

# RISK ELIMINATION IN CZECH AGRICULTURE BY MEANS OF AGRICULTURAL INSURANCE INSTRUMENTS\*

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A high level of entrepreneurial risk is typical for agriculture due to biological nature of production. Currently the process of risk reduction is based on two standards. The first one of these is the optional individual commercial insurance, the second one is the State support ad hoc in case of vast natural catastrophes. Insufficient insuredness in the domain of agricultural production over the Nineties and several natural disasters made the State to accept certain measures to rule the situation. Since 2000 State authorities began supporting agricultural insurance by means of subsidies. Since 2004 the PGRLF has started announcing and processing the support of documented agricultural insurance. A moderate improvement of the situation in the level of insuredness has been recorded in 2008 only. In spite of that, the CR belongs to the countries of Europe having low level of insuredness (37%) particularly in crop insurance. Need for a system solution is felt still more. The paper offers a basic model of agricultural insurance functioning based on the Uninsurable Risks Fund. According to statistical analyses made, the system solution requires a co-operation between State policy-makers, commercial insurers and agricultural producers and their unions.

agricultural insurance; insurance market; State support; catastrophic risks; insuredness; Uninsurable Risks Fund

## INTRODUCTION

There is a very high level of entrepreneurial risk in agriculture that is caused by biological nature of agricultural production and by random effects of the factors of climate. Today's entrepreneurs in agriculture realize this risk fully and mostly they try to manage it. Some of such situations can even reach the level of a crisis threatening the farm's vitality. The only financial device for moderation of the negative consequences of agricultural risks is the agricultural insurance. The model for elimination of the biological-nature-caused risks in agricultural production is built on two standards in the Czech Republic (Prášilová et al., 2008). The first one of these is the State budget from where subsidies ad hoc are paid to farmers in case of natural catastrophes or other calamities. Such subsidies are paid to all the farmers whose production has been damaged by the calamity happened. The second standard is commercial insurance being currently offered in full volumes by four insurance companies. This standard, too, is supported by the State financially, by means of subsidies covering partial compensation of the insurance premiums paid for agricultural insurance. Actual technical measures for submission, endorsement and processing of the farmers' applications are fully under the cognizance of the Farmers and Foresters Support and Guaranty Fund (PGRLF).

## MATERIAL AND METHODS

Target of the project is an analysis of the current level and development of risk elimination devices in Czech ag-

riculture by means of agricultural insurance in crop production and livestock production based on use of statistical methods. As an integral part of the project also analysis of State financial support of agricultural insurance is included (Ducháčková, 2000). As the project outcome, design of a model of agricultural insurance functioning at the levels of subjects participating is presumed.

Data for the analysis of current levels of Czech agricultural insurance and of the factors affecting the State support of agricultural insurance have been obtained from many sources. Each of these has supplied a part of the data only. Regarding that data on insured subjects are in the possession of private insurance companies only, it is impossible to obtain the primary data. The research proper, hence, has been performed based on accessible data by Czech Association of Insurers, Ministry of Agriculture of the Czech Republic and the PGRLF. The format of the data has been in the shape of summary time series. All the data are of the type of administration mass data and they have been processed using statistical procedures from Statistica 8 system.

## CONCEPT OF RISK AS RELATED TO INSURANCE

Risk is defined as the possibility of an event having the outcome biased from the target with a probability. In such a situation, the future event is probabilistically characterized in advance, inclusive of a probability distribution (Hebák, 1998). Besides the risk, also the so-called pure uncertainty is distinguished, where information on occurrence of the event is mostly missing hence, it is not

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possible to describe it. Insurance practice applies the concept of risk three ways:

- an “object” being threatened by a random danger (person, building, plantation, animals, transport vehicle, machinery),
- an event causing damage (fire, flood, frost, accident, injury, infection, death etc.),
- probability of a random event happening and bringing negative effects (D u c h á č k o v á , 2003).

Economic subjects try to prevent risks and their possible negative effects to materialize. In general, it is not possible to eliminate risk but there are certain chances in activities of people, limiting materialization of risk by means of appropriate preventive measures or dispersing risk and thereby averting it. When even these chances are practically exhausted it is possible to consider financial coverage of risk. Thereby the subject endangered can secure financial recovery of damages caused by the risk materialized (W a l t e r , 1994).

Financial recovery can be secured three ways:

- 1) coverage of the risk by the State (extensive natural catastrophes, coverage of elementary social needs of the State’s population),
- 2) individual risk coverage (formation of individual financial reserves by persons, families, legal subjects by means of various types of savings),
- 3) insurance (transfer of the risk to another subject). This means, in principle, formation of financial reserves for risk coverage, where risk is subdivided between more participants and risk coverage is not limited by the

insured party’s funds saved. The level of coverage is stated by insurance policy (C i p r a , 1999).

Diversification of one’s activities and sale of a part of one’s risk to others can reduce the risk. This way distribution of the risk and reduction of its level can be reached. Modern procedures of risk diversification give the chance of financial reserves formation and the system of wider reinsurance gives a certain degree of security to the socio-economic environment.

In correspondence with risk theory, insurance can be expressed such that, separate insured parties transfer their risks, the potential calamitous consequences of which are intolerable to those insured, upon the insurer. The insurer is then able, on the condition of a sufficiently large set of risks of a similar nature (a large and homogeneous insurance portfolio), not only to manage the total risk taken over helping himself with the insurance premiums cashed, but to transform it into an object of profitable commercial activity. The insurer employs the principle of solidarity among those insured enabling him to distribute the damage suffered by some among the entire set of subjects exposed to the same risk (S m e j k a l , R a i s , 2006).

#### AGRICULTURAL INSURANCE

Besides insurances commonly applied in the business area the agricultural subjects can purchase a special agricultural property insurance. Crop insurance, livestock in-

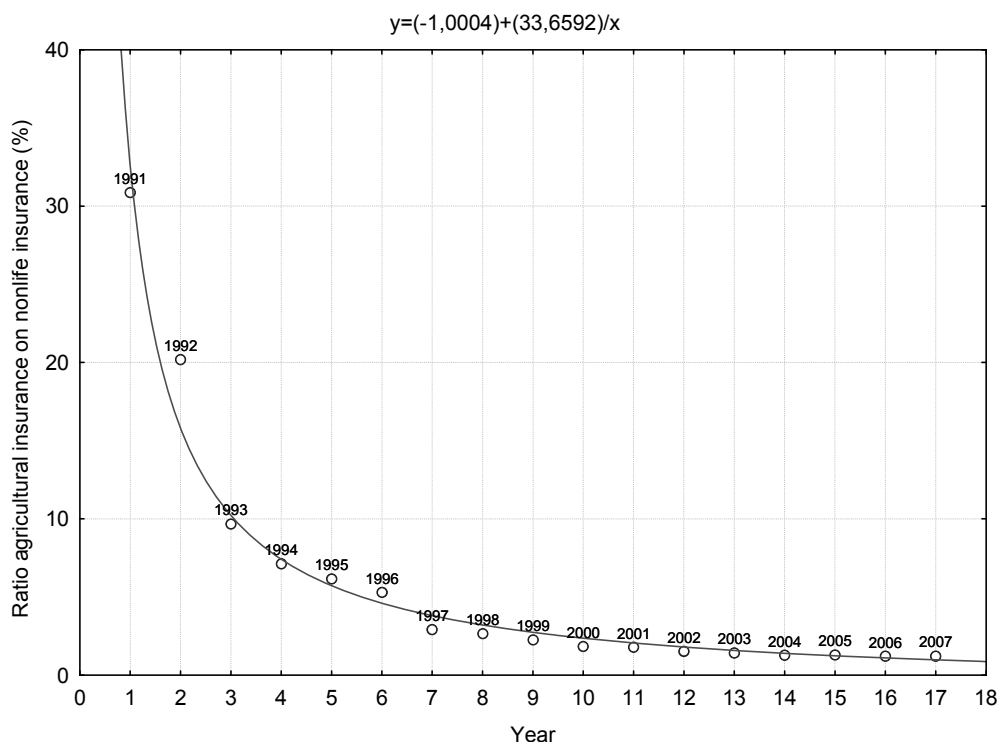


Fig. 1. Hyperbolic trend of agricultural insurance share on the non-life insurance (%)  
Source: Czech Association of Insurers, Ministry of Agriculture of the Czech Republic

surance and forest insurance only, belong to agricultural insurance.

### Analysis of current agricultural insurance development

A significant special feature of crop insurance and livestock insurance is the fact that, damages occur within different growth stages of the plantations or age categories of livestock. The present value of these can be very different therefore when the insurance policy is being negotiated the potential value of harvest or of productive animal has to be considered. This fact is important for damage reimbursement. Agricultural production insurance is a flexible product and each farming subject (be it a person or a company) can select the insurance type according to their economic capacities. The damage recorded becomes a damage insured as soon as the insurer endorses acceptance.

Agricultural insurance passed through a substantial transformation after 1989 in connection with changes of the socio-economic character of national economy. This concerned the forms as well as the contents of the industry. In 1990 it became obvious that, the insurance legal system valid so far would not be workable in the socio-economic situation to come. The obligatory agricultural insurance was abolished by ČNR (Czech National Council) Act No. 594/1990, on the 1991 Czech Republic State Budget. That means, by 1990 the period of legal obligatory insurance of agricultural organisations and overall insurance of harvest was terminated. This year of the principal transition was the last year when agricultural insurance was secured

by Czech State Insurance Company (Česká státní pojišťovna) monopoly. Agricultural insurance was separated organisationally at that time. Livestock insurance preserved a similar extent as was the case in the obligatory insurance, in crop insurance the coverage was limited mainly upon natural calamity damages. Since 1991 the agricultural insurance has been sold on commercial basis only and the tendency of development of its share on the non-life insurance market over 1991–2008 is demonstrated by Fig. 1.

However, the economic situation of agricultural producers has a negative impact on their decision-making as concerns purchase of insurance. This fact affected strategy of the insurers as well. While in 1995 there were 10 commercial insurers on the agricultural insurance market by twelve years later only three have remained (2006, ...). Other insurers departed this area of uncertain products one after the other. Recently, the Austrian Agra company started considerable activities in agricultural insurance domain.

Until 2000 the farmer was fully limited by his/her own decision as concerns the consequences of agricultural activities insurance purchased. Insecurity at one side and lack of finance at the other produced a sharp drop of agricultural insurance sold. Fig. 2 demonstrates the development of basic agricultural insurance indicators over 1990–2008 in CR.

Even against the farmers' repeated own personal experience with natural calamities and livestock infections, the situation in the levels of agricultural insurance sold since 1995 has not changed. Some of the years (2003, 2004, 2005) even recorded a moderate reduction of the

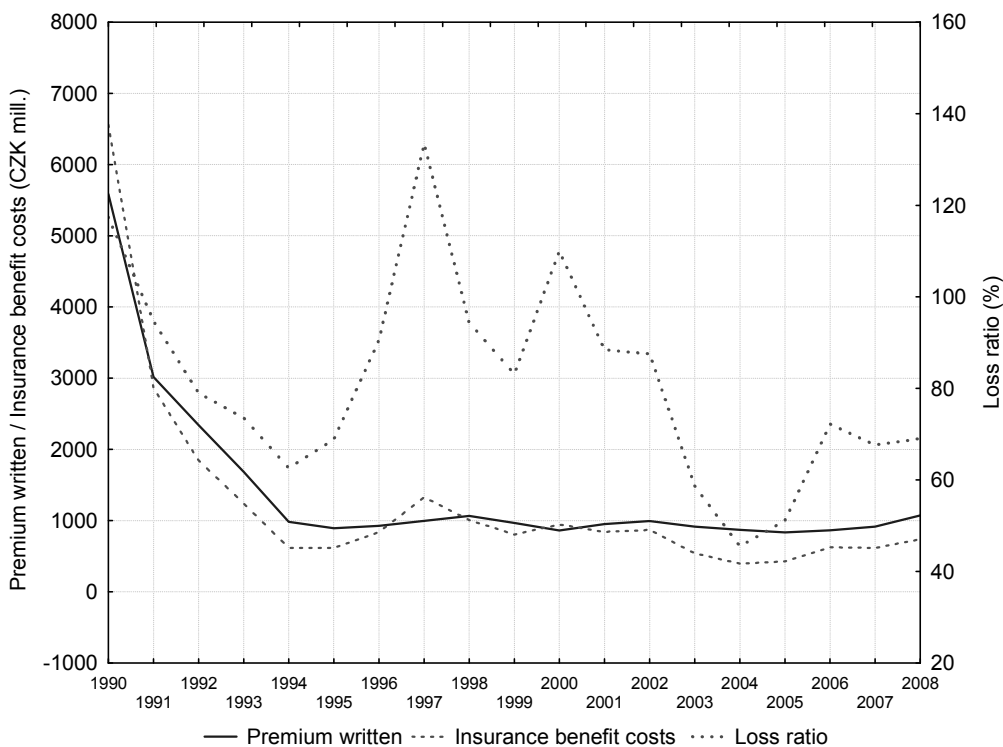


Fig. 2. Development of agricultural insurance indicators in CR (1990–2008)

Source: Czech Association of Insurers, separate insurance companies

insurance premiums ordered. However, this time it was not farmers' disinterest in insurance, which was behind the drop, but it was the effect of livestock numbers reduction and of the bonus system introduction by the insurers. The insurance premiums ordered time series since 1995 shows

a stationary picture. If we look at the problem from the livestock and crop production viewpoint especially, we can find obvious differences in the insurance levels between the substantial branches. Figs 3 and 4 use the same scales whereby they facilitate comparison.

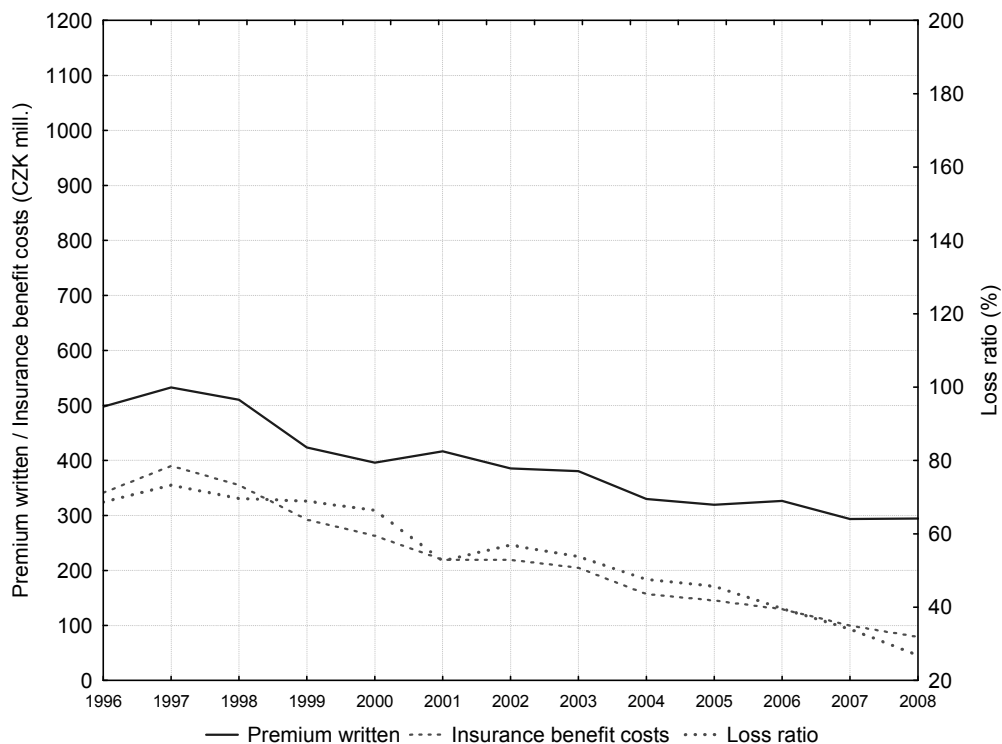


Fig. 3. Agricultural insurance in livestock production (1996–2008)



Fig. 4. Agricultural insurance in plant production (1996–2008)

### Support of progress of agricultural insurance by the State

The unfavourable trend in the commercial agricultural insurance has lasted over more than ten years and the entire situation in the unpredictable risk management has not been positive for the agricultural production. Therefore, the State offered an active support in 2000 for the first time. A support programme “Infection fund and agricultural insurance subsidies” was designed by the Ministry of Agriculture for separately insured agricultural subjects over the period 2000–2003. It supported livestock breeders having documented livestock infection insurance and crop growers having crop insurance against calamities. An overview of State support inclusive of the subsidy rates is given in Table 1.

The realization of the agricultural insurance support idea was very hopeful during the starting period. The situation began changing when the subsidy fund had been exhausted by other subsidy subtitles (cadavers, paratuberculosis) that stood at a higher degree of preference. This irregularity led as far down in the end of the period, as not

to pay any subsidy for the support of agricultural insurance to any farmer in 2003.

Table 2 represents the development of requested and paid insurance benefits in the agricultural insurance over 1998–2006 incl. of some elementary measures.

The levels of premiums prescribed have been dropping permanently. While in the Nineties this decrease was linked to farmers’ disinterest in agricultural insurance, currently the situation changes since the dropping premiums reflect inter alia dropping livestock numbers and shrinking area of farmland. Also the good level of damages over the recent years plays its role. Fig. 5 is based on the same data and it brings a graphic picture of the development of damages moreover.

In 2004 the Farmers and Foresters Support and Guaranty Fund offered support to farmers on the order of their agricultural insurance purchased, for the first time. Conditions for support applications are noted in advance and a confirming document by the insurer is only needed on the payment of prescribed premiums broken down to live-

Table 1. State subsidies for coverage of a part of costs for agricultural insurance 2000–2003

Indicator	Year 2000	Year 2001	Year 2002	Year 2003
Crop insurance	Not supplied	Subsidy rate: up to 10% of costs documented Actual: 10%	Subsidy rate: up to 10% of costs documented Actual: 10%	Subsidy rate: up to 20% of costs documented Actual: 0%
No. of applications		2204	2213	2168
CZK mill. drawn		44.170	45.976	0 Requested: 89.729
Livestock infection insurance	Up to 35% of costs documented	Subsidy rate: up to 35% of costs documented Actual: 35%	Subsidy rate: up to 35% of costs documented Actual: 20.4%	Subsidy rate: up to 30% of costs documented Actual: 0%
No. of applications	cca 1400	2614	2501	2405
CZK mill. drawn	60.0	78.787	48.854	0 Requested: 67.751

Source: Ministry of Agriculture of the Czech Republic, own calculations

Table 2. Development of premiums prescribed and benefits paid in agricultural insurance in CR over 1998–2006

Agricultural insurance						
Year	Premium written (CZK mill.)	$d_{ii}$	$k_i$	Insurance benefit costs (CZK mill.)	$d_{ii}$	$k_i$
1998	1065.0	–	–	1006.8	–	–
1999	967.9	–97.1	0.91	803.9	–202.9	0.8
2000	861.6	–106.3	0.89	947.4	143.5	1.18
2001	952.8	91.2	1.11	842.1	–105.3	0.89
2002	992.9	40.1	1.04	869.4	27.3	1.03
2003	915.5	–77.4	0.92	537.7	–331.7	0.62
2004	869.4	–46.1	0.95	393.3	–144.4	0.73
2005	835.2	–34.2	0.96	426.5	33.2	1.08
2006	864.9	29.7	1.04	625	198.5	1.47
2007	913.5	48.6	1.06	617.6	–7.4	0.99
2008	1072.3	158.8	1.17	751.5	133.9	1.22
Average	937.34	0.73	1.001	711.02	–25.53	0.971

Source: Czech Association of Insurers, own calculations

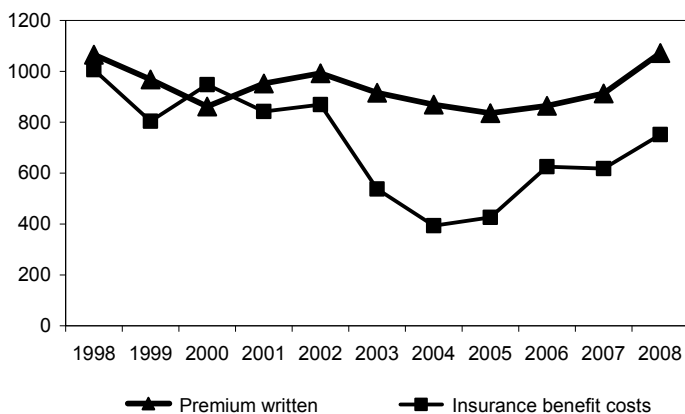


Fig. 5. Agricultural insurance in CR 1998–2008 and development of damages (CZK mill.)

Table 3. Relationship between the premiums prescribed and the support

Year		Premiums prescribed (CZK thousand)		Damages in CR (%)	
		Livestock (Infections)	Crops	Livestock	Crops
2004	PGRLF	234 414	505 588	46.78	44.67
	Support	15%	30%		
	Insurance market CR**	261 385	534 407		
	% share	89.68	94.61		
2005	PGRLF	227 307	481 578	45.37	54.73
	Support	15%	30%		
	Insurance market CR**	257 514	513 061		
	% share	88.27	93.86		
2006	PGRLF	197 936	490 074	39.61	92.04
	Support	20%	50%special 35% other		
	Insurance market CR**	255 511	538 526		
	% share	77.47	91.00		
2007	PGRLF	196 053	577 470	34.00	82.47
	Support	20%	50% special 35% other		
	Insurance market CR**	234 437	611 007		
	% share	83.63	94.51		
2008*	PGRLF	148 650	618 256	26.73	86.56
	Support	20%	50% special 35% other		
	Insurance market CR	148 259	852 634		
	% share	100%	72.51		

Source: Czech Association of Insurers, PGRLF. own calculations

\* exploratory data, \*\* only members of Czech Association of Insurers

stock infections and crop damages. The level of support is fixed annually and it is guaranteed. Table 3 shows the degree of coverage of the documented prescribed premiums in CR by the farmers' applications for support from PGRLF over 2004–2008.

The share of funds available for support, be it for livestock infections or crop damages, is stable. Farmers exploit the chance of agricultural insurance financial stimulation and as seen in the overall insurance development, this situation has an upward trend. The PGRLF has again offered the agricultural insurance support programme for

2008, whose final results will be available by the middle of 2009. The number of applications accepted shows a higher degree of the breeders' interest in the livestock infection insurance as against 2007.

#### EU Common Agricultural Policy and agricultural insurance

Every EU member state has their own agricultural insurance system. The EU/CAP agrees with insurance support availability up to 50% of documented premium

Table 4. Levels of insuredness and State support in some EU countries

State	Levels of insuredness in EU agricultural production			
	Crops	Comment	Livestock	Comment
Slovakia	45%	State subsidies on premiums 50% from 2002	80%	State subsidies on premiums 50% from 2002
Spain	40%	Subsidies about 50%, system based on co-operation of State and private sectors	90%	Subsidies about 50%, system based on co-operation of State and private sectors
Austria	80%	Subsidies by State and Union Lands 50%, wide scale of risks covered, incl. drought	26%	Commercial livestock insurance develops since 2004
Germany	70%	Mostly risk of hail only, no subsidies	80%	About 50% of farms and over 80% breeders insured
Sweden	60%	Hail and frost damage	85%	Commercial insurance covers damages above State guaranty
Greece	100%	Legal compulsory insurance by State-owned ELGA company	100%	Legal compulsory insurance by State-owned ELGA company
France	60%	Mostly hail risk	about 25%	Estimation of Groupama, Co
Czech Republic	37%	2007 – State subsidies on insurance at 35%, special crops 50%	80%	2007 – State subsidies on infection insurance 20%

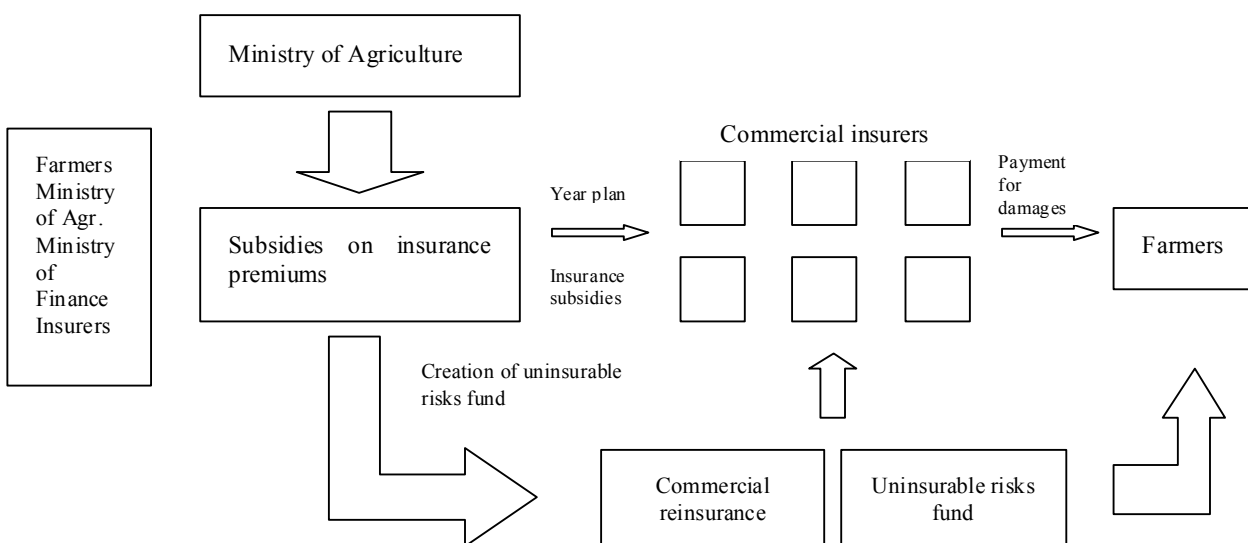


Fig. 6. Design of a model of agricultural insurance functioning  
Source: Česká pojišťovna, PGRLF, own calculations

amounts but the source of support payments has to come from national funds. The regulations of Association for State Support in Agriculture 2000/C 28/02 and Order of Committee about help of the part no. 87 and 88 consider the insurance a suitable device for crisis and risk management in agriculture. In the recommendations it is given that, the support is aimed at small-size and middle entrepreneurs, for a large-size entrepreneur economic independence is being assumed. Table 4 shows the real international position of the CR in the levels of insuredness of crops and livestock.

## CONCLUSION

In 2009 Czech Republic chairs European Union. One of the fundamental problems of the presidency should be the management of risks and crises be. The problem is cur-

rently being pushed aside by the world economic situation therefore the whole process of the untenable agricultural insurance situation should be started from the national levels. Results of analyses show that, future negotiations will bring formation of a system for agricultural entrepreneurs that includes the Uninsurable Risks Fund. Fig. 6 presents a likely model of agricultural insurance functioning, the active elements of which are the State, commercial insurers and producers. The solution offered by Fig. 6 brings to the producers:

- support in risk management,
- a complete choice of products comparable with the most advanced EU countries,
- high quality consultation and services,
- fast settling process,
- security in case of a catastrophic damage.

Commercial insurance is a suitable device for risk management in agriculture. Currently it is being comple-

mented by State support. In spite of this, the development of agricultural insurance in the agricultural production is not satisfactory. The level of insuredness in crop production keeps itself at a low level of 37%. On the other hand, livestock insurance with 80% insuredness shows itself better. A partial change in the producers' behaviour has been brought about by the support of agricultural insurance from the PGRLF coffers. However, the need for a system solution of the riskiness in agricultural production is strongly felt, since only this way the agrarian sector can manage the uninsurable risks without affecting negatively the producers and the State budget.

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### **Eliminace rizika v zemědělství ČR působením nástrojů zemědělského pojištění.**

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Zemědělství se vyznačuje vysokým stupněm podnikatelského rizika v důsledku biologického charakteru výroby. Proces snižování tohoto rizika je v současné době postaven na dvou pilířích. Prvním je dobrovolné individuální komerční pojištění a druhým je státní podpora typu ad hoc při katastrofických událostech plošného charakteru. Nedostatečná propojištěnost v zemědělské prvovýrobě v 90. letech minulého století a několik katastrofických událostí přiměly stát k určitým krokům pro řešení situace. Od roku 2000 začal stát formou dotačních titulů podporovat zemědělské pojištění. Od roku 2004 podporu prokázaného zemědělského pojištění vyhlašuje a vyřizuje PGRLF. K mírnému zlepšení propojištěnosti došlo až v roce 2008. Přesto ČR patří zvláště v pojištění plodin k evropským zemím s nízkým propojištěním (37 %). Stále více se ukazuje nutnost problematiku řešit systémově. Příspěvek představuje základní model pro fungování zemědělského pojištění se založením Fondu nepojistitelných rizik. Pro systémové řešení se ukazuje na základě provedených statistických analýz nutná spolupráce státní politiky, komerčních pojišťoven, prvovýrobců a jejich svazů.

zemědělské pojištění; pojistný trh; státní podpora; katastrofická rizika; propojištěnost; fond nepojistitelných rizik

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