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Networking among Russian farmers and their prospects for success

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ABSTRACT

In most post-socialist economies, private farming has re-emerged after regime change, although even today this sector most often accounts for only a minor proportion of national production. Russian private farmers are reported to dislike formal cooperatives, so this study investigated whether their informal collaborative arrangements may affect their business results. A survey involving personal interviews with 158 randomly chosen private farmers in the Kurgan Region examined whether collaborating farmers are economically more successful and consider their financial situation to be better than that of neighbouring farmers. Ordinary least square and ordered probit regression analysis indicated that farmers with stronger networks are more successful in terms of farm wealth, and also relative to the financial situation of their immediate neighbours. This suggests that success among private farmers in a post-socialist setting is related to their networks.

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1. Introduction

After the dissolution of the Soviet Union in 1991, the Russian government expressed the ambition ‘that private farmers would become significant economic producers, able to compete with the large farm sector’ (Wegren, 2008, p. 138). However, private farming proved not to be as successful as the political leadership in Russia and many Western experts anticipated in the early 1990s (Davydova & Franks, 2006). Leaders and experts were unrealistic about how quickly new institutions could be established in Russia after many decades of a command economy. After a peak of around 280,000 farms in the mid-1990s, their number steadily declined. The large-scale state and collective agricultural enterprises persevered, although largely converted into corporate farms – production co-operatives or investor-owned firms in the form of limited liability companies or open and closed joint stock companies (Uzun, 2008; Wegren, 2008).

Since the 1990s, the position of private farming in Russia has steadily strengthened (Wolz, Golovina, Nilsson, & Hess, 2016), although the sector still plays a modest, though increasing, role (Spoor, 2012). In 2016, private farming contributed 12.5% of total

agricultural production, while corresponding figures for corporate farms and household plot producers were 52.8% and 34.7%, respectively (Rosstat, 2017). However, the contribution of private farmers is increasing over time (Table 1), not because of an increasing number of farms but because of larger average acreage per farm. These farms have little in common with the peasant farmers in Russian history and the model of private farming in the minds of the reformers during the early 1990s (Van Atta, 1993; Wegren, 2000). Present-day private farmers are fully commercialised and linked to the upstream and downstream sectors (Wolz et al., 2016).

The group of private farmers in Russia is probably quite heterogeneous in many respects, for example concerning financial success. Some farmers are expanding their agricultural activities, one explanation for this being the improvement in the overall economic situation after 1998 (up to 2014/15) and the options for private farmers to participate in government support schemes (Wegren, 2014). The present study focuses on a specific factor, namely the collaborative arrangements Russian farmers have with various types of actors in their business environment. The aim of the study is to explore potential links between the success of Russian private farmers and their collaborative networks.

This paper is structured as follows: the section below presents a review of the institutional conditions for private farming in Russia and formulates a hypothesis for empirical testing. The next section presents the methodological choices used for the collection and analysis of data, while the section thereafter presents the results of the empirical study. The findings are discussed and some conclusions are drawn in the final sections.

2. Institutional conditions for private farming

Changing institutional conditions may provide explanations for the expansion of Russian private farming during recent years. Institutions comprise sets of rules, norms, shared opinions, common beliefs and conceptions, and similar constructs, all of which direct the actions and interactions of individuals, groups and organisations. Hodgson (2006) suggests that institutions are ‘systems of established and prevalent social rules that structure social interaction’, later adding that ‘... firms (and other organizations) are thus all institutions’. Hence, the expansion of private farming in Russia is an expression of an institutional change, which is dependent upon changes in adjacent institutions. The growth in Russian private farming may be related to changes in the surrounding economic, political and social institutions.

The institutional setting that could bring success to entrepreneurs, such as private farmers, comprises open markets, respect for property rights, protection of competition and individualised incentives (Lerman, 2001). Entrepreneurs should be free to choose between various business partners and to design collaborative arrangements according

Table 1. Main indicators of private farming in the Russian Federation (1991–2016).

Private farm attribute	1991	1995	2000	2005	2010	2014	2016
Number of private farms	4400	280,100	261,700	257,400	285,000	223,200	174,600
Average farm size (hectares)	41	43	58	75	85	162.8	240.9
Aggregate acreage (thousand hectares)	180	12,044	15,179	19,305	24,225	37,965	42,061
Share of national agricultural production (%)	< 1	1.9	3.2	6.1	7.2	10.0	12.5

Source: 1991–2000: Rosstat (2004); 2005–2014; Rosstat (2015a, 2015b); 2016: Rosstat (2017).

to their own preconditions. Informal collaboration, or networks, may be of special importance for entrepreneurs in a transition economy. However, the institutional structures of a waning planned economy may inhibit entrepreneurs' range of choice (Nilsson, Golovina, Hess, & Wolz, 2016).

The contradictions between various institutional attributes have been cited by some researchers as the reason for the slow start to private farming in Russia (e.g. Lerman, 2008; Sutherland, 2008; Wegren, 2014). Apart from the poor macro-economic situation during the 1990s, several explanations concern institutional conditions (Davydova & Franks, 2006). One condition is the slow introduction of private property rights to land and other agricultural production factors, and poor legislation concerning the renting of land. The land reform was not well prepared. When the initial government subsidies to private farmers were suddenly brought to a halt, private farmers experienced difficulties in getting access to farm inputs and machinery. However, the government provided some support to prevent corporate farms from going bankrupt, meaning the private sector could not develop a competitive structure after regime change (Prosterman, Mitchell, & Rorem, 1997; Wegren, 2000).

Until the turn of the millennium, the Russian government's agricultural support programmes were designed to support all types of producers, regardless of their size and legal form, although during the early 1990s the emphasis was on promoting private farms. During the late 1990s and early 2000s, however, government emphasis shifted back to the promotion of large-scale farms. After a few years, support for private farms was made available again, but later private farmers had received significantly less support than large corporate farms. Thus, the creditworthiness of private farmers has suffered (Wegren, 2014).

More recently, private farming has received more government support again, which may be one reason why 'private farming has emerged as a success' (Wegren, 2011, p. 212). Private farming has also been strengthened because the Association of Peasant Farms and Agricultural Co-operatives (AKKOR), the national lobby organisation, changed its policy. Having been an autonomous organisation, it has now established links to the leading political party in Russia. Through that connection, its resources have expanded and it is acting to promote entrepreneurial development in rural areas. This has resulted in some processes among farmers and within AKKOR, which may also have led to the more favourable government support programme in 2012 (Wegren, 2014).

Service co-operatives are weak in Russia, although such organisations are valuable for farmers in many other countries and there has been a strong co-operative tradition since the pre-socialist period (Kotsonis, 1999; Kurakin & Visser, 2017). Such organisations are formed to market farmers' agricultural products, provide farmers with agricultural inputs, offer credit to producers, give advice concerning production matters etc. However, in the mind of Russian farmers, the concept of formal co-operatives is associated with the Soviet farm system (Golovina & Nilsson, 2011). Without co-operative societies farmers may rely on informal forms of collaboration (Davydova & Franks, 2006; Gardner & Lerman, 2006; Hagedorn, 2014; Small, 2007).

Hence, farmers' networks may involve collaboration with other farmers, local business partners, local policy makers and the labour force as well as membership in political parties and business associations. These observations give rise to the following

hypothesis for the present empirical study: *the success of Russian private farm enterprises is related to farmers' collaborative arrangements.*

3. Methodology

To test the hypothesis that Russian private farmers' success was related to their formal and informal networks, the following analytical steps were conducted:

- (i) Establishing a conceptual framework that relates private farmers' success to explanatory dimensions of their networks within formal and informal institutions, while keeping farmers' socioeconomic characteristics constant.
- (ii) The development of a questionnaire and assignment of each survey question to one of the explanatory dimensions.
- (iii) Estimation of multivariate regression models with control variables for the farming population's socioeconomic heterogeneity. Through these models it can be assessed if there is a statistical effect of a respective explanatory variable on the dependent variables.
- (iv) Interpretation of the results from the multivariate regression models: statistically significant explanatory variables are interpreted as indications of the corresponding explanatory dimension being statistically related to the private farmers' success.

3.1. Data collection

An empirical survey was conducted among private farmers in the Kurgan Region, which is located in the south-western part of the Siberian lowland. It belongs to one of the seven regions making up the Western Siberian Grain Belt, where about 70% of all grain in Asiatic Russia is produced (Griewald, 2016). Of the region's population of 861,896 (2016), about 40% live in rural areas (Kurganstat, 2016). The agricultural area comprises about 4 million hectares, of which 2.2 million are arable. Agriculture is an important sector, contributing 12.6% to gross regional product (Kurganstat, 2015). Basic information for the present analysis was obtained from statistics and through interviews with key informants in the region. Considering the extreme heterogeneity within the agricultural sector of the Russian Federation (Golovina, Nilsson, & Wolz, 2012), it is not possible to estimate to what extent agriculture in the Kurgan Region is representative of Russian agriculture.

After a slow start, private farming in the Kurgan Region developed sharply during the 1990s (Table 2). Since then, the number of farms has declined, but the remaining farms are cultivating more land and their share of total agricultural production has increased, from 4% in 2000 to about 7% in 2010 and almost 16% in 2016. The average farm size has increased at a faster rate than the national average, particularly in the last decade, to 586.6 hectares in 2016. The contribution of private farms to regional agricultural production has also increased faster than the national average. One reason for this might be small farmers giving up due to the relatively good state of the overall economy up to the time of the survey. The repercussions of the economic recession following the events of 2014 were not fully felt at that time and instead the political programme of

Table 2. Main indicators of private farming in the Kurgan Region of Russia (1991–2016).

Private farm attribute	1991	2000	2010	2012	2014	2016
Number of private farms	17	3808	2383	1470	1181	1124
Average farm size (hectares)	69	72	128.4	211.6	278.6	586.6
Aggregate acreage (thousand hectares)	1.2	272	306	311	329	659
Share of the Kurgan Region's agricultural production (%)	0.1	4.0	6.9	6.8	11.9	15.7

Source: 1991–2014: Kurganstat (2015); (2016): Rosstat (2017).

2012 was primarily relevant for the farmers. In addition, some farmers who had registered their farms as limited liability companies then re-registered them as private farms, mainly because this made it easier to comply with taxation and accounting rules.

A structured questionnaire was designed for the survey. The questionnaire was comprised of theoretically derived questions and socioeconomic issues that served as control variables. Data collection took place during three months in spring 2015. One of the authors and a group of students and postgraduate students did personal interviews with farmers. The basis for selecting respondents was the government's list of registered private farmers in the Kurgan Region. To ensure representativeness, a random sampling procedure was conducted, whereby 30% of the farmers within each of the region's 24 districts were selected.

In 2015 the official list comprised 1186 private farmers in Kurgan Region, but during the interviews it turned out that 25–30% of the registered farmers no longer had any farming operations. Some of the active farmers, especially those with smaller operations, were reluctant to participate in face-to-face interviews. Thus, 167 farmers were interviewed but some respondents provided inconsistent or incomplete answers, leaving 158 interviews in the final sample. This number corresponds to about one-fifth of all registered farmers in the region and to almost one-quarter of the active ones. Interviews were conducted in all districts of the region. The survey covered farms that differ in terms of size, gender, specialisation and year of establishment.

3.2. Constructs and hypotheses

Following the hypothesis that the success of Russian private farm enterprises is related to farmers' collaborative arrangements, we investigated the relationship that Russian private farmers have in their business environment and the degree of success in their business operations. It must be acknowledged that it is impossible to establish any causality between these two constructs. On the one hand, farmers might succeed in their operations thanks to a good set of business relationships; on the other hand, farmers might have established good relationships once they had achieved successful business operations.

In this study, farmers' degree of success was considered the *dependent variable*. However, there is no objective value of the farmers' business success and therefore two dimensions of farm success were applied.

1. *Stated farm wealth*: 'Income in the survey year' captured the total farm income generated in the year before the survey took place. In addition, farmers were asked 'How much money would you get if you were to sell the farm this year?' as an approximation of the farm's value. Farm income and farm value are correlated (correlation coefficient

0.69), but not identical. For example, given that individual years may not be equally good for all farms in a region, income may vary randomly from year to year. However, a farm's value is an approximation of the long-term income-generating potential. On the other hand, it is not the only valid measure of success, because some farmers rent part of their land and thus generate income from a relatively low farm value. The sum of a farm's income and its reported farm value was therefore considered 'farm wealth' (wealth = farm income + farm value). It can be taken as an approximation of total farm success.

Alternative measures of farm success would have been possible as well. For instance, total number of animals and total quantity of crops produced could have been interpreted as a measure of farm size and farm productivity. However, it turned out that the farms in the sample had a rather heterogeneous structure, so that it would have been more difficult to combine different types of farm output into a single index than relying on respondents' estimates of monetary measures.

However, one problem with stated farm income is that the farmers, perhaps deliberately, did not provide data at all or underreported figures, though this option was the only one possible given the financial and logistical constraints of the survey. This problem has also been observed by Kitching (1998) with private farmers and Spoor and Visser (2004) with managers of large farms. In order to account for this problem, we adopted an additional, alternative dimension of farm success.

2. *Stated relative financial situation*: In contrast to 'farm wealth' as a monetary measure, farmers were asked to indicate 'How is your family's financial situation compared with that of other families in the neighbourhood?' by selecting one of the following five options: 'Much better than average: 1', 'Better than average: 2', 'Average: 3', 'Poorer than average: 4' and 'Much poorer than average: 5'. Answers to this question were interpreted as the farmers' perceived success relative to neighbouring farms as potential peers and may therefore serve as an indication of farmers' perceived overall satisfaction and, hence, their success.

The *independent variables* concerned the farmers' interactions with various partners, as well as farmer and farm characteristics, related to the farmers' networks. All these variables were recorded from the farmer's perspective – the type of resources that are instrumental for running private farms, the social structure in the farmer's family and what the farm can offer to the local community. These variables are categorised into the following explanatory dimensions:

- X: Characteristics of the farm and the farm household to control for heterogeneity
- A: The farmer's informal collaboration
- R: Risk perception as an aspect of entrepreneurship
- S: The farmer's business skills in relation to what is required by the environment
- Z: The farmer's membership of formal organisations
- I: Match of institutional settings
- L: The farmer's relationship to the labour force

To what extent any of these dimensions may empirically turn out as relevant predictors of 'success' can only be determined through statistical tests. Therefore, the variables obtained from the survey with private farmers were assigned to these dimensions because they can serve as empirical approximations to them. Each dimension is

therefore described through a vector of explanatory variables that constitute farmers' responses to the corresponding survey questions. Furthermore, out of the dependent variables and these vectors of independent variables, two statistical models were formulated that allowed us to put the hypothesis to a statistical test.

3.3. Statistical models for testing the hypothesis

The dependent variable of model 1 was *stated farm wealth* and of model 2 was *stated relative financial situation*:

Model 1:

$$\begin{array}{l} \text{stated} \\ \text{farm} \\ \text{wealth}_i \end{array} = \beta'X_i + \beta'A_i + \beta'R_i + \beta'S_i + \beta'Z_i + \beta'I_i + \beta'L_i + \varepsilon_i$$

Model 2:

$$\begin{array}{l} \text{relative} \\ \text{financial} \\ \text{situation}_i \end{array} = \beta'X_i + \beta'A_i + \beta'R_i + \beta'S_i + \beta'Z_i + \beta'I_i + \beta'L_i + \varepsilon_i$$

By taking the vectors of independent variables into account in these models, the hypothesis was tested in a multivariate context. The advantage of this multivariate approach is that the effect of each explanatory variable on the dependent variable can be estimated with much greater precision than through bivariate correlations. The parameters β are the regression parameters to be estimated and ε_i is an error term that is assumed to be normally distributed with $N(0, \sigma^2)$ and statistically uncorrelated to the explanatory variables.

The first specification of the model with stated farm wealth as the dependent variable was estimated through ordinary least squares regression (OLS). This was possible because the dependent variable is continuous. The second model specification used answers about farmers' stated financial situation relative to their neighbours, as it was reported on a five-point Likert scale. The discrete and ordered characteristic of this outcome variable was addressed through estimation of the model according to an ordered probit regression (Greene & Hensher, 2008). A disadvantage of the ordered probit approach is that neither the sign nor the magnitude of the estimated β can receive a direct interpretation. Instead, marginal effects (dy/dx) must be calculated in a separate step after initial estimation of the model (Greene, 2003). Once computed, however, these marginal effects can be conveniently interpreted as the change in the probability of an answer falling into one of the categories 'much better', 'better', 'about average', 'worse than average' or 'much worse than average', given a one unit change in the corresponding explanatory variable.

4. Results

Descriptive statistics on the sample of 158 farms are presented in Table 3. Missing values occurred only in very few instances, e.g. when no data were provided on the magnitude of incurred losses, and were replaced by the sample mean or, where plausible, by zero.

Table 3. Descriptive statistics on farm characteristics within the sample, $n = 158$.

	Min.	Max.	Mean	Median
Age of respondents (years)	25	84	48.89	50
Gender (1 = male, 2 = female)	1	2	1.11	1
Education (1 = basic general (9 years), 2 = full general (11 years), 3 = technical secondary school, 4 = university)	1	4	3.08	3
Other business before farming (1 = yes, 2 = no)	1	2	1.90	2
Household size (number of persons)	1	10	3.88	4
Farm size (hectares)	10	7000	614.16	300
Tractors (number)	1	15	3.26	3
Contribution of animal husbandry to farm income (%)	0	100	29.11	0
Contribution of crop production to farm income (%)	0	100	67.41	90
Contribution of service activities to farm income (%)	0	85	1.22	0
Contribution of other activities to farm income (%)	0	90	2.25	0
Farm successor (1 = yes, 2 = no)	1	2	1.28	1
Year when farm was founded	1989	2014	2003	2006
Proportion of farm income in total income (%)	0.02	1	0.82	0.91
Proportion of land owned (%)	0	1	0.45	0.33
Membership of AKKOR* (yes = 1, no = 2)	1	2	1.76	2
Membership of a political party (yes = 1, no = 2)	1	2	1.89	2
Farm income: income from private farm 2014 (thousand roubles)	13	21,000	1352	500
Farm value (thousand roubles)	0	80,000	3682	1500

Note: *AKKOR: Association of Peasant Farms and Agricultural Co-operatives in Russia.

As can be seen from Table 3, the typical respondent was a 48-year-old male who had higher education at the level of technical secondary school. Almost all respondents had been involved in another business before they started farming and the average farm had 614 hectares. Many farms had started in the past 15 years. Farmers owned on average slightly half the land they farmed. Farm households comprised on average four members. The vast majority of farms were involved in crop production, while about one-third also had animal production. Farm income contributed more than 80% of total household income on average.

Table 4 presents regression results for both statistical models. The left-hand column in this table lists all explanatory variables grouped along the respective vectors used in this regression. The variables contained in each of the vectors represent answers to questions in the questionnaire. However, the questionnaire contained even more variables than the ones included in model 1 and model 2. After pre-tests, only those variables with the strongest explanatory power were retained, while the ones without explanatory power were not included in the models. This was done in order to keep the regression models as parsimonious as possible. Hereafter, the interpretation of the estimated coefficients from model 1 and model 2 in Table 4 are discussed.

4.1. X: characteristics of farm household and farm

The impact of socioeconomic factors on farm success has, in general, been found to be significant in many other farm surveys (e.g. Wegren, 2014). The results of the present study confirm this, but to a limited degree: age, gender and the number of household members had no significant effect on the probability of the perceived financial situation being better or much better than in the average neighbourhood. The variable on gender was then removed from the regression models in order to avoid further collinearity with other explanatory variables.

Table 4. Regression results*. Significance codes: 0 '****' 0.001 '***' 0.01 '**' 0.05 '*' 0.1 '.' 1. ' ' 1.

Vector	Dep. variable (y)	OLS (robust)		Ordered probit: marginal effects dy/dx					
		<i>log of 'Farm wealth'</i>		<i>'Family financial situation relative to neighbours'</i>					
		Coef.	p-val.	y = 'much better'	p-val.	y = 'better'	p-val.	y = 'about average'	p-val.
	(Intercept)	12.539	0.000 ***						
X	Age	0.012	0.158	0.00	0.14	0.00	0.11	0.01	0.11
X	Hhmembers	-0.042	0.641	0.00	0.94	0.00	0.94	0.00	0.94
X	Other businessbefore	-1.352	0.000 ***	-0.04	0.18	-0.14	0.13	0.18	0.13
X	Factor(schooling)2	-0.703	0.081.	-0.01	0.51	-0.03	0.50	0.03	0.50
X	Factor(schooling)3	-1.164	0.003 **	-0.01	0.86	-0.02	0.87	0.03	0.86
X	Factor(schooling)4	-0.544	0.111	0.00	0.92	0.01	0.91	-0.01	0.91
X	RentIndi	0.852	0.017 *	-0.04	0.01 **	-0.21	0.38	0.23	0.00 ***
X	Ownshare	-0.679	0.013 *	0.03	0.26	0.10	0.23	-0.14	0.23
X	RentOwnShr	-0.347	0.155	-0.02	0.35	-0.07	0.34	0.09	0.33
X	RentalPrice	0.000	0.001 **	0.35	0.02 *	0.00	0.01 **	0.00	0.00 ***
X	Beef	1.170	0.000 ***	-0.03	0.11	-0.10	0.11	0.13	0.10.
X	Sheep	-0.623	0.002 **	0.06	0.13	0.14	0.05 *	-0.19	0.06.
X	Poultry	-0.987	0.000 ***	-0.02	0.40	-0.07	0.46	0.08	0.44
X	OtherAnimal	1.549	0.000 ***	-0.04	0.01 **	-0.20	0.00 ***	0.22	0.07.
X	Other farm activities	0.213	0.616	-0.04	0.02 *	-0.16	0.04 *	0.19	0.02 *
X	Fulltime workers	0.033	0.053.	0.66	0.97	0.00	0.97	0.00	0.97
X	Parttime workers	-0.039	0.114	0.00	0.91	0.00	0.91	0.00	0.91
X	Servicesactivities	-0.036	0.000 ***	0.33	0.98	0.00	0.98	0.00	0.98
X	log(wealth)			0.02	0.04 *	0.07	0.02 *	-0.10	0.02 *
A	GetFuel	0.276	0.001 ***	0.00	0.64	0.01	0.64	-0.02	0.64
A	GetMarketing	-0.234	0.004 **	0.01	0.20	0.04	0.18	-0.06	0.17
A	GetProcessFacilities	-0.203	0.041 *	0.00	0.69	-0.01	0.69	0.02	0.69
A	GetWorkers	0.319	0.000 ***	-0.01	0.45	-0.02	0.42	0.03	0.42
R	RiskPricesIntput	-0.247	0.028 *	0.00	0.70	0.01	0.71	-0.02	0.71
R	RiskPersonal	-0.240	0.000 ***	-0.01	0.33	-0.02	0.32	0.03	0.31
R	RiskWeather	0.309	0.008 **	-0.03	0.07.	-0.10	0.07.	0.13	0.05 *
R	RiskCatastrophy	-0.317	0.002 **	0.04	0.02 *	0.13	0.01 **	-0.17	0.01 **
S	Skillsmanagement	-0.282	0.011 *	0.00	0.92	0.00	0.92	0.01	0.92
S	Skillsaccounting	0.399	0.001 **	-0.03	0.08.	-0.09	0.04 *	0.11	0.04 *
S	Skillseconomics	-0.499	0.000 ***	0.03	0.09.	0.09	0.04 *	-0.12	0.04 *
S	FreedomSecurity	-0.088	0.421	-0.02	0.04 *	-0.07	0.03 *	0.10	0.02 *
Z	RelationCooperation	-0.337	0.007 **	0.02	0.31	0.05	0.29	-0.07	0.29
Z	Rel.OtherPriv.Farms	0.254	0.010 *	-0.03	0.07.	-0.08	0.04 *	0.11	0.04 *
Z	Partymember	0.261	0.357	-0.08	0.04 *	-0.25	0.01 **	0.33	0.01 **
Z	AKKORmember	0.430	0.066.	0.01	0.78	0.02	0.78	-0.02	0.78
Z	Memberbusinessorg	2.864	0.001 ***	-0.07	0.45	-0.21	0.43	0.28	0.43
Z	CoopinArea	0.199	0.348	-0.04	0.13	-0.11	0.11	0.15	0.11
Z	WishCoop	-0.277	0.194	-0.02	0.43	-0.05	0.47	0.07	0.46
I	ImpProducts	0.241	0.008 **	0.01	0.31	0.04	0.25	-0.05	0.26
I	ImpPolitics	-0.180	0.146	-0.03	0.05 *	-0.10	0.01 **	0.13	0.01 **
L	Empprofitshare	-0.312	0.001 ***	-0.01	0.15	-0.05	0.12	0.06	0.12
L	Emppersonal	-0.247	0.014 *	-0.01	0.16	-0.04	0.15	0.06	0.14
L	Empsocialrel	0.362	0.001 ***	-0.02	0.13	-0.07	0.09.	0.09	0.08.
	Outlying obs.	-3.576	0.000 ***	0.95	0.00 ***	-0.20	0.26	-0.75	0.00 ***
R-squared: 0.71, Adj. R-squared: 0.57				Number of cases correctly predicted = 116/158 = 73.4%					
F-statistic: 4.99, p-value: 1.43e-12				AIC: 327.04; Chi-Sq.(53) = 82.7283 [0.0056]					

Note: *Results for the ordered probit estimations of category y = 'worse than average' and y = 'much worse than average' were included in the estimations but were insignificant throughout and are not reported here.

The level of education and renting land from private individuals were positively related. Wealthier farms also reported paying higher rental prices or tended to have non-monetary agreements on how to pay rental prices. All this points to negotiating

position as a positive determinant of farm success. The proportion of owned land in total farmland expresses the degree to which the respondent owned the farm or was a tenant of other landowners. This variable was non-significant throughout the stated financial situation relative to neighbours, but was significantly negatively related to farm wealth. Hence farms with a high share of rented land can operate more successfully.

While animal husbandry contributed on average only about 30% of total farm income, it had a significant effect on farm wealth. However, the type of animal husbandry clearly played a role. While beef cattle production and production of other animals (mainly dairy cattle) had a very high positive effect on farm wealth, sheep and poultry production had a significant negative effect on farm wealth. Other types of animal husbandry, e.g. pig production, had no significant effect.

4.2. A: the farmer's informal collaboration

One set of questions referred to collaboration, with respondents being asked about collaboration in each of five types of business activity: fuel for transport, marketing of products, processing facilities, veterinary services and occasional manpower (e.g. for harvesting). The question asked was: *For these business activities, do you get support from or collaborate with business partners? (as much as is needed – 1; very much – 2; much – 3; to a small extent – 4; not at all – 5).*

Vector A in Table 4 shows that stated farm wealth was positively related to required support and collaboration as it shows farmers' ability to commission or get access to fuel and additional workers during peak times. However, relying on support or collaboration with others regarding processing facilities and help with marketing services was rather negatively related to farm wealth. These two services seemed to be severe bottlenecks and, once they were overcome, higher farm income was achieved. Interestingly, none of these variables relating to collaborative arrangements were significant in the ordered probit model regarding the perceived financial situation relative to that of neighbours. This makes sense as long as farms within the same neighbourhood can be expected to collaborate primarily with each other, regardless of their level of wealth. Thus, collaboration was overall positively related to farm wealth, but the degree of collaboration did not necessarily leave individual farms better off than their neighbourhood average.

4.3. R: risk perception as an aspect of entrepreneurship

Another determinant of farm success may be personal risk perception as an important component of entrepreneurship. Farmers were asked about five types of risk, of which high perceived risk of changing input prices and perceived risk of personal illness or overall catastrophes were negatively related to farm wealth. Only perceived risk of adverse weather conditions was positively related, which points to farmers' attention regarding weather conditions as an important management skill. However, findings regarding weather and other natural catastrophes were somewhat contradictory to farm wealth and financial situation relative to the neighbourhood. Farmers who were more anxious about their farm failing from other natural risks were more likely to fall into the category of farms that were much better off or better off than the

neighbourhood average. A plausible explanation is that the most successful farmers tend to have all other risk sources relatively well under control.

4.4. S: the farmer's business skills in relation to what is required by the environment

The respondents were asked to assess their skills on a Likert scale with respect to five categories: management, accounting, agronomy, animal husbandry and farm economics (*extremely good* – 1;...; *not at all* – 5). The perceived skills relating to farm economics and farm management proved to be significant and showed a negative sign. This means that these variables were positively related to farm wealth and financial situation relative to the neighbourhood. However, in the case of accounting skills, a significantly positive coefficient was found for farm wealth, implying that wealthier respondents had less perceived skills in accounting. This is presumably because larger and better organised farms can be expected to pay accounting or tax consultants, rather than performing these tasks themselves.

The variable 'freedom-security' deserves special attention. It refers to the question: *How do you value freedom in your work against security of income? (Maximum freedom, minimum security – 1;...; Minimum freedom, maximum security – 5)*. It did not show a significant effect on farm wealth, but a very strong one on the perceived financial situation relative to neighbours. It carried a negative sign, implying that higher-level answers (which capture a stronger preference for security against freedom) were correlated with a lower probability of feeling financially much better off or better off than neighbouring farmers. Respondents who expressed a strong preference for freedom over security may represent the more risk-loving farmers in the sample.

4.5. Z: the farmer's membership in formal organisations

This vector included variables about membership of a political party, the farmers' association AKKOR or any other business organisation. For model 1, membership of a business organisation was significant at a very high level, and membership of AKKOR was significant at a 10% level, both with positive coefficients. Respondents with strong ties to official organisations are able to get good access to fertilisers and pesticides in particular, or may have better marketing networks, particularly with representatives of the upstream and downstream sectors. Regarding membership in a political party, the results show a significantly higher probability for party members stating that their financial situation was similar to the average of their neighbours and significant probability that it was better or much better. Thus, party membership was not relevant for farmers' success.

Control variables for the presence of co-operatives in the area and the potential wish to participate in such a co-operative were insignificant throughout. The respondents were also asked about their relations with other private farmers. This factor was significant for farm wealth. The farmers agreed that personal relations are very important for their willingness to cooperate with other farmers. Similarly, more successful farmers had closer mutual support from fellow farmers. This shows that, on an informal level, networks of mutual support play a vital role in increasing farm wealth.

4.6. I: match of institutional settings

The estimated coefficient for the responses to a question about how the farm is regarded by local policy makers proved to be significant for perceived financial situation relative to neighbours. The statement was: *My farm is appreciated by the political leadership of the community or town (agree fully – 1;...; disagree fully – 5)*. If the farmers did not feel that their farm was appreciated by the local political leadership, the probability of selecting the family's financial situation in category 1 (much better than average) or 2 (better than average) was significantly reduced, while the probability of selecting category 3 (similar to average) was significantly increased. Thus, farmers who thought that they were appreciated by policymakers and the local government in their region also tended to perceive their financial situation to be better or much better than the average in their neighbourhood. Furthermore, respondents who did not think that their products were of high importance for the local community tended to have significantly higher farm wealth (*The products that I produce are of great importance to the local community or town (agree fully – 1;...; disagree fully – 5)*). This is plausible, because the largest and wealthiest farms can be expected to target distant markets for their products. Focusing on the local community as a market for food products can be an indication of small farm size and/or less successful national or international marketing activities.

4.7. L: the farmer's relationship to the labour force

Farmers' relations to employees are similar to their business relations to suppliers of farm inputs, the difference being that the employees deliver services and not goods. Thus, farm labour is one type of input, and farmers act on the labour market just as they do on other farm input markets. Respondents who offered more profit-sharing incentives or had closer personal relationships with their employees compared with other farmers in the region had substantially higher farm wealth. However, farmers who stated that their employees did not consider good social relations with other employees to be important revealed significantly higher farm wealth. This can be explained by the presence of moral hazards between workers and farmers: monetary incentives and close social relations to the employer increase worker productivity and contribute to farm wealth. On the other hand, employees may form alliances among themselves and engage in less productive activities during working hours unless the employer takes measures to prevent this.

One observation was identified as a severe outlier and was marked by a dummy variable ('OutlyingObs'), rather than being dropped from the dataset. This observation referred to a farm, which had relatively low wealth, but which was reported to be financially much better off than the neighbourhood average. This observation was not removed because all other answers from this respondent appeared plausible; the large discrepancy between stated farm wealth and self-assessment could not be explained with the set of explanatory variables in this instance. Not controlling for this outlying observation, on the other hand, severely influenced the regression results.

In summary, the regression results in Table 4 appear to be robust for both model 1 and model 2. The findings show that most of the significant explanatory variables

appear to refer to institutional characteristics or attributes of networks, rather than to farm and household characteristics. Both regression models indicated that good entrepreneurship, collaboration and good relationships with both employees and other private farmers were strongly related to reported farm success, measured according to two success dimensions. Various forms of informal collaboration and membership of business organisations were reported by the most successful farmers, which may indicate that connection and frequent interaction with fellow farmers are important.

5. Discussion

The findings support the hypothesis that the success of Russian private farmers is related to their collaborative arrangements. Both the farmers' self-reported farm wealth (farm income + farm value) and their stated financial situation relative to neighbours proved to be related to their networks with other farmers and local business partners, business associations, policymakers and the labour force. However, it cannot be claimed that Russian farmers' success would be fully determined by networking; it may equally be the case that successful farmers have good opportunities for networking.

Farm wealth was higher for respondents who belonged to certain formal institutions, such as business associations. Transaction costs might be reduced through such networks. Surprisingly, membership of AKKOR, which is supposed to support private farmers, or of a political party had no significant effect on farm wealth. Business associations with a broader focus were more important. The most successful farmers more often had links with upstream and downstream businesses.

The relationship with local policymakers was ambiguous. While membership of a political party was not related to farm wealth *per se*, respondents who stated that they did not feel much appreciated by the local political leadership were less likely to report a financial situation better than the neighbourhood average. Here, two subgroups of farmers can be distinguished. On the one hand, some farmers utilise their networks in order to get better access to farm inputs. On the other hand, others are relatively far from established institutions and this group may contain those who derive utility from being independent entrepreneurs. It was found that the valuation of freedom versus security of income was a significant determinant of farm success in terms of financial situation relative to the neighbourhood. Respondents with a strong preference for individual freedom over income security tended to be significantly more likely to report a better or even much better financial situation than the local average.

Respondents who declared themselves to have higher than average farm wealth stated that they provided appropriate financial or non-pecuniary remuneration to employees. Good relations with employees may prevent moral hazards and shirking, e.g. in terms of theft on the farm. This is especially the case as there is a shortage of skilled agricultural labour in rural Russia (Wegren, 2014).

Among the successful farmers surveyed, there was an entrepreneurial orientation and a sense of risk taking as opposed to income security, which might be linked to collectivism. Formal ties to political parties did not affect farm success. While the culture of the old command economy inhibited entrepreneurial activity (O'Brien, Patsiorkovsky, Korkhova, & Dershem, 1993), a shift is underway. Efendiev and Sorokin (2013, p. 111) state that 'individualism and entrepreneurial activity are growing rapidly...'.

As in other cases where institutional changes have occurred, the expansion of private farming in Russia could be regarded in terms of an interplay between endogenous and exogenous processes (Aoki, 2007, 2011). The farmers influence each other in regard to mentalities, norms, opinions and other institutional components. These changes are partly an effect of institutional changes within the surrounding society. At the same time, the political system, commercial partnerships, local communities etc. have reason to take farmers into consideration when they realise that the private farming sector is gaining strength. The stronger private farming becomes, the more influence it may have on the attributes of adjacent institutions

6. Conclusions

Private farmers in today's Russia operate in an institutional setting that is becoming more favourable in political, business and social terms. Farmers must not only be successful as farm managers, but also when managing various business and social relations. Farmers' interaction with business partners is essential for their access to various farm inputs. The overall level of appreciation by the local society is likely to strengthen the position of the farmers.

All these factors indicate that the conditions for private farming in Russia have improved, especially in comparison with the economically harsh period endured by private farming in the 1990s and early 2000s. Results presented in this study show that private farmers in Russia have emerged as a relevant new pillar of Russian agriculture. During this process, their collaborative networks have partly worked as substitutes for the changing formal institutions.

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