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# Income stabilisation in a changing agricultural world: policy and tools

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# Income stabilisation in a changing agricultural world: policy and tools<sup>1</sup>

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## Abstract:

This paper attempts to draw conclusions regarding Risk Management instruments (RMI) for potential development or expansion in the EU (Garrido and Bielza, 2007). Using data from EU countries, compiled in the course of two EU research projects about RMIs, we perform a cross-sectional analysis of the role of agricultural insurance and *ad hoc* payments. Tests of comparisons of means of key insurance data reveal the impact of insurance policies and the degree of competitiveness in supply side. While the presence of subsidies explains differences across EU member states' (MSs) insurance data, the degree of competitiveness is not a differentiating factor. In the last part of the paper, we rate a number of RMIs on the basis of a number of criteria. We conclude that RMIs on EU scale should be flexible enough to accommodate very diverse risk contexts, farmers' demands and ongoing national programmes. Our conclusions may be useful in defining RMIs within the scope of European Agricultural Policy, and as an extension of similar studies (Cafiero et al. 2005; European Commission (2006a).

## 1 Scope and objectives

This paper attempts to summarise the policy-relevant conclusions that emerge from a more thorough review of risk management instruments for agriculture. It builds on relevant literature, on recent work commissioned by EU institutions (Parliament: Cafiero et al. 2005, and the European Commission 2005, 2006a, 2006b) and on qualitative field work carried out by the authors in several EU countries. In the first section, the distinction between business risks and catastrophic and crisis risks is briefly reviewed in the second section. In the third section, we review some of the instruments

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<sup>1</sup> Summary paper of the review carried out pursuant to WP4 of "Income stabilisation", European Project 'Design and economic impact of risk management tools for European agriculture', Contract Number: 006613. See Annex 1, with the full document (Garrido & Bielza, 2007).

used by MSs . Country data from the EC (2006a), combined with other sources and the authors' own findings, provide a snapshot of the current situation and of important trends. The fourth section summarises the major findings of the literature about the advantages and disadvantages of the most common risk management instruments. We conclude with a discussion of the three proposals of the EC (EC, 2005), which have attracted most attention recently (Cafiero et al.2005; EC, 2006a).

## **2 Business risks vs catastrophic and crisis risks**

Risk is as facet of hazard and is endogenous to the ability to cope, not a fundamental concept by itself. Policies and risk management instruments target both aspects, in an attempt to reduce vulnerability to hazards. Defined in these terms, precise risk measurements are difficult to come by, because the errors in defining and measuring hazards and vulnerability multiply the errors associated with risk evaluations. For instance, Cafiero et al. (2005) contend that, after the 2003 CAP reform, EU farmers' income will be more stable, contrary to a widely held belief, which is grounded on the supposition that EU farm prices would be more volatile (Alizadeh and Nomikos, 2005; Antón & Giner, 2005).

Cafiero (2005) and the European Commission (2006a) use regional indicators of yield variability, droughts and other variables mapped in GIS. While these certainly convey an idea of the sources of the regional variability of yields on continental scale, they fail to draw a clear distinction between entrepreneurial and catastrophic risks. Very little about the actual vulnerability of farms can be learned from these maps, in part because farmers are generally speaking well prepared to cope with their usual risks. Few direct measurements and analyses of the income variability of European farms are available. Comparing the income variability of farms of various countries included in the FADN., Vrolijk and Poppe (2007) show that the largest and more competitive farms tend to experience larger revenue instability (both in absolute and relative terms) than smaller farms. More productivity and size may be associated with more exposure and income stability, but also with greater accessibility to credit and a wealth of risk management instruments.

Furthermore, no study is available that evaluates the short- and long-term consequences of serious crises for EU farmers. While there is a notable lack of research on what policies are most effective in dealing with risks on EU scale, a great deal of research has addressed specific risks on a regional or even smaller scale. Unfortunately, typical business risks, which are less difficult to manage in the EU, have been paid much more attention than crises and disasters.

## **3 Risk management instruments in practice**

### **3.1 *Policy and risk management instruments across EU countries***

As the European Commission (2006a) clearly details, there is a great diversity of policy options, risk management instruments and initiatives among MSs. During the past five years, a number of MSs (notably Austria, France, Greece, Italy and Spain) have given a serious impulse to policies aimed at providing farmers with a safety net. Others, including UK, Germany and The Netherlands, still rely on *ad hoc* relief and catastrophe

compensation, and have reinforced farmers' training programmes for coping with risks. This great diversity of measures results from at least three different factors: (1) the types of risks and hazards faced by MSs' farmers differ widely, (2) the extent to which farm holdings have been consolidated and restructured, and (3) the various approaches of MS to help farmers to cope with risk.

Animal health policy is perhaps the only area in which the EU has developed a common approach to reduce risks' diseases. Unlike other agricultural risks, contagious animal diseases have regional, market and even human health implications. One key strategy for the protection of European livestock and citizens is to intensify border controls and enforce traceability, animal identification and labelling (European Commission 2006b). While this recent evaluation indicates a number of strengths and positive views, there are areas which demand renewed efforts. In particular, the way in which *ad hoc* compensation schemes are co-funded by the EU and MS may create incentives for moral hazard both at farms and MSs levels. As Mangan and Burrell (2003) show, the financial consequences for national farms on and off quarantine zones create winners and losers, depending on whether exports are banned and on the magnitude of the epidemic. Consumer welfare also depends on the severity of an outbreak and on its market implications.

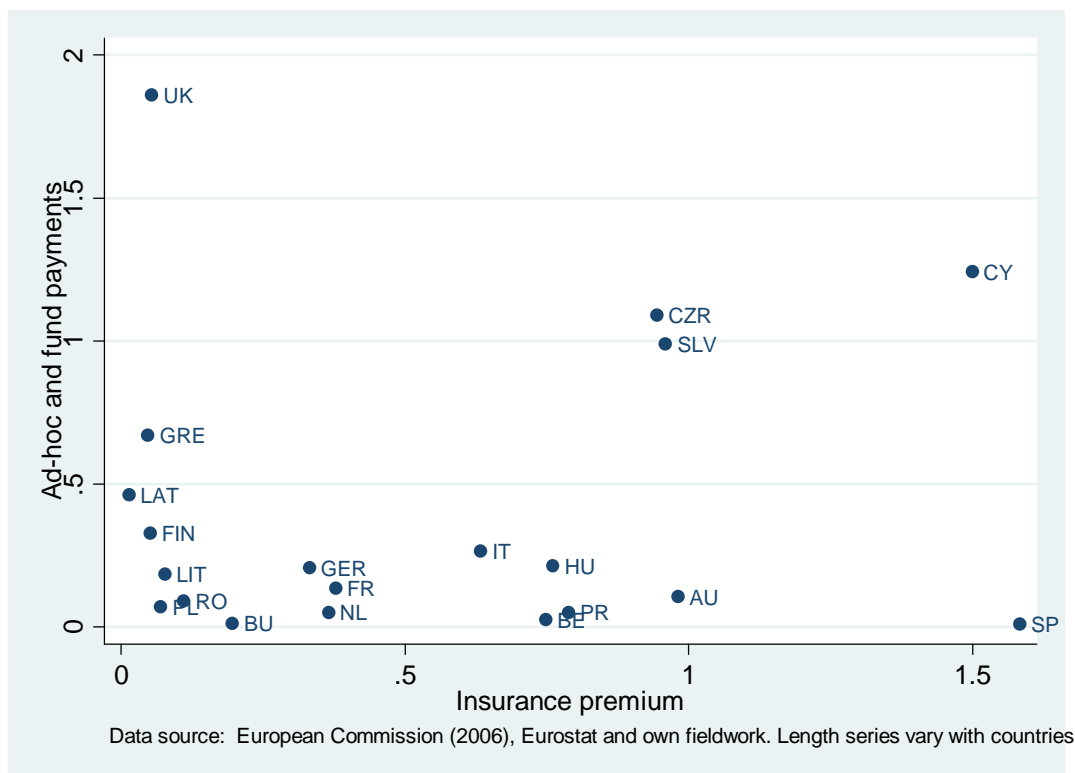
Leaving aside the EU's initiatives in the area of animal health, the following variables have been proposed to represent MSs' policy approaches<sup>2</sup>: (1) Percentage of *ad hoc* and fund payments over total agricultural output (including crop and livestock); (2) Percentage of insurance premia over agricultural output (including also crop and livestock premia).

As figure 1 shows, MSs' national policies stand between two extremes represented by the UK and Spain. Based on recent data, the UK has mostly relied on *ad hoc* payments while Spain relies on agricultural insurance. Note that, apart from these countries, most MSs spent less than 1% on both insurance premia and funds/*ad hoc* contributions. The combined expenditure on *ad hoc* payments and insurance in the Czech Republic and Slovenia are among the highest in the EU. In the following sections, we sharpen the focus on the differences among MSs in the area of *ad hoc* payments and insurance.

**Figure 1. *Ad hoc* payments vs. insurance (annual payments expressed in % of total agricultural production)**

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<sup>2</sup> Unless noted all data used in this section is borrowed from (European Commission 2006a), Eurostat and complemented by the authors' own fieldwork



According to data from the EC (2006a), almost all MSs make *ad hoc* payments and a smaller percentage have either public or private stabilisation funds. Ad-hoc payments to livestock growers are common in UK, Ireland, Belgium, Poland, Germany and Sweden (not represented in Figure 1 because of lack of insurance data). Ad-hoc payments to crop farms are mostly related to frost, drought, hail and excessive rainfall. In France and Germany droughts have taken more than 65 and 30% of the ad-hoc payments made in the last ten years. On the basis of the available data, total annual ad-hoc payments in the EU are about €1 billion (considering a period that varies among MS and ranges from ?? ??

The EU has played a leading role in promoting animal health during the past decade (Council Decision 90/424/EEC). It has financed losses caused by animal disease using ad-hoc compensations by means of market support instruments, and loss-based compensation, using the ‘veterinary fund’. The veterinary fund is fed by livestock farmers and/or MSs’ contributions (it varies across MSs). The total budget for veterinary measures under Decision 90/424/EEC has peaked to €563 million in 2001 (with 80% assigned to the emergency fund for veterinary complaints, and 20% to disease eradication) and fell to €220 million in 2005 (with 91% and 2.2% in the same programmes) (European Commission, 2006b).

#### ■ *Agricultural insurance*

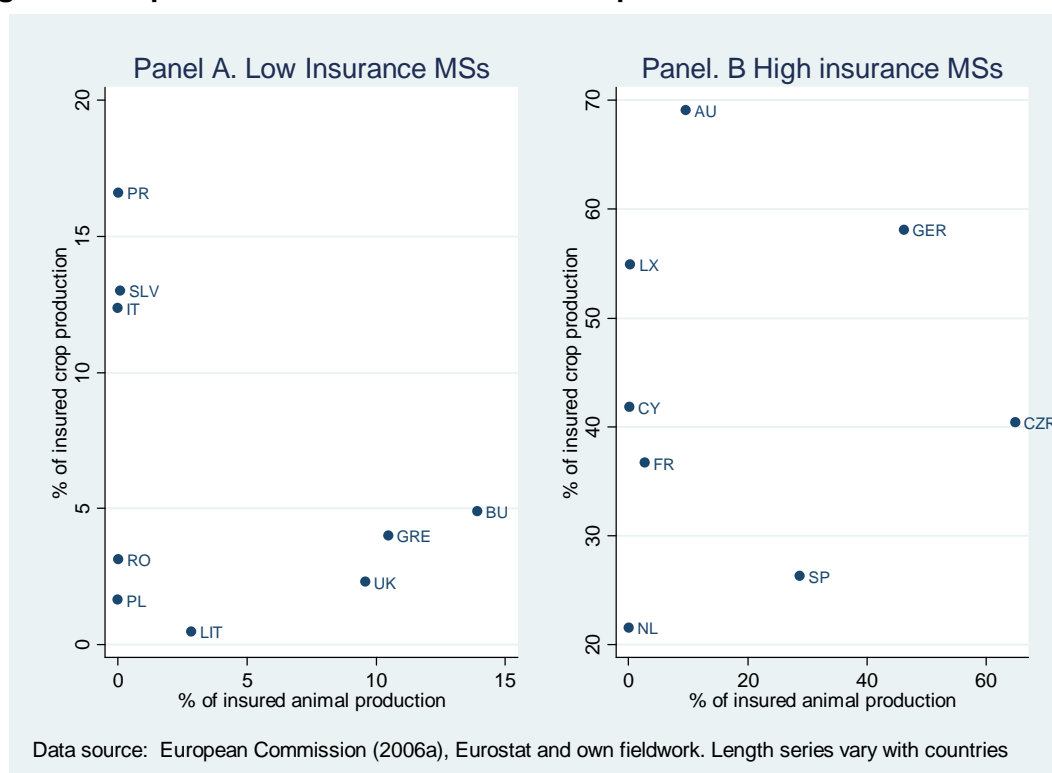
Agricultural insurance is offered in the EU in a wide variety of formats and with a wide degree of public-sector involvement. It is also evolving, with some member states such as Austria, Italy, France and Spain showing significant growth in the past few years.

European Commission document EC (2006a) has offered the most detailed compilation since those authored by Forteza del Rey (2002) and OECD (2000).

The major findings of these sources can be summarised by looking at the proportion of insured production and the impact of premium subsidies on some other key parameters.

In Figure 2 we plot the proportion of insured crop production and the proportion of insured animal value against livestock production in most MSs for which data are available. In the left panel, we expand the scale to allow for a better representation of MS with low insured production. Note that percentages vary significantly across MS, with Austria, Germany, Denmark and the Czech Republic with the largest insured proportion of output. In the middle group, we find France, Cyprus and Spain.

**Figure 2. Proportion of insured animal and crop value**



Insurance policies vary significantly across MS, more than Figure 2 suggests. There are a number of factors that help us to understand these differences.

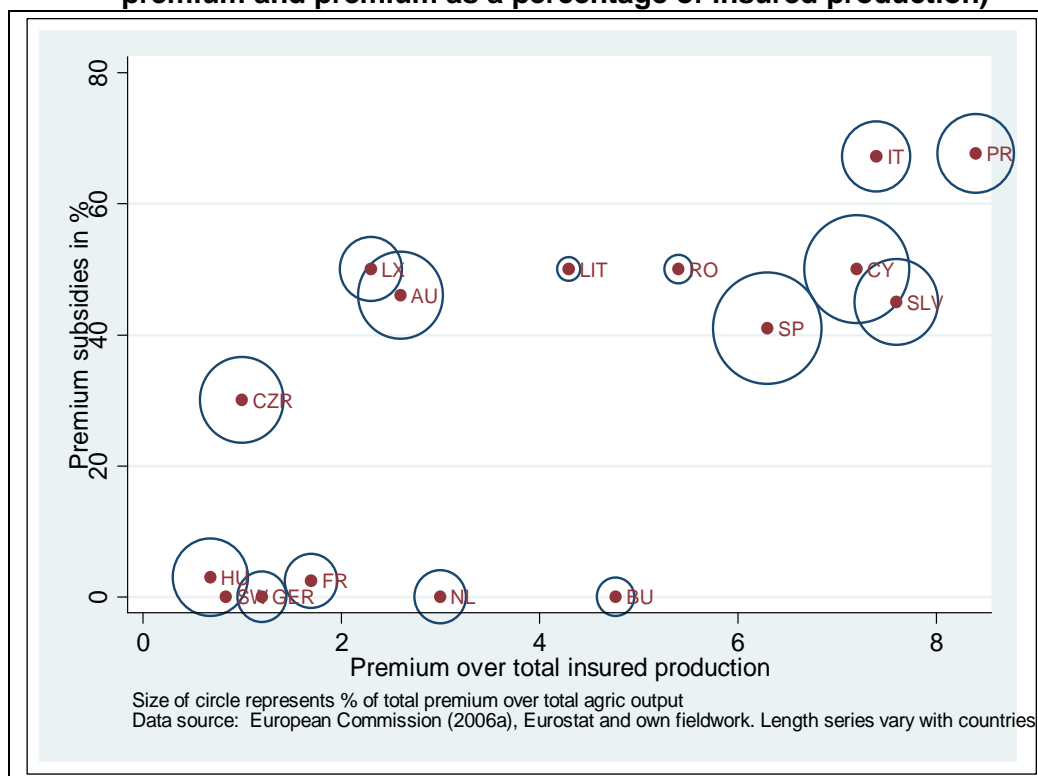
First, agricultural insurance exists both with and without the governmental support in the form of premium subsidies. Furthermore, even if a country has a high insurance penetration rate among crop and livestock farmers, that does not mean that all crop or animal risks are covered. In Figure 3, we plot the situation as regards three key variables. The vertical axis represents premium subsidies measured as a percentage of total premium. The horizontal axis measures the ratio of premium to total insured production. The size of the circle represents total premium against total agricultural production.

Figure 3 helps identify three groups of MSs. There is the group of Mediterranean countries (except Greece, not shown because of the lack of information) in the upper right-hand side. These countries subsidise intensely the premia, and premia are relatively large with respect to total agricultural output. At the other extreme, we find

Germany, Denmark, France, Eire and Sweden. These countries' premia and subsidies are relatively small or zero. Total premia are also relatively small compared to the value of farm production. The size of the circle represents the percentage of total agricultural production that is normally insured. Data show that penetration rates are greater in countries where insurance is less subsidised, though coverages are broader in the Mediterranean countries.

Figures 1, 2 and 3 portray a landscape at EU level that can be summarised by the following trade-off. In order to provide a safety net, MSs can resort to *ad hoc* payments in lieu of catastrophes or crises, however differently they may be defined around the EU, or else they can use subsidised insurance to promote the purchase of wide-coverage premia. Data from individual MSs suggest that unless insurance is subsidised, coverages are limited and rarely cover crisis losses. When these occur, government expenditure in the form of *ad hoc* payments is unavoidable. Standing between these two policy extremes, countries such as France, Italy or Austria are swaying in the direction of more insurance. France and Spain have linked the eligibility to ad-hoc funds to the purchase of agricultural insurance.

**Figure 3. Insurance policies across EU MSs (Subsidies as a percentage of premium and premium as a percentage of insured production)**



### 3.2 Major institutional trends and innovation

The previous brief review is no more than an updated snapshot of the situation around the EU. Field work carried out for this study shows that many countries are making progress and finding new ways of providing safety nets for their farmers.

- *Technical Innovations*



Index insurance based on vegetation indices to cover drought episodes (US, Spain, Canada and experimentally in France, South Africa and Ukraine).

Parametric insurance (based on rainfall indices in Australia; water, rainfall and drought in India; rainfall indices in Morocco and Romania; this under study).

Derivatives (weather-based in The Netherlands for greenhouse horticulture; river flow derivatives in Mexico for water supply risks).

Contractual agriculture in speciality crops, using (i) forward contracting; (ii) downstream-upstream contracting along the market chain; (iii) derivatives and over-the-counter contracts (iv) bankruptcy swaps in the rural banking sector (throughout the EU and the US).

#### ▪ *Institutional innovations*

Austria, Italy and France are promoting and expanding the penetration of agricultural insurance.

France began offering an experimental pilot revenue insurance policy for oil crops denominated in MATIF future prices.

In Spain, Italy and France, the eligibility for receipt of ad hoc aid, as well as the size of such aid, is becoming increasingly conditional on purchasing agricultural insurance. Ad hoc aids are only granted to non-insurable hazards. The Netherlands cancelled the programme of compensation for excessive rainfall, since public-sector insurance is now available.

The UK is focusing on helping farmers diversify and on reinforcing training programmes in risk management. A proposal called “*Cost-sharing*” is trying to set up an arrangement to share the costs of fighting disease outbreaks between government and industry. This scheme would consist of a system of taxes which would accumulate from year to year, with some similarity to a fund.

The Netherlands and UK do not make ad-hoc payments to compensate for climatic hazards.

The US now offers on-line probability estimates of single and multiple climatic hazards for various time-scales (days, weeks, months) on a very small geographical scale. This offers option contracts and derivatives a chance to deal with very specific climate protection products (Turvey, 2007).

## **4 Key lessons**

### **4.1 About agricultural insurance**

The history of agricultural insurance is full of bad examples and critical periods (see (Hueth and Furtan, 1994; Hazell et al. 1986). However, there are many other positive evaluations (Burgaz Moreno and Pérez-Morales, 1996; Mishra, 1996 ). Furthermore,

many problems are related to asymmetric information, and a number of problems have been ascribed to public participation in agricultural insurance<sup>3</sup>:

– **Lack of competition in the insurance market**

To date, no rigorous study has evaluated the degree of market power and lack of competitiveness. Yet, as premia are set by the insurance companies, competition among companies can only be based on their retailing services, and the additional insurance or financial services that they offer farmers. In most cases, agricultural insurance is just a small part of the insurance business contracted in rural areas. The lack of competitiveness strictly attributable to agricultural policies is likely to be small.

Using data collected by the EC (2006a), statistical analyses were performed in order to evaluate the extent to which competition in the insurance markets has some impact on various national insurance data. In Table 1, countries in which insurance rates are formed in competitive markets are separated from those in which rates are set by governments or where there is only one selling agency.

**Table 1. The impact of competitiveness on key insurance parameters among EU Member States (averages, standard deviation and means t-tests; n, number of countries included in each group)**

Variable	Without competition	With competition	Means comparisons (T-tests)
(1) % of insured animal production	7.45 (10.4) n=7	7.65 (13.9) n=18	p>0.1
(2) % of insured crop production	28.03 (28.06) n=7	10.41 (12.3) n=18	p<0.05
(3) % Premium over insured production	4.3 (2.1) n=6	3.7 (3.1) n=11	p>0.1
(4) Loss ratios	0.77 (0.22) n=6	0.71 (0.27) n=13	p>0.1
(5) Type of insurance (1,2,3) <sup>1</sup>	2.14 (0.9) n=7	1.72 (0.67) n=18	p>0.1

<sup>1</sup>Categories are 1 (only if single-risk insurance); 2 (if 1+ MCPI insurance) and 3 (if 2 + yield insurance)

\*p<0.05.

Source: European Commission (2006a), Eurostat and own fieldwork and statistical analysis. The list of countries included in the analysis are (a) Without competition: AU, CY, GRE, IR, LIT, LX, SP; (b) with competition: BE, BU, CZR, DK, FIN, FR, GER, HU, IT, LAT, NL, PL, PR, RO, SLK, SLV, SW, UK).

The comparison of means of the five variables reveals that the two groups differ significantly only in the percentage of insured crop production (line 2). The group with ‘no competition’ has a significantly higher penetration rate of insurance in crop production. In the remaining variables the group of countries with competitive insurance markets does not differ significantly from the other group.

– **Rent seeking by insurance companies**

<sup>3</sup> We are indebted to Professor Brian Wright for the ideas reviewed here.

It is often argued that insurance companies end up capturing the ?? rents // profits resulting from the premium subsidies (Hueth et al., 1994). While there is no evidence to support this conclusion, the fact that subsidies explain the growth of insured crops in all countries is an indication that insurance companies are surely the recipients of part of the subsidies. While there is no case available of a private system providing broad insurance coverage to growers, there is evidence of more rapid innovation in publicly run systems than in privately run systems.

– **Excessive loading rates in comparison to banking services**

Hazell et al. (1986) compared the administrative costs of agricultural insurance in many countries, about 6% of the insured value, with those of other insurance sectors, 1.5%. In Spain, Agroseguro (SA), the pool of insurers, had a ratio of running costs over total liability of 0.3% in 1993, while in 2005 it was 0.25%. As new policies are based on indices, with a technological and IT platform and no need to perform on-site loss adjustment, administrative costs are bound to be reduced.

– **Large transaction costs needed to prevent problems associated with asymmetric information**

This criticism is supported in view of the results of the US and Spain from the early 80s and many developing countries. More recently, actuarial imbalances have been brought closer in line with those needed to ensure financial sustainability. This has been possible because both of these countries have made an effort to screen the individual farmers' risks, collect more historical individual and zonal data, and expand the portfolio of coverages to increase risk pooling benefits (as Table 2 shows, loss ratios are only slightly higher in MSs with premium subsidies than in MSs without them).

– **Subsidised insurance crowds out other privately provided instruments**

No serious study has been conducted that deals with the use of more than RMI. In those countries where insurance has been publicly developed and uptake rates are high, farmers are generally given the option of selecting from a wide menu of coverages and policy formats. Data on insurance participation show that, at least in Spain, very few farmers exhibit continuous and invariable insurance strategies (Garrido & Zilberman, 2007). This result suggests that farmers follow economic incentives, learn from their insurance experience and select their portfolio of instruments according to rational (or at least pseudo-rational) criteria. Traditionally, insurance strategies have been combined with the use of financial instruments, to which insured farmers have enjoyed preferential access granted by rural banks. It is very likely that insurance makes some risks much more transparent and that insurance experience helps farmers dissociate the sources of risks to which they are exposed.

In an attempt to evaluate whether premium subsidies have an impact on some of the key insurance variables, we performed some statistical tests to differentiate those countries with insurance subsidies (AU, CY, CZR, FR, IT, HU, LAT, LIT, LX, PR, RO, SLK, SLV and SP) from those without them (BE, BU, DK, EST, FIN, GER, IR, NL, PL, SW, UK), using the data compiled by the EC (2006a). In Table 2, we compare for those countries for which data are available the proportion of insured animal production, the proportion of insured crop production, the premium over insured production, loss ratios and insurance types.

**Table 2. The impact of insurance subsidies (averages, standard deviation and means t-tests; n, number of countries included in each group)**

Variable	With premium subsidies	Without premium subsidies	Means comparisons (t-tests)
(1) % of insured animal production	7.8 (18.17) n=11	7.29 (13.9) n=14	p>0.1
(2) % of insured crop production	22.5 (22.76) n=11	6.3 (12.3) n=14	p<0.05
(3) % Premium over insured production	4.6 (2.82) n=5	2.32 (1.59) n=11	p<0.01
(4) Loss ratios	0.79 (0.28) n=7	0.62 (0.16) n=12	p<0.05
(5) Type of insurance (1,2,3) <sup>1</sup>	2.21 (0.18) n=12	1.33 (0.14) n=14	p<0.1

<sup>1</sup>Categories are 1 (only if single-risk insurance); 2 (if 1+ MCPI insurance) and 3 (if 2 + yield insurance)

\*p<0.05.

Source: European Commission (2006a), Eurostat and own fieldwork and statistical analysis. Countries included in the analysis are: (a) With subsidies AU, CY, CZR, FR, GRE, HU, IT, LAT, LIT, LX, PL, PR, RO, SLK, SP; (b) without subsidies BE, BU, DK, EST, FIN, GER, IR, NL, SW, UK.

When we control for whether or not countries subsidise premia, we find statistically significant differences in four of the five descriptive variables. The results show that premium subsidies help to increase the value of insured crop value (line 1) and are accompanied by larger relative premia (line 3). Furthermore, premium subsidies tend to be associated with greater insurance diversity and coverage (line 5). However, the percentage of insured animal production is not significantly different among groups of MSs, and loss ratios are lower in countries without subsidies.

## 5 Rating of Risk Management Instruments under debate

In the following tables we rate all the instruments that have been under discussion by the European Commission (2006a; 2006b) and by Cafiero et al. (2005). The bases for our judgment are the literature, documentation and private interviews<sup>4</sup>. In Tables 3a and 3b we attempt to rate each family of instruments, based on a number of criteria. Ratings are merely illustrative of major trends and are based on the assumption that instruments are applied using the best actual practice. The policy options that are reviewed include the EC's (2005) three options; i.e. (1) insurance for natural disasters, (2) stabilisation funds and (3) provision of basic coverage against income crises; Cafiero et al (2005) *ex-post* compensation for catastrophes and incentives for lower hazard reduction; the EC's (2006a) seven alternative insurance options, ranging from single-risk to revenue insurance and public reinsurance.

<sup>4</sup> See Annex for a detailed treatment and the sources.

**Table 3a. Rating alternative RMIs (1 min - 5:max)**

Policy option	Discriminates between normal risks, crises and disasters* (1: poor discriminant; 5 strong discriminant)	Addresses risks of livestock epidemics*	Acceptance by	
			Farmers	Insurers and other private agents*
<b>EC (2005)-Option 1</b> (Insurance for natural disasters only)	5	1	2	1
<b>EC (2005)-Option 2</b> (Stabilisation funds)	1	2	2 (varies across MS)	1
<b>EC (2005)-Option 3</b> (Providing basic coverage against income crises))	2	2	3	1
<b>Cafiero (2005) alternative proposal</b> (For ad hoc crisis aids; only <i>ex-post</i> direct damage compensation)	5	4	2	2
<b>EC (2007) – EU-wide system of agricultural insurance:</b>				
(1) Single-risk or MPC	2	1	3	3
(2) Yield insurance(a)	2	1	4	3
(3) Whole-farm yield Insurance	1	3	1	2
(4) Income/Revenue Insurance	2	4	3	4
(5) Area index insurance (arable crops only)	2	2	2	3
(6) Indirect-index insurance	3	2	1	4
(7) Public reinsurance	2	2	4 (to the extent that insurance becomes cheaper)	5

Source: Authors' own elaboration based on Annex

**Table 3b. Rating alternative RMIs (1 min - 5:max)**

Policy option	Prone to welfare losses due to informational asymmetries*	Incentives for:		Cost effectiveness (ΔU/Public Expend)*	Compatibility with other EU policies*	Complement (1) / Substitute (5) with privately offered instruments*	Vulnerability to rent seeking*	Reliance on large reinsurance costs*	Administrative complexity
		misreporting actual losses*	excessive risks' exposure*						
<b>EC (2005)-Option 1</b> (Insurance for natural disasters only)	1	1	3	4	5	2	2	4	3
<b>EC (2005)-Option 2</b> (Stabilisation funds)	1	1	1	4	4	2	2	1	3
<b>EC (2005)-Option 3</b> (Providing basic coverage against income crises)	3	2	4	5	2	4	3	5	4
<b>Cafiero (2005) alternative proposal</b> (For crises' ad-hoc aids; only ex-post direct damage compensation)	1	2	3	4	2	1	2	2	2
<b>EC (2007) – EU-wide system of agricultural insurance:</b>									
(1) Single-risk or MPC	2	1	3	4	3	1	4	1	3
(2) Yield insurance(a)	2	2	2	3	2	3	3	2	4
(3) Whole-farm yield Insurance	3	3	4	3	2	3	3	3	
(4) Income/Revenue Insurance	2	3	3	4	2	4	4	3	5
(5) Area index insurance (arable crops only)	3	2	3	2	1	4	2	4	4
(6) Indirect-index insurance	4	1	4	2	2	2	2	2	4
(7) Public reinsurance	1	1	2	2	2	1	2	3	3

. Source: Authors' own elaboration based on Annex

On the basis of the above ratings, it seems evident that no one instrument beats the others in all aspects. Furthermore, instruments that would be more appropriate for natural catastrophes will behave poorly for outbreaks of animal epidemics. The economic efficiency of public initiatives (welfare gains per € of expenditure) is greater with smaller coverages and guarantees. Low-coverage instruments also provide a screening device to set up eligibility conditions for ad-hoc payments related to non-insurable risks. A growing number of MSs are building on this type of conditional eligibility, encouraging the connection of different instruments, and offering dual approaches that include privately provided instruments and public safety nets. Instruments that can be administered at less cost, using IT technologies, indexing components, with no or little need for loss adjustment also have a better chance of offering more value at the lowest cost.

Finally, the instruments that seem to best complement privately offered instruments and that are more compatible with other EU policies also offer the most basic forms of protection. These include catastrophe insurance or single-peril insurance, policies which the private sector offers in many countries and which it could increasingly promote in the near future, especially if loss adjustment procedures can be made online or using IT.

## 6 Conclusions

The following ideas appear to have strong support from the literature and the experiences reviewed so far:

1. Contingent-state contracts, futures/options and other index derivatives are useful mechanisms. However, agriculture in the EU is extremely diverse under natural conditions, as in terms of risks and structural situations. Widely traded securities/assets that permit hedging risks will be difficult to develop, because basis risks and trading costs will be a serious obstacle to 'take-up' by farmers. Yet, as technological innovations enable the development of more diverse index instruments, a market may develop for these in the EU. At present, the use of financial instruments among farmers and even cooperatives is low.
2. A diverse set of risk-management instruments should target multiple risk sources both within farm boundaries and across the market chain from the farm-gate to the wholesale market. In highly capitalised agriculture, we are seeing major innovations in contractual agreements along the market chain that will enable professional farmers to externalise part of their risks.
3. When risk instruments are subsidised, it is a general rule that instruments with improved coverage and risk reduction potential come with lower subsidy efficiencies. More euros are needed in relative terms to provide better risk reduction effects, when these are already large. Yet, in the case of insurance, reducing subsidies would likely be followed by lower rates of use of instruments.
4. Actuarial ratios of mature and growing agricultural insurance systems have shown consistency and soundness. Actuarial techniques have improved

significantly, helping countries control problems of asymmetric information and of poor loss adjustment procedures. On the EU scale, actuarial ratios do not differ significantly among MSs with or without subsidised premia. The era of poor insurance performance indicators around OECD countries came to an end in the mid-1990s.

5. Growing insurance portfolios increase the effects of risk-pooling and reduce the cost of reinsurance in relative terms. Some hazards, such as droughts or epidemics, for which disaster payments are offered in some countries, are now insurable.



## References

- Alizadeh, A. and N. Nomikos (2005). *Agricultural Reforms and the Use of Market Mechanisms for Risk Management*. London: Futures and Options Association.
- Anton, J. and C. Giner (2005). Production Incentives of Risk-Reducing Policies and Strategies. Paris: OECD.
- Burgaz Moreno, F., and M.M. Pérez-Morales (1996). *1902-1992 Noventa Años de Seguros Agrarios en España*. Serie Estudios, Madrid: MAPA.
- Cafiero, C.; Capitanio, F.; Cioffi, A.; Coppola, A. (2005). *Risks and Crisis Management in Agriculture*. European Parliament document (IP/B/AGRI/ST/2005-30).
- ENESA (2004). Barómetro sobre seguros agrarios. Madrid: IKERFEL.
- European Commission (2006a). *Agricultural insurance schemes*. JRC report. Ispra
- European Commission (2006b). *Evaluation of the Community Animal Health Policy (CAHP) 1995-2004 and alternatives for the future*. Brussels
- European Commission (2005). Communication from the Commission to the Council On Risk and Crisis Management in Agriculture. Commission of the European Communities, Brussels 02.02.05.
- Forteza del Rey, V. (2002). Diagnóstico del Seguro Agrario en los Diferentes Países de la Unión. International Conference: Agricultural Insurance and Income Guarantees, Madrid 13-15 May.
- Gardner, Bruce L. (2002). Risk Created by Policy in Agriculture. Just & Pope (Eds). *A Comprehensive Assessment of the Role of Risk in U.S. Agriculture*: pp. 537-556. Norwell, MA: Kluwer Academic Publishers.
- Garrido, A. and M. Bielza (2007). Review of historic, current and developing private, public and public-private risk management instruments. Manuscript. 80pp.
- Garrido, A. and D. Zilberman (2007). Revisiting the demand for agricultural insurance: the case of Spain. Presented at the Seminar de la EAAE, *Managing of Climate Risks in Agriculture*. Berlin, July, 5-6.
- Hazell, P., C. Pomareda, and A. Valdés (1986). *Crop Insurance for Agricultural Development: Issues and Experience*. Published for IFPRI by Johns Hopkins University Press.
- Hueth, D.L., and W.H. Furtan (1994). *Economics of Agricultural Crop Insurance: Theory and Evidence*. Norwell, MA: Kluwer Academic Publishers.
- Lagerkvist, C.J. (2005). Agricultural policy uncertainty and farm level adjustments—the case of direct payments and incentives for farmland investment. *European Review of Agricultural Economics* 32 (1): 1–23
- Mangen, M.-J. J. and Alison M. Burrell (2003). Who gains, who loses? Welfare effects of classical swine fever epidemics in the Netherlands. *European Review of Agricultural Economics* 30 (2): 125-154.

Mishra, P.K. (1996). *Agricultural Risk, Insurance and Income. A Study of in the Impact and Design of India's Comprehensive Crop Insurance Scheme*. Aldershot, UK: Avery.

OECD (2000). *Approaches to Income Risk Management in OECD Countries*. Paris: OECD.

Turvey, C. (2007). Weather risk contingent credit instruments. Presented at the Seminar of the EAAE, *Managing Climate Risks in Agriculture*. Berlin, July 5-6.

Vrolijk, H.C.J., K.J. Poppe & J.H. Wisman. (2007) Volatility of Farm Incomes, Prices and Yields in the European Union. Working Paper (WP2, Income Stabilisation). LEI-DLO. Den Haag.