Crop and livestock insurance in Poland reconsidered: challenges from the perspective of agricultural policy

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Abstract: This paper aims at identifying and presenting challenges for crop and livestock insurance in Poland from the perspective of the agricultural policy. First, a comprehensive analysis of of crop and livestock systems for the Polish agriculture between 2011 and 2014 (based on data from Polish Financial Supervision Authority, and other central statistics, Polish Farm Accountancy Data Network database as well) showed that Poland has a strongly subsidised crop and livestock insurance. Agricultural production has to with the risk of drought that results from climate variability affecting Poland. The agricultural sector remains under the influence of impulses from further political and environmental determinants (for example, climate change). There are two main categories of challenges from the perspective of agricultural policy (1) macroeconomic (for example, related to the impact on 'sustainable' public finance and limited expenditures for national agricultural policies) (2) sectoral (both on insurers and agriculture as the whole sector, with a particular attention to sustainable development). In Poland policy options for farm risk management should put an emphasis on the balance between budget flexibility and the criterion of efficiency (from the perspective of insurers). This also refers to analysis of potential paths for development of insurance markets.

1. Introduction

In the European Union (EU) there have been various agricultural insurance systems depending also on national agricultural policy measures. Morever, both at the level of the EU and Member States (MS) policy makers have debated on degree of public sector involvement in providing risk management tools for farmers[1]. Still, partly subsidised crop and livestock insurance products are popular risk management instruments in Poland. This leads to the discussion on whether and how to support crop and livestock insurance, given 'smart' and 'sustainable' development of agri-food sector and rural developement.

The main research objective of the paper is to discuss main challenges for crop and livestock insurance in Poland from the perspective of the agricultural policy. The remainder of the article is as follows: in the next section we present a brief literature review. In the third section we propose a comprehensive analysis of of crop and livestock systems for the Polish agriculture between 2011 and 2014 (based on data from Polish Financial Supervision Authority, and other central statistics, Polish Farm Accountancy Data Network database as well). Documentary research (based on a selection of some EU and Polish govermental report, legal acts and research papers related to risk management in agriculture) was carried out. We analyzed changes in legislation relating to crop insurance and livestock (well before the Polish

[1] In the line with Article 36 from the Regulation (EU) No. 1305/2013, "risk management measures" may refer to "financial contribution" both (i) to "insurance premiums", (ii) to 'mutual funds" that may tackle with natural disasters and a significant drop of farm income.

accession to the European Union). Then, we pointed out trends in the segment of subsidized crop and livestock insurance. In the fourth section,-we indicate challenges and conceptualise interrelationships (in the form of the diagram), implementing elements of textual analysis[2]. We used some selected elements based on the linguistic analysis of documents related to CAP (2014-2020) and national agricultural policy in order to focus on the keyword related to the risk management. The article concludes with recommendations and proposes new avenues for further research. It should be noted that this paper focuses on the perspective of agricultural policy and contributes to the debate on the system of agricultural insurance in the framework of the Common Agricultural Policy (in particular, after 2020).

2. Literature review

There is a plethora of empirical studies on risk management in agriculture,. This may result from a relatively long history of subsidised crop insurance programme, for example in Canada and the U.S. Nevertheless, some streams in the literature may be identified: (a) an assesment of the impact of changes in agricultural policies on decision of farmers (consequently) and evaluating of efficiency of risk management programmes from the standpoint of public finance (e.g. Glauber, Collins & Barry, 2002), (b) a micro-level analysis of determinant of purchase of crop insurance (e.g. . Van Asseldonk, Meuwissen & Huirne, 2002; Mishra & Goodwin, 2003; Serra *et al.*, 2003). Particularly, some American studies focused on the issue of subisidized crop insurance (for example, Glauber, 2004). Atwood, Watts and Baquet (1996) analysed microeconomic implications of farmers' engagement in crop insurance programmes. Their results indicated that farmer's participation in subsidised crop insurance programmes along with price support may be rational from from the point of view of maintaining higher leverage. Yu, Smith and Sumner (2016, p. 1) indicated that 'holding insurance coverage constant' may have postive effects on farm results (revenues, but, indirectly as result, incomes). Moreover, subsidised premium may attract farm operators to decide on raising 'crop insutance coverage'. Moreover, Mishra and Goodwin, (2003) paid a particular attention to the significance of the involvement of public policy in the crop insurance system. Most results from American and Canadian studies indicated a necessity for greater involvment of the private sector. Dissemination of multiperil crop insurance (MPCI) is one of suggested proposals for agricultural policy in developed countries.

The efficiency of subsidised crop and livestock insurance systems in some EU-15 countries has been explored and discussed in selected number of empirical studies (see: Garrido & Zilberman, 2007; Enjolras & Sentis, 2011; Santaremo *et al.*, 2016). We still face the limited number of articles that focus on the issue of subsidised crop insurance in new MS EU, in particular, in Poland. This also refers the issue of the impact of agricultural insurance on the financial situation of farms in new MS EU. The key rationale for maintaing subsidised crop and livestock insurance systems in most EU countries seems to be a necessity to provide reasonable insurance premiums for farmers (see: European Commission, 2008). Moreover, some results of an in-depth cost-benefit analysis for the public sector underline the significance of 'a financial support to insurance premiums on a balanced annual altitude'

[2] Loughran and McDonald (2016) suggested that an extended ' textual analysis' can base on looking for 'target phrases' and 'compling word lists that share common sentiment'.

(p. 194). Public expenditures for ad-hoc payments for farmers are relatively lower than in countries with nonsubsidied crop and livestock insurance system. American findings of Burns and Prager (2016) indicate that crop insurance premiums may affect farmers' decisions to expand utilised arable areas. This effect was statistically significant in the case of the type of 'midsize cash grain farms'.

3. An evolution and current state of the system of crop and livestock insurance system in Poland: towards multiple-peril insurance

In Poland the system of obligatory crop insurance was introduced after the World War II, in 1952. The insurance protection included only hail and flooding risk. Until 1989, insurance system for the agricultural sector in Poland based on solutions in regulations in relevant legal acts. This meant implementation of protection after meeting the circumstances was defined in the relevant legal regulation, without the need to conclude an insurance contract. The insurance market was monopolised by state-owned insurer, PZU (Państwowy Zakład Ubezpieczeń). In 1990 this state, under the conditions of a free market economy was radically altered. Property (related only to buildings of farm household) and liability insurance for farmers remained obligatory. It should be noted that elimination of the obligation to purchase crop insurance and livestock reduced the number of farmers who used this instrument of risk management (Walczak, 2015). Table 1 presents key changes along with novels to the legal acts on crop and livestock insurance in Poland. In the line with basic regulations from 2005, farmers were obliged to to insure minimum 50% of the areas to which it has direct payments in the preceding year, at least one of the following risks: floods, drought, hail, the adverse effects of wintering and spring frosts. As Walczak (2015, p. 100-101) underlined that a change of legal regulations would lead to the popularization mainly crop insurance, but this has not been reflected by an increase in acreage insured. Current legal proposals, i.e. the bill amending the law on crops and livestock insurance (Rządowy projekt…, 2016) is to improve the security system in agriculture by providing wider availability of crop insurance. New proposals are oriented to disseminate multi-peril crop insurance policies and new regulations that will be more preferable for the insurance sector (*Resort…*). This abovementioned bill (Rządowy projekt…, 2016) presents details on insurance contracts related a set of risk factors (multiple-peril crop insurance).

Table 1. Evolution of legal regulations on crop and livestock insurance in Poland

Year of novels	Scope of changes
2006	Two risks (fire and explosion) were eliminated, a list of crops potentially covered by insurance (e.g. (hops, vegetables, fruit shrubs and trees, potatoes) was enhanced.
2007	A list of crops (tobacco, strawberries, legumes) covered by insurance was enhanced; it was possible to separate them risks in the insurance and crop insurance from „certain risks" on a particular area
2008 (two novels)	Change in the definiton of „spring frosts"; lower subsidy (50% of insurance premium) Regulations concerning control in insurance companies by ministry responsible for agricultural issues.
2011	Selection of insurance companies who may offer crop and livestock insurance with subsidised premiums
2015	Increasing the level of subsidization of premiums (to 65% of premiums in the case of crop insurance; higher tariffs than 6% of sum insured; possibities for „coinsurance agrreements" for insurance companies
2016*	A significant increase in the tariff rates– with lower bonitation grades (V and VI in the system of bonitation grade in Poland). Flexibility (with the some limitation from the side of the legislature) for setting tariff rates (from 0.47% to 19% depending on the type of crop, its susceptibility to certain risks and position in the bill increased the current tariff rates of 3.5%, 5% and 6% of the sum insured up to 9%, with the possibility of increasing to 12% and 15% in the case of crops grown on agricultural land respectively to the lowest bonitation grades - V and VI). Proposals for MPCI for the agricultural sector.

Source: based on a detailed analysis of the legal situation carriet out by (Walczak, 2015) and (Rządowy projekt…, 2016; Ministerstwo Rolnictwa… 2016).

Table 2 presents the situation from the point of view of insurers, the number of concluded crop insurance policies slightly increased (by 9.4%) in the analysed period (2011-2014). This may be a positive symptom. Morever, the stagnation in the livestock insurance market can be observed. The ratio of number of indemnities to number of policies (approx. 30%) remained relatively stable.

Table 2. The number of crop and livestock insurance policies and related indemnities – the situation between 2011-2014

Years	Crop insurance		Livestock insurance	
	Number of policies	Number of indemnities	Number of policies	Number of indemnities
2011	53	18	13	5
2012	42	23	10	4
2013	45	6	8	7
2014	58	12	11	3
Change (2014/2011) * 100	109,4	66,7	84,6	60,0

Note: expressed in thousands.
Source: based on Polish Finanical Supervision Authority (KNF) data (recalculated by Pawłowska-Tyszko, 2014).

As shown in table 3, the gross loss ratio, as calculated as the ratio of total indemnities paid to total gross premium, was not stable in the segment of voluntary crop and livestock insurance (even 260% in 2012). The amount of total gross premium collected (as for crop and livestock insurances) was higher than 160 million PLN). On the background of the rest of agricultural insurance products this segment requires considerable attention and public support in the form of limited subsidy to crop and livestock insurance premiums.

Table 3. Voluntary crop and livestock insurance – selected measures and indicators

Description	2011	2012	2013	2014	Change (2014/2011)*100 or (2014-2011)**
Total gross premium collected for **all property agricultural insurances**	640,9	653,8	655,8	668,6	104,3
Total gross premium collected (millions PLN) - for the group of **crop and livestock insurances**	165,2	181,8	163,7	164,1	99,3
Total indemnities paid **for all property agricultural insurances**	422,7	646,5	259,8	272,5	64,5
Total indemnities paid for the group of **crop and livestock insurances**	202,1	472,6	83,8	115,5	57,1
GLR* – all property insurances	66,0	98,9	39,6	40,8	-25,2**
GLR - only voluntary and livestock insurance	122,3	260,0	51,2	70,4	-51,9**

Note: *GLR – gross loss ratio – calculated as as the ratio of total indemnities paid to total gross premium collected respectively, ** percentage points.
Source: based on Polish Finanical Supervision Authority (KNF) data (recalculated by Pawłowska-Tyszko, 2014).

The table 4 describes indeminities paid classified by various categories of risk affecting agricultural production. This refers to data reported for Polska Izba Ubezpieczeń (Polish Insurance Association) and submitted to the Ministry of Agriculture and Rural Development. Agricultural production was strongly affected by weather variablity, that may be result from climate changes (see: Możdzioch & Ploch, 2010). The risk of drought in designing crop insurance has been regarded as very difficult. The probability of this risk is so high that the price of the policy exceeds the maximum rates specified in the regulations. Thus, ad-hoc payments in the case of huge disasters stabilise the income situation of farmers.

Table 4. The amount of indemnities paid by insurers that entered into an agreement with the Ministry of Agriculture and Rural Development – classification by the type of risks

Risks	2011		2012		2013		2014	
	A*	P**	A	P	A	P	A	P
drought	2 313 371	0,64	116 227	0,02	39 174	0,03	90 000	0,03
flooding	1 894 610	0,52	1 081 410	0,15	1 697 745	1,12	1 074 932	0,41
adverse effects of wintering	160 644 322	44,40	587 776 226	81,78	13 033 520	8,61	10 695 829	4,07
spring frost	137 249 546	37,93	7 386 628	1,03	3 322 207	2,19	132 738 562	50,45
hail, torrential rain, lightning, landslide, avalanche	59 736 981	16,51	122 345 441	17,02	133 342 663	88,05	118 487 472	45,04
TOTAL	361 838 830	100	718705932	100	151 435 309	100	263 086 795	100

Note: A - the amount [PLN], P – percentage – the amount from the particular risk/the total amount of claims paid.
Source: based on justification attached to a govermental bill amending the law on crop and livestock insurances (Rządowy projekt…, 2016).

Table 5 presents the the average annual efficiency of state subsidies to crop insurance premiums that is measures as the ratio of indemnities paid to state subsidy to crop insurance premium. As Walczak (2015, p. 116) noted, the „with regard to crop insurance, farmers receive more funds than the annual average state subsidies to these insurances", the year of 2012 may be a good example.

Table 5. The average annual efficiency of state subsidies to crop insurance premiums

Years	Amount of public subsidy (thous. PLN)	Amount of indemnities paid (thous. PLN)	Efficiency indicator: indemnities paid/public subsidy (%)
2011	124 166,70	361 838,83	291,41
2012	162 248,80	718 705,93	442,97
2013	164 245,50	151 435,31	92,20
2014	161 464,73	263 086,79	162,94
Change (2014/2011)*100 or: 2014-2011	130,0	72,7	-128,47

Source: as in Table 4.

Since estabilishing of the system of subsidized voluntary insurance coverage for at least 7 million hectares of crops has fairly optimistically assummed. However, as table 6 presents, much lower acreage was actually covered by insurance in each of the years: 2011 - 3 032 634 ha, and in 2014 - 3 269 871 ha (small increase of just less than 8%), which accounted for approx. 30% of sown agricultural land, i.e. 10 419 913 ha (according to Główny Urząd Statystyczny, 2015).

Table 6. Utilised arable areas covered by crop insurance in Poland

Years	Number of hectares of utilised arable areas
2011	3 032 634
2012	2 751 438
2013	3 398 811
2014	3 269 871
Change (2014/2011)*100	107,8

Source: as in Table 4.

Tables 7 and 8 refer to the situation of commodity farm households participating in Polish system of Farm Accountancy Data Network (FADN). It should be noted that approx. 80% these entities were not covered by crop insurance. 'Large' and 'very large' farms (30 hectares of UAAs and above) accounted min. 55% of total number of farms from FADN sample (table 7). The share of 'very small' farms in the total number decreased which may raise some concerns about financial stability these households. As presented in table 8, approx. 35% of commodity farms in Wielkopolska and Slask (western and south-western voivoideships) used crop insurance polices as risk management tools. On the other side, less than 10% farmers in 'Mazowsze i Podlasie' paid crop insurance premiums. This may result from agrarian tradition in Wiekopolska and a relatively strong crop specialisation).

Table 7. The share of insured commodity farm households paid crops insurance premiums in the total number of commodity farm households (FADN sample)

Classes by area of utilised arable areas (hectares of UAA)	2011	2012	2013	2014
Very small (<=5 ha)	3,1	2,2	1,6	1,9
Small (5<= 10 ha)	8,9	7,1	6,8	6,3
Medium - small (10<=20 ha)	12,9	13,3	13,8	12,7
Medium – large (20<=30 ha)	19,6	18,5	17,8	18,7
Large (30<=50 ha)	26,3	27,3	28,1	27,4
Very large (>50 ha)	39,9	40,1	39,1	38,9
TOTAL	21,0	21,2	21,1	21,0

Source: based on Polish FADN data.

Table 8. The share of insured commodity farm households paid crops insurance premiums by FADN regions in the total number of commodity farm households (FADN sample)

FADN Regions	2011	2012	2013	2014
Pomorze i Mazury	21,4	23,5	22,6	21,5
Wielkopolska i Śląsk	35,7	36,8	37,6	37,4
Mazowsze i Podlasie	8,6	7,7	7,2	7,2
Małopolska i Pogórze	13,3	11,8	12,9	13,4
Total	21,0	21,2	21,1	21,0

Source: based on Polish FADN data.

3. Challenges from the perspective of agricultural policy - a conceptual approach

Figure 1 describes interdependencies between farm household that may treated as the centre of „black box". Decison of farm operators are affected by sectoral determinants, for example concerning market situation (e.g. price stability). The agricultural sector remains under the influence of impulses from further political and environmental determinants (for example, climate change). Możdzioch and Ploch (2010) enumerated negative and positive implication of climate change on economic situation of agriculture in Poland. They stated that negative aspects related to, inter alia, lowering yield of main cereal. Morever, predominance of light soils in central Poland intensifies processes of erosion. Although some positive aspects may be identified (e.g. lengthening of the growing season). There are two main categories of challenges from the perspective of agricultural policy (1) macroeconomic (for example, related to the impact on 'sustainable' public finance and limited expenditures for national agricultural policies) (2) sectoral (both on insurers and agriculture as the whole sector, with a particular attention to sustainable development). Sector challenges include social context related to the issues of ageing in rural areas, sucession. The interchangeabilty between social policy instruments and agricultural policy measures with respect to should be discussed. In this context there are proposals proposals currently in the legislative process (e.g. the bill of law of fund for protection of agricultural incomes that will be financed from food processors' contributions).

It should be added that from the Polish perspective, subsidised 'crop' and 'livestock' insurance products are treated as important instrument ensuring financial stability of farm households. Nevertheless, in the case of severe disaster events ad hoc payments complement the ongoing 'safety net' for Polish agriculture. In-depth textual analysis indicated that demand of these products is limited because of some shortcoming reported by farmers (for example, limited insured sum, too high insurance premia, too high transaction cost). From the point of view of the insurance markets, there is a long list factors indicating a low attractiveness of the agricultural sector. Still, the fact that farmers and policy makers prefer the traditional form of risk management (including, subsidised insurance products) may slow down adaptation of relatively new solutions.

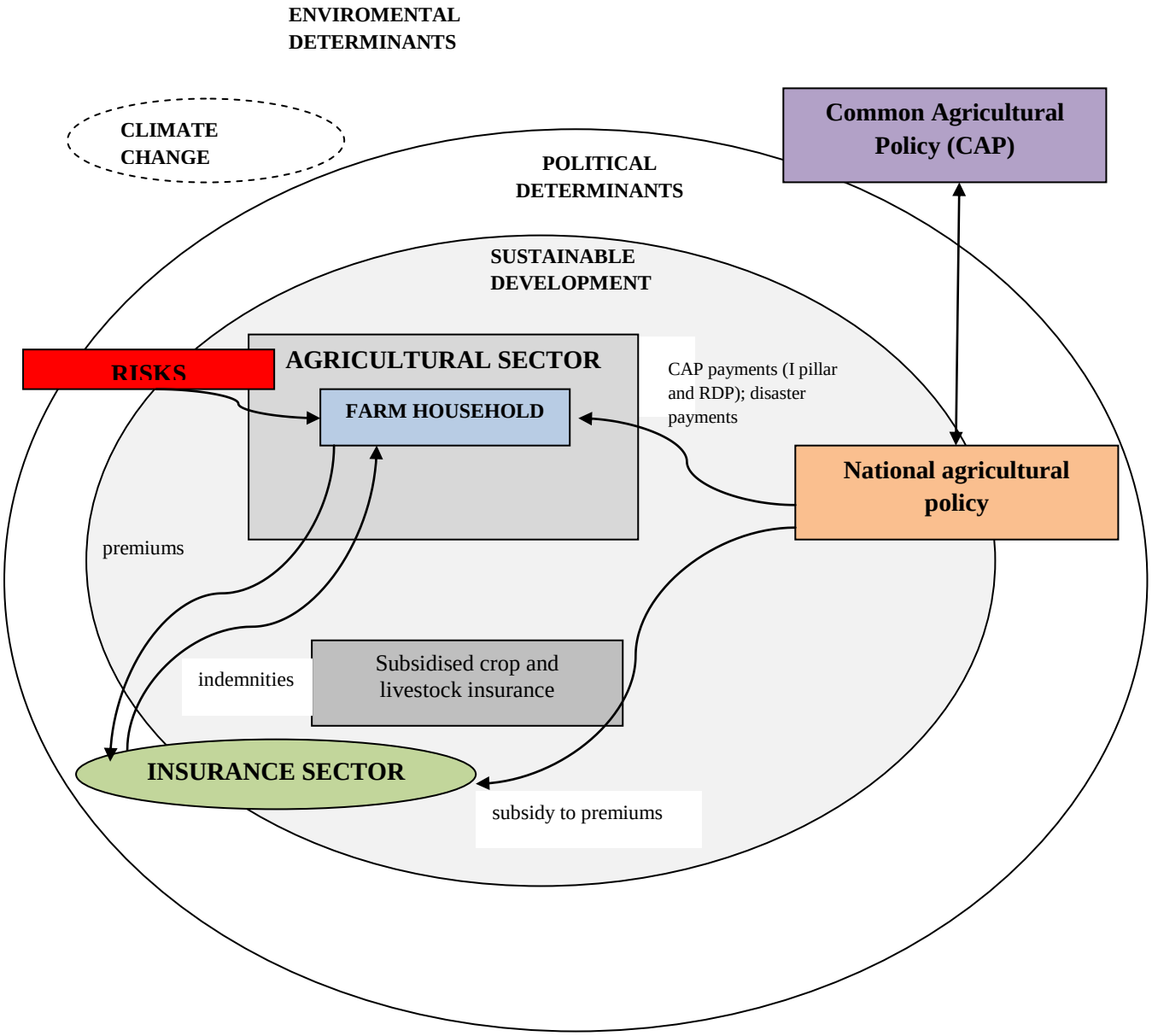

Figure 1. Farm household versus risk management: a conceptual approach

As table 9 presents, 'sustainable' is one of keywords for main legal regulations concerning CAP. Hovwever, as the occurency and frequency of very important phrase 'risk management' was much lover. It should be noted that in Polish regulations on rural development programme the word of 'insurance' relate both to social ('social securities' - ubezpieczeania społeczne) and business (incl. crop and livestock) insurance.

Table 9. The element of textual analysis of selected legal acts related to risk management in agriculture

Document	Phrases	Occurency	Frequency [%]
Regulation (EU) No 1305/2013.. on rural development	*Risk management* *Insurance* *Sustainable*	12 11 31	0,1 0,1 0,3
Regulation (EU) No 1306/2013 - financing CAP	*Risk management* *Insurance* *Sustainable*	1 - 6	<0,1 - -<0,1
Program Rozwój Obszarów Wiejskich 2014-2020 [Rural Development Programme 2014-2020]	*Risk management* *Insurance* *Sustainable*	23 47 (15 in relations to analysed group of insurance) 93	<0,5

Note: as Polish translation.
Source: own computation.

5. Concluding remarks

The demand for private risk management instruments depends strongly on the degree of public support (the share of subsidized premiums) as well as other variables The system of crop and livestock insurance in Poland is strongly subsidised and covers only 30% areas sown in Poland. Agricultural production deals with the risk of drought that results from climate variability affecting Poland. Morever, finanical conditon of many small-sized farms („social" farm household) strongly depend on subsidy instruments of agricultural policy and national social policy. Implementation MPCI instruments may have a positive impact on higher demand for crop insurance in Poland.

The lack of detailed data on farm income (acccounting systems are not obligatory in Poland) may inhibit the development more complex instruments (for example, IST). It should be emphasised that, for example, new institutional approaches may strengthen intitatives for cooperation beetween insurers, financial institutions (including cooperative banks) and research institutions. Future research should be based on empirical studies at farm-level data (incl. variables describing farm-level geographical data, GIS, survey-based research, economic experiments). In Poland policy options for farm risk management should put an emphasis on the balance between budget flexibility and the criterion of efficiency (from the perspective of insurers). This also refers to analysis of potential paths for development of insurance markets.

In future research we plan to examine the possible effect of substitution of specific single-risk crop insurance with multiple-peril crop insurane (MPCI). This may be an option for farmers dealing with various risks (not only drought), but also maintain profitability criteria of services from the point of view of the insurance sector. The option of MPCI policies may provide farmers a greater access to insurance that are partly subsidized by the budget.

References

Atwood, J.A., Watts, M.J., & Baquet, A.E. (1996). An Examination of the Effects of Price Supports and Federal Crop Insurance Upon the Economic Growth, Capital Structure, and Financial Survival of Wheat Growers in the Northern High Plains. . *American Journal of Agricultural Economics, 78 (February 1996),* 212-224.

Burns Ch.B. & Prager D.L. (2016). *Do Direct Payments and Crop Insurance Influence Commercial Farm Survival and Decisions to Expand?* Selected paper presented for presentation at the 2016 Agricultural & Applied Economics Association, Boston, MA, July 31-August 2, 2016.

Enjolras G., Sentis P. (2008). The Main Determinants of Insurance Purchase : An Empirical Study on Crop insurance Policies in France, Paper provided by LAMETA, Universtiy of Montpellier in its series Working Papers with number 08-06., Retrieved from: http://www.lameta.univ-montp1.fr/Documents/DR2008-06.pdf

Enjolras, G. & Sentis, P. (2011). Crop insurance policies and purchases in France. *Agricultural Economics, 42*, 475–486.

European Commission (2008). *Agricultural insurance schemes. Final Report*. Modified February (2008). Directorate General JRC Joint Research Centre – ISPRA, Institute for the Protection and Security of the Citizen Agriculture and Fisheries Unit, Brussels, Belgium. Agricultural Insurance Schemes.

Garrido, A., & Zilberman, D. (2007). *Revisiting the demand of agricultural insurance: The case of Spain*. Contributed paper presented at the 101st Seminar of the European Association of Agricultural Economists. Berlin, Germany.

Glauber, J.W. (2004). Crop insurance reconsidered. *American Journal of Agricultural Economics, 86(5)*, 1179–1195.

Glauber, J.W., Collins, K.J., & Barry P.J. (2002). Crop insurance, disaster assistance, and the role of the federal government in providing catastrophic risk protection. *Agricultural Finance Review*, 62(2), 81– 01.

Główny Urząd Statystyczny (2015). *Użytkowanie gruntów i powierzchnia zasiewów w 2014 r.* [Land use and sown area in 2014]. Warszawa: GUS.

Loughran, T. & Mcdonald, B. (2016). Textual Analysis in Accounting and Finance: A Survey. *Journal of Accounting Research, 54*, 1187–1230.

Ministerstwo Rolnictwa i Rozwoju Wsi (2016). *Ubezpieczenia-upraw-rolnych-i-zwierzat-gospodarskich-w-2016-r*, Retrieved from: https://bip.minrol.gov.pl/Informacje-Branzowe/Ubezpieczenia-upraw-rolnych-i-zwierzat-gospodarskich/Ubezpieczenia-upraw-rolnych-i-zwierzat-gospodarskich-w-2016-r (30.08.2016).

Ministerstwo Rolnictwa i Rozwoju Wsi. *Program Rozwoju Obszarów Wiejskich na lata 2014-2020* (date of modified version: 27.04.2016).

Mishra, A.K. & Goodwin, B.K. (2003). Adoption of Crop versus Revenue Insurance: A Farm-Level Analysis. *Agricultural Finance Review*, Fall 2003, 143-155.

Możdzioch M., Ploch, A. (2010). Zmiany klimatyczne a ubezpieczenia upraw rolnych [Climate &changes vs. crop insurance]. *Wiadomości Ubezpieczeniowe, 3/2010,* 133-150.

Pawłowska-Tyszko, J. (2014). *Ubezpieczenia i podatki* [Insurance and Taxes]. In: A. Kowalski (Ed.). *Analiza produkcyjno-ekonomicznej sytuacji rolnictwa i gospodarki żywnościowej w 2013 roku* [Analysis of production and economic situation of agriculture and food economy in 2013]. Warszawa: Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej – PIB.

Regulation (EU) No 1305/2013 of The European Parliament And Of The Council Of 17 December 2013 on Support For Rural Development By The European Agricultural Fund For Rural Development (Eafrd) And Repealing Council Regulation (Ec) No 1698/2005.

Regulation (EU) No 1306/2013 Of The European Parliament And Of The Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008

Resort rolnictwa chce upowszechnić ubezpieczenia pakietowe, Retrived from http://agrobiznes.money.pl/artykul/resort-rolnictwa-chce-upowszechnic,87,0,2004823.html (30.08.2016).

Rządowy projekt ustawy o zmianie ustawy o ubezpieczeniach upraw rolnych i zwierząt gospodarskich [Bill amending the Law on crop and livestock insurances], 2016. A, http://www.sejm.gov.pl/sejm8.nsf/agent.xsp?symbol=RPL&Id=RM-10-19-16.

Santeramo, F.G, Goodwin, B.K., Adinolfi, F., & Capitanio, F. (2016). Farmer Participation, Entry and Exit Decisions in the Italian Crop Insurance Programme. *Journal of Agricultural Economics, 67(3),* 639–657.

Serra, T., Goodwin, B.G., & Featherstone, A.M. (2003). Modeling Changes in the U.S. Demand for Crop Insurance During the 1990s. *Agricultural Finance Review, Fall 2003*, 109-125.

Van Asseldonk, M., Meuwissen M., & Huirne R. (2002). Belief in Disaster Relief and the Demand for a Public-Private Insurance Program. *Review of Agricultural Economics, 24(1),* 196-207.

Walczak, D. (2015). *Current and proposed changes in economic insurance in agriculture*, In J. Pawłowska-Tyszko J. (Ed.). *Current status and prospects of development of the tax system and insurance scheme of the Polish agriculture*, p. 96-120, Warsaw IAFE-NRI.

Yu, J., Smith, A., & Sumner, D.A. (2016). *The Effects of the Premium Subsidies in the U.S. Federal Crop Insurance Program on Crop Acreage*. Agricultural and Applied Economics Association, 2016 Annual Meeting, July 31 August 2, Boston, Massachusetts, 2016 Annual Meeting, July 31-August 2, Boston, Massachusetts.