

**Typologies of Household Risk-Taking:
Contemporary Rural Russia as a Case Study**

Stephen K. Wegren*

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Contact Address:
Department of Political Science
Carr-Collins Hall, Rm. 207
Southern Methodist University
Dallas, TX 75275-0117
214-768-2523
swegren@smu.edu

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* Professor of Political Science at Southern Methodist University, Dallas, TX.

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INTRODUCTION

Two of the most challenging—and controversial—questions about agrarian reform in post-Soviet Russia have been *who* responded to market reform in the new market-based environment and *how* did they do so—topics that have been of interest to analysts for several years and about which several publications have appeared.ⁱ A fundamental issue that underpins the logic of market reform and the attempt to deconstruct Soviet-type economies is: in an economic environment in which several mechanisms function to assure basic survival, combined with new opportunities to increase the household standard of living, which households will become risk-takers and which will remain risk-averse? This question of risk-averse vs. risk-taking, which is derived from the larger question of rural responses to market reform, is the focus of this paper.

The present paper contributes to the literature by postulating continua of risk and analyzing characteristics of risk-averse and risk-taking rural households in contemporary rural Russia. The purpose is twofold: first, to disaggregate “the peasantry” in a way that will be analytically useful for comparative agrarian studies; and second, to provide detail about households’ characteristics along risk continua by using rural Russia as a case study. Households are used as the unit of analysis because they have become the primary producer of foodstuffs since the early 1990s (measured in ruble value), and this situation is unlikely to change in the foreseeable future,ⁱⁱ especially when considering the initiatives adopted by the Russian government to encourage household production in its

program “Development of the Agroindustrial Complex” (which is discussed in more detail in the Conclusion). This developmental program, which is really a strategy for rural revival after the depression of the 1990s, originally was operational during 2006-2007, but in 2007 a longer-term program spanning 2008-2012 was adopted.

The paper’s specific application is to rural households in middle income countries, not traditional peasant societies. This paper uses survey data from 900 rural households in nine regions of Russia to analyze risk and rural households’ responses to risk (see Appendix A). The core questions to be addressed are: (a) which households are risk-averse and which are risk-takers?; (b) what are the characteristics of those different types of households?; and (c) which factors have greatest causal properties in explaining household risk-taking? Many analyses of rural households use household characteristics as the independent variable and behavior (responses to reform) as the dependent variable. This paper is different in that it places behavior on a risk continuum, and examines the characteristics of households according to their location on that continuum.

PEASANTS AND RISK

Peasants and peasant societies face a variety of different types of risk. There are of course risks from nature—drought, flood, pests, soil erosion, spoiling of the ecology on which agriculture depends, or extreme fluctuations in temperature. Beyond risks posed by nature, there are man-made risks that threaten peasants’ existence. For example, there is risk associated with structural economic factors such as macro-economic transformation leading to violations of peasants’ moral economy, the proletarianization of rural labor and conversion of agricultural labor to urban wage labor, and state-led commercialization of

agricultural production—all of which may translate into poverty for at least some of rural society. More recently, globalization has contributed to forcing smaller farmers out of business, those who cannot compete with large agribusiness and who are not able to influence governments as effectively as the teams of lobbyists hired by processing, shipping, and trading agrofirms (Halweil, 2000: 12-28). Moreover, states themselves may pose risk through their economic policies toward agriculture, for instance their taxation policy toward the rural sector, discriminatory state interventions in the form of urban bias, or, in the case of Russia in the 1990s, state withdrawal.ⁱⁱⁱ There is also risk to peasants' livelihood generated by private industry, for instance Monsanto with its genetically modified crops and so-called "terminator technology" (Hsin, 2003: 39-41).

At the household level, risk varies depending on the location of the household on an income and standard of living continuum. For peasants on the edge of survival, it has been argued that peasants will pursue safety and subsistence first, ahead of income maximization. Towards this end, peasant villages engage in collective cooperation to ensure the survival of all [Scott, 1976]. It is also well-known how peasants in traditional societies plant their crops in different locations in order to lessen the risk that pests, poor soil quality, or drought would wipe out their entire crop. Conversely, households located on the upper end of the income continuum face risk too, but have somewhat different decisions. Upper income rural households that do not attempt to adapt to new opportunities run the risk of falling behind; others that attempt to adapt but are not successful run the risk of failure, which may result undue economic hardship.

Households also face the risk that flows from overt resistance and the resulting punishment if the resistance is not successful. In Stalin's Soviet Russia in the 1930s, the

primary risks confronting the peasantry were the failure to collectivize (or to resist collectivization), and the risk of being branded a “kulak” as a result of class warfare in the countryside unleashed by the Kremlin [Fainsod, 1958; Lewin, 1968; Davies, 1980; Conquest, 1986; Fitzpatrick, 1994; Viola, 1996; Viola, 2002; and Viola, et al., 2005].

Covert resistance—so-called weapons of the weak—allow outlets for peasants to circumvent perceived economic or legal discrimination [Scott, 1985; Colburn, 1989]. In the Soviet context of the 1930s, there is some question as to what constituted covert resistance and what behavior was merely a rational response to ensure survival within the existing institutional environment [Osokina, 2002]. Nonetheless, in historical contexts where the threat of violence or forcible coercion is absent, it should be noted that these strategies of covert resistance also comprise a type of risk that derives from not benefiting from new economic opportunities. In this case, resistant households that employ weapons of the weak may find such strategies to be ineffective or even counter-productive depending on the nature of the political system and type of regime.

The foregoing discussion of risk is important because it leads us to the point that not only are sources of risk diverse, but perceptions of risk vary according to the economic status of a household. The point is simple, and obvious, but nonetheless important: traditional peasant households in underdeveloped states have unique perceptions of risk and orientations to risk, and face different types of risk than do “urban peasants”—rural households located on the semi-periphery of urban settlements in medium income economies, where household members have access to education, transportation, and communication links to the world outside their specific village.

Not only do peasants in traditional and middle income countries face different risks, so too do different strata of peasants, and thus will respond differently. While Marx was prone to seeing an undifferentiated peasantry, Vladimir Lenin spoke repeatedly about different strata of peasants—poor, middle, and rich—a status that influenced not only their economic activity but also their political values and orientations. As is well-known, the Bolsheviks used the poorer strata of peasantry in their class warfare during 1918-21, and again during Stalin's collectivization in the 1930s. Lenin's perception of differing strata of peasantry was further developed in analyses of peasants and their role in peasant-based revolutions during the 20th century [Wolf, 1969; Migdal, 1974; Paige, 1975; McClintock, 1984; Hawes, 1990]. As it relates to Russia, a class-based analysis of the peasantry was used by practically all Western and Soviet historians of the Russian Revolution in 1917 and thereafter, and is found in virtually every classic analysis ever published. The point is, that to understand the perceptions and realities of risk that peasant households may face, it is necessary to consider not only the larger environmental context and the general level of development of society, but also the specific characteristics of households that frame the orientation to risk-taking. The argument here is for disaggregating the peasantry into strata—which may be based on any number of criteria—because different each stratum perceives different risks and will respond accordingly.

Rural Russia Today and Risk

Although in many ways rural Russia today is not dissimilar from the rural environment that existed in the 19th century, contemporary rural Russia is not a

traditional peasant society. While there are many villages that are remote and would meet most any standard of “rural,” it is also true that numerous rural households are located in semi-peripheral areas to urban centers. Moreover, most rural households possess at least some modern amenities: wash machines, TVs, VCRs, and a smaller percentage have cars or motorcycles. Almost all rural households have radios which permit outside news to be received, and a large percentage of rural residents read a newspaper at least once a week. Their homes have electricity, and although indoor plumbing is not universal, a respectable percentage have running water. While the quality is low, rural schools provide education through the 10th grade. There is near complete literacy, and a high percentage have finished secondary school. Buses provide transportation to nearby urban centers that enable interaction between urban and rural dwellers.

Most importantly, for all but the very poorest households, the standard of living and *not* basic economic survival is the crucial issue that confronts the household. Basic survival does not depend upon household agricultural production—many households continue to have one or more members employed by a large farm (a successor to Soviet-era collective and state farms), and depending on location, one member might have employment in an urban center. Moreover, basic survival is ensured by the existence of a “private plot”—a small allotment of land used for subsidiary agriculture, for which households had use rights into perpetuity under communism. These plots ranged in size during the Soviet period depending on family size and occupation, but typically were about .25 hectares and in no case no larger than .50 hectares. In the post-Soviet period, these plots may have been converted to private property and could be expanded. Today, at low end of the income scale, the very poorest households depend upon their private

plot as their basic source of food. The Director of the Agrarian Institute in Moscow, Aleksandr Petrikov, has estimated this stratum to consist of about 33 percent of rural households. The bulk of households with private plots, about 55 percent, consume some of their plot production and they sell some, thereby providing non-monetary income and supplementing the household's monetary income. A third group, a minority of about 12 percent, are commercially oriented and sell their production as the basic component of household income [Petrikov, 2007].

Furthermore, households' survival and basic economic security continue to be provided through state transfer payments of various kinds, assistance from friends, relatives, and even managers of large farms, even though at lower levels than previously.^{iv} Finally, as part of employment on large farms in the Soviet era, employees often "liberated" (stole) inputs they needed for operation of their subsidiary agriculture, they cheated on their reported work time to work on their private plot, or they "expropriated" food from the large farm to meet households' needs and to supplement the family's standard of living. Although stealing was most likely more prevalent during the Soviet period, it has continued into the post-communist period [International Finance Corporation, 1998: 27; Ioffe, Nefedova, Zaslavsky, 2006: 98-99]. The point is that rural households in Russia today have a variety of different sources to ensure their basic survival, and thus it is the contention of this paper that survival is not primary concern for most households, even though most rural households would be considered to be poor. With basic survival assured, risk-taking becomes possible for some households.

NEW ECONOMIC OPPORTUNITIES

The Soviet economic system provided welfare state benefits that were intended to minimize risk at the individual level and maximize economic production at the enterprise level. Although the Soviet planning system had many deficiencies, it is important to recognize that the state mitigated individuals' risk by providing cradle to grave employment and security from unemployment, inflation, and recession. Employees on collective farms were made eligible to receive welfare state benefits beginning in 1966. The extension of the welfare system to farm employees, combined with the lessening of state urban bias in the post-Stalin period, meant that rural households did not need to worry about survival and could concentrate on improving their standard of living. From the mid-1960s to the late 1980s, there was slow, but mostly steady, growth in rural households' possession of amenities, income, and standard of living, before dropping significantly during the 1990s [Evans, 1981; Schroeder, 1983; Evans, 1996; Wegren, 2003].

The fall of the communist system ushered in significant economic reform, and with that transformation came new opportunities as the planned economy ceased to exist. In its place came market reform and privatization, policies that have been extensively analyzed. For that reason, a full review of reform policies and problems is beyond the scope of this paper, and thus the reader is directed elsewhere [Aslund, 1995; Gustafson, 1999; Braguinsky and Yavlinsky, 2000; Freedland, 2000; Hough, 2001; Goldman, 2003]. Opportunity, of course, is related to risk. With new opportunities came choices and decisions. New types of risk arose, both from action or inaction. For example, action decisions could lead to economic failure or bankruptcy. Decisions of inaction could result

in falling behind, as participant households benefited and differentiated themselves from the inactive households.

As market reform unfolded during the 1990s, the post-Soviet agricultural system resembled less and less the Soviet system. In fundamental ways agricultural policies after 1991 were different from those in the Soviet-era, although these changes did not all occur at once. To cite just a few examples, the following changes in state policies at the national level occurred: (a) the ending of state planning of agricultural production; (b) state control over wholesale prices for inputs was eliminated, exposing food producers to “market prices” which in practice often entailed monopolistic price setting; (c) federal subsidies and credits to large farms were drastically cut, forcing farms to curtail construction, maintenance, land improvement, social services, and infrastructure projects; (d) state food procurements and obligatory deliveries were reduced, and later, practically abolished; and (e) a liberalized food import policy was introduced, which allowed foreign foodstuffs to compete directly with domestically grown food. As a result, large farms and rural households adapted and changed their behavior to meet the new economic environment.^v

At the household level, a series of opportunities and decisions presented themselves. Households no longer faced restrictions on the production from private plots as size limits were expanded and restrictions on livestock holdings removed.^{vi} Individuals no longer had limits on income and were free to diversify their sources of income, which is to say that rural dwellers could pursue off-farm employment opportunities. At the same time, employment on a large farm was no longer guaranteed or assured. Moreover, the Soviet-era welfare state benefits were degraded society-wide, giving way to

unemployment and the rise of poverty. In particular, rural unemployment was disproportionate, and by several accounts more than one-half of rural households existed below the official poverty line during the 1990s [Wegren, O'Brien, Patsiorkovski, 2003; O'Brien, Wegren, Patsiorkovski, 2004b].

There were also other economic opportunities that arose. In food trade, new channels for the sale of produce emerged which provided households (and large farm enterprises) with choices about food marketing. Households and individuals were given the right to obtain additional agricultural land through the receipt of land shares from large farms, from leasing agricultural land, or after 1994, by buying agricultural land. Restrictions on the movement labor were reduced so that employees on large farms were free to search for employment in a city, on a more profitable large farm, or in a different agricultural region. A wholesale market developed so that households could, at least in theory, obtain inputs from sources other than the large farm where household members might be employed. A private retail market also developed where agricultural machinery and equipment, even animals, could be purchased. Of course, many of these developments yielded rudimentary institutions that would take time to fully develop, but the point is that there was identifiable movement away from Soviet-era practices during the 1990s. New economic opportunities, movement away from welfare state policies, and the eroding of state-sponsored economic security provided households with choices, but also brought risk into the equation. Not all households responded similarly to new opportunities. The section below investigates the characteristics of risk-averse and risk-taking households.

RISK AND TYPOLOGIES OF RURAL HOUSEHOLDS IN RUSSIA

Much of the classic literature in peasant studies has focused on rural protest and resistance, a predilection that has resonated in some of the literature on post-Soviet Russia as well [Leonard, 2000; Pisano, 2004]. However, rural reform in post-communist Russia has *not* been primarily characterized by protest or resistance. Why? The answer is threefold. First, contemporary agrarian reform may be termed a “giving” reform. Giving reforms usually enjoy peasant support, unless peasant expectations are disappointed, as in the case of Emancipation in the 1860s [Emmons, 1968]. In contemporary Russia, however, there is substantial evidence of popular support for the philosophical underpinnings of reform during the 1990s, which is not to suggest that rural dwellers did not grumble over the way it was implemented or some of the economic consequences that resulted [see Wegren, 2005, chps. 3 and 4]. Support for the philosophical underpinnings of post-Soviet agrarian reform is further supported by the fact that (modest) rural protests *did* arise in response to the realization that land reform delivered much less than promised, as became clear when land share holders began to lose their rights or had difficulty converting shares to land during 2004-2006. In other words, similar to Emancipation, there was some unrealized expectations. A second reason is that basic household survival was ensured through various mechanisms as elaborated below, even if rural standards of living did decline during the 1990s. A third reason is that market reform provided new opportunities for coping, through adaptation and innovation, thereby allowing some households to prosper.

Not all rural households adapted equally, and certainly growing stratification attests to the fact that some have prospered more than others. While previous research has

investigated rural stratification in post-communist Russia [O'Brien, Wegren, and Patsiorkovski, 2007], virtually no attention has been devoted to the characteristics of risk-taking and risk-averse households in the post-Soviet environment. Contemporary rural Russia provides an excellent case study because it allows us to operationalize risk and opportunity, and to examine which households adapted (took risk) and which households did not as the economic system and environment changed. Therefore, a primary contribution of this analysis is to disaggregate the peasantry by identifying household characteristics that correspond to behavioral responses.

Flowing from macro-level policy changes that were introduced in 1992 as part of economic reform away from the communist system, rural households in Russia had several decisions to make that entailed different degrees of risk. Most fundamentally, with the removal of limitations on income earnings and the ending of secure employment, households had to decide whether to continue activities that ensured basic subsistence and not much more, or to take risks to expand production and become at least partially commercialized. For purposes of this analysis, it is postulated that the most crucial decisions that entail risk were: (a) how much food to sell from household production; and (b) whether to increase household land holdings.

Food sales affect households' income and are related to the overall standard of living. In the new economic environment, households are able to sell as much food as they calculate they are able without damage to members' health. Regarding land, the decision, and opportunity, to expand land holdings represent a dramatic change from the Soviet period. In the post-communist period, households have been able to expand the size and type of land holdings, to own this land, or to merely lease it. Depending on the intended

use, land expansion may be modest—less than a hectare—or virtually unlimited in the case of private family farms, who are bounded only by financial resources to acquire land and the ability to cultivate it productively. Expanded land holdings are important because they may lead to increased food production, and by extension, food sales. Further, land holdings have been shown to be an important factor in households' standard of living, income stratification, and social mobility [Wegren, O'Brien, and Patsiorkovski, 2006a; Wegren, O'Brien, and Patsiorkovski, 2006b].

These two decisions are important because they give rise to follow-on considerations. For example, if a household were to increase food sales, several subsidiary decisions are necessary: (a) what will be the relationship between increased food sales and household production—will production increase also or remain essentially the same, with a decline in various household consumption uses? (b) how to distribute additional output among different uses—sell, household consumption, livestock consumption? (c) where and to whom to sell additional output? Rent a stall at a nearby urban market? (a decision that presumes transportation and sufficient household labor to have a worker absent from production). Sell “surplus” production to a large farm? If so, what are the opportunity and monetary costs of not selling through private channels? Sell to a food processor? If so, how to obtain market information so that fair wholesale prices could be negotiated? (d) If the household chooses to increase output, should the household hire additional labor? (especially pertinent if the household has started a family farm or added significant amounts of land).

The expansion of household land holdings also entail follow-on decisions: (a) does the household have the economic means to take on long term economic responsibility of

more land? Most additional land was leased, not purchased, which meant that a financial responsibility was placed on the household for the duration of the lease agreement. Moreover, according to law, the quality of agricultural land had to be maintained and used effectively or else it was subject to confiscation. (b) Does the household have sufficient human capital to ensure that additional land can be used productively and profitably? (c) Are households members willing to make a commitment to remain in the village, or are younger members likely to migrate to an urban center in search of better paying employment? (d) Does the household possess, or have the prospect of obtaining, the necessary agricultural tools and machinery to utilize additional land profitably, a decision that rests upon the financial condition of the household or access to credit?

Thus, rural Russian households in the post-Soviet period had to decide whether to continue to operate within the economic parameters that existed during the Soviet period, which entailed using small plots of land for subsidiary agriculture that provided basic subsistence but not a whole lot more. Conversely, attendant with the new economic opportunities that arose as a result of market reform, households could now decide to become more entrepreneurial. This decision entailed increasing risk by expanding land holdings, selling more household production, and increasing productive capital—the latter being a type of risk that entailed whether or not to expend monetary capital (or take on debt) to acquire additional livestock or agricultural machinery that would allow for the expansion of land holdings.

Following from the discussion above, household risk is operationalized as land expansion and level of household food sales.^{vii} Land expansion is defined as an expansion of the household private plot, increase in the size of rental plots of land, or an increase in

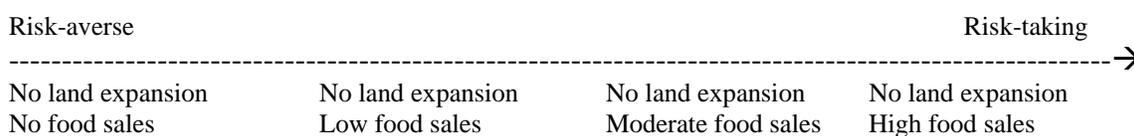
other types of land, for instance the purchase of agricultural land that is not a private plot. The time line is 1991-2006. Land shares (paper entitlements), which all members of collective and state farms and selected service personnel to these farms received during 1992-1994, were not included in this analysis because the acquisition of land shares did not require any action by household members and therefore no risk was undertaken, although it should be noted that some households disposed of their land shares subsequently.^{viii} The three land variables (plot, rental, other) were recoded into one variable called “total land expansion” which captures increases in real land holdings since 1991.^{ix} A dichotomous variable is used in the analysis—whether a household expanded land holdings or not—without a nuanced analysis of the effects of the size of land increase, due to space considerations in this paper. It is hypothesized that distinctive characteristics will be evident for households that increased land holdings by large amounts, but that analysis will have to be pursued elsewhere.

The second category that helps define risk concerns food sales by the household. Food sales are measured by the ruble value of monthly food sales from household production. For the risk continua below, “no” food sales is self-explanatory—the household consumed all of the food it produced and reported no income from the sale of agricultural produce. “Low” food sales are defined as income generated from food sales equal to about 16 percent or less of total household monthly monetary income. In other words, the household consumed most of the production, but not all of it. “Moderate” food sales are defined as income generated from food sales equal to 20-33 percent of total household monthly monetary income. “High” food sales are defined as income generated

from food sales equal to 50 percent or more of total household monthly monetary income. These households may be considered to be commercially oriented.^x

Households may be dichotomized into two groups, one that expanded land holdings and one that did not. The group that did not expand land holdings is represented in Figure 1.

Figure 1



The continuum of household risk shown in Figure 1 depicts households that did not expand their land holdings. At the far left end of this risk continuum are households that are considered to be risk-averse because they essentially decided to continue behaviors that were predominant during the Soviet period. These households have not expanded land holdings and consume all of the food that they produce. Proceeding along the continuum to the right, the next category is also risk-averse and includes households that have not expanded land holdings and consume most of their production. The following category to the right may be considered somewhat risk-taking and includes households that have not expanded land holdings but sell a moderate amount of their production. Finally, the most risk-taking households are found at the far right of the continuum and include households that have not expanded land holdings and sell most of their production.

Characteristics of Households with No Land Expansion

The households indicated in Figure 1 are less adaptive in that they did not use opportunities afforded by reform to expand land holdings since 1991. Nonetheless, there are noteworthy differences in characteristics among households found on this continuum. The starting expectation is that risk-averse households are more risk-averse for a reason, namely, that they have certain characteristics that put them at a disadvantage.^{xi} This expectation is born out by data, as shown in Table 1.

Place Table 1 here

The table shows that risk-averse households (found on the two points on the left of the continuum) have lower household monetary income, which would be expected with the absence of food sales or low levels of sales. It should be noted that the risk-averse households with lower monetary income receive more income from employment wages and transfer payments. The insignificance of food sales acts as an incentive to diversify income sources by devoting some labor to household non-agricultural business, which usually has higher wages than agricultural work. In this respect, risk-averse households show evidence of adaptation, although it is not especially significant. Additionally, risk-averse households are disadvantaged in socio-demographic factors: fewer members in the household, less household labor, and less assistance from friends and neighbors.^{xii} The mean ages of the husband and wife are higher in risk-averse households. Further, risk-averse households also have lower mean levels of each type of productive capital,

including the smallest land holdings among the four groups of households. Finally, risk-averse households produce less food, a function of the factors discussed above.

Conversely, risk-taking households do not have the same disadvantages. Households that sold moderate levels of food have a higher mean monetary income than risk-averse households, and more of that income is generated by activity by household members—growing and selling food—as opposed to transfer payments or wages from large farms. Households with moderate food sales also have more household members, more available household labor, have more friends and neighbors assist them, and the husband and wife are somewhat younger. These households have higher levels of productive capital, including more land. They also produce more food. Overall, households with moderate food sales have more advantages and fewer disadvantages than risk-averse households.

The most risk-taking households are ones who receive more than one-half their monthly income from the sale of food. The table shows that these households are distinctive in several ways. First, their mean monetary income level is significantly higher—more than double that of risk-averse households with no or low food sales, and more than 70 percent higher than households with moderate food sales. Households with high food sales also have the most income from household non-agricultural business, no doubt a function of having the most household members and the highest level of household labor. These households are also advantaged in their age structure, and have the highest levels of productive capital, including land holdings. They also produce the most food, which is to be expected given their commercial orientation.

The discussion based upon Table 1 paints a suggestive picture: disadvantaged households are more risk-averse and will tend to sell less food, while more advantaged

households will tend to sell more of their production. But which advantages (or disadvantages) are more important? That is, do factors of productive capital have the same causal properties as socio-demographic factors? Is it possible to specify which factors have more explanatory power as to why households engage in risk by selling more food? For the answer, a regression model was run holding land expansion constant. The model used food sales as the dependent variable and regressed the factors listed in Table 1. Food production variables were excluded, since it is obvious that sales are a function of production levels, and the number of pensioners was added as an independent variable. The results are shown in Table 2.

Place Table 2 here

With an adjusted R square of .74 and $p = <.01$, the model as a whole has high explanatory power and is statistically significant; thus we are assured that the findings are real and not a statistical aberration. Among the variables in the model, four are statistically significant ($p < .05$) and will be the focus of analysis. Those four variables are total household monetary income, income from household business which normally entails non-agricultural activities, the number of cows, and the number of pigs. In order of the strength of causality (beta), the number of pigs is first (beta=.469), the number of cows is second (beta=.390), and total household income is third (beta=.324). Household business is signed negatively which means that households face a trade off: devote labor and time to a non-agricultural business or to selling food. The more food a household sells, the less it is able to engage in non-agricultural business, which makes intuitive

sense given the demographic constraints that most rural households face. From this table we may conclude that households that have more livestock and that have higher total monetary income sell more of their production, and thus may be considered to be more risk-taking. A higher number of animals equates to higher food production; with higher production, household consumption needs are met and the surplus of high value products may be marketed, which in turn augments household income. Higher income for some households contributes to differentiation and stratification.

Characteristics of Households with Land Expansion

The households indicated in Figure 2 have been more adaptive to the new economic environment in that they used opportunities afforded by reform to expand their land holdings since 1991. Of the households that did increase real land holdings, the overwhelming percentage of households increased their land holdings by .01-1.0 hectares. A very small percentage of households increased land holdings by 10 or more hectares, and these households are typically commercially oriented private family farms. It should be noted, however, that the number of family farms in the sample is very small, and so their inclusion does not distort the analysis. Nationwide, the number of family farms in Russia has ranged between 250,000-280,000 since 1994.

Figure 2

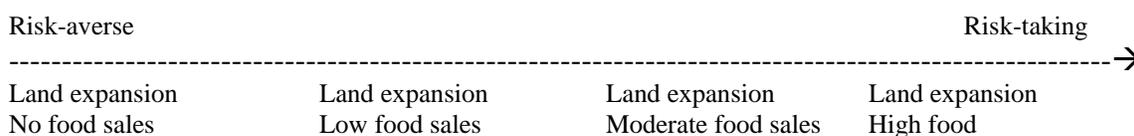


Figure 2 illustrates households that expanded land holdings. As was true for households that did not expand land holdings, there are noteworthy differences in characteristics among households found on this continuum. This continuum uses the same four categories of household risk and the same definitions of food sales as in Figure 1. The characteristics of households on this continuum are indicated in Table 3, and it should be noted that they do not share the linear pattern that was displayed in Table 1.

Place Table 3 here

If the households that had no food sales are excluded from the analysis for the moment, the households on the remaining three points of the continuum share a similar linear pattern that was displayed in Table 1—namely, that total monetary income increases as one moves along the continuum to the right, income from food sales (obviously) increases, and that income from non-agricultural business increases but is not a significant aspect of total household income. In terms of socio-demographic factors, households with more food sales have somewhat more members, more available labor, and slightly more assistance from friends. Age differences across points of the continuum did not vary significantly. Assistance from neighbors does not progress in a linear manner; similarly, neither do factors of productive capital. Notably, land holdings do not increase as food sales go up as with households on the first continuum, although commercially oriented households have the largest land increase. Food production displays the expected pattern. Overall, the results are more mixed than was found among

households that did not expand land holdings, although in general households that sell the most food have the most advantages.

A second regression model was run for households that expanded land holdings, using food sales as the dependent variable and the same factors used in the regression displayed in Table 2. Land expansion was held constant. The results are indicated in Table 4.

Place Table 4 here

This model as a whole has an adjusted R square of .51 and $p < .01$, meaning that the model is statistically significant and has reasonable explanatory power although not as high as the first regression model. Among the variables in the model, eight are statistically significant ($p < .05$) and will be the focus of analysis. Four of the variables were statistically significant in the first regression model, including: total household monetary income, income from household business which normally entails non-agricultural activities, the number of cows, and the number of pigs. Four other variables are statistically significant only in the second regression model. They include the number of pensioners, weighted household labor, the number of sheep, and the number of autos.

For the entire model, a rank order for the strength of causality (beta) shows that total household income (beta=.649) has by far the greatest explanatory power and displays very strong causality, especially for a single variable. The number of pigs (beta=.279) and the number of cows (beta=.137) also have an effect on the level of food sales, but much less so than in the first model. The remaining variable, the number of sheep, even though

it is statistically significant, does not have strong explanatory power ($\beta=.079$). Interestingly, the number of pensioners and weighted household labor are signed negatively, suggesting that these households with higher food sales have younger members and have substituted mechanical labor for manual labor, although it should be noted that the causal effects are not strong. The most significant variable signed negatively is income from household business with a $\beta= -.492$. This result strongly suggests that households which expanded land holdings face a more severe trade off than those that did not expand land. Households with more land faced more critical choices whether to devote labor and time to a non-agricultural business or to selling food. Similar to the first regression model, the more food a household sells the less income it receives from non-agricultural business.

Combining the Two Models

Having examined the two groups of households individually, those that expanded land holdings and those that did not, in this section the two groups are combined into one in order to obtain a general picture of the variables that best explain why households take risk by selling more food. Using the same variables as in Tables 2 and 4, Table 5 presents a unified regression model. In Table 5, the variable “total land expansion” (excluding land shares) was substituted for total land holdings and is used as one of the independent variables.

Place Table 5 here

The combined model as a whole has an adjusted R square of .54 and $p = <.01$, meaning that this model is also statistically significant and has similar explanatory power as Table 4. Further, similar to Table 4, this model has the same eight variables that are statistically significant. The same variables are signed positively and negatively as in Table 4, and the rank ordering is the same. Both the model in Table 4 and the model in Table 5 show that total household monetary income is the best predictor as to whether a household will sell high volumes of food ($\beta = .593$), which means that households with higher monetary income are more likely to be risk-takers. Moreover, this model confirms that households with more livestock holdings will have more income from agricultural sales. Thus, this model confirms that households that are more economically secure, that is, that have certain advantages, are more likely to be risk-takers, a finding that is not particularly surprising.

But advantaged households are not necessarily advantaged in the ways one would normally expect. In particular, the data presented in Table 5 suggest three unexpected findings. The first unexpected finding concerns household demographics. One might expect that demographic factors would play a significant role in food production, food sales, and overall household welfare. However, the table shows that assistance from friends and neighbors is not an important factor that affects food sales, which comports with the finding that economically secure households sell more food. Economic security would appear to breed a degree of independence, but these variables were not statistically significant so that conclusion remains for further analysis. The table also shows that household labor does not matter much to food sales and is signed negatively ($\beta = -.090$), which is somewhat surprising because other analysis has shown that household

labor has an important impact on household food production [O'Brien, Patsiorkovski, and Dershem, 2000]. Instead, Table 5 suggests that food sales may operate independently of household labor and the size of the family; what is more important is the possession of livestock. A comparison of households with high food sales in Tables 1 and 3 show that they both have similar number of members and available household labor. Thus, the findings here suggest that food sales are not a function of household demographics.

The second unexpected finding relates to agricultural land. In all three regression models land holdings and land expansion were not statistically significant and the betas were low, indicating that land is not a critical determinant in the amount of food a household will sell. On the one hand, this finding makes sense because the amount of land that most households added is so small, most commonly less than one hectare, that the impact may be expected to be less than substantial. On the other hand, the data are clear that land expansion is not a causal factor in food sales. In fact, comparing households with high food sales in Tables 1 and 3, it is clear that households that expanded land holdings do not have substantially higher monetary income than those which did not, R24,628 versus R23,551 (which equates to about \$40 a month at the existing conversion rate in 2006). Thus, the finding strongly suggests that economic security—higher monetary income—may be attained without an expansion of land holdings (thereby implying an increase in other productive capacity and/or increased labor efficiency by the household).

The final unexpected finding concerns income generated from non-agricultural activities. It might be expected that households engaged in entrepreneurial activity in the form of non-agricultural business would also have higher food sales as part of that

entrepreneurial spirit, but this is not the case. The data strongly suggest—evidenced in all three regression models—that most households must choose to either engage in non-agricultural business or high volumes of food sales. This decision is likely a function of limited human, social, and productive capital by most households.

Thus, the model suggest that the more advantaged a household is, the more likely it is that it will be a risk-taker. At present, the percentage of “advantaged” rural households in Russia is relatively small, and therefore the task of the Russian government is to increase the number of households that are “advantaged.” From a policy standpoint, priority should be given to increasing household income and livestock possession, and less attention is warranted for expanding household land holdings and augmenting household demographics. Further discussion of policy implications, and dilemmas, is presented below.

CONCLUSION: THEORETICAL AND POLICY IMPLICATIONS

This paper attempted to make a number of theoretical contributions. One contribution was to disaggregate the term “peasantry” that is used so often in the agrarian literature without a sensitivity to the fact that different strata face different risks and different opportunities. Second, the paper offered continua of risk for different types of households (land expanders and non-land expanders) that may be useful as a framework for comparative agrarian studies. A continuum of risk presented four groupings of households, distinctive by their behavior. Finally, using Russia as a case study, the paper quantified how characteristics between risk-averse and risk-taking households differ, with the intent to provide a basis for comparison that may be modified and applied

comparatively, depending on the specific regional context. The upshot is that discussions about peasant societies would be well-served to frame the analysis in such a way as to account for different strata of peasant households, the different perceptions of risk that each stratum has, and the differing responses that households will exhibit toward risk, depending on where they fall on the continua presented above.

The findings also have policy relevance for Russia. The regression models above are clear that higher income households and households with more livestock will be more risk-taking by engaging in more food sales. From a policy standpoint, therefore, the task of the Russian government is to increase rural households' income and to facilitate acquisition of more livestock. In 2006 the Russian government adopted the aforementioned program "Development of the Agroindustrial Complex." The program was adopted against the backdrop of increasing rural stratification, evidenced by a significant increase in the coefficient of differentiation and a growth in the concentration of monetary income and land in an upper cohort.^{xiii} For example, in a survey of 800 rural households in 2001 conducted by the author, the coefficient of differentiation was 5.6, which rose 10.8 in the 2006 survey, which means that the upper 10 percent of households had almost 11 times the mean monthly monetary income as the lowest 10 percent of households.^{xiv}

The Russian government's development program offers governmental financial support in two broad areas.^{xv} The first is to develop the animal husbandry sector, leading to an increase in the production of animal husbandry products. The second broad policy area is to stimulate small farming enterprises (individual and household private plots, and private farms), along with various types of cooperatives.^{xvi} With regard to the first policy

objective, the federal government provides assistance to domestic animal husbandry by purchasing pedigree livestock and modern equipment abroad, and then leasing the animals and equipment at subsidized rates to large farms, private farms, and even households through the state owned company Rosagroleasing.

In the second policy arena, the federal government makes credit available to households on easy terms through various banks and subsidizes the interest rate. During 2006, the first year of the program, the head of Rossel'khozbank (Russian Agricultural Bank) indicated that his bank distributed R18 billion to 122,000 households [*Krest'ianskie vedomosti*, no. 23 (June 2007): 6]. During 2007, by early December another 150,000 households had received R21.2 billion [*Krest'ianskie vedomosti*, no. 49 (December 2007): 3]. For households that operate a private plot, a line of credit of up to R150,000 is available for one individual (with collateral), or R300,000 for a jointly owned plot, repayable within two or five years depending on how the money is to be used [*Krest'ianskie vedomosti*, no. 37 (September 2006): 4, 7.] Unsecured loans (no collateral) have a maximum credit line of R30,000. Thus, through these two initiatives it appears the Russian federal government adopted a program that will strengthen the economic condition of rural households, thereby increasing the propensity for risk-taking, increasing the number of households willing to take risk, and increasing households' entrepreneurial and commercial activities, all of which will improve rural standards of living, reduce rural poverty, and better prepare the rural economy for international competition once Russia joins the World Trade Organization.

But the policy dilemma is that it may not be sufficient to merely move households up the income scale, even if the evidence from this paper suggests that will increase the

propensity for risk-taking. The situation is more complicated and requires not just a change in income status, but a change in mentality as well. Pallot and Nefedova argue that “the principal constraint on the further development of individual farming in Russia is rural people’s limited horizons; they are unable to see beyond their few square meters of allotment, even if they have been successful in making money from it by responding to the demands of the market” [Pallot and Nefedova, 2007: 204]. Based on their survey interviews, these same researchers note that faced with a hypothetical five-fold increase in household income, the “majority” of households would keep production the same or even decrease it; and they observed that “it is striking in how few districts households would use this opportunity to invest in their smallholding” [Pallot and Nefedova, 2007: 200]. Is there a way to reconcile the evidence from this paper and the views of Pallot and Nefedova?

Two comments in response. First, there is likely to be a lag effect, which will only be evident over time, and which will require longitudinal data to track. That is, it is unlikely that the “majority” of households would feel secure enough to expand production and by extension increase their food sales, or to invest in production *immediately* after household income increased substantially. Based on the safety first maxim, it is likely to take several years of high income for risk-taking behavior to be justified and implemented. In the short-term, one would expect behavioral inertia based upon previous ways of thinking and household calculations.

Second, the 2006 data used in this paper shed further light on which households may be inclined to increase production or to invest in their productive capacity. On the one hand, the 2006 data used here support Pallot and Nefedova in that most households

indicated no plans to increase food production in 2007—66 percent (597) said they planned no increase, while 32 percent (290) planned to increase production by varying amounts (the remaining households answered that they planned to decrease production). However, among households with high levels of food sales (irrespective of land expansion), only 15 percent said they would not increase production, and only one household responded that it planned to decrease production. Conversely, among households that planned to increase food production, only 16.5 percent were from households with no food sales, and 18 percent came from households with low food sales. The remaining two-thirds of households, those with moderate to high food sales, indicated a planned increase. Therefore, the comments by Pallot and Nefedova actually *confirm* the importance of analyzing peasant households by strata, whether they are based on income, or, as in this paper, by level of food sales. The point is that we can only understand the nuances of household responses and risk-taking behavior by disaggregating households according to selected criteria.

NOTES

ⁱ Of particular note are Norsworthy [2000]; O'Brien and Wegren, [2002]; Wegren, O'Brien, and Patsiorkovski, [2002]; O'Brien, Wegren, and Patsiorkovski, [2004a]; Macey, Pyle, and Wegren, [2004]; Pisano, [2004]; Wegren, [2004]; Wegren, [2005]; O'Brien and Patsiorkovski, [2006]; Ioffe and Nefedova, [2006]; and Pallot and Nefedova, [2007].

ⁱⁱ Households account for over one-half the ruble value of total food production, ranging from 50 percent to as high as 58 percent during the past 15 years. Of course, households' contributions vary by food commodity. With small land holdings and limited production capital, households are best at animal husbandry production, potatoes, and vegetables. The overwhelming percentage of grain output, both food and industrial, is grown by large farms and private farms.

ⁱⁱⁱ In Stalin's Russia in the 1930s, for example, peasants in Soviet Ukraine faced the risk of starvation as a result of state-led collectivization.

^{iv} In the post-Soviet period, transfer payments as a percentage of household income has declined [O'Brien, Patsiorkovski, and Dershem, 2000; O'Brien, Wegren, and Patsiorkovski, 2004a]. The same is true for material support from large farms. Support and assistance from friends and relatives varies according to the economic status of the receiving household.

^v For a discussion of reform policies in agriculture and patterns of adaptation, see Wegren [2005, chps. 3 and 4].

^{vi} The expansion of size limits was a post-Soviet occurrence and was intended primarily to differentiate private plots from private farms, each having different tax obligations and levies on production. For example, income from the sale of produce from a private plot is not subject to income tax, whereas the sale of production from a private farm is considered income and subject to tax. The removal of restrictions on the number of livestock, chickens, pigs, horses, etc. actually occurred in the late Gorbachev period and was not unique to the post-communist period.

^{vii} In some ways, land expansion and food sales affect household decisions differently. The demographic decline in rural Russia makes land expansion complicated for many households, while the contraction in the number of household members to feed makes increased food sales more possible.

^{viii} It should be noted that as part of the process of agrarian reform in post-Soviet Russia, all members of collective and state farms, and selected service personnel to these farms, were distributed land shares during 1992-1994. The size of the land share was determined by the total amount of agricultural land held by the farm, divided by the number of persons who had a right to a land share. Village administrations defined the norms governing land share size. Norms could vary from area to area within a raion, depending on the density of the population. There were also significant regional differences in land share size. Land shares were paper entitlements to an abstract tract of land; no real land was distributed unless the member terminated employment on the large farm. For most families, land shares became the predominant source of "land ownership," accounting for 89% of private ownership of land by citizens in 2006 [Volkov, 2007: 5]. For farm members that did not terminate employment on a large farm, land shares could be

converted to real land for subsidiary farming. Shares could also be disposed of in a number of ways, including selling the rights to the shares, leasing the shares back to the large farm or to private farmers, and bequeathing or gifting the shares. Most land share owners ended up leasing the land shares back to the large farm. For a discussion of land shares and their usage, see Nasonova, [2007].

^{ix} The analysis focuses on land expansion rather than land holdings. The reason is that land expansion is different from land holdings—almost all households already had land or access to it as a carryover from the Soviet period—and thus land expansion would require a deliberate and subsequent action. If the size of land holdings were to be used, the analysis would be skewed because households' land holdings' were a function of use rights granted during the Soviet period.

^x These categories are my own and are arbitrary, although I would note that other authors have used similar percentages for categories to identify market, semi-market, and non-market oriented households [see Pallot and Nefedova, 2007: 196]. On the other hand, Praust [cited in Pallot and Nefedova, *ibid*] used a threshold of 80 percent for market oriented and 30 percent for non-market oriented households, which strikes me as too high for both categories.

^{xi} The original analysis included husband's education, wife's education, number of horses possessed by the household, and number of mechanical agricultural tools possessed by the household. However, education levels did not vary significantly across groups, and the possession rate of horses and mechanical tools was so low that these variables were excluded in the final analysis.

^{xii} In the survey, assistance ranged from "moral support" to actual material support in the form of labor in subsidiary agriculture, labor assistance in the household, and capital (monetary loans).

^{xiii} The "coefficient of differentiation" is a ratio of income received by the top 10 percent of households and the bottom 10 percent of households. Using total income (monetary and non-monetary, panel survey data show an increase in the coefficient of differentiation from 2.7 in 1991 to 6.3 in 2003. [See O'Brien and Patsiorkovski, 2006: 96-97]

^{xiv} Households in the lowest 10 percent income category had a mean of 3,530 rubles a month, while households in the upper 10 percent income bracket had a monthly mean of 38,330 rubles.

^{xv} The program is available at the website of the Russian Ministry of Agriculture: www.mcx.ru under the link "Natsional'nyi proekt 'Razvitie APK.'"

^{xvi} By the beginning of 2008, the original goals were to increase the production of milk by 4.5 percent and meat by 7 percent in comparison to 2005; to increase the volume of food production from private plots and private farms by 5-7 percent; to purchase and lease 100,000 head of pedigree cattle; purchase modern efficient equipment for the creation of 130,000 cattle stations; and to create 2,550 rural cooperatives (550 processing cooperatives, 1000 service cooperatives, and 1000 credit cooperatives). Periodic progress reports in reaching these goals have been available at the website of the Ministry of Agriculture, as well as in the specialized agricultural press.

APPENDIX A

The data set for this paper come from a cross-sectional survey of nine regions and 900 rural households in 2006, funded by the National Council for Eurasian and East European Research. The nine regions stretch the entire length of Russia from west to east and include: Altai krai, Amur oblast, Krasnodar krai, Voronezh oblast, Moscow oblast, Leningrad oblast, Kurgan oblast, Krasnoyarsk krai, and the Republic of Tatarstan. The pretest was conducted in Kaluga oblast in the first half of 2006. Some of the regions are agriculturally rich—Krasnodar, Voronezh, Tatarstan—while in others agriculture is secondary to industry, processing, or mining (Altai, Amur, Krasnoyarsk). Altogether, the survey was conducted in 10 raions, totalling 34 villages. A total of 100 households sampled in each region.

The regions were selected specifically for geographical diversity—the intent was to have a sample region from each federal okrug, and to add an ethnic component through the inclusion of Tatarstan. One person from each household was interviewed, although information was collected about other members of the household as well. The questionnaire was comprised of more than 100 questions on various economic, political, social, and demographic aspects; and there was a special section devoted to questions on land relations. The villages were located from a range of 5-60 kilometers from a raion center.

Interviews were conducted person-to-person by a research team from the Institute on Socio-Economic Studies of the Population (Russian Academy of Sciences, Moscow), with a refusal rate of less than five percent. Households to be surveyed were selected

from the household list of permanent residents in each village, a list that is kept by the village administration for all households within its jurisdiction. This list is updated annually and contains demographic and social characteristics of the households in the village. For previous surveys conducted by the author and his Russian colleagues, households were selected randomly, a method that had the benefit of reflecting the demographic profile of rural Russia but which had the disadvantage of over-weighting respondents who were female and older. The consequence of this method led, perhaps, to an understatement of rural change and the types of change that were occurring. In order to compensate, the 2006 survey used a stratified sample in order to lessen the presence of older females and to capture more of the economically active cohort. Thus, for example, in a 2001 survey of 800 households (also funded by NCEEER), 67 percent of the sample was comprised of women, 42 percent were aged 60 and over, and 45 percent were retired. In contrast, in the 2006 sample, only 52 percent were female, 26 percent were aged 60 or over, and 29 percent were retired.

Table 1: Mean Characteristics of Households that Did Not Expand Real Land Holdings

	<i>No food sales</i> (n=176)	<i>Low food sales</i> (n=132)	<i>Moderate food sales</i> (n=105)	<i>High food sales</i> (n=180)
<i>Household Income</i>				
Total household monetary income (in rubles, monthly)	11,272	9,444	13,711	23,551
Household income from sale of agricultural production	0	932	3,218	12,411
Household income from business activities (in rubles, monthly)	852	634	26	1,042
<i>Socio-demographic factors</i>				
Number of household members	2.6	2.9	3.6	4.0
Weighted household labor	1.8	2.2	2.7	2.9
Assistance from friends	2.8	2.8	3.0	3.3
Assistance from neighbors	4.0	4.2	4.5	3.8
Age of husband	53	51	45	45
Age of wife	56	52	42	43
<i>Productive capital</i>				
Number of cows	.10	.23	1.1	2.4
Number of sheep	.81	1.03	3.5	2.3
Number of pigs	.06	.52	1.4	4.0
Number of autos	.38	.44	.65	.72
Number of trucks	.02	.03	.10	.18
Number of mechanical ag tools	.09	.10	.27	.52
Land holdings (excluding land shares), in hectares	.16	.22	.31	1.4
<i>Food Production</i>				
Meat production (kg)	80	142	350	856
Potato production (kg)	663	1,493	2,199	2,871
Vegetable production (kg)	274	374	516	2,610

Notes: Numbers have been rounded. R28=\$1.

Weighted household labor: is based on a weighted scale as follows: 0 for persons aged less than 8 years of age or more than 80; 0.25 for persons aged 8–11 and 75–79; 0.50 for persons aged 12–14 and 71–74; 0.75 for persons aged 15–16 and 66–70; and 1.0 for persons aged 17–65. These figures were then summed for each household. The result is a scale of household labor: 0–1.74, 1.75–2.74, 2.75–3.74, 3.75–4.74, and 4.75+. Hence, the higher the mean, the greater the availability of household labor there is in a household.

Assistance from friends: is reported number of friends who offer different kinds of assistance.

Assistance from neighbors: is reported number of neighbors who offer different kinds of assistance.

Food production: is annual; not all households produced each commodity.

Source: Author's survey data, 2006.

Table 2: Linear Regression of Household Characteristics on Food Sales for Households that Did Not Increase Land Holdings

	<i>Unstandardized coefficients</i>	<i>Standard error</i>	<i>Beta</i>	<i>T</i>	<i>Sig.</i>
Constant	-2638.2	1155.2	--	-2.28	.02
<i>Household income</i>					
Total household monetary income	162.0	.022	.324	7.44	<.01
Household income from business activities	-128.0	.030	-.161	-4.26	<.01
<i>Socio-demographic factors</i>					
Number of household members	-253.1	203.4	-.072	-1.24	.21
Number of pensioners	-339.0	235.9	-.062	-1.43	.15
Weighted household labor	190.5	247.6	.043	.769	.44
Assistance from friends	66.5	52.8	.042	1.25	.20
Assistance from neighbors	-42.5	55.9	-.024	-.760	.44
Age of husband	29.1	35.7	.093	.815	.41
Age of wife	1.3	34.9	.004	.037	.97
<i>Productive capital</i>					
Number of cows	1115.4	95.5	.390	11.6	<.01
Number of sheep	42.7	26.9	.047	1.58	.11
Number of pigs	978.6	72.1	.469	13.5	<.01
Number of autos	-220.5	308.6	-.024	-.715	.47
Number of trucks	95.7	607.6	-.005	-.158	.87
Land holdings	2317.0	1453.7	.049	1.59	.11

R Square=.75

Adjusted R-squared=.74

Anova F=58.6

P=<.01

Table 3: Mean Characteristics of Households that Expanded Real Land Holdings

	<i>No food sales</i> (n=100)	<i>Low food sales</i> (n=178)	<i>Moderate food sales</i> (n=88)	<i>High food sales</i> (n=153)
<i>Income</i>				
Total household monetary income (in rubles, monthly)	16,010	10,988	14,826	24,628
Household income from sale of agricultural production	0	1,675	5,290	13,333
Household income from business activities (in rubles, monthly)	2,946	262	278	977
<i>Socio-demographic factors</i>				
Number of household members	3.0	3.4	3.5	4.0
Weighted household labor	2.4	2.5	2.7	3.0
Assistance from friends	2.8	3.0	3.3	3.4
Assistance from neighbors	3.4	4.1	4.5	3.8
Age of husband	46	46	46	44
Age of wife	45	44	43	43
<i>Productive capital</i>				
Number of cows	.65	.48	1.5	2.5
Number of sheep	.86	2.9	4.8	2.6
Number of pigs	.49	.92	1.7	4.3
Number of autos	.67	.53	.75	.74
Number of trucks	.20	.05	.10	.19
Number of mechanical ag tools	.43	.15	.33	.56
Land increase (excluding land shares), in hectares	.19	.28	.20	1.5
<i>Food Production</i>				
Meat production (kg)	267	236	415	903
Potato production (kg)	1,239	1,724	2,839	3,131
Vegetable production (kg)	543	442	1,123	2,862

Notes: Numbers have been rounded. R28=\$1.

Weighted household labor: is based on a weighted scale as follows: 0 for persons aged less than 8 years of age or more than 80; 0.25 for persons aged 8–11 and 75–79; 0.50 for persons aged 12–14 and 71–74; 0.75 for persons aged 15–16 and 66–70; and 1.0 for persons aged 17–65. These figures were then summed for each household. The result is a scale of household labor: 0–1.74, 1.75–2.74, 2.75–3.74, 3.75–4.74, and 4.75+. Hence, the higher the mean, the greater the availability of household labor there is in a household.

Assistance from friends: is reported number of friends who offer different kinds of assistance.

Assistance from neighbors: is reported number of neighbors who offer different kinds of assistance.

Land increase: in the table, three cases are deleted for the no food sales category because they distorted the results. The mean increase with all cases in the category is 3.7 hectares, due to the fact that one household increased land holdings by 300 hectares and another by 43 hectares. The reported .19 hectare increase is for 97 of the 100 cases in the category.

Food production: is annual; not all households produced each commodity.

Source: Author's survey data, 2006.

Table 4: Linear Regression of Household Characteristics on Food Sales for Households that Increased Land Holdings

	<i>Unstandardized coefficients</i>	<i>Standard error</i>	<i>Beta</i>	<i>T</i>	<i>Sig.</i>
Constant	-1787.9	1757.0	--	-1.01	.31
<i>Household income</i>					
Total household monetary income	387.0	.030	.649	13.03	<.01
Household income from business activities	-.495	.054	-.492	-9.09	<.01
<i>Socio-demographic factors</i>					
Number of household members	505.4	340.1	.100	1.48	.13
Number of pensioners	-747.8	368.0	-.092	-2.03	.04
Weighted household labor	-1037.3	420.7	-.152	-2.46	.01
Assistance from friends	103.7	117.4	.035	.884	.37
Assistance from neighbors	9.5	76.6	.005	.124	.90
Age of husband	-75.3	76.5	-.139	-.984	.32
Age of wife	115.6	73.4	.22	1.57	.11
<i>Productive capital</i>					
Number of cows	374.4	133.1	.137	2.81	<.01
Number of sheep	42.1	20.0	.079	2.10	.03
Number of pigs	532.8	86.2	.279	6.17	<.01
Number of autos	-1317.7	532.3	-.095	2.47	.01
Number of trucks	-236.6	687	-.022	-.344	.73
Land holdings	13.1	27.2	.032	.484	.62

R Square=.53

Adjusted R-squared=.51

Anova F=26.6

P<.01

Table 5: Linear Regression of Household Characteristics on Food Sales for All Households

	<i>Unstandardized coefficients</i>	<i>Standard error</i>	<i>Beta</i>	<i>T</i>	<i>Sig.</i>
Constant	-1690.1	1164.8	--	-1.45	.14
<i>Household income</i>					
Total household monetary income	.336	.021	.593	16.3	<.01
Household income from business activities	-.384	.032	-.404	-11.9	<.01
<i>Socio-demographic factors</i>					
Number of household members	172.7	219.2	.039	.788	.43
Number of pensioners	-825.6	243.6	-.117	-3.38	<.01
Weighted household labor	-522.8	265.8	-.090	-1.96	.05
Assistance from friends	18.1	65.2	.008	.278	.78
Assistance from neighbors	.772	53.4	.000	.014	.98
Age of husband	-28.1	44.0	-.065	-.638	.52
Age of wife	59.7	42.5	.142	1.40	.16
<i>Productive capital</i>					
Number of cows	569.5	90.6	.202	6.28	<.01
Number of sheep	46.8	15.9	.078	2.93	<.01
Number of pigs	584.8	61.7	.294	9.46	<.01
Number of autos	-848.8	340.0	-.071	-2.49	.01
Number of trucks	-113.8	504.3	-.009	-.226	.82
Land increase	-18.5	20.4	-.037	-.907	.36

R Square=.55

Adjusted R-squared=.54

Anova F=55.4

P<.01

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