How well does the crop insurance market function in Russia?

Ihtiyor Bobojonov, Linde Götz and Thomas Glauben[1]

[1] Leibniz-Institute for Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Str.2, D-06120 Halle (Saale), Germany; contact: bobojonov@iamo.de

Paper prepared for presentation at the EAAE 2014 Congress
'Agri-Food and Rural Innovations for Healthier Societies'

August 26 to 29, 2014
Ljubljana, Slovenia

How well does the crop insurance market function in Russia?

Ihtiyor Bobojonov, Linde Götz and Thomas Glauben

Abstract

In this paper we aim to investigate the demand for crop insurance in Russia, identifying primary influencing factors. We use a cross-sectional yearly data set on participation in crop insurance and agricultural production for about 60 regions (oblasts) of Russia for the years 2008-2011. We follow Goodwin's (1993) approach to estimate the crop insurance demand model with the proportion of planted acres insured as the dependent variables. Our results suggest that the previous subsidy policy to reimburse 50 percent of the insurance premiums has reduced the demand for crop insurance. This may be explained by the negative price elasticity of insurance demand as well as with the cumbersome reimbursement mechanism. Furthermore, operation costs of insurance companies lie above international averages and absorb nearly all governmental subsidies without transferring it to the producers. Therefore, the insurance program in Russia does not function as a subsidy transfer mechanism for farmers. The improvement of the efficiency of the insurance industry in Russia is required in order to increase the attractiveness of the program.

Keywords: Crop insurance, Russia.

1 Introduction

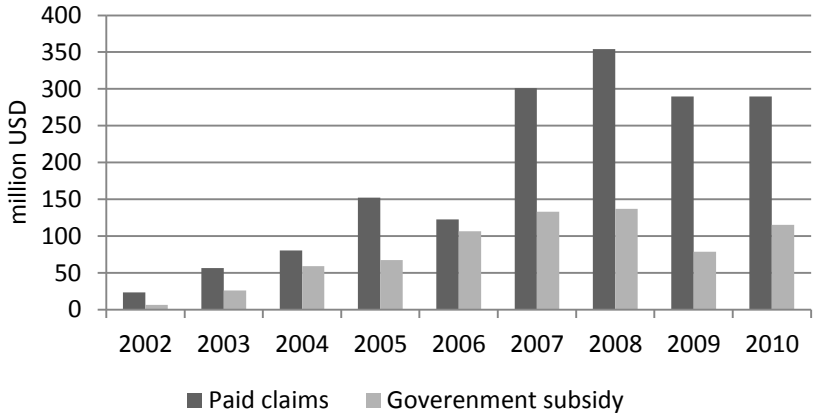
Kazakhstan, Russia and Ukraine (KRU), which have emerged over the last decade as major grain exporters, could play a significant role in improving the food security situation in the world. For example, these countries accounted for 20% of global wheat exports on average between 2005 and 2012 (USDA 2011). However, agricultural production in the KRU is very volatile with large variations in agricultural yields. This leads not only to high price volatility in the domestic markets of the KRU but also increases price volatility on world agricultural markets. The negative impact of production volatilities associated with weather extremes were very acute in the years 2008, 2010 and 2012 when significant reduction in production was observed caused by severe droughts and fire in large grain producing regions of the KRU. In particular, severe droughts and fire in large grain producing regions of the KRU in the years 2008, 2010 and 2012 have led to partially strong production decreases. This motivated the KRU governments to implement export restrictions as e.g. export taxes, export ban in 2007/08 and 2010/11 which had an additional increasing effect on the world market price (Götz et al. 2014). Yet, agricultural production and the importance of the KRU for global grain supply could further increase due to the re-cultivation of formerly abandoned land and the increase in production efficiency. However, whether KRU realize their huge potential, depends on a number of factors, including technological development, levels of infrastructure improvement and priorities of local policymakers. Furthermore, natural climatic conditions are characterized by extreme weather events which lead to high volatility in yields and substantial variation in the total grain harvest. This serves as a great challenge and hampers the further development of the grain industry (e.g. UNDP, 2012). Especially high yield volatility effects farmers' decision making and often forces farmers to select less extensive production schemes with low fertilizer use and low quality of seeds (Bokusheva and Hockmann 2006).

The productivity and efficiency of grain production could be increased by increasing quantity and quality of inputs such as fertilizer and seeds. Reducing production risk by crop insurance might foster the increased use of inputs and investment in production in developing countries as widely discussed in the available literature (Bobojonov et al. 2014). Another issue making agricultural insurance important in these countries is the lack of storage and low farm gate prices when compared to the farm gate prices in other grain producing countries such as the USA (Swiss Re, 2010b). Low profit margin of agricultural production in the RUK urges farmers to sell their yield right after the harvest without storage in order to pay back the credits they obtained for purchasing inputs during the vegetation period (Swiss Re, 2010a, 2010b). Reducing production risk by crop insurance might allow capital build up and increase investments in market infrastructure such as storage facilities which Russia urgently needs. Therefore, crop insurance may contribute to stabilizing production volatilities and prices in the CIS (UNDP 2012) and might serve as a means to mobilize the grain production in the region especially in the areas. However, there is a lack of information about the current role and function of agricultural insurance in these countries. This study therefore pioneers to assess how well the agricultural insurance market is functioning in Russia. We tackle this question by analysing the development of the premiums, subsidies paid to farmers, indemnities and the loss ratio. In addition, we also investigate the factors influencing insurance demand in the country.

2 Development of agricultural insurance in Russia

Agricultural insurance was mandatory during the Former Soviet Union (FSU) period and implemented by the governmental company Gosstrakh. After independence crop insurance programs became voluntary and farmers' participation was rather limited. In recent years the KRU governments have increased the level of subsidies for crop insurance (Mahul & Stutley 2010). In particular, the government subsidizes a multi-peril crop insurance system and finances 50% of the premium to the farmer since 2004. According to this program, farmers initially have to pay the full premium to the insurance company and 10% of the premium is

Figure 1: The dynamics of indemnity payments and government subsidies in Russia



Source: Own illustration based on (Bogachev, 2012; Insur-info, 2008)

compensated by the regional government and 40% by the federal government. Though, the law on agricultural insurance was changed in 2011. The farmers' premium payments are reduced to 50% whereas the government pays the additional 50% directly to the insurance company. Private insurance companies also offer a livestock insurance which is subsidized by the government since the beginning of 2013. Commercial crop insurance is rarely offered

by insurance companies (Mahul and Stutley 2010). Rather, insurance companies offer credit-linked insurance products. To become eligible for subsidized agricultural credit, farmers have to purchase agricultural insurance. Insurance companies participating in the subsidized insurance program have to reinsure at least 20% of their risk with the Russian agricultural insurance pool (Mahul & Stutley 2010). Figure 1 makes evident that the importance of agricultural insurance was constantly increasing since 2001 which is represented by the increasing amount of paid claims in Russia. Also, government subsidies were increasing overall and are represented by the grey bars. After a temporary decrease in 2009, paid claims increased again in 2010. Besides, the area insured decreased from 25% in 2008 to 13% in 2010 for Russia. (Bookinsurant 2012). Since the law on agricultural insurance was reformed in 2011, crop insurance penetration has increased again to about 20% (FASI 2013).

3 Data and methodological approach

We use panel data for 2008-2011 (Rosstat, 2013) for about 40 grain producing oblasts of the Central, Black Earth, North Caucasus and Volga districts of Russia on the participation in crop insurance (insurance indemnities, premium, insurance subsidy) and agricultural production (grain yields; share of agricultural enterprises, private farms and animal production in total agricultural output, availability of machinery, total agricultural output). The data set comprises 218 observations. All variables are measured in Roubles per ha except the shares in agricultural output and the availability of machinery, the latter given in kW per ha. The data is transformed to logarithm and we estimate the following demand model (Goodwin 1993):

$$y_{it} = \bar{\alpha} + X_{it}\beta + e_{it}$$

where $\bar{\alpha}$ represents the mean intercept. We choose the share of the insured area in oblast i as the dependent variable (y_{it}), and X_{it} contains variables on crop insurance participation and agricultural production. We also calculate the loss ratio and producer loss ratio as the ratio between claims and premia based on 2008 and 2010 data. The producer loss ratio is based on the premium the farmers pay whereas the loss ratio also accounts for the premium subsidies.

4 Results

The insurance demand equation presented above was estimated within a pooled ordinary least squares (OLS), a fixed effects model and a feasible generalized least squares (FGLS) model framework. Wooldridge test for autocorrelation in panel data is conducted and no first-order autocorrelation is found in the defined model specifications. Estimation results of all three models are presented in Table 1. As expected, the coefficient of the premium paid by the farmers has a negative sign in all 3 models and parameters are statistically significant as well. Further, the previous year's yields seem not to have a large influence on the insurance purchase decisions. The estimated parameter for the share of the agricultural enterprises is not significant in the OLS and fixed effects model, but significant at 10 percent level in the FGLS model. Also, the estimated parameter for the share of individual farms has a significant positive effect within the pooled OLS and the FGLS model framework. This suggests that individual farms participated more often in insurance programs than enterprises.

The different model approaches provide mixed evidence regarding the influence of livestock production and the output per ha. Results of all three models further show that the higher the availability of machinery, the lower is the share of the insurance area. This might be traced

back to farms which have already invested in new machinery, have lower demand for credit, and therefore have a lower demand for crop insurance.

To further investigate the efficiency of the crop insurance market in Russia we calculate the loss ratio. Figure 2 makes evident that the loss ratio is rather small with an average value of 0.57. Thus, insurance companies use about 0.43% of the premiums obtained for covering their costs and to achieve profits. Also, the variation of the loss ratio is rather small, given that agricultural yields in Russia are characterized by high systemic risks and thus large fluctuations. The distribution of the loss ratio among the oblasts makes evident that only for a few cases the loss ratio exceeds 1, even though our data covers the extreme drought year 2010.

Grain producing oblasts have experienced very high level of losses in 2010. However, only in a few regions insurances paid compensations exceeding the collected premiums within one year. Usually, one may expect the largest part of the indemnities transferred to the agricultural producers in the weather extreme years; however, this does not seem to be the case in Russia.

Table 1: Regression results (share of insured area serves as dependent variable)

	OLS	Fixed effect	FGLS
premium per ha	-0.555***	-0.463*	-0.379***
	(0.14)	(0.18)	(0.07)
$yield_{t-1}$	0.081	0.171	-0.054
	(0.24)	(0.27)	(0.12)
Percent enterprises	0.192	-0.946	0.300*
	(0.27)	(1.06)	(0.13)
Percent individual farms	0.708***	-0.243	0.722***
	(0.19)	(0.61)	(0.09)
Percent livestock	0.972*	-3.604**	1.156***
	(0.46)	(1.22)	(0.23)
availability of machinery	-1.076**	-2.161*	-1.153***
	(0.37)	(0.89)	(0.19)
output per ha	0.318	-2.017*	0.289*
	(0.28)	(0.92)	(0.13)
constant	9.212***	13.854*	8.904***
	(1.89)	(5.90)	(1.02)
R^2	0.214	0.738	
N	218	218	218

Notes: numbers in the brackets show the standard errors, ***, **, * show significance at the 1% (5%, 10%) levels; Source: Own calculations.

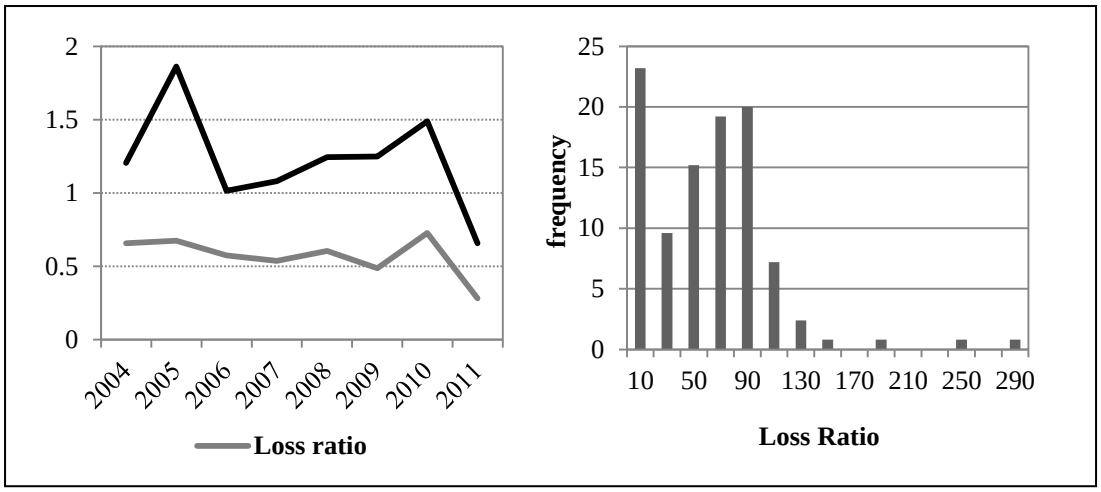
5 Conclusions

The results of the analysis show that the price of insurance plays a significant role in the formation of demand for insurance products. Higher premiums may reduce the demand as confirmed by all three type of models considered in the analysis. Thus, the subsidy policy of Russia of charging the full price from the producers and reimbursing 50 percent later was not a proper mechanism to support the developments in this field. Therefore, direct subsidization of the premiums -as implemented in 2013- may be considered as a better mechanisms.

Furthermore, analyses show that regions with higher level of machinery may have less demand for insurance. This might be explained the important role of insurance to be used as credit collateral. Rich farms with higher value of assets may use assets as collateral which may reduce the need to use insurance as collateral.

Our analysis of the loss risk ratio shows that the crop insurance market of Russia is not functioning well as a risk management mechanism and does not provide a hedging effect during the systemic drought years. Thus, the performance efficiency of the subsidized insurance program needs to be improved in order to make it attractive to farmers. Especially the pay-outs during the drought years need to be increased.

Figure 2: Dynamics of loss ratios and distribution of the loss ratios at oblast level (2010)



Source: Own illustration based on Rosstat (2013).

References

Bobojonov, I., Aw-Hassan, A., Sommer, R. (2014). Index-based insurance for climate risk management and rural development in Syria. Climate and Development, 6 (2): 166-178

Bogachev, A.I. (2012). Modern condition and perspectives of development of agroinsurance system with state support. КубГАУ 80: 1-11.

Bokusheva R. and H. Hockmann (2006). Production risk and technical inefficiency in Russian agriculture, European Review of Agricultural Economics 33(1): 93-118.

Bookinsurant, (2012). На господдержку сельхозстрахования в 2013-2020гг. будет выделено 67,179 млрд руб. http://bookinsurant.ru.

Götz, L., I. Djuric and T. Glauben (2014). Price Damping and Price Insulating Effects of Wheat Export Restrictions in Kazakhstan, Russia, and Ukraine, Poster Paper accepted for the XIIII Congress of the European Association of Agricultural Economists, August 26-29, Ljubljana, Slovenia.

Goodwin, B. (1993): An Empirical Analysis of the Demand for Multiple Peril Crop Insurance, American Journal of Agricultural Economics 75: 425-434.

Insur-info (2008). Сельскохозяйственное страхование с государственной поддержкой на территории России. Медиа-Информационная Группа «Страхование сегодня» (МИГ).

Mahul, O., Stutley, C.J. (2010). Government Support to Agricultural Insurance Challenges and Options for Developing Countries. The World Bank, Washington DC.

Rosstat (2013). Crop insurance data Russia, unpublished.

Swiss Re (2010a). Sowing the seeds for record harvests: risk reduction a must for Russian agriculture.

UNDP (2007). Food Security Challenges Facing Central Asia. Bratislava, SLOVAKIA - 29 May 2012. http://europeandcis.undp.org/data/show/F852DE83-F203-1EE9-B9652F6FB29D423C

USDA (2011). Russian Federation – Federal Law on State Support of Agricultural Insurance, GAIN Report Number RS1138.