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The Department of Agricultural Economics and Management

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The Role of Land Markets in Improving Rural Incomes

by

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Chapter B:
THE ROLE OF LAND MARKETS IN IMPROVING RURAL INCOMES

Zvi Lerman and David J. Sedik

Individualization of agriculture has been one of the most immediate outcomes of the post-1999 land reform – particularly striking in a country that for more than a decade had maintained a highly conservative Russian-style land policy. This change in farm structure has led to resumption of agricultural growth, triggering recovery after a long transition decline (see **Chapter A**). Yet agricultural growth, despite its prominence among national economic indicators, is of little import unless it raises the welfare of the rural population. In the present chapter we examine the impact of land reform on rural family incomes and consider the role that land markets play in this process. The analysis relies on the household-level findings of the 2005 FAO survey (Lerman et al., 2007) and this source is not identified explicitly in what follows.

There are huge gaps in size between the three main categories of farms in Ukraine – corporate farms, peasant farms, and household plots. The mean size in the survey is 1,700 hectares for corporate farms, 140 hectares for peasant farms, and 1.7 hectares for household plots. The corporate farms are still much larger than in market economies (500-600 hectares for the average corporate farm in the U.S.), while the household plots are still much smaller than the average family farm in market economies (130 hectares in land-rich U.S., 20 hectares in EU-15). The size gaps perpetuate the strong duality of farm structure that characterized Soviet agriculture.

We do not observe economies of size among Ukrainian farms (see **Chapter A**). There are actually indications that the very small family farms – the traditional household plots that were substantially enlarged during the process of reform – are outperforming the large corporate farms and the mid-sized peasant farms. Yet the smallness of household plots is always a point of contention in Ukraine, as in other CIS countries: Are the small household plots sustainable? Can they be legitimately regarded as agricultural producers, or are they merely subsistence units operated on a part-time basis? These conventional questions sound distinctly hollow in view of the huge persistent role that household plots play in agriculture across all CIS countries.

Our conclusions in **Chapter A** suggest that there is no justification for continuing policies that favor large corporate farms over smaller family farms, and all types of farms – large and small, corporate and individual – should be allowed to evolve on a level playing field, as they normally do in established market economies. We obviously do not recommend continuing with the efforts to sustain the large corporate farms. Yet larger size means more production, more surplus, more sales, and thus possibly more income for rural families. It is in this context that we explore the relationship between family income and farm size for the individual farm sector in Ukraine. Our discussion has no bearing whatsoever on the issue of the size effect for large corporate farms.

The present chapter is organized around two strands of argument. We first provide empirical evidence that, among the relatively small individual farmers, family incomes increase with farm size. The difference in family income between the smallest (1-2 hectares) and the largest (more than 50 hectares) individual farms is quite substantial: by a factor of 4 or more. An additional factor that contributes to higher family incomes is commercialization of farm operations, i.e., ability or willingness to sell at least some of the farm products. This factor is naturally also linked to farm size, as only relatively large farms can generate saleable surplus, while very small farms produce just enough for household consumption. Indeed, we

show that the share of output sold increases with farm size, contributing to an increase in family income for "sellers".

We then proceed to demonstrate that land markets in fact function in Ukraine, although they are currently limited to leasing transactions because of the continuing moratorium on buying and selling of land. Leasing transactions enable farmers to enlarge their holdings, and land markets in Ukraine, despite the restrictive political environment, fulfill their theoretical role of allowing land to flow from passive to active users or from less efficient to more efficient producers. By allowing farm augmentation, land markets directly contribute to improvement of rural incomes. Land leasing apparently will retain its role as the dominant market transaction even when the moratorium is lifted, yet family farmers may start exploiting the new opportunities for buying and selling of land. Corporate farms in all probability will continue to rely almost exclusively on leasing of land from individual landowners, although the more profitable and affluent among them may be able to raise the capital for purchasing land.

Rural Family Incomes and Farm Size

Our study focuses on the relationship between family incomes and farm size. Incomes were estimated from survey data for two distinct categories of rural families – families of peasant farmers operating an independent family farm outside collective or corporate frameworks, and other rural families operating a traditional household plot in addition to wage employment or reliance on pensions and social insurance. We will refer to the first category as farmer families (or in short farmers) and to the second category as employee families (or in short employees), although many of them are just pensioners (i.e., former employees).

Farmers earn much more than employees both per family and per capita (**Table 1**). The average yearly income for farmer families is 54,500 hrivny, compared with less than 10,000 hrivny for employees. For farmers most of the cash income is from farm sales and a very small share comes from salaries and pensions. Employees, on the other hand, rely to a much greater extent on salaries and pensions and less on farm sales.

Table 1. Structure of cash family income*

	Farmers (*n*=267)	Employees (*n*=827)*
Sales of farm products, %	87	31
Sale of services, %	2	2
Non-farm income (business and property), %	0	4
Salaries, %	7	41
Social transfers, %	3	21
Remittances from relatives, %	0	1
Sale of assets, %	1	0
Other, %	0	0
Total income, %	100	100
Total income, hrivny	54,500	9,750
Per capita income, hrivny	15,300	3,100
Land used, ha	113	1.7

*Based on weighted average amounts by sources of income.

Another component that differentiates farmers from employees is income from property (i.e., lease payments for land, dividend payments for asset shares, etc.), which

accounts for 4.2% of family income for employees and is practically zero for farmers.[1] While farmers cultivate all their land and rely primarily on farm production as a source of income, employees willingly lease out some of their land (mainly their land shares) and thus earn extra income from lease payments (**see below**). Moreover, farmers do not engage in any off-farm business activity either, devoting all their time and efforts to the family farm. Farmers' income is thus substantially less diversified and more at risk than the income of employee families.

Table 1 gives the structure of cash income by sources as reported in the survey. It includes income from sales, wage income, pensions, and other cash receipts. It does not include the value of own farm products consumed by the family. This value can be regarded as additional non-cash income enjoyed by the family: consumption of own farm products replaces cash expenditure on food purchases. Imputed income includes the estimated value of consumption of own products as well as cash earnings from outside sources.

Table 2. Estimating the imputed income (in hrivny)

	Farmers	Employees
Cash income	54,500	9,750
Value of output*	30,000	5,700
Percent of output consumed on farm	35	80
Estimated value of consumption of own farm products	10,500	4,600
Imputed income	65,000	14,350

*Median for farmers, mean for employees. This choice is justified because of the much higher variability for farmers, where the coefficient of variation is 243% compared with only 97% for employees.

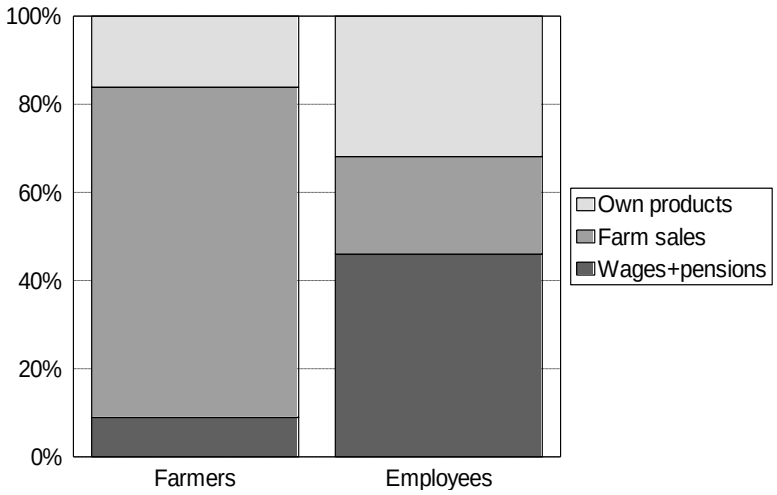

Figure 1. Structure of imputed family income (including value of own products consumed) for peasant farmers and rural employees.

The value of own consumption estimated from the survey ranges from nearly 5,000 hrivny a year for employee families to 10,000 hrivny a year for farmer families (**Table 2**), adding respectively 20% and 50% to the cash income of these families.[2] Based on these estimates, the value of own consumption of farm products is 32% of imputed income for employee families and 16% for farmer families. Farm sales remain the dominant component

[1] For the subset of employee families that lease out land, lease payments averaging 100 hrivny per hectare per year contribute 6.4% of total family income. Thus, on average lease payments make a relatively small contribution to income.

[2] Estimation of the value of consumption of own farm products from survey data is a notoriously difficult undertaking when no special diaries are filled in. The estimation requires aggregation of many variables, and proliferation of missing values is a major problem preventing consistent calculations for the full sample. Instead of the conventional case-by-case calculation, we have roughly estimated the value of consumption of own farm products by multiplying the average value of output by the average proportion retained on the farm for the use of the family.

of farmers' income even after imputing the value of own products, whereas in employee families wages, pensions, and the value of own products are more important than sales (see **Figure 1**).

The absolute difference in cash family income is largely an outcome of the difference in farm sizes: 113 ha for farmers, 1.7 ha for employees (see **Table 1**). Regression analysis shows that family income increases with farm size (**Table 3**), and land on its own explains nearly 23% of the variability in cash family income. Income also increases with family size (the labor pool available for production) and decreases with the age of the family head. The average age of family members has a positive effect on income due to the contribution of pensions that the older family members receive. There is also a certain farm type effect: farmer families earn more than employee families adjusted for land and other factors, as is evident from the statistically significant positive coefficient of the farm type dummy in the regression.

Table 3. Determinants of family income in linear regression#

	Regression coefficients
Constant	8.577*
Land (logged)	0.139*
Family size	0.150*
Age of head of family	-0.012*
Average age of family members	0.009*
Farm type: farmers relative to employees	0.507*
R-square	0.274
N	1080

#Dependent variable: logged income (excluding the value of own consumption).
*Significantly different from zero at p= 0.1.

Data grouped by logged farm size categories show a clear increase of total cash income, and especially farm income, with the increase of farm size (**Figure 2**). The share of farm income increases from 17% in the smallest farms to more than 70% of total income in the largest. Not only total income increases: income per capita also increases with farm size (**Figure 3**), rising quite dramatically from less than 5,000 hrivny per capita for households with up to 1-2 hectares to 20,000 hrivny and much more for farms larger than 50 hectares. Because of the farm size effect, families of peasant farmers enjoy much higher incomes than other rural households (54,500 hrivny for farmers, 9,750 hrivny for employee households; see **Table 1**).

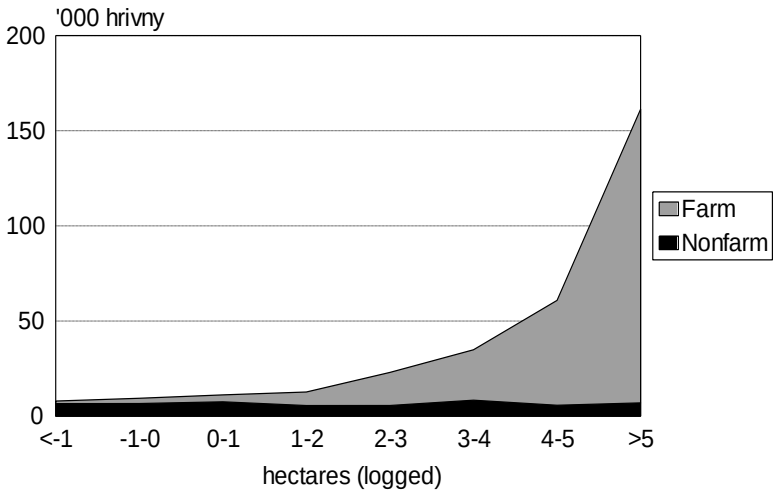

Figure 2. Farm and non-farm cash income as a function of farm size for families of peasant farmers and rural employees combined. Farm size is in logged hectares: −1 stands for 0.4 ha, 0 for 1 ha, 2 for 2.5 ha, 2 for 7 ha, 4 for 55 ha, 5 for 150 ha.

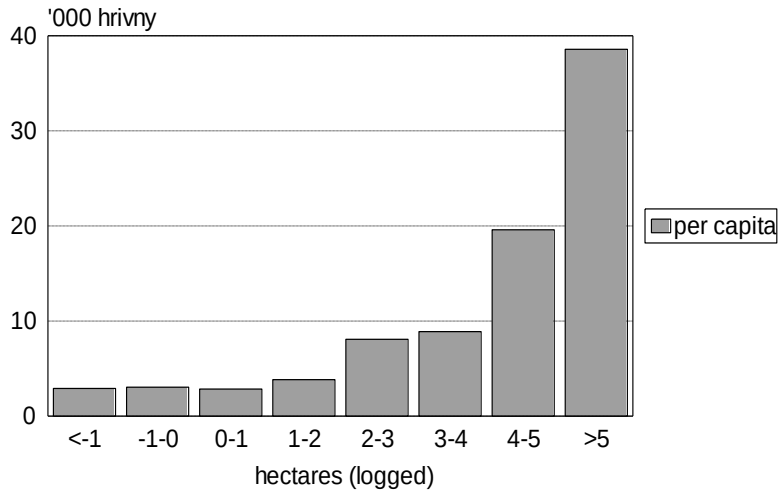

Figure 3. Per capita cash income as a function of farm size for families of peasant farmers and rural employees combined. Farm size in logged hectares.

In addition to quantitative information on family incomes, the survey explored the families' perception of well-being through qualitative questions that classified the perceived standard of living into three levels: low, when family income allows nothing beyond food and daily necessities; medium, when family income is sufficient for food, daily necessities, clothing, and other consumption needs; and comfortable, when in addition to the consumption needs the family can afford to purchase durables and in general does not experience material difficulties. The qualitative perception of well-being is consistent with quantitative income estimates: family income increases from low to comfortable level of well-being for both farmers and employees.

Farmers' families achieve a higher (perceived) well-being than the families of other rural households (characterized as employees; **Table 4**). The frequency of respondents reporting a comfortable standard of living is substantially higher among farmers than among employees; and conversely, the frequency of respondents reporting a low standard of living (just sufficient to meet the daily needs) is substantially higher among employee families. This is consistent with the observation that farmer families enjoy higher incomes than employee families (**Table 1**).

Table 4. Perceived well-being among farmers and employees (percent of respondents)

Level of well-being	Farmers (*n*=309)	Employees (*n*=848)
1. Low (not more than food and daily necessities)	**28**	**48**
2. Medium (daily necessities, clothing, etc.)	51	44
3. Comfortable (able to purchase durables)	**21**	**8**

We have previously noted that family income increases with farm size. It is therefore not surprising that family well-being also increases with the area of land used (or in case of employee families, also with the area of owned land, where some of the owned land may be leased out and earn a certain lease income). Households reporting a low level of well-being command significantly less land than households reporting a comfortable level of well-being (**Table 5**).

Table 5. Standard of living and family income increase with land area used (farm size, ha).

Level of well-being	Farmers, ha*	Employees, ha used**	Employees, ha owned#
1. Low (not more than food and daily necessities)	61	1.45	3.73
2. Medium (daily necessities, clothing, etc.)	106	1.42	4.56
3. Comfortable (able to purchase durables)	326	4.21	4.53

* Statistically significant differences (p = 0.10): 1-3, 2-3
** Statistically significant differences (p = 0.10): 1-3, 2-3
# Statistically significant differences (p = 0.10): 1-2

The positive relationship between the level of family well being and farm size is rigorously confirmed by multinomial logistic regression. This analysis shows that the probability of having a higher standard of living (well-being level 3) increases with the area of land used, while the probability of having the lowest standard of living (well-being level 1) decreases rapidly with farm size. This pattern is observed both for farmers and employee families in the survey (for details of this analysis see Lerman et al. (2007)).

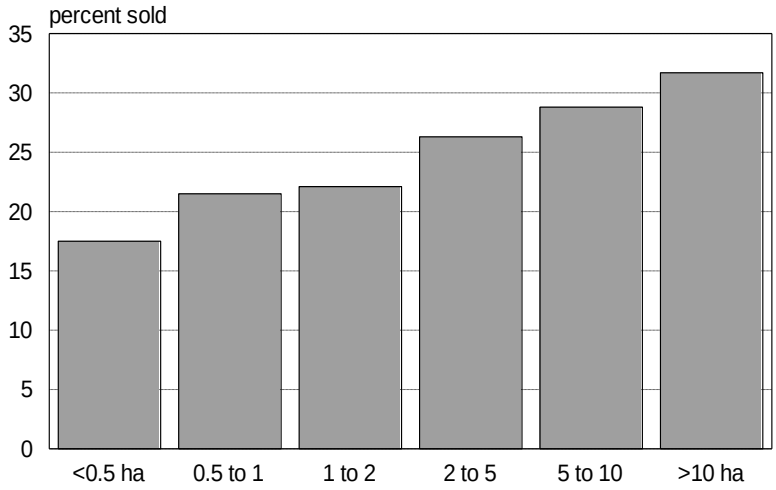

Figure 4. Share of output sold in household plots as a function of farm size.

Commercialization is an obvious factor that tends to increase family incomes, as sale of farm products contributes a substantial portion of family income (see **Table 1**). Peasant farms are generally viewed as commercial farms, and indeed 60% of peasant farmers in the 2005 FAO survey sell more than half their output. Yet the stigma of subsistence farming attached to household plots is not entirely justified either. Fully 62% of household plots in the survey report some farm sales and 10% sell more than half their output. Among household plots, the share of output sold clearly increases with plot size (**Figure 4**). Household plots of up to 1 hectare sell less than 20% of their output, while plots larger than 5 hectares sell around 30% of output (the differences across size categories are statistically significant). This is consistent with the patterns of sales versus consumption observed for other transition countries. The level of commercialization is generally observed to increase with farm size: larger farms produce a marketable surplus, while very small farms need everything they produce to feed the family. Looking at it from a different angle, we observe that the average size of "sellers" (i.e., household plots reporting any sales of farm products) is 2.1 hectares compared with 1.1 hectares for "non-sellers" (i.e., households without any farm sales).

Our survey results clearly show that family income increases with farm size among individual farmers in Ukraine, due both to increased production and to higher willingness to sell. Peasant farmers with their larger land holdings and higher levels of commercialization earn more than other rural households in absolute terms and they report a substantially higher standard of living. Yet despite the relatively lucrative financial situation the dichotomy of peasant farmers and rural employees appears almost solidly frozen: only 4% of respondents are planning to become peasant farmers within the next 2-3 years. These few are mainly motivated by hopes of a better future for their children, prospects for higher income, and independence. The remaining 96% have no plans to become peasant farmers despite better financial prospects. They are primarily deterred by lack of capital, risk aversion, as well as age and poor health. Concerns about access to inputs and lack of enthusiasm on the part of other family members to continue with farming activities are also cited as obstacles.

Land Market Transactions and Farm Size

National-level statistics record a massive shift of agricultural land from corporate to individual farms (see **Chapter A**). We now use survey data to examine the impact of these changes on farm sizes and especially on the development of land markets, which in theory provide a medium for the transfer of land from less efficient to more efficient land owners.

While buying and selling of land is usually regarded in market economies as the typical ownership-transfer transaction, land-market activity is by no means limited to buying and selling. Land markets also include leasing of land, which is quite prominent in market economies and in all transition countries. Leasing can follow two paths: leasing out by "passive" landowners who do not wish to cultivate (or cannot cultivate) all their holdings; and leasing in of land by active farmers who find it necessary to enlarge their farm size. Experience in transition countries shows that markets for buying and selling of agricultural land are extremely limited due to a variety of institutional and social reasons, while leasing of land is quite widespread. Ukraine still has a moratorium on land sales (until 2008, or possibly 2012), and the 2005 FAO survey records virtually no buy-and-sell transactions.[3]

In the 2005 FAO survey, employee families and peasant farmers display totally different patterns of participation in land-market transactions. Among employee families more than 50% lease out land to other users, while leasing in is marginal (3% of respondents). Among peasant farmers, on the other hand, more than 50% lease in land and there are no instances of leasing out.[4]

While peasant farmers use all the available land and do not lease anything out, employee families farm just 36% of the family's total land holdings: 1.67 hectares is used for farming out of total of 4.6 hectares on average, and the rest is leased out. The employee families who lease out land (52% of respondents) start off with much larger holdings than the families who farm their entire (or almost entire) owned land: 6.2 hectares compared with 2.0 hectares on average (**Table 6**, first two columns). There are no other significant differences between the families in these two groups (same family size, same age structure). Lack of machinery and working capital, as well as low profitability are cited among the main reasons for not cultivating all the available land (20%-30% of respondents). Labor shortages are also an important obstacle, which is consistent with the observation in **Table 6** that families leasing out land or cultivating only owned land are smaller than families leasing in land. Shortage of purchased inputs and land quality do not appear to be a significant obstacle.

Land leasing is practiced as a market mechanism for increasing the farm size. This is clear not only for peasant farmers, among which land leasing is very widespread, but also for the small proportion of employee families who lease in land. Among employee families, those few who lease in land cultivate much larger holdings: nearly 16 hectares compared with 1-2 hectares for the rest (**Table 6**, last column). The entire difference is leased land, as the absolute area of owned land in these families is around 2 hectares, roughly the same as for the other rural households. The employee families who lease in land are larger with significantly

[3] There is still considerable resistance to the very notion of buying and selling land, especially among corporate farm managers and household plot operators, less so among peasant farmers. Half the respondents in these two categories expressed negative opinion of the possibility of conducting buy-and-sell transactions in agricultural land. There is less resistance among peasant farmers, where the percentage of respondents with a positive view of buy-and-sell transactions is higher than the percentage of those with a negative view.

[4] Corporate farms, unlike peasant farms and household plots, have very little own land and they rely primarily on land leased from individuals (members, shareholders, and other rural landowners). In the present circumstances only a small minority of shareholders and other lessors actually work in the corporate farm: most are passive landowners who entrust their land to the corporate farm against a promise of lease payments without expecting the security of a wage job.

younger heads of household and spouses. In terms of the ownership structure of their holdings, they use a much smaller share of owned land than households in the other two categories.

Table 6. Three cohorts of employee families with different land leasing strategies: those who farm their entire owned land, those who lease out, and those who lease in

	Farm all owned land	Lease out	Lease in
Number of respondents	382	436	24
Percent of respondents	45%	52%	3%
Available, ha	2.0	6.2	15.7
Used, ha	1.8	0.8	15.6
Percent owned land	91%	92%	14%
Wish to enlarge, ha	0.7	0.2	8.4
Family members	3.4	3.5	4.2
Age of head of household	52	54	46
Age of spouse	46 (*n*=353)	49 (*n*=411)	46

Table 7. Effect of leasing on farm size among peasant farms

	Percent of respondents	Farm size, ha	Owned, %	Use rights, %	Leased, %
Farms with leased land (*n*=163)	53	227*	12	4	84
Farms without leased land (*n*=143)	47	53*	61	39	0
All sample (*n*=309)	100	144	18	8	74

* Difference significant by *t*-test (*p*=0.000).

Growth of the much larger peasant farms is also entirely attributable to land leasing: farms with leased land achieve sizes in excess of 200 hectares, while farms without leased land average only 50 hectares (**Table 7**). Of the 140 hectares in an average peasant farm, only 18% is owned land, while the remaining 82% is leased from other landowners or from the state. Regression analysis shows that one hectare of additional leased land produces a one hectare increase in farm size (regression coefficient 1.02, R^2=0.94). Thus, on the whole, peasant farmers and employee households follow totally different leasing strategies: most peasant farmers lease in land to enlarge the cultivated area, while most rural households lease out land that they cannot cultivate.

Sources of land for farm enlargement

Plans for farm enlargement as revealed by the respondents in the survey provide an indication for the potential demand for land and land-market transactions. Rural families generally do not utilize all their land and only a small percentage augment their holdings by leasing in. Accordingly, only 9% of respondents among household plot operators wish to enlarge their land, more than doubling the plot size from 3.5 hectares to 7.8 hectares. Peasant farmers, on the other hand, utilize all the land that they have: there is practically no unutilized land and no leasing out among peasant farmers in the survey. Accordingly, 35% of peasant farmers desire to enlarge their holdings, adding 178 hectares to their current 182 hectares. An additional source for potential demand for land are the corporate farms, which typically have very little owned land and rely almost totally on leased land. Among corporate farm managers, fully 38% indicate that they wish to enlarge their farms by about 50%: from 1,950 hectares to 2,930 hectares.

Possible sources of additional land as reported by the three categories of respondents are shown in **Table 8**. Since land leasing rather than buying and selling of land is the dominant land-market transaction in Ukraine today, it is quite understandable that a major

source envisaged by all respondents is leasing additional land, and at that mainly from the state. Remarkably, however, nearly 30% of household plot operators think they will be able to buy more land for their plot, whereas peasant farmers and farm managers are much less optimistic with regard to the possibility of buying land. Farmers and even more so farm mangers expect to rely more on leasing from private individuals (either in the form of physical plots or land shares). This probably reflects the fact that farmers and farm managers are better informed in the legal intricacies of the current moratorium on land sales, yet across all respondents there appears to be readiness and willingness to engage in buy-and-sell transactions once the moratorium is lifted.

Table 8. Potential sources for acquiring land for farm enlargement (multiple answers allowed)

	Households	Farmers	Corporate farm managers
Lease from state/municipality	34	39	35
Lease from corporate farm	12	13	22
Lease from private individual	17	28	44
Lease land shares from individuals	15	26	46
Buy land	29	12	10

The profiles of farming families (both those operating household plots and peasant farms) who wish to enlarge their farms are compared in **Table 9** with the profiles of families who are satisfied with their present land holdings. In those cases when the respondent wishes to enlarge the family farm, both the head of household and the spouse are younger than among those who do not desire more land. This is of course consistent with the need to ensure sufficient human capital for a larger farm. Another component of human capital – family size – is statistically significant among household plot operators, where the wish to enlarge is associated with larger families, but not among peasant farmers. Similarly, differences in physical capital as manifested in smaller land holdings drive the desire to enlarge the farm among household plot operators, but not among peasant farmers (for corporate farms, the differences in farm size between those intending to enlarge and the rest are not statistically significant either).

Table 9. Profiles of farming families wishing to enlarge their farm

	Households		Peasant farms	
	Wish to enlarge	No	Wish to enlarge	No
Percent of respondents	9	91	35	65
Land holdings, ha	3.5*	4.9*	178	126
Family size	4.1*	3.6*	4	4
Age head of household	45*	53*	47*	49*
Age spouse	41*	48*	43*	47*

* Differences statistically significant at $p = 0.1$.

Conclusion

Land policies are a key factor in determining family incomes and subjective well-being. Larger family farms lead to higher incomes and improved well-being. Larger farms also generate tradable surplus that can be sold for cash, thus further increasing family income. Today, the basic mechanism for farm enlargement in Ukraine is land leasing. Employee families that do not cultivate all their land for various reasons are the main suppliers of land for leasing, while peasant farms (and also corporate farms) are the main lessees. Leasing transactions are thus the principal vehicle through which land markets in Ukraine fulfill their fundamental function of allowing land to flow from less active to more active users.

When the moratorium on buying and selling of land is eventually lifted, farmers will face additional degrees of freedom in their farm-augmentation decisions. They may in fact start exploring the new opportunities for purchasing land alongside leasing. Thus, in Moldova, where buy-and-sell transactions have been allowed since 1999, the average number of agricultural land sales in recent years runs at a rate of 40,000 transactions involving slightly less than 40,000 hectares per year (Lerman and Cimpoies, 2006). The transfer rate through land sales is about 3% of landowners and about 2% of privately owned agricultural land. In Azerbaijan, where buying and selling of land also began in 1999, the number of land sale transactions increased rapidly from 2,000 in 2002 to 12,000 in 2005, reaching about 1.5% of the number of landowners (Amin Ismailov, Azerbaijan Land Cadastre, private communication). In Poland and Romania, where land sales have been freely allowed since the early 1990s, about 5% of respondents in several surveys report engaging in buy-and-sell transactions (Lerman et al., 2004, p. 81). The transfer rates in transition countries are substantially lower than the average of 7% for EU-15 (Baldwin, 1998), but they nevertheless provide an encouraging sign of development for land markets that began to emerge only after the collapse of the Soviet system.

However, the evidence from Russia, a country particularly close to Ukraine because it lifted the moratorium on buying and selling of land as recently as 2003, is not particularly encouraging. In Russia, land sale transactions represent 2.5% of the total number of 1.8 million transactions in agricultural land, whereas the remaining 97.5% are land leasing transactions (Lerman and Shagaida, 2007). Thus, although we can expect some development with buying and selling of land once the moratorium is lifted in Ukraine, land leasing will probably remain the dominant mechanism for farm augmentation for years to come. This conclusion is supported by recent findings from Hungary, where households extend their cultivated area by a combination of buying and leasing: while they may prefer to buy land from considerations of property rights security, real-life liquidity and credit constraints force them to settle for leasing (Vranken and Swinnen, 2006). The lifting of the moratorium in Ukraine will add a new category of land transactions to the existing "portfolio", without replacing the prevalent leasing contracts.

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