership and Operation Shares by Size Class: 2001 EC Data

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Land Owned</th>
<th>Land Operated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent of Farms</td>
<td>Percent of Land Held</td>
</tr>
<tr>
<td>Less than 1 mz</td>
<td>37.0%</td>
<td>1.1%</td>
</tr>
<tr>
<td>1 - 5 mz</td>
<td>24.1%</td>
<td>6.4%</td>
</tr>
<tr>
<td>5 - 10 mz</td>
<td>14.8%</td>
<td>10.1%</td>
</tr>
<tr>
<td>10 -20 mz</td>
<td>10.2%</td>
<td>13.5%</td>
</tr>
<tr>
<td>20 – 50 mz</td>
<td>9.0%</td>
<td>31.9%</td>
</tr>
<tr>
<td>50 - 100 mz</td>
<td>3.7%</td>
<td>24.2%</td>
</tr>
<tr>
<td>100 - 200 mz</td>
<td>1.2%</td>
<td>12.7%</td>
</tr>
<tr>
<td>200 - 500 mz</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>More than 500 mz</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

### Table 5. Gini Coefficients of Land Ownership with and without Hurricane Mitch

<table>
<thead>
<tr>
<th>Scenario</th>
<th>All Panel</th>
<th>Comayagua</th>
<th>Ocotepeque</th>
<th>Santa Barbara</th>
<th>Yoro</th>
<th>All EC</th>
<th>Colon</th>
<th>Intibuca</th>
<th>Ocotepeque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>0.76</td>
<td>0.79</td>
<td>0.76</td>
<td>0.70</td>
<td>0.69</td>
<td>0.72</td>
<td>0.76</td>
<td>0.71</td>
<td>0.70</td>
</tr>
<tr>
<td>Without Mitch</td>
<td>0.76</td>
<td>0.79</td>
<td>0.76</td>
<td>0.69</td>
<td>0.69</td>
<td>0.73</td>
<td>0.76</td>
<td>0.72</td>
<td>0.72</td>
</tr>
</tbody>
</table>
Figure 1. Land Sales Volume 1994-2000: Panel Subsample

Figure 2. Land Sales Volume 1994-2000: EC Subsample
Figure 3. Share of Net Acquisitions by Farm Size Category
1993 - 2000

Figure 4. Land Rented, Panel and EC Samples, 1994-2000
Figure 5. Land Rentals, By Land-Owned Size Category, Total 1994-2000