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Rural Household Saving Determinants in Kazakhstan

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Abstract

This paper provides an analysis of microeconomic factors that explain the savings behavior of rural households in Kazakhstan based on unique survey data. Rural household savings are estimated in order to test household responses to income, monetary or non-monetary wealth, and some socio-economic variables. Based on the analysis results, we conclude that although some rural households save in the form of financial assets, most households prefer to save in animal stock. It is explainable by the reluctance of commercial banks – the only source of financial services for the rural population in Kazakhstan – to deal with low-income rural clientele. The conclusions suggest that the government should revise its policies regarding Rural Credit Partnerships (RCPs), making them full-fledged cooperative institutions for savings and loans.

Introduction

In transition economies with underdeveloped credit and insurance markets in rural areas, household savings are a crucial determinant of welfare. To be able to smooth out unexpected variations in their income, rural households resort to savings,

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which are usually a means to accumulate assets in the absence of formal financial markets.

Sameroynina (2005) studied saving behavior among households in Russia and deduced that the marginal propensity to save is positively correlated to the income level. Lahiri (1989) in a study on savings in Asian countries also showed a positive correlation between the rate of growth of personal disposable income and private savings. These results are supported by Schrooten and Stephan (2003), who showed that per capita income in Eastern European transition economies positively influences savings. These findings are applicable for the agricultural sector in transition economies, as income in rural areas is inherently uncertain, especially in activities related to agricultural production. Deaton (1991) emphasizes that many uncontrollable causes, such as weather, pests, disease, and fires, make yields uncertain. In addition, variability of agricultural prices in an unstable transition economy can generate fluctuations in farmers' incomes even when output is stable.

Household income is one of the determinants of household savings. A number of authors used as determinants of saving behavior non-financial assets, such as real estate, cars, durable goods, and animal stock. Kulikov et al. (2004) concluded that there is no significant effect of ownership of real estate on saving, while ownership of durable consumer goods reduces household savings. Nevertheless, if wealth is in the form of productive assets, such as farmland, it can have a positive impact on saving. In other words, larger land plots provide farmers with higher benefits and, as a result, ensure greater opportunities for earnings.

The type of work determines the regularity of income. Denizer et al. (2000) in his study of households from Bulgaria, Hungary, and Poland from the mid-1990s showed that saving is a positive function of income, but is unaffected by the source of income.

Education is a factor that has an effect on asset accumulation (Browning and Lusardi, 1996). Education affects savings performance by influencing the level of income and the options for asset accumulation available to the individual. Bernheim and Garrett (1996) showed that saving rates increase with education, and at the same time, the study emphasized that low-income individuals have less access to financial education.

Among studies that consider credit as a factor influencing savings, some support the theoretical view that access to credit reduces the incentives to save: current savers may reduce their savings because future needs can be financed more easily through credit. However, in his empirical study Rogg (2000) showed that savings are positively related to credit access.

Micro-econometric analysis helps to assess the importance of various economic factors and household characteristics for saving decisions. Such analyses may also help shed light on the motives underlying the decision to save. This paper presents

a micro-econometric analysis of the determinants of the rural household saving decision and factors determining the saving goals of the rural population in Kazakhstan based on data collected by a 2011 survey in Pavlodar region of North Kazakhstan. One reason for the limited literature on the determinants of rural household saving in Kazakhstan is the lack of appropriate data, in particular, data sets containing information on household income, savings, and wealth. Such datasets are not readily available in most transition countries, including Kazakhstan. Therefore, this 2011 survey can be considered unique.

The paper is aimed to contribute to the understanding on rural household saving behavior in at least three ways. First, it is a first study to estimate rural household saving for Kazakhstan using primary data and econometric tools; overall, only a small number of studies have dealt with saving behavior of rural households in transition economies. Second, we attempt to assess ways in which rural households in Kazakhstan prefer to save. Third, we seek to assess the effect on household saving of variables that capture its purposes to save.

The rest of this paper is structured as follows. The following section presents an overview of the structure of agricultural sector in Kazakhstan. Then we describe the survey, define the variables, and provide summary statistics. This is followed by the results of our micro-econometric analysis of the saving behavior of rural households in Kazakhstan. The article concludes with some preliminary conclusions and recommendations.

Structure of agricultural sector in Kazakhstan

Currently in Kazakhstan, as in most other CIS countries, there are three types of agricultural producers. Two of the farm types are registered legal bodies – the commercially oriented corporate farms and individual (family) farms. The third farm type are the semi-commercial subsidiary household plots (SSHs), which are not formally registered and are classified as physical persons. In 2009, there were 35 state-owned corporate farms, about five thousand private corporate farms, and 170,000 individual (family) farms. The number of SSHs has always varied around two million, close to the total number of rural households in the country. SSHs, by their nature, produce for family consumption, but in fact, most of these producers operate as commercial farms. For the overwhelming majority of the rural population, the SSH is the main, if not the only, source of income.

SSHs produce a large part of agricultural output. Table 1 breaks down agricultural production by type of producer and highlights, in particular, the growth of individual farms in crop production (from 3% in 1995 to 42% in 2002) and the growth of subsidiary household plots in livestock production (from 66% in 1995 to

87% in 2002). Grain production in Kazakhstan is dominated by large corporate and individual farms, whereas vegetables, fruits, livestock, and dairy production are dominated either by small individual farms or more often by SSHs.

Table 1: Structure of agricultural production by farm type, percent

	1995	1999	2002
Crop production			
Corporate farms	69	46	33
Individual farms	3	26	42
Subsidiary household plots	28	29	26
Livestock production			
Corporate farms	32	10	8
Individual farms	2	5	5
Subsidiary household plots	66	85	87

Source: Agency of Statistics of the Republic of Kazakhstan. www.stat.kz and own calculations.

Thus, SSHs are the main suppliers of a number of essential agricultural commodities in Kazakhstan's domestic market. However, as unregistered physical persons, SSHs are excluded from state support programs, most of which are geared to the needs of large-scale producers. Even small-scale family farms – registered legal bodies – have limited access to preferential state credit lines and other support programs. On the other hand, the unregistered SSHs in many cases are large enough to be considered as family farms, but they are not motivated to register and change their status. The basic reason is that they do not believe they would get any benefits from registering as a legal body, while certainly becoming subject to heavy controls by state agencies, tax inspectors, and other bureaucratic authorities.

Data sources and description of variables

The majority of Kazakhstan's rural population earn their living from small-scale household plots (SSHs), which are not registered as legal entities. Due to the poorly developed micro-credit system in rural areas and the absence of commercial bank branches, the impact of formal financial institutions (FIs) on SSH performance is largely unknown. Therefore, we focus on savings instead of credit; it may be argued that individuals should be able to save their way out of credit

constraints. However, another issue arises: people need accessible saving opportunities to save securely.

The main objective of this study is to explore the relationships between the socio-economic characteristics of rural households and their saving behavior.

The data set

We investigated how and to what extent socio-economic factors affect the probability to save in financial assets (deposit accounts and cash) in the presence of an alternative saving channel, namely saving in animal stock. This was done by carrying out an econometric analysis based on a static model with cross-sectional data for a specific year (2011).

The target population of the study included rural households in Pavlodar region of North Kazakhstan regardless of occupation, educational level, and other socio-economic indicators. The data were collected from 38 villages in eight rural districts in Pavlodar region. The total sample size included 704 respondents.

The cross-sectional primary data relating to the socio-economic particulars of the selected households and other data relating to their saving behavior have been collected by means of questionnaires. The questionnaire consists of 32 questions aimed to clarify how rural people save in different ways. Respondents were asked to provide both social and economic data, such as average annual income, the purposes of saving, employment, assets owned, access to the Internet, as well as gender, age, family size, and education.

Sample description

The objective of this study is to analyze the household saving behavior given the effects of various socio-economic factors. The factors whose impact on saving will be examined in this study are education, family size, income, age, readiness to deal with formal FIs, and ownership of a private house or a private car.

Education can be defined as acquiring skills, which should help people to reach higher standards of living. Education is a process of getting new knowledge, acquiring specific desirable qualities, and ability to independently process information for making better decisions. Table 2 shows that respondents who grew up in Soviet time (the age group of 31-50 and older) had less opportunities to get higher education (about 15% of respondents), while rural population in the age group of 21-30, who grew up after the collapse of the Soviet Union, have had more opportunities to get higher education (about 34%). Kazakhstan's current education policy sets special state quotas and state grants for young people from rural areas, which facilitate their access to universities and colleges. Additionally, not only private institutions of higher learning, but also state institutions provide education on a commercial basis, thus increasing the available options.

Table 2: Educational attainment by age group, percent

Level of education	Age group				
	Under 20	21-30	31-50	51-68	Older than 68
Primary school	20.00	0.00	0.72	2.84	20.00
Secondary school	40.00	28.47	42.79	58.87	80.00
Vocational school	40.00	37.96	37.74	24.11	0.00
Higher education	0.00	33.58	18.51	12.77	0.00
Post-graduate	0.00	0.00	0.24	1.42	0.00
Total	100.00	100.00	100.00	100.00	100.00

Source: Own survey, 2011

The surveys provides evidence of an inverse U-shaped age profile of income level: middle-aged adults report higher income than the younger and older cohorts (Figure 1). The initial increase of income with age may be related to accumulation of experience and greater efforts to keep a job, especially in civil services, where income is relatively high and the rotation level is very low. On the other hand, this appears to be a worldwide problem with the younger generation in rural areas: the young people are reluctant to work in agriculture because of low income, and the better-educated young people, who can potentially command higher income, prefer to work in urban areas.

**Figure 1: Average annual income by age group, million KZT**
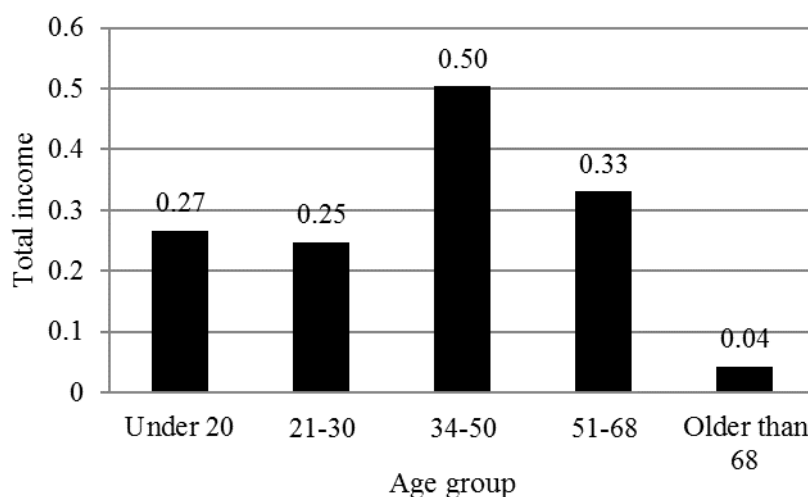
Source: Own survey, 2011

Table 3: Educational attainment by type of occupation, percent

Level of education	Occupation							
	Ag Sector	Non-ag sector	Civil servant	SSH	Self-employed (non-ag)	Student	Retiree	Unemployed
Primary	1.68	0.59	0.00	0.50	2.56	0.0	11.11	3.23
Secondary	52.10	46.15	14.29	51.00	38.46	50.0	62.96	32.26
Vocational	36.97	34.91	41.90	31.50	48.72	28.57	14.81	25.81
Higher	9.24	17.75	43.81	16.5	7.69	21.43	11.11	38.71
Post-grad.	0.00	0.59	0.00	0.50	2.56	0.0	0.00	0.0
Total	100	100	100	100	100	100	100	100

Source: Own survey, 2011

Table 3 shows that there are no significant differences in the composition of educational level by type of employment, excluding civil service. All forms of occupation in rural areas are represented mostly by people with secondary and vocational education, and the proportion of people with higher education is relatively high only among civil servants. Due to lower standards of living and outdated technologies used in agricultural production (which do not require higher qualifications), well-educated people cannot find highly paid jobs in rural areas.

Figure 2: Shares of saving options, percent (n=704): black bars include mixed forms of saving; shaded bars exclude mixed forms of saving
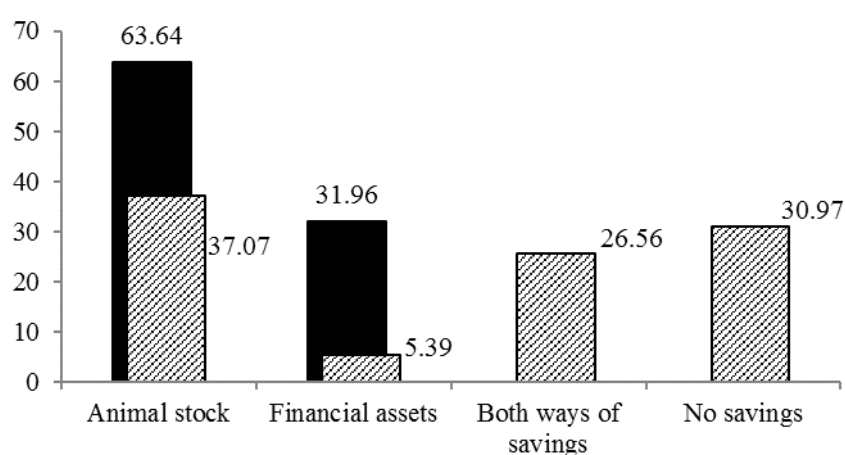
Source: Own survey, 2011

Figure 2 depicts the proportions of respondents who choose different saving options. The majority of respondents (448 respondents, or 64%) save in animal stock (black bar in Figure 2). More than half of these respondents also save in financial assets, as only 37% save exclusively in animal stock, foregoing the option of saving in financial assets (shaded bar in Figure 2). At the same time, 225 respondents (32%) save in financial assets, but only 5.4% save exclusively in financial assets, without any savings in animal stock (black and shaded bars respectively in Figure 2). About 27% of respondents use both saving options, namely, save in animal stock and financial assets simultaneously, whereas 31% of respondents indicated that they made no savings either in animal stock or in financial assets (last two shaded bars in Figure 2)..

Methodology

Two hypotheses were formulated to determine to what extent various factors affect a decision of rural households in Kazakhstan to save either in animal stock or in financial assets.

Hypothesis 1: Saving in animal stock is the most preferred form of savings in rural Kazakhstan. As income increases, the preferences of the rural people shift from saving in animal stock to saving in financial assets.

Hypothesis 2: Forms of saving differ for different saving purposes. Saving in animal stock is preferred over saving in financial assets when the purpose of saving is investment; saving in financial assets is preferred over saving in animal stock when the purpose of saving is to gain access to formal financial services.

These hypotheses are tested using a binomial probit model and a bivariate probit model.

Two binomial probit models are estimated separately to identify the determinants of the two response variables "saving in animal stock" and "saving in financial assets". The standard format for the binomial probit models is as follows:

$$Y = X \, \beta + \varepsilon,$$

where Y is the respondent's saving choice; X is a vector of observable independent variables; β is the vector of coefficients to be estimated, and ε is the error term. Here $Y = 0$ if the respondent does not save at all (either in animal stock or in financial assets) and $Y = 1$ if the respondent chooses to save in animal stock or alternatively in financial assets (Sutherland, 2010).

In our study, we estimate two independent binomial probit models. In the first model, Y is the respondent's binary choice with regard to saving in animal stock;

in the second model, the dependent variable Y represents the alternative choice of saving in financial assets.

otherwise,A bivariate probit model is a natural extension of the binomial probit model that allows more than one equation, with correlated error terms. Using this model for our analysis we assume that the two binary response variables – saving in animal stock and saving in financial assets – vary jointly. We estimate the coefficients that explain their joint distribution. The general specification for a two-equation model with the same set of independent variables would be (Green 1993)

$$Y_1^* = \mathbf{X}\,\boldsymbol{\beta}_1 + \varepsilon_1, \quad Y_1 = 1 \text{ if } Y_1^* > 0, \quad Y_1 = 0 \text{ otherwise,}$$

$$Y_2^* = \mathbf{X}\,\boldsymbol{\beta}_2 + \varepsilon_2, \quad Y_2 = 1 \text{ if } Y_2^* > 0, \quad Y_2 = 0 \text{ otherwise.}$$

In this model, Y_1 stands for saving in animal stock and Y_2 for saving in financial assets. With two binary variables, four possible pairs of outcomes may be observed. We have two binary dependent variables (Y_1, Y_2), where $Y_1 = 1$ if the respondent saves in animal stock and $Y_2 = 1$ if the respondent saves in financial assets. These two dependent variables are modeled jointly by the two equations above. Each pair of dependent variables for respondent i has one of four possible outcomes:

$(Y_{1i} = 1, Y_{2i} = 1)$ – saving in both animal stock and financial assets;
$(Y_{1i} = 1, Y_{2i} = 0)$ – saving in animal stock but not in financial assets;
$(Y_{1i} = 0, Y_{2i} = 1)$ – saving in financial assets but not in animal stock;
$(Y_{1i} = 0, Y_{2i} = 0)$ – no savings in either asset.

In this analysis, we assume that, in general, all respondents are willing to save. The estimated regression coefficients are difficult to interpret directly, because a formal probit model only allows estimation of ranges of probabilities and marginal effects (Green 1993). Therefore, we compute the marginal effects of the explanatory variables on the probability of making savings in animal stock and the probability of making savings in financial assets.

Results for Hypothesis 1
For Hypothesis 1, we used seven independent variables (predictors): HOUSE, CAR, CREDIT, INCOME, AGE, EDUCATION, and FAMILY:

- HOUSE is a binary variable that refers to ownership of the house (i.e., a privately owned house that could be sold, not a rented house): own a private house = 1, do not own a house = 0.

- CAR is a binary variable that refers to ownership of a car: own a car = 1, do not own a car = 0.
- CREDIT is a binary variable that refers to the respondent's wish to apply for credit from a formal financial institution: wish to get credit = 1, do not wish to get credit = 0.
- INCOME is a continuous variable that measures the respondent's total income from all available sources, in million KZT.[2]
- AGE – a discrete variable grouped into five levels: "1" stands for respondents younger than 20 years old; "2" for respondents between 21 to 30 years old; "3" for respondents between 31 to 50; "4" for respondents between 51 to 68; "5" for respondents older than 68 years.
- EDUCATION – a discrete variable grouped into five levels: primary school = 1, secondary school = 2, vocational school = 3, higher education = 4, postgraduate studies = 5.
- FAMILY – a continuous variable that refers to family size (the number of family members).

Binomial probit models

Two binomial probit models are estimated independently, one for saving in animal stock and the other for saving in financial assets. Each model as a whole is statistically significant, that is, it fits significantly better than the model without predictors.

In probit models, a positive estimated coefficient means that an increase in the predictor leads to an increase in the predicted probability. A negative coefficient means that an increase in the predictor leads to a decrease in the predicted probability.

Table 4 presents the estimation results for the two models. The left-hand part of the table correspond to the model where the dependent variable is the choice to invest in animal stock. Of seven explanatory variables in this model, only two variables INCOME and EDUCATION are not statistically significant. However, the coefficient of INCOME has a positive sign, which means that an increase in income would tend to increase the probability to save in animal stock; the coefficient of EDUCATION is negative, meaning that higher educational attainment would tend to lower the probability to save in animal stock. The coefficients of the other five variables are statistically significant (at various levels) and have a positive sign. Specifically, ownership of a private house or a car, readiness to apply for credit in formal financial institutions, being older, or having

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2 KZT stands for Kazakhstan Tenge, the national currency of Kazakhstan (US$1 = 150 KZT in 2011).

a larger family – all increase the probability that the rural household chooses to save in animal stock.

The right-hand part in Table 4 presents the estimation results for a model where the dependent variable is the choice to invest in financial assets (bank deposits or cash). The coefficients of EDUCATION and FAMILY are not significant in this model, but both have a positive sign. This means that increases in educational attainment and in family size tend to increase the probability of saving in financial assets. The other five coefficients are significant at various levels and have a positive sign. The corresponding variables thus have a statistically significant positive effect on the probability of saving in financial assets.

**Table 4: Binomial probit results for saving in animal stock
and in financial assets separately (2011 survey)**

	Saving in animal stock			Saving in financial assets		
	Coefficient	Marginal effect	Signif. level	Coefficient	Marginal effect	Signif. level
HOUSE	0.565***	0.206	0.00	0.356***	0.126	0.001
CAR	0.5713***	0.194	0.00	0.442***	0.164	0.000
CREDIT	0.558***	0.208	0.00	0.395***	0.137	0.000
INCOME	0.015	0.006	0.56	0.285*	0.101	0.051
AGE	0.169*	0.062	0.03	0.176*	0.063	0.025
EDUCATION	-0.036	-0.013	0.58	0.065	0.023	0.317
FAMILY	0.1439***	0.052	0.00	0.036	0.012	0.254
_constant	-1.305		0.00	-1.941		0.000
Prob > χ^2 = 0.0000 Log likelihood = -402.2366 Pseudo R^2 = 0.1283				Prob > χ^2 = 0.0000 Log likelihood = -410.26445 Pseudo R^2 = 0.0699		
Number of observations: 448				Number of observations: 225		

Note: *** - significant at a level of 0.1%; ** - significant at a level of 1%; * - significant at a level of 5%

Estimated probit coefficients only give the direction of the average effect and the significance, but not the magnitude. To be able to see how much the probability of the outcome variable changes with changes in the value of the explanatory variables, one needs to calculate the marginal effects. Marginal effects show the percentage change in the predicted probability that Y = 1 for a unit change in the independent variable (Hilmer et al. 2014). The marginal effects for both models – saving in animal stock and saving in financial assets – are presented in Table 4.

Marginal effects calculated for the binomial probit model that describes the choice to invest in animal stock indicate that an increase of family size by one family member increases the probability of saving in animal stock by 5.2%; owning a private house or a car increases the probability of savings in animal stock by 20.6% and 19.4%, respectively; being in a group of respondents who would like to apply for formal credit increases the probability to save in animal stock by 20.8%; an increase of one year in respondent's age increases the probability of choosing this saving alternative by 6.2%. The marginal effects of income and education in this model are not statistically significant.

Marginal effects calculated for the binomial probit model that describes the choice to invest in financial assets show that owning a private house or a car increases the probability of saving in financial assets by 12.6% and 16.4%, respectively; wishing to apply for credit increases the probability to save in financial assets by 13.7%; age has almost the same marginal effect on the probability of saving in financial assets as for savings in animal stock – 6.3%. An increase of income by one million KZT increases the probability of saving in financial assets by 10.1%, but this estimate has borderline statistical significance (significance level 0.055). The marginal effect of education remains statistically not significant, as in the previous model

Bivariate probit model

Our two possible outcomes – savings in animal stock and savings in financial assets – are not mutually exclusive and we can have such outcomes as making savings of both forms simultaneously or not making any savings. A bivariate probit model is estimated to allow for this simultaneity and error term interaction. This model estimates two binary dependent variables that vary jointly, so that there is a correlation between the error terms in the two equations (Sutherland, 2010). With two binary variables, four possible outcomes may be observed. The model as a whole is statistically significant, i.e., it fits the data significantly better than the model without predictors (Wald $\chi^2 = 142.54$, p < 0.0000) (Greene, 1993).

As one can see from Table 5, there are no major differences between the results of the binomial probit models (uncorrelated error terms) and the bivariate probit model (correlated error terms). The same variables as before are statistically not significant in these models and the same variables are statistically significant with positive estimated coefficients. The conclusions made for the binomial probit models also apply to the results of the bivariate probit model.

The marginal effects after the bivariate probit show how the probabilities of either making savings in animal stock ($Y_1=1$, $Y_2=0$) or making savings in financial assets ($Y_1=0$, $Y_2=1$) change as an explanatory variable changes from 0 to 1 in the

case of categorical variables or by one unit in the case of continuous variables, after controlling for the other variables in the model.

**Table 5: Bivariate probit results for saving in animal stock
or in financial assets jointly (2011 survey)**

	Bivariate probit coefficients for $Y_{1i}=1$: Saving in animal stock			Bivariate probit coefficients for $Y_{2i}=1$: Saving in financial assets		
	Coefficient	Marginal effect	Signif. level	Coefficient	Marginal effect	Signif. level
HOUSE	0.566***	0.207	0.000	0.355***	0.126	0.001
CAR	0.553***	0.188	0.000	0.446***	0.166	0.000
CREDIT	0.545***	0.203	0.000	0.397***	0.138	0.000
INCOME	0.016	0.115	0.558	0.320*	0.005	0.024
AGE	0.168*	0.062	0.031	0.173*	0.062	0.027
EDUCATION	-0.04	-0.015	0.539	0.068	0.024	0.288
FAMILY	0.148***	0.054	0.000	0.033	0.012	0.283
_cons	-1.294		0	-1.943		0

Likelihood-ratio test of ρ=0: $\chi^2(1) = 31.9508$ $\text{Prob} > \chi^2 = 0.0000$
Number of observations : 704

Note: *** - significant at a level of 0.1%; ** - significant at a level of 1%; * - significant at a level of 5%.

Although the marginal affects calculated from the bivariate probit estimates are slightly different from the marginal effects calculated from the binomial probit models, the tendency is the same. The difference in values can be explained by the nature of the bivariate probit model, which considers four combinations of outcomes of two simultaneous dependent variables: saving in animal stock, saving in financial assets, saving in both forms, no saving at all.

Results for Hypothesis 2
For Hypothesis 2, the explanatory variables are the various purposes of saving, which are expected to influence the choice of the particular form to save. Three binary independent variables are used in these models: INVESTMENT, PRIVATE, and FINANCIAL.
- INVESTMENT – a variable that includes saving for equipment purchases, for education (investment in human capital), and for house renovations and

improvements (INVESTMENT = 1 if any of these purposes are mentioned; otherwise INVESTMENT = 0).

- PRIVATE – a variable that includes saving for personal purposes, such as a wedding, a funeral, or an emergency (PRIVATE = 1 if any of these purposes are mentioned; otherwise PRIVATE = 0).
- FINANCIAL – a variable that includes saving to repay a loan (interest and principal) or to qualify for a credit application (FINANCIAL = 1 if any of these purposes are mentioned; otherwise FINANCIAL = 0).

For Hypothesis 2 we adopted the same approach as for the Hypothesis 1. First we estimate two binomial probit models and then a bivariate probit model.

Binomial probit models

Two binomial probit models are estimated independently, one for the choice to save in animal stock and the other for the choice to save in financial assets. The model for choosing to save in animal stock as a whole is statistically significant, that is, it fits significantly better than the model without predictors. The model for choosing to save in financial assets is not statistically significant. The estimated coefficients are positive for both models.

**Table 6. Binomial probit estimation of choices
to save for various purposes (2011 survey)**

	Saving in animal stock			Saving in financial assets		
	Coef.	Marginal effect	Signif. level	Coef.	Marginal effect	Signif. level
INVESTMENT	0.482***	0.179	0.000	0.133	.0477	0.205
PRIVATE	0.337***	0.124	0.002	0.141	.0507	0.194
FINANCIAL	0.084	0.030	0.579	0.101	.0369	0.504
_cons	-0.037		0.705	-0.610		0.000
	Prob > χ^2 = 0.0000 Log likelihood = -449.17935 Pseudo R^2 = 0.0266			Prob > χ^2 = 0.4710 Log likelihood = -439.84281 Pseudo R^2 = 0.0029		
	Number of observations: 448			Number of observations: 225		

Note: *** - significant at a level of 0.1%; ** - significant at a level of 1%; * - significant at a level of 5%.

Table 6 shows that the coefficients of the two variables INVESTMENT and PRIVATE are statistically significant and positively affect the probability to save in animal stock; the coefficient of FINANCIAL is also positive, but it is not

statistically significant. In other words, if the respondent's purpose is to save toward buying equipment, paying for education, or making renovations (invest in physical and human capital), the probability that they would save in animal stock increases. The same result holds when the purpose of saving is to meet various personal needs. Table 6 also shows the marginal effects, i.e., the percentage change in the probability to save in animal stock as each explanatory variables increases by one unit, changing from 0 (no) to 1 (yes). Thus, if the respondent's purpose is to save for investment in physical or human capital (INVESTMENT = 1), the probability to save in animal stock increases by 17.9% relative to INVESTMENT = 0; if the aim is to save for personal needs (PRIVATE = 1), the probability to save in animal stock increases by 12.5% relative to PRIVATE = 0. The marginal effects calculated for saving in financial assets are not statistically significant.

Bivariate probit model

The model as a whole is statistically significant, i.e., it fits the data significantly better than the model without predictors (Wald χ^2 = 23.34, p < 0.0000). The estimation results for the two forms of saving (saving in animal stock and saving in financial assets) are presented in Table 7.

Table 7. Bivariate probit estimation of choices
to save for various purposes (2011 survey)

	Saving in animal stock ($Y_{1i} = 1$)			Saving in financial assets ($Y_{2i} = 1$)		
	Coef.	Marginal effect	Signif. level	Coef.	Marginal effect.	Signif. level
INVESTMENT	0.469***	0.095	0.000	0.143	-0.028	0.175
PRIVATE	0.319***	0.048	0.003	0.153	-0.014	0.159
FINANCIAL	0.086	-0.003	0.569	0.100	0.0014	0.511
_cons	-0.026		0.787	-0.620		0.000

Likelihood-ratio test of ρ=0: χ^2 (1) = 55.0675   Prob > χ^2 = 0.0000
Number of observations: 704

Note: *** - significant at a level of 0.1%; ** - significant at a level of 1%; * - significant at a level of 5%.

There are no major differences between the estimated coefficients of the two binomial probit models (Table 6) and the bivariate probit model (Table 7). Conclusions made for the binomial models also apply to the coefficients of the bivariate probit model. Yet the values and signs of the marginal effects calculated for the bivariate probit model are different from the binomial probit models.

Actual and predicted proportions of outcomes in Table 8 show that the percentage of those who save exclusively in financial assets is very low (6.0% predicted, 5.4% actual). This is understandable in view of inadequate development of the financial markets in Kazakhstan, where rural people have limited access to formal financial services. They have no financial education and show little trust toward official institutions, which explains their reluctance to save in financial assets.

The proportions of rural households saving exclusively in animal stock is much higher (39.5% predicted, 37% actual). The predicted proportion of rural population who choose both types of savings is 26.1% and actual number equals to 26.6%.

The predicted percentage of those without any savings is 28.4% compared with 31% actual. Thus, almost one third of the respondents do not make any savings.

Table 8: Actual and predicted sample proportions (number of respondents)

Animal stock	Financial assets	
	0	1
0	218 (200)	38 (42)
1	261 (278)	187 (184)

Note: Figures in parentheses are predicted values

Although rural people in Kazakhstan keep some cash savings at home and very few have deposit accounts in formal financial institutions, most of the respondents prefer to save in kind by purchasing animal stock. Some are forced to hold cash in amounts greater than absolutely necessary for everyday expenditure because no better options are available in rural areas for saving in financial assets. Formal financial institutions still do not have a well-developed network of branches in rural areas in Kazakhstan. Only two banks out of 35 have branches in rural district centers and they offer a limited menu of financial services. Saving in financial assets is highly convenient in terms of liquidity and accessibility, but keeping large sums of cash at home is very risky and in the absence of formal financial institutions people prefer saving in kind.

Reasons not to deal with formal financial institutions

The survey includes questions on why people do not use formal financial services. Out of 704 respondents, 218 (or about 31%) do not make savings either in animal stock or in financial assets, i.e., one third do not have enough income to save or

their debts are too high to allow savings. Fully 86% of the respondents (604) indicated that they did not have a deposit account; in other words, only every seventh rural inhabitant has an account in a commercial bank. For comparison, in the United States, 87% of the adult population have a bank account. Even in developing countries, the percentage of population with a bank account is higher than in Kazakhstan: 48 % in rural Upper Pradesh and Andhra Pradesh, India; 43 % in 11 urban areas in Brazil; 41% in Bogota, Colombia; and 25 % in Mexico City. Mexican households reveal interesting reasons why some do not have a bank account: 70% of respondents claim that bank fees and minimum balance requirements are too high, 16% consider that the banks are not trustworthy, and only 2% indicate an inconvenient location as a reason preventing them from having a bank account (Demirgüç-Kunt et al., 2008, p. 34).

**Figure 3: Reasons not to deal with formal
commercial banks (percent of respondents)**
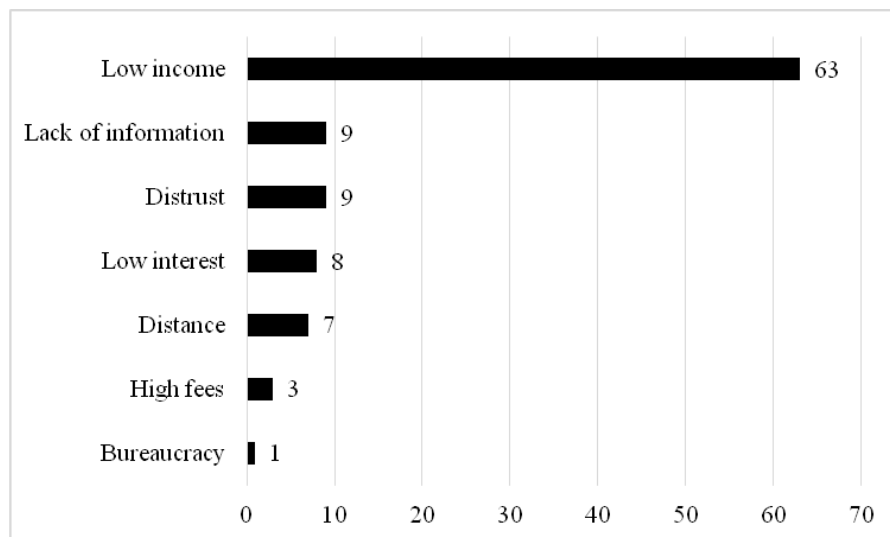
Source: Own survey, 2011

Among reasons preventing Kazakhstan's rural population from opening a bank account the most significant are low income, lack of information, and distrust (Figure 3). People from rural areas are less financially literate and have relatively low economic status; therefore, most of them simply are afraid of opening an account in a private commercial bank for fear of being cheated. Commercial banks, in turn, are reluctant to deal with low income savers and thus do not provide enough information in a comprehensible form. Bank staff are not always sensitive

to such specific clientele, and financially illiterate respondents are reluctant to visit banks because they do not get favorable responses. Commercial banks do not have specific products directed to the needs of rural clients.

While the main reason for not saving in a formal financial institution remains low income (63% of respondents), the other reasons should be carefully considered by policy makers and bank officials. Thus, 9% of respondents indicated that they did not trust formal institutions. Three reasons – lack of information, bureaucracy, and distrust – can be grouped as factors that characterize financial illiteracy of the rural population. Fully 19% are financially illiterate by this measure, so that every fifth respondent requires special treatment by the banks.

Conclusions and recommendations

Despite the limited dataset embracing only one region in Kazakhstan, the results reported in this article are mostly in accordance with findings in the empirical literature on savings in rural areas of developing and transition economies. Still, some unexpected findings emerge.

The theory of saving still does not provide a clear list of factors that determine saving choices. Our study shows that although household income has low significance, it positively influences saving in financial assets (e.g., cash), but has no statistically significant effect on savings in animal stock. Credit and private property, on the other hand, have a statistically significant effect on both forms of saving.

Savings in animal stock rather than financial assets are used to cover such needs as education, purchase of new equipment, renovation, as well as weddings and funerals. Rural people find it difficult and expensive to save in the form of deposits in formal financial institutionss, while keeping cash at home is too risky.

The results of this study show that a number of steps should be undertaken to improve saving behavior in rural areas. Low income was indicated as a main factor preventing rural households from making savings in formal financial institutions (Figure 2). Because of the importance of the income factor for making savings in financial assets, it is necessary to implement policies that increase rural household incomes. Relatively large household plots (SSHs) in Kazakhstan, which are sometimes the size of small family farms, should be given economic incentives to register as family farms so that they can access state programs targeted to small- and medium-size private farms. Government institutions that are responsible for implementing rural development programs need to increase their efforts to improve the business environment in rural areas. This should include measures concerning transport and communication infrastructure, information technologies, extension

services, marketing channels, training in financial literacy. The government should also increase its funding of adult education programs. Our results show that these will motivate households to increase their production, income, and hence savings.

Another very important way to improve saving conditions for the rural population in Kazakhstan is to revise the regulations that govern existing rural credit partnerships (RCPs) (Gaisina, 2011). RCP membership is restricted to legal entities and SSHs are thus excluded from all RCP services. Furthermore, according to the current law, RCPs are not allowed to take deposits. Since RCPs cannot attract savings, they can only offer a very limited range of loan products. This is unfortunate as there would be obvious advantages if agricultural producers and rural people in general could place their savings in credit partnerships rather than in commercial banks (or other formal credit institutions).

- Partnerships could use these savings for the sole purpose of lending to members and devise the lending terms so that loans are the mutual responsibility of all members. This approach will reduce the default risk in RCPs even below today's low level. Commercial banks, on the other hand, can place savings anywhere on behalf of and under the responsibility of the bank.
- Savings regulations in credit partnerships should be based on conditions that are determined and accepted by a general meeting of the members. In contrast, bank deposits are recognized as a public contract and are regulated by the Law on Banking. There is no direct participation by depositors or borrowers in the bank's decisions.
- Those who place their savings in rural credit partnerships would have more incentives and opportunities to keep their partnership financially sound than those who save in commercial banks. In this way, small savings accounts could become a stable and relatively low-cost source of finance and, in due course, make up the main share of funds available for loans.

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