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Philippine Institute for Development Studies
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

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Land Rental Market Activity in Agrarian Reform Areas: Evidence from the Philippines

M. Ballesteros and F. Bresciani¹

Abstract: Using data from 3,120 farm household surveyed in 2000 and 2006 the paper tests for factors that affect the degree and extent of households' participation in the rural land rental market. The survey period coincided with the full implementation of the Comprehensive Agrarian Reform Program (CARP) which imposes restriction on the conveyance and transfer (including rental) of all lands awarded under the program. Econometric results show that the rural land rental market is not functioning efficiently. Transaction costs in land leasing are significant resulting in high proportion of non-participants and incomplete adjustment towards desired cultivated area for households that participate in the market. Moreover, the poor and landless have limited access to the land rental market since participation in the market is not determined by agricultural ability but is strongly influenced by endowment of land and access to formal credit. While households with less land tend to rent-in more land, the demand for land increases for household owning land more than 5 hectares. On the other hand, the wealth bias of rural credit market is creating more barriers for the poor to access land. The poor has been able to participate in the rental market through share tenancy arrangements but dependence on informal credit markets constrains them to operate desired cultivated area. The twin effects of inefficient land rental market and credit market imperfections can offset labor advantages of family farms and cause farms to operate below optimal level. The need to achieve an efficient farm size is critical for rural development and should be viewed separately from land ownership. In particular, the land rental market plays a critical role in access to land by the poor and in households' adjustment to an optimal farm size. It would thus be desirable for the government to improve the regulatory framework for the land rental market to operate efficiently.

Key words: land market, land tenure, agrarian reform, Philippines

I. Introduction

Access to land by the poor is one of the necessary conditions for poverty reduction in the rural sector. While land redistribution program such as CARP provides an opportunity for farm workers to access land, such program is but a short-term measure. In the long-term, the efficient functioning of the land market is critical specifically that of the rental market.

The land rental market is an important institution in agriculture. The temporary transfer of land use via tenancy, either by fixed rent or sharecropping arrangements, is one of the oldest institutions in the agriculture sector. Theory and empirical evidences show that this practice has efficiency advantages because it enables the transfer of factors of production (i.e. land and labor) to household who would have more productive use of the land. Transfer of land through rental provides access to land to those with high agriculture ability but own little land or no land. Thus the rental market allows for more efficient farm size and provides

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an opportunity for the landless to climb up the agricultural ladder. Moreover, as the off-farm economy develops, the rental market provides the mechanism for adjustment in farm operations without change in land ownership.

However, under the Philippine agrarian reform law, land rental market activity for agriculture is constrained. The first major land reform law passed in 1972 (P.D 27) has outlawed tenancy in particular sharecropping due to the perceived exploitative nature of this arrangement. Share tenancy was then considered inconsistent with the program's aim to "emancipate the tenant from the bondage of the soil." Likewise, under the Comprehensive Agrarian Reform Law of 1988, any form of transfer of the land awarded under the Comprehensive Agrarian Reform Program (CARP) is prohibited. A 10-year prohibitory period in any form of conveyance except to heirs and government (e.g. DAR or the Land Bank) has been imposed by law. This means that beneficiaries of CARP are unable to freely engage in land market transactions and that land rental whether fixed or sharecropped is considered illegal.

This law can have adverse effects on the efficiency of the land rental market. It could result in informal land transactions which is inefficient. It can also constraint rental activity due to the possibility that leasing of awarded lands under the current law could lead to rental disputes and to cancellation of awarded rights on land.

The objective of this paper is to assess the behaviour of the land rental market under the current implementation of the agrarian reform program. Specifically, we examine the extent of rental activity in agriculture, access to land by the poor, and changes in the pattern of rental activity overtime.

The rest of the paper is organized as follows. In the next section we provide an overview of rental market activity in agriculture using Census data for 1991 and 2002. Section 3 presents the methodology and data for the analysis. Section 4 evaluates the determinants of participation and the functioning of the land rental market using the model provided in literature. Section 5 discusses the changes in the pattern of rental contracts and the possible effects of CARP on the market. The last section concludes with policy recommendations.

II. Overview of Rural Land Rental Market Activity

Land rental is widely practiced in Philippine agriculture. Rental activity both sharecropped and fixed rent arrangements represent one fourth of cultivated land. The proportion differs across regions (Table 1). Area of land rented is largest in the Ilocos Region and CALABARZON area while smallest in regions claimed by the Bangsamoro as Ancestral Domain (Zamboanga, South Cotobato, and the Autonomous region of Mindanao (ARRM).

Sharecropping is the preferred contract in all regions with an average of 80% of total rented area under tenancy. An exception is the region of Western Visayas where the proportion of sharecropped and leased areas is about the same. This region includes the province of Negros which has the largest agriculture area devoted to sugarcane production. Corporate

farm structure is commonly observed in sugarcane and the preference for such structure has been attributed to scale economies.²

Table 1. Proportion of Agriculture Land Area Rented by Region, 2002

		Total Farm Area (ha)	Tenanted		Leased		Both	
			Area (ha)	% to Total Farm Area	Area (ha)	% to Total Farm Area	Area (ha)	% to Total Farm Area
Philippines		9,670,793	2,061,761	21.3	521,534	5.4	2,583,295	26.7
NCR	National Capital Region	71,632	1,953	2.7	1,974	2.8	3,927	5.5
CAR	Cordillera Administrative Region	177,839	21,474	12.1	10,879	6.1	32,353	18.2
Region 1	Ilocos Region	270,664	109,912	40.6	12,356	4.6	122,268	45.2
Region 2	Cagayan Valley	540,812	100,043	18.5	39,044	7.2	139,087	25.7
Region 3	Central Luzon	552,106	94,520	17.1	51,788	9.4	146,308	26.5
Region 4A	CALABARZON	588,515	237,303	40.3	14,652	2.5	251,955	42.8
Region 4B	MIMAROPA	542,217	118,029	21.8	20,501	3.8	138,530	25.5
Region 5	Bicol Region	891,955	274,778	30.8	37,009	4.1	311,787	35.0
Region 6	Western Visayas	666,917	96,045	14.4	84,724	12.7	180,769	27.1
Region 7	Central Visayas	522,434	112,373	21.5	15,833	3.0	128,206	24.5
Region 8	Eastern Visayas	723,047	224,801	31.1	24,393	3.4	249,194	34.5
Region 9	Zamboanga Peninsula	785,295	126,782	16.1	15,507	2.0	142,289	18.1
Region 10	Northern Mindanao	746,901	129,984	17.4	66,549	8.9	196,533	26.3
Region 11	Davao Region	758,335	105,096	13.9	22,472	3.0	127,568	16.8
Region 12	SOCOSKARGEN	775,309	137,201	17.7	48,301	6.2	185,502	23.9
Region 13	Caraga	523,408	94,994	18.1	29,234	5.6	124,228	23.7
ARMM	Autonomous Region in Muslim Mindanao	533,410	76,473	14.3	26,315	4.9	102,788	19.3

Source: Census of Agriculture

Rental activity by crop also shows that for sugarcane, the area of land under leased are larger than those under sharecropped contracts (Table 2). On the other hand, for palay, corn, coconut, and banana, sharecropped area is almost 70% of rented area by crop. Corn, however, is shifting to lease contract with the increase in the area cultivated for yellow corn production for export. Among the major crops, about 75% of the total area cultivated for pineapple is rented mainly under lease contract. This reflects the dominance of corporations both local and foreign in the pineapple industry. In particular, two multinational corporations (MNCs) – Del Monte and Dole Philippines, dominate the pineapple industry in Davao Regions and have been in operation since the 1950s. These MNCs used to lease large tracts of land from government and big landowners. Under CARP, lease arrangements may have been maintained through leaseback wherein beneficiaries of land reform enter into long term lease with the MNC as a means of land redistribution. The possibility of contract growing arrangements between MNCs and farmers have provided higher returns to land which could have also encouraged wealthier farmers to increase their landholdings through rental.

² Empirical evidence showed that economies of scale do exist in sugarcane production. This means that larger farms are more efficient (R. Briones, 2008, CARP and Sugarcane Farms).

Table 2. Proportion of Agriculture Land Area Rented by Crop, 2002

	Tenanted		Leased		Both	
	% to Total Crop Area	% to Rented Area	% to Total Crop Area	% to Rented Area	% to Total Crop Area	% to Rented Area
Palay	23.1	73.4	8.4	26.6	31.4	100
Corn	19.3	78.0	5.4	22.0	24.7	100
Coconut	24.4	91.8	2.2	8.2	26.6	100
Sugarcane	7.7	41.0	11.1	59.0	18.8	100
Banana	21.3	79.7	5.4	20.3	26.7	100
Pineapple	7.2	9.6	67.9	90.4	75.2	100

Source: Census of Agriculture

In the case of banana, although corporations also dominate the banana export industry, operations have been historically through small farms. Small farm operation has been maintained and the preference is for growership and/or marketing contracts rather than lease or leaseback arrangements.

It appears that corporate farms play a major role in the land rental market. Where they dominate, rental market is active and lease contracts are more common. On the other hand, for the traditional crops (i.e. palay, corn, coconut) sharecropping is widely adopted and plays an important role in access to land by the poor and landless.

Rental is observed across all farm sizes and forms with share tenancy as the most common arrangement in all farms (Table 3). In the case of purely rented farms (i.e. no farm land is owned), the extent of rental is highest in farms less than one hectare. The proportion declines as farm size increases. On the other hand, the opposite trend is displayed in mixed farms where farm household own some land. Rental participation is highest among larger farms in mixed farms. It appears that farmers with no land tend to rent much smaller farms than those that have some land owned. Between 1991 and 2002, there has been a decline in the number of purely rented farms specifically farms less than three hectares. In contrast, more than 200% increase in the number of farms with mixed tenure is observed.

Table 3. Distribution of Rented Farms by Size, 1991 and 2002

Farm size	1991						2002					
	One form of tenure			Mixed form of tenure			One form of tenure			Mixed form of tenure		
	Tenanted	Leased	Both	Own and tenanted	Own and leased	Both	Tenanted	Leased	Both	Own and tenanted	Own and leased	Both
Number of farms	20.1	8.6	28.7	16.4	3.6	20.0	19.9	6.6	26.5	54.6	6.8	61.4
less than 1 ha	22.5	9.7	32.2	11.4	1.3	12.8	20.7	7.2	27.9	57.6	3.6	61.2
1.001 to 2.000 ha	19.8	10.3	30.1	16.0	2.8	18.8	19.9	7.5	27.4	54.0	6.3	60.3
2.001 to 3.000 ha	17.7	7.3	25.0	20.0	4.9	24.9	18.8	5.6	24.4	52.4	9.6	62.0
3.001 to 4.000 ha	16.5	5.7	22.2	21.6	6.7	28.3	18.1	5.1	23.2	50.7	11.0	61.8
4.001 to 5.000 ha	15.8	4.0	19.8	24.2	8.0	32.2	18.1	4.0	22.2	50.4	13.7	64.1
5.001 to 7.000 ha	15.5	3.8	19.3	23.1	7.9	31.0	18.1	4.0	22.1	50.3	13.1	63.4
7.001 to 10.000 ha	15.9	3.1	19.0	24.7	8.8	33.5	18.4	3.6	22.0	51.3	14.8	66.1
10.001 to 25.000 ha	14.1	2.7	16.9	25.0	10.3	35.3	17.3	3.6	21.0	48.6	16.5	65.0
greater than 25 ha	9.5	2.9	12.5	16.5	21.1	37.6	12.7	4.1	16.8	37.0	27.6	64.5
Total farm area (ha)	1,311,507.3	489,393.2	1,800,900.5	463,708.3	193,343.7	657,052.0	1,371,172.8	412,987.0	1,784,159.8	939,515.8	220,880.5	1,160,396.3
Average area (ha)	1.9	1.7	1.9	2.6	5.0	3.1	1.9	1.7	1.8	1.9	3.5	2.1

Note: figures are percent to all farms

own = includes full ownership and ownerlike possession of land

Source: Asia-Pacific Policy Center (APPC) revised Census of Agriculture

The same trend is also noted for the major crops – palay, corn, coconut, sugar, banana and pineapple. Rental activity increased significantly between 1991 and 2002 among farms which possess own land (Table 4). On the other hand, the number of farms that is purely tenanted or leased has substantially declined. There seems to be an increasing difficulty among non-land owning farmers to participate in the land rental market.

Table 4. Distribution of Rented Farms by Crop, 1991 and 2002

	Palay		Corn		Coconut		Sugar	
	1991	2002	1991	2002	1991	2002	1991	2002
<u>One form of tenure</u>								
Tenanted	12.3	15.2	20.0	18.3	13.5	15.3	11.6	11.2
Leased	7.7	6.4	5.1	4.6	4.7	4.1	7.3	5.4
Both	20.1	21.7	25.1	22.9	18.1	19.4	18.8	16.6
<u>Mixed form of tenure</u>								
Own and tenanted	6.0	16.4	4.1	10.3	4.5	10.5	5.1	7.9
Own and leased	1.4	2.2	0.7	1.4	1.0	1.4	1.8	3.8
Both	7.4	18.6	4.8	11.8	5.5	11.9	6.9	11.7

Note: own includes full ownership and ownerlike possession of land

Source: Asia-Pacific Policy Center (APPC) revised Census of Agriculture

III. Methods and Data

We examined the land rental activity using the model developed in the literature (Bliss and Stern 1982; Skoufias 1995). The model asserts that the rationale of land leasing can be explained by imperfections in the rural labour and credit markets. These imperfections which arise from indivisibilities of labour, lack of off-farm opportunities as well as wealth bias in access to credit, restrict adjustments through these markets. The rental of draft animals also involves significant principal-agent problems and constraints to credit access create difficulties in buying or selling land or bullocks. Moreover, land sale involves transfer of discrete units while land rental may not be so. Thus, the temporary transfer of land through rental provides an efficient adjustment mechanism such that an optimal or desired farm size can be attained.

Assuming the absence of transaction cost in the land rental market, the household obtains its notional demand for net land leased in, Y^* . However, in the presence of transaction costs, the amount leased would amount to Y . This functional relationship is specified as,

$$(1) \quad Y = h(Y^*) ; h \text{ is the adjustment function which is affected by the presence of transaction cost.}$$

Given that Y^* is unobservable, it is assumed that households have a desired cultivated area (DCA) which is determined by agricultural ability, i.e., endowment of labor (\bar{L}) and farm animals (\bar{O}) and endowment of land (\bar{A}). DCA is increasing in both \bar{L} and \bar{O} . Households with surplus labour relative to their land assets would choose to rent in land while those with more land relative to their labour capacity would rent out their surplus land. This relationship is expressed as follows:

$$(2) \quad Y^* = DCA - LAND = f(\bar{L}, \bar{O}) - \bar{A}$$

DCA can depend on other variables aside from labor and draft. Deininger and Songqing (2003) include other factors such as agricultural ability, opportunities for off-farm employment, ability to access credit and other household resources and characteristics.

Combining equations (1) and (2) yields the linear equation:

$$(3) \quad Y = c + h'f_1 \bar{L} + h'f_2 \bar{O} - h' \bar{A}$$

where; c = constant term, $h' = \frac{\partial h}{\partial(DCA - A)}$ = the slope of the adjustment function

and $f_1 = \frac{\partial f}{\partial O}$, and $f_2 = \frac{\partial f}{\partial L}$ = marginal responsiveness of DCA to labor and draft

The econometric equation is as follows:

$$(4) \quad Y = \beta_0 + \beta_1 \bar{L} + \beta_2 \bar{O} - \beta_3 \bar{A} + e$$

If adjustment is done perfectly, $h' = 1$ or $\beta_3 = -1$, the actual cultivated area, Y is equal to the desired cultivated area and the transaction costs in the land rental market is insignificant.

To test the model, we used farm level data from the 2000 and 2006 surveys conducted by the Institute of Agrarian and Rurban Development (IARDS) an agency commissioned by the Department of Agrarian Reform to assess the impact of CARP on productivity and poverty. The two surveys allowed for comparison across years. Originally, 1,824 households were interviewed in 2000 but during the resurvey in 2006 only 1,623 of the former respondents can be resurveyed.³ From this list we dropped those households whose household heads were not the same as those interviewed in 2000. The data for analysis emerged from a panel of 3,120 households.

The households were selected from 43 provinces which had the largest area of CARP lands. From each of these provinces, farm households were randomly selected from a classification of agrarian reform beneficiaries (ARBs) and non-agrarian reform beneficiaries (non-ARBs). The ARBs are households who have been awarded lands or have been instituted as leaseholders under CARP while the Non-Agrarian Reform Beneficiaries (Non-ARBs) are households who are not beneficiaries or have not been awarded land under the CARP.

We estimate the econometric equation using probit and tobit models for participation and area rented, respectively. The explanatory variables include family labor, farm animals and land endowment. In addition, we used age, gender and education as proxy for agricultural ability. Credit access was estimated using household credit demand function (see Appendix 1). Both random and fixed effects were used for the probit and tobit models. The random effects appear to be more appropriate for the model.

³ No replacement was provided for dropped households. The reasons given for the attrition of ARB respondents were as follows 42.7 percent was caused by death, 17.1 percent by migration, 12 percent by selling or mortgaging, and 6.1 percent by physical disability. There were no reasons provided for the attrition of non-ARB households. DAR and UPLB Foundation (2007) Assessment of CARP and its Impact on Rural Communities: Micro Perspective (Final Report).

IV. Determinants of Land Rental Market Activity

Descriptive analysis of the survey data is presented to show the adjustments taking place among farm households in the land rental market. Table 5 shows that a large proportion of households (63%) specifically small land owners are self cultivating not renting land. This set of households suggests two possible scenarios; one, that these households are perfectly adjusted; two, they are prevented from participation due to significant transaction costs. The latter scenario can result in rationing even under conditions of flexible contracts (Skoufias 1995). In particular, there can be significant search and contract cost in the market. One possible source of transaction cost is the law prohibiting ARBs to engage in rental contracts with the land awarded to them. Rental arrangements thus are mostly informal. Although the implementation of the law is lax, the beneficiary would be at a disadvantage when legal action is taken.

Further, an assessment of the ratio of household's endowment of non-land factors of production to land ownership and to land operated (or farm size) shows that participation in the rental market is affected by endowment of labour both male and female. Controlling for land holdings and farm size, the factor ratios of renters prior to participation statistically differs from that of owner-cultivators or the non-participants in the rental market. The factor ratios on family labour particularly male labour are found to be adjusted to that of owner's ratio for those renting-in land (Table 6). This is not observed in the case of draft labour. On the other hand, for households who rent-out, both endowment of family and draft labor do not affect participation in the rental market. However, these results presuppose that non-participation in the rental market is considered optimal which as mentioned earlier does not seem to be the case.

We further examined these results using the econometric model. Table 6 shows the descriptive statistics from the regression equations. The role of DAR in the land rental market is shown through the inclusion of ARB and ARC dummies. Classifying farm households in terms of these dummies reveal that there are differences in land ownership and farm size between ARBs and non-ARBs. On the other hand, residing within an ARC displays no dissimilarity within groups. Non-ARBs though appear to have greater demand for land than ARBs as seen in the comparison of farm size with agriculture land owned.

It is further observed that average male and female labour for all households increased in 2006. The probability of access to credit is also similar for ARBs and non-ARBs except for those non-ARBs not in ARCs. In terms of crop production and profits, it is observed that ARBs in ARC seems better off but they appear vulnerable to shocks. In 2006, net income is only half of that in 2000. Other households also suffered similar declines except for ARBs not in ARCs.

Table 5. Comparison of Pre and Post Factor Ratios, Owner and Renters by Farm Size. 2006

	Owners			Renting-In			Renting-Out			P-value for test between groups*				
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Owner vs. Renting-in			Owner vs. Renting-out**	
										Small	Medium	Large	Small	Medium
No. of Households	760	84	18	333	52	15	95	9	1					
Agri land owned	1.40	4.62	10.96	0.20	1.14	1.81	2.13	6.29	8.80					
Farm Size	1.40	4.62	10.96	1.39	4.34	10.51	0.85	4.50	7.70					
Farm animals per agri land owned	0.26	0.10	0.06	1.00	0.42	1.11	0.24	0.19	0.00	0.650	0.683	0.916	0.608	0.266
Farm animal per ha. of land operated	1.32	0.32	0.16	1.44	0.46	0.20	2.18	0.40	.	0.228	0.189	**	0.501	0.938
Agri land owned per family labor	0.45	1.33	3.04	0.08	0.34	0.97	0.63	2.22	8.80	0.000	0.000	0.001	0.001	0.092
Land operated per family labor	0.45	1.33	3.04	0.47	1.23	4.11	0.25	1.69	7.70	0.351	0.648	0.233	0.000	0.742
Agri land owned per male family labor	0.73	2.28	4.71	0.12	0.55	1.60	1.12	2.74	8.80	0.000	0.000	0.003	0.002	0.228
Land operated per male family labor	0.73	2.28	4.71	0.73	2.18	5.55	0.45	1.98	7.70	0.794	0.775	0.492	0.000	0.792
Agri land owned per female family labor	1.03	3.18	6.91	0.15	0.76	0.68	1.45	4.52	.	0.000	0.000	0.000	0.001	0.107
Land operated per female family labor	1.03	3.18	6.91	1.10	2.75	6.91	0.60	3.33	.	0.090	0.311	0.876	0.000	0.851

Note:

small: <= 3.0 hectares

medium: = 3.1 - 7.0 hectares

large: >= 7.1 hectares

*If p-value <0.05, the groups compared significantly differ

** test is not performed for groups when there are very few observations

Table 6. Descriptive Statistics, Land Rental Market*

	ARB, ARC		ARB, Non-ARC		Non-ARB, ARC		Non-ARB, Non-ARC	
	2000	2006	2000	2006	2000	2006	2000	2006
Number of households	261	418	480	307	120	240	699	575
Agri land owned	2.3	2.0	2.3	2.0	1.5	1.2	1.4	1.0
Farmsize	2.1	2.0	2.1	2.1	1.6	1.4	1.7	1.2
Percent irrigated land	39.7	39.6	39.3	35.7	39.7	32.3	29.1	31.2
Male family labor	1.8	2.5	1.9	2.4	1.7	2.3	1.4	2.2
Female family labor	1.7	2.2	1.6	2.2	1.2	1.9	1.2	2.0
Age of household head	55.7	59.9	56.0	62.4	55.3	59.3	54.7	60.1
Predicted value of credit access	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Crop value	47,745.0	24,364.9	31,364.1	35,349.9	30,994.0	21,618.4	21,531.9	18,599.1
Gross profit	22,899.5	11,017.7	13,824.6	16,397.4	19,043.4	8,064.6	10,330.2	7,864.3
Net profit	22,966.5	10,387.2	14,560.6	11,745.1	15,344.3	9,356.0	10,101.7	8,589.2

The regression results from the land rental market equation did not confirm the hypothesis that endowment of labour services affects participation in the land rental market. The key factors that affect the probability of land market participation are land endowment and credit access (Table 7).⁴ Households with less land endowment and better access to credit are more likely to rent in. However, in the case of land owned, it is possible that large landowners would not want to part with their land. The probability to rent in increases among households with land owned greater than 5 hectares controlling for land quality and location. Another finding is that households located in ARCs are less likely to rent in land which may be due to lack of supply of rental land in ARCs.

Land endowment also affects the likelihood of renting out but in the opposite direction. Households with surplus land have higher probability of renting out but those with bigger landholdings (as mentioned earlier) are less likely to do so. A bigger area of irrigated land creates the motivation to rent out which could imply that the presence of irrigation balance out the demand for more land. Households with access to credit are less likely to rent out land but the effect is weak which suggests that the decision to rent out is less affected by credit constraints compared to renting in.

Table 7. Probability Estimates of Renting-in/Renting-out (random effects)

Variables	Rent-out			Rent-in		
	Coef.	Std. Err.	Marginal Effects (dF/dx)	Coef.	Std. Err.	Marginal Effects (dF/dx)
Agri land owned	0.369402	0.046192	*** 0.082766	-0.335384	0.053163	*** -0.070265
Agri land owned X 2006	-0.042325	0.047628	-0.009483	-0.262217	0.070886	*** -0.054936
Agri land owned > 5 ha	-0.119354	0.043135	*** -0.026742	0.136600	0.056699	** 0.028618
Agri land owned > 5 ha X 2006	-0.055516	0.057367	-0.012439	0.171148	0.108654	0.035856
No. of plots owned	0.051768	0.082775	0.011599	0.238554	0.092186	*** 0.049978
Male family labor	-0.012522	0.033249	-0.002806	0.047297	0.034836	0.009909
Female family labor	-0.043971	0.037898	-0.009852	0.009467	0.038205	0.001983
Age of household head	0.003477	0.004668	0.000779	-0.002541	0.004582	-0.000532
Educ of household head	-0.039515	0.031303	-0.008854	-0.009667	0.029641	-0.002025
ARB dummy	0.088106	0.109128	0.019617	-0.138899	0.105454	-0.029413
ARC dummy	0.082681	0.108430	0.018744	-0.309851	0.115390	*** -0.061995

⁴ The predicted credit access value is estimated from a credit demand function (see Appendix 1).

Percent irrigated owned land	0.003407	0.001156	***	0.000763	-0.001114	0.001172	-0.000233
Percent plain owned land	-0.005877	0.005365		-0.001317	-0.002583	0.004665	-0.000541
Percent rolling owned land	-0.006946	0.005471		-0.001556	-0.001040	0.004758	-0.000218
Percent hilly owned land	-0.006987	0.005576		-0.001566	0.000185	0.004883	0.000039
Province dummy	-0.000185	0.000112	*	-0.000042	0.000313	0.000115	***
Credit access (predicted)	-0.698625	0.386153	*	-0.156530	1.544897	0.404087	***
Farm animals	-0.042312	0.061511		-0.009480	-0.014750	0.066827	-0.003090
_cons	-0.935741	0.653106			-1.043160	0.578388	
Number of obs	1062			1062			
LR chi2 (18)	151.65			132.82			
Prob > chi2	0.0000			0.0000			
Pseudo R2	0.1559			0.1348			
Log likelihood	-410.6319			-426.2995			

The amount of area rented is tested using full sample regression (OLS) and censored Tobit regression in the subsamples for household who rent-in and rent-out. The net land rent-in is constructed by subtracting total agriculture land owned from the operated land or farm size. Thus, negative values of the dependent variable correspond to renting-out land; positive values represent household renting-in and zero values are households that did not participate in the rental market during the period of survey. The same explanatory variables from the probit model were used in the regressions.

The results are presented in Table 8. Labour endowments both male and female are not significant determinants of the net amount of land rented-in or rented-out. This result is consistent with the probit results. It is possible that family labour both male and female would rather rely on off farm income sources rather than use labour resources in cultivating rent-in land. This can be looked upon as insurance through risks diversification.

On the other hand, the ownership of agriculture land is a major determinant of net land rent-in controlling for quality of land and location. Those with higher (lower) amount of land endowment tend to rent-out (rent-in) more land. This result is consistent with probit results which suggest the important role played by land endowment in the decision to rent-in or rent-out. Moreover, the tobit results also confirmed that households with larger owned land, i.e. greater than 5 hectares have higher demand for land. However, this finding is significant only in 2006 which indicates possible structural shift in land rental market behaviour between 2000 and 2006.

The positive and significant coefficient of access to credit implies that imperfections in the credit market lead farm households to adjust their operational landholdings through the land market. Under this condition, households that are credit constrained would have difficulty renting-in or would be unable to fully adjust to their desired cultivated area even if the land rental markets operate perfectly. Likewise, households would also rent-out more land when access to credit is constrained. The highly significant effect of credit access in the rental markets suggest that labour advantages of family farms can be offset by capital constraint resulting in smaller farm sizes.

The relation between the amount of land leased and the proportion of irrigated land owned is positive and significant for households who rent out. This is consistent with the findings from the probit estimates. It confirms the role of irrigation in balancing out the demand for land.

Being an ARB or in ARC affects only the amount of land rent in. The negative coefficient implies that an ARB or a household residing in ARCs to rent in less land. This finding suggests the presence of negative externalities associated with being beneficiary of the CARP.

A test on the coefficient of agriculture land owned is performed to assess whether the land rental market allows those participating in it to adjust to their desired farm size. As mentioned earlier, the coefficient of land own measures the function of imperfection in the land rental market. If households do not face significant transaction costs, the adjustment of land owned to desired cultivated is achieved and the coefficient of land owned should be equal to -1. The negative sign implies that households with less landholdings rent in more land while those with higher land endowment rent-out land. The result of the test performed on the data shows that the coefficient of land owned is less than -1 thus the adjustment taking place in the land rental market is less than perfect. On the average, the amount of net land rent-in is only 57% of the desired area suggesting significant transaction costs in the rental market.

Table 8. Determinants of Net Land Rent In (random effects)

	Full Sample Regression			Rent-out (tobit)		Rent-in (tobit)			
	Coef.	Robust Std. Err.		Coef.	Std. Err.	Coef.	Std. Err.		
Agri land owned	-0.297330	0.081520	***	1.130932	0.114904	***	-0.573771	0.144852	***
Agri land owned X 2006	-0.100614	0.054185	*	-0.085643	0.116096		-0.791735	0.180996	***
Agri land owned > 5 ha	-0.317632	0.089784	***	-0.156268	0.101485		0.095019	0.148417	
Agri land owned > 5 ha X 2006	0.403988	0.121123	***	-0.241087	0.130813	*	0.687396	0.250367	***
No. of plots owned	0.414978	0.113716	***	-0.255580	0.199077		0.606668	0.241471	**
Male family labor	0.014109	0.028703		-0.042441	0.082122		0.085258	0.091380	
Female family labor	0.061129	0.032827	*	-0.084119	0.094454		0.124494	0.098423	
Age of household head	0.000553	0.003291		0.002509	0.011577		-0.006619	0.012095	
Educ of household head	0.033001	0.027686		-0.147943	0.077941	**	-0.040050	0.077590	
ARB dummy	0.099423	0.109284		-0.054486	0.270414		-0.497257	0.275470	*
ARC dummy	-0.263107	0.086014	***	0.329969	0.268730		-0.871795	0.302998	***
Percent irrigated owned land	-0.000684	0.000889		0.007542	0.002893	***	-0.002343	0.003065	
Percent plain owned land	0.004599	0.002133	**	-0.015551	0.012757		-0.001321	0.012092	
Percent rolling owned land	0.007903	0.002354	***	-0.021816	0.013055	*	0.002013	0.012317	
Percent hilly owned land	0.011222	0.002867	***	-0.021331	0.013325		0.009184	0.012620	
Province dummy	0.000379	0.000117	***	-0.000711	0.000271	***	0.000760	0.000304	**
Credit access (predicted)	1.934114	0.448085	***	-2.659094	0.948387	***	4.980335	1.043851	***
Farm animals	-0.026650	0.050862		-0.141984	0.151319		-0.142217	0.175579	
_cons	-1.691002	0.398868		-1.184074	1.604333		-4.193799	1.513961	
Number of obs.	1062			1062			1062		
Log likelihood				-607.4026			-700.2423		
Prob > chi2				0.0000			0.0000		
Test aglandown = -1									
chi2 (1)				1.3			8.66		
Prob > chi2				0.2545			0.0033		

*** significant at 1%

** significant at 5%

* significant at 10%

Note: All coefficients of renting-out were multiplied by -1 for ease of interpretation.

V. Changes in the Pattern of Rental Activity in Agrarian Areas

We further examined the relationship between agriculture land owned and farm size by using farm size as dependent variable to the explanatory variables provided in the land rental model. Table 9 presents results from both fixed and random effects estimation. The fixed effect model is the appropriate model for this test. The significance of the (see F-test)

suggests presence of differences among households arising from time invariant unobserved variables.

The results from the fixed effects model show that operational landholding is primarily determined by the size of agriculture land owned. Households with higher land endowment operate larger farms controlling for land quality, location and household resources. This relationship is observed to be more pronounced in 2006 compared to 2000 which suggest a worsening land rental market in the rural areas. This trend is also reflected Figure 1. The steeper slope in 2006 implies a less active rental market in 2006 compared to 2000. A 45-degree line implies that farm size and area owned is equal at all points thus absence of trade.

Table 9. Determinants of Farm Size

Variables	Fixed Effects			Random Effects		
	Coef.	Std. Err.		Coef.	Std. Err.	
Agri land owned	0.552638	0.096650	***	0.715861	0.002779	***
Agri land owned X 2006	-0.178763	0.070512	**	-0.097980	0.003245	***
Agri land owned > 5 ha	-0.120351	0.081950		-0.312349	0.009525	***
Agri land owned > 5 ha X 2006	0.358644	0.089032	***	0.417610	0.012989	***
No. of plots owned	0.550853	0.149016	***	0.432965	0.005048	***
Male family labor	0.063518	0.078361		0.018548	0.002065	***
Female family labor	-0.057095	0.072290		0.056933	0.001873	***
Age of household head	0.002171	0.014593		0.000117	0.000217	
Educ of household head	0.076035	0.091301		0.033267	0.001931	***
ARB dummy	0.012494	0.387805		0.109208	0.005573	***
ARC dummy	-0.399702	0.219587	*	-0.270048	0.005465	***
Percent irrigated owned land	-0.002180	0.002519		-0.000440	0.000048	***
Percent plain owned land	0.007396	0.012627		0.004242	0.000272	***
Percent rolling owned land	0.011254	0.012767		0.007560	0.000296	***
Percent hilly owned land	0.007521	0.012957		0.009284	0.000463	***
Province dummy				0.000348	0.000008	***
Credit access (predicted)	2.191664	0.674541	***	1.778835	0.030744	***
_cons	-1.631642	1.564258		-1.618076	0.032311	
	No. of obs.	1062		No. of obs.	1062	
	F (16, 280)	17.63		Log Likelihood	-623.5171	
	Prob > F	0.0000		Prob > chi2	0.0000	
	F test that all u _i = 0:					
	F(765, 280)	1.33				
	Prob > F	0.0023				

*** significant at 1%; ** significant at 5%; * significant at 10%

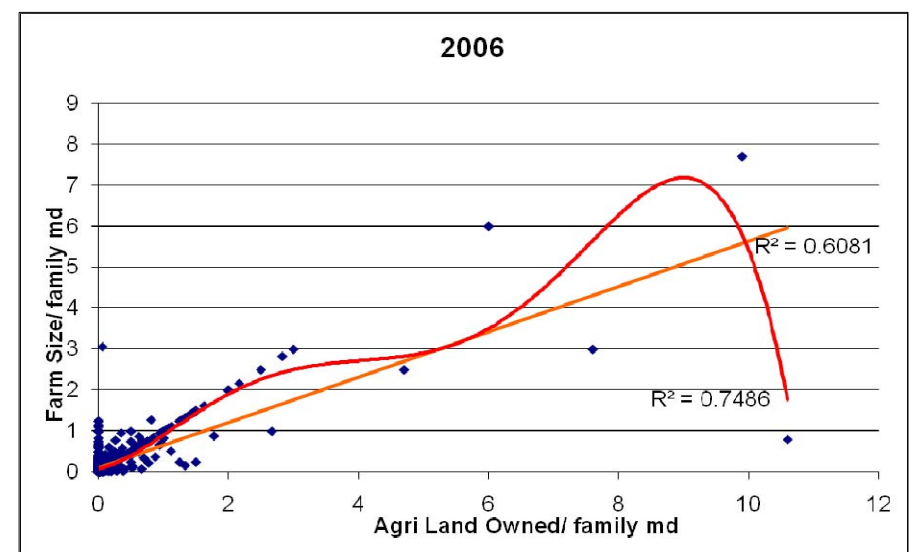
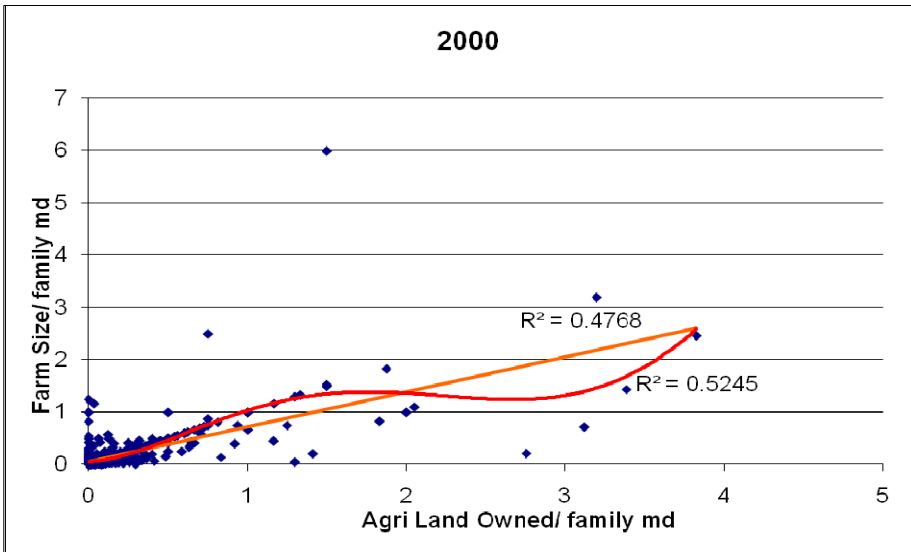
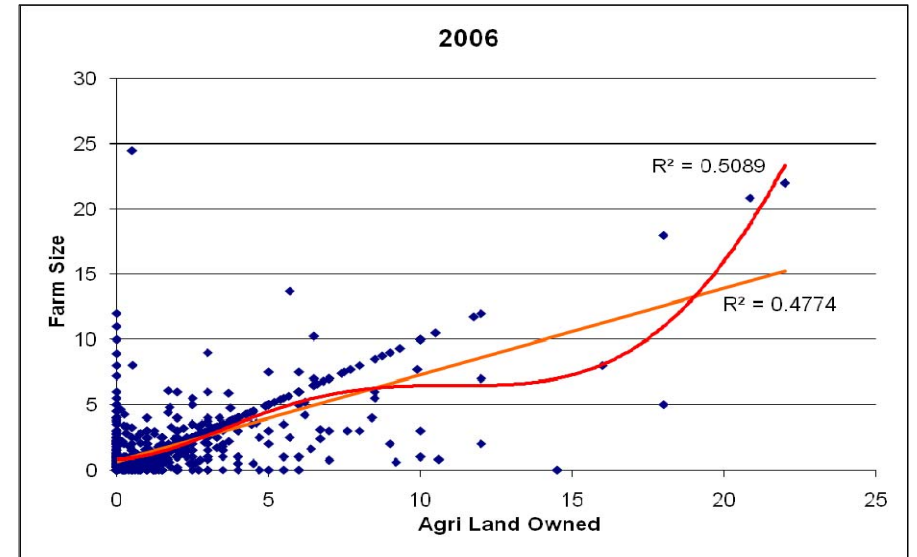
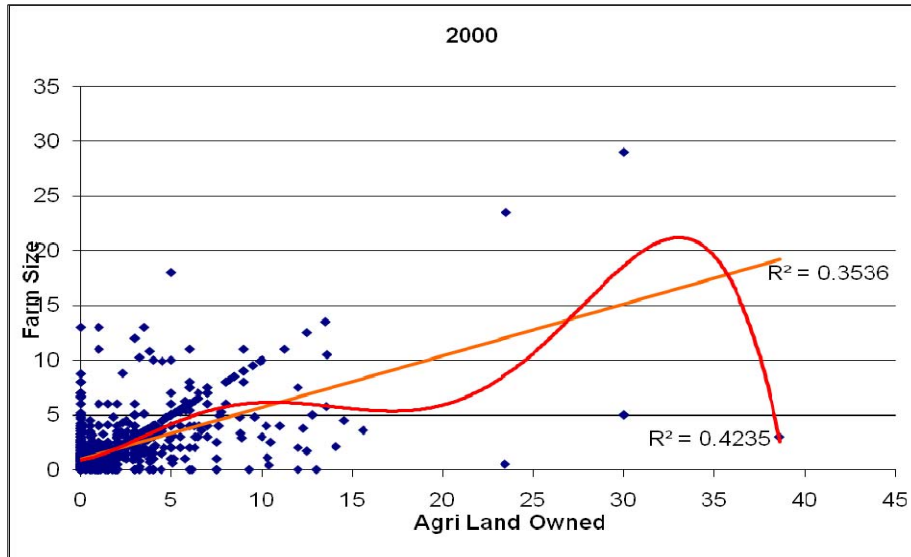


Figure 1. Owned Land vs. Farm Size

The implication of these changes on share tenancy is critical given that access to land by the poor is primarily through share tenancy. We test the factors that affect the choice for share tenancy and the results show that age and ownership of farm work animals are major determinants of choice of contract (Table 10). The negative sign of age variable suggests that younger farmers prefer share tenancy contracts. Farmers with more work animals also choose share tenancy. The results also show that ownership of land is not critical in share tenancy. ARBs are also less likely to choose share tenancy possibly because they either cultivate their own land or lease out their land. An important finding is that credit access is not a significant determinant of share tenancy contracts. This means that controlling for crop type and location, share tenancy allows poor farmers with agricultural ability to gain access to land.

Variable	Random Effects		Pooled			
	Coef	Std. Err.	Coef	Std. Err.		
Credit access (predicted)	0.58392	0.85782	0.12813	0.08216		
Irrigated land dummy	-0.27758	0.20198	-0.05739	0.02754	**	
Agri land owned	0.14995	0.09429	0.01786	0.00479	***	
Agri land owned >5 ha	0.06209	0.11468	0.00222	0.00557		
Dummy plot size_plain	-0.18757	0.41629	0.00419	0.01577		
Dummy plot size_rolling	0.04821	0.45958	0.03922	0.01969	**	
Plot size, ha	-0.10380	0.10575	-0.01446	0.00773	*	
Plot size >5ha X plot size	0.03614	0.10814	0.00933	0.00692		
Age of household head	-0.02658	0.00978	***	-0.00351	0.00068	***
Education of hh head	0.07087	0.06835		0.00863	0.00390	**
Year 2006 dummy	0.35602	0.19028	*	0.04526	0.01579	***
No. of farm animals	0.27398	0.10955	**	0.03941	0.00980	***
Male family labor	-0.06869	0.06834		-0.01613	0.00535	***
Female family labor	0.01565	0.08246		-0.00274	0.00569	
ARB dummy	-0.89870	0.24373	***	-0.23749	0.02634	***
ARC dummy	-0.09681	0.22964		0.02011	0.01828	
Province dummy	0.00016	0.00025		0.00001	0.00003	
Rice dummy	-1.33892	0.32894	***	-0.49846	0.03700	***
Corn dummy	-0.39301	0.30815		-0.07372	0.03113	**
Permanent crop dummy	1.09281	0.38321	***	0.03625	0.03014	
Cash crop dummy	0.43901	0.43875		0.01761	0.03020	
_cons	2.34264	0.80953		1.05219	0.05412	
	No. of obs.	752		No. of obs.	752	
	Prob > chi2	0.0000		Prob > chi2	0.0000	
	Log likelihood	-		Log likelihood	-	
		319.585			238.551	

The insignificant results of credit access support empirical studies that viewed share tenancy as a credit substitute. The landlord provides the tenant both working capital and consumption credit. However, recent surveys show that the patron-client relationship has weakened overtime and with land reform, this bond has been severed. Tenants remain dependent on the informal credit market but instead of landlords, relatives and friends are providing the bulk of the credit needs of tenants.

This shift (which could have started under the 1972 land reform) is reflected in the current sharing arrangement. Prior to land reform, the landlord shouldered the cost of inputs and

normally received 60% of the output. The current arrangement shows that in majority of the contracts, the tenant is mainly responsible for working capital requirement. This arrangement is observed regardless of the length of tenancy relations (Table 11). It is adopted in rice, corn and coconut farms. This change in tenancy relation implies that the credit or insurance advantage of tenancy contracts dissipates. CARP have succeeded in reducing patron client relation but poor farmers remain dependent on the informal sector. Based on the IARDS survey data, most tenants (38%) seek assistance from relatives and only 14% go to landlords for assistance (Table 12).

The dependence on informal credit constrains farm households since interest rates in the informal sector could be thrice that of the formal sector. Moreover, the informal sector specifically relatives and friends have limited resources. Thus, attention on access to formal credit of small farmers remains relevant under CARP.

Table 11. Share Tenancy Arrangement by Crop 2006

Tenant Share: Inputs	Owner Share: Output	Rice		Corn		Coconut	
		% resp.	Ave. length of tenancy (years)	% resp.	Ave. length of tenancy (years)	% resp.	Ave. length of tenancy (years)
100	5	1.1	60.0	-	-	-	-
100	10	1.1	20.0	-	-	-	-
100	15	1.1	50.0	-	-	-	-
100	20	2.2	32.5	13.6	20.7	-	-
100	25	37.1	25.7	54.5	16.7	7.3	12.0
100	30	16.9	27.1	9.1	20.0	9.8	22.0
100	35	1.1	n.a.	-	-	2.4	25.0
100	40	3.4	26.5	-	-	-	-
100	45	1.1	1.0	-	-	-	-
100	50	5.6	23.0	9.1	18.0	31.7	24.4
100	60	-	-	-	-	7.3	8.7
100	66	1.1	25.0	-	-	2.4	n.a.
100	70	-	-	-	-	12.2	28.3
100	75	-	-	-	-	4.9	29.0
100	80	-	-	-	-	2.4	n.a.
80	20	-	-	9.1	12.5	-	-
75	10	2.2	20.0	-	-	-	-
75	25	1.1	20.0	4.5	30.0	-	-
75	50	2.2	6.5	-	-	2.4	57.0
50	30	1.1	29	-	-	2.4	n.a.
50	50	18.0	19.1	-	-	9.8	23.5
50	66	-	-	-	-	2.4	30.0
50	75	1.1	51.0	-	-	-	-
25	75	1.1	15.0	-	-	-	-
0	50	1.1	n.a.	-	-	-	-
0	75	-	-	-	-	2.4	n.a.
Total Responses		89	25.1	22	18.0	41	23.8

n.a. = not available

* vegetables, sugarcane (1), banana (1), primary crops (undefined)

Table 12. Type of Support Obtained by Share Tenants by Source 2006

	None (%)	Financial Support		Techno-logy (%)	Total
		Farm Operations (%)	Others (%)		
Land owner	91.6	7.8	0.6	0.0	167
Input dealer	98.3	1.7	0.0	0.0	177
Output dealer	95.5	3.4	1.1	0.0	179
Relatives	68.5	8.9	22.0	0.6	168
Gov't Organizations	92.3	3.0	1.2	3.6	169
Others	70.0	10.0	20.0	0.0	40

Note: Percentages are based on the total

VI. Concluding Remarks

The temporary transfer of land via the rental market is an important mechanism to allow the poor and landless to gain access to land for agriculture. However, we find that in the case of rural Philippines, the land rental market is not functioning efficiently. Adjustment in the land market has been less than optimal which suggests the presence of significant transaction costs in the market.

Credit market imperfections are also creating barriers for the poor to access land and for optimal farm size to vary with ownership of land. The evidence from the study shows that access to formal credit markets strongly influence participation in the rental market. Agricultural ability has no significant effect but instead ownership of farm land is important. Although we find negative relationship between ownership of land and demand for land, it appears that the demand for land rises for those with land greater than 5 hectares thus large landowning households would rent-in more land. Overtime, the trends also show that farm households with ownership of land (regardless of size) have rising participation in the market while the landless households have declining participation. One can also interpret the declining participation of the landless in terms of transaction cost. The costs of monitoring and contract enforcement could be less with farmers who are cultivating their own land compared to landless farmers thus the preference of landowning families to rent-out their land to co-landowners.

The only possible means for the “poor and efficient farmers” to gain access to the land is via share tenancy contracts. Under share tenancy, agricultural ability is relevant while credit access and land ownership are not critical factors. However, their participation can be limited because of their dependence on informal creditors particularly relatives and friends. Given the limited resources and higher cost of informal loans, households tend to keep their farms small even if the land rental market operates perfectly. The twin effects of land rental market inefficiency and credit imperfections thus can offset labor advantages of family farms and cause farms to operate below optimal.

Under the agrarian reform program, the more important aspect may be for government to provide the environment that will allow farms to operate efficiently. The efficient farm size

should be viewed separately from land ownership. In particular, the land rental market plays a critical role in households' adjustments to an optimal farm size and in providing a role for land reform even when scale economies are present. The possible existence of larger farms is not a cause of worry if rental markets are working well. It would thus be desirable for the government to improve the regulatory framework for the land rental market to operate effectively. Possible areas for government action are the following: (1) provision of clear property rights on land awarded under CARP; (2) regulation of rental fee for agriculture land; and (3) deregulation of land rental market to lower transactions costs and allow beneficiaries to freely engage in rental transfers.

Appendix 1

Probability Estimates of Credit Access

Variables	Random Effects			Fixed Effects		Pooled (OLS)	
	Coef.	Std. Err.	dF/dx	Coef.	Std. Err.	Coef.	Std. Err.
Fully amortized dummy	-0.054419	0.096385	-0.016389	0.029803	0.042941	-0.012535	0.129618
Titled owned land	0.051145	0.024096	** 0.014255	0.026201	0.012833	** 0.012154	0.004561
Formal owned land	0.006211	0.044062	0.002199	0.012612	0.019520	0.004934	0.006533
HH expenditure	0.137786	0.052096	*** 0.040632	0.010787	0.023895	0.008427	0.006357
HH members with tertiary education	0.010166	0.001661	*** 0.002969	0.001032	0.001092	0.002519	0.000318
Age of household head	-0.007140	0.020079	-0.001996	0.000153	0.017688	-0.000439	0.002676
Age of household head square	0.000029	0.000175	0.000008	-0.000053	0.000138	0.000000	0.000023
Distance to bank	-0.001121	0.003625	-0.000284	-0.003966	0.002303	* -0.000111	0.000429
ARC dummy	0.134297	0.072173	* 0.038918	0.043724	0.038879	0.012377	0.011279
ARB dummy	-0.156266	0.079458	** -0.044573	-0.038407	0.067172	-0.021425	0.010935
Membership in coop	0.335208	0.068690	*** 0.100983	0.028491	0.033856	0.058851	0.010935
Brgy urban dummy	0.059376	0.108484	0.016799	(dropped)		0.000748	0.016735
Percent irrigated land	0.000628	0.000735	0.000186	-0.000407	0.000449	0.000106	0.000114
Province dummy	-0.000156	0.000081	* -0.000046	(dropped)		-0.000019	0.000011
_cons	-2.424916	0.780937		0.345043	0.613612	-0.087148	0.098571
	No. of obs.	2070		No. of obs.	2070	No. of obs.	2070
	Wald			F (13,		Wald	
	chi2(15)	109.53		887)	1.24	chi2(15)	149.47
	Prob > chi2	0.0000		Prob > F	0.2429	Prob > chi2	0.0000
	Log	-		corr (u_i		Log	
	likelihood	1074.889		Xb)	-0.143	likelihood	--47.248

*** = significant at 1%

** = significant at 5%

* = significant at 10%

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