Prospects for agricultural Insurance in Europe
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3 and 4 October 2016 - Wageningen (NL)

AGRICULTURAL RISK, INSURANCE MARKET AND COMMON AGRICULTURAL POLICY IN ITALY: A CRITICAL ANALYSIS OF THE RISK MANAGEMENT APPROACH

Gianluigi Gallenti

Department of Economic, Business, Mathematical and Statistical Sciences Bruno de Finetti” (DEAMS), University of Trieste (Italy)
STRUCTURE OF THE PRESENTATION

• Aims
• Methods
• Background
• Results
• Conclusions
AIMS & METHODS

Aims:
• to analyze agricultural risk management based on insurance schemes in Italy, in the context designed by the CAP 2014-2020

Methods:
• literature review
• statistical analysis
• SWOT analysis
### BACKGROUND

#### Risk management tools in agriculture

<table>
<thead>
<tr>
<th></th>
<th>Farm / household / community</th>
<th>Market</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Reduction</strong></td>
<td>- Technological choice</td>
<td>- Training on risk management</td>
<td>- Macro policies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Disaster prevention (flood control...)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Prevention of diseases</td>
</tr>
<tr>
<td><strong>Risk Mitigation</strong></td>
<td>- Diversification in production</td>
<td>- Futures / options</td>
<td>- Tax system income smoothing</td>
</tr>
<tr>
<td></td>
<td>- Crop sharing</td>
<td>- Vertical integration</td>
<td>- Counter-cyclical Programme</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Production / market contract</td>
<td>- Border and other measures in the case of contagious disease outbreak</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Spread sales</td>
<td>- Market-price support (intervention buying, buffer stocks)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Diversified finance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off-farm work</td>
<td></td>
</tr>
<tr>
<td><strong>Risk Coping</strong></td>
<td>- Borrowing from neighbours / family</td>
<td>- Selling financial assets</td>
<td>- Disaster relief</td>
</tr>
<tr>
<td></td>
<td>- Intra-community charity</td>
<td>- Saving / borrowing</td>
<td>- Social assistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off-farm income</td>
<td>- All agricultural support programs</td>
</tr>
</tbody>
</table>

Source: Scottish Government (2010), adapted from OECD (2009a)
# BACKGROUND

## Insurability

<table>
<thead>
<tr>
<th>risk that could be fully transferred to the insurer</th>
<th>risks that could only be partially transferred to the insurer</th>
<th>risks that could not be transferred to the insurer</th>
</tr>
</thead>
<tbody>
<tr>
<td>all risks that offer economic protection without limitation of the amount of coverage</td>
<td>risks that exceed total capacities of insurers and all reinsurance, by the size of potential damage, and one portion of surplus risk remains uncovered</td>
<td>are those risks that are not covered by any insurance type</td>
</tr>
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</table>

risks are insurable if (Skees and Barnett; 1999):
1. the insurer and the insured have the same information as regards the probability of a bad outcome (*symmetric information*)
2. risks is *independent* across insured individuals
3. in order to fix the premium rates, the insurance company must be able to *calculate the probability of loss*
4. premium must be affordable for farmers
Background

### Insurability

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferable risks</td>
<td>All risks that offer economic protection without limitation of the amount of coverage</td>
</tr>
<tr>
<td>Partially transferable risks</td>
<td>Risks that exceed total capacities of insurers and all reinsurance, by the size of potential damage, and one portion of surplus risk remains uncovered</td>
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<tr>
<td>Non-transferable risks</td>
<td>Are those risks that are not covered by any insurance type</td>
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In agriculture:

1. **Asymmetric information** is frequently, so the main related problems can be **moral hazard** and **adverse selection**;
2. Many risks (related with whether and market factors) are correlated (**systemic risk**);
3. **Difficulty in calculating the premium on actuarial basis**: lack of data is a major obstacle; moreover can be difficult to determine the exact cause and the entity of loss;
4. Consequently the **premium** is usually **too expensive** for farmers.

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**Background**

**Insurability**

<table>
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<th>Causes</th>
<th>Situations (effects)</th>
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<tr>
<td>Asymmetric information</td>
<td>Moral hazard</td>
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<tr>
<td>Correlation of variables</td>
<td>Adverse selection</td>
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<tr>
<td>That affects the risk</td>
<td>Systemic risk</td>
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<tr>
<td>Lack of data</td>
<td>Premium calculation problems</td>
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- **CAUSES**
  - Asymmetric information
  - Correlation of variables that affects the risk
  - Lack of data

- **SITUATIONS (EFFECTS)**
  - Moral hazard
  - Adverse selection
  - Systemic risk
  - Premium calculation problems
## BACKGROUND

### Insurability

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<td>• diversification on farming, at regional level,...</td>
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### situations (effects)

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- causes: asymmetric information, correlation of variables that affects the risk, lack of data
- situations (effects): moral hazard, adverse selection, systemic risk, premium calculation problems
- implementing/improving a data-base
- diversification on farming, at regional level,...
- Expansion/diversification of the insured areas
### Insurability

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<td>adverse selection</td>
<td>systemic risk</td>
</tr>
<tr>
<td>technical solution / condition of insurance contracts</td>
<td>innovation in insurance contract for risk diversification (multi-risk, pluri-peril,...)</td>
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</tbody>
</table>
BACKGROUND

- agricultural insurance markets is too vulnerable and the private market fails

- the public-private intervention seeks technical solutions rather than trying to remove the causes of non-insurability

- public authorities subside these technical solutions to create an insurance market, through which

- to reach some goals: supply stability, market stability, income stability, ...

- **Insurance is the most important (in some case the only) instrument adopted and sustained for risk management in agriculture**
BACKGROUND

International literature review highlights:

• severe asymmetric information problems
  (Garrido and Zilberman, 2008)

• adverse selection situations
  (Babcock and Hennessy, 1996; Coble et al., 1996; Makki and Somwaru, 2001; Moschini and Hennessy, 2001; Quiggin et al., 1993; Serra et al., 2005; Skees and Read, 1986; Smith and Goodwin, 1996)

• moral hazard situations
  insurers must count on objectively discriminatory elements to group of agents under homogenous risk levels, and charge different premium
  (Garrido and Zilberman, 2008)
BACKGROUND

International literature review highlights:

• farmers behavior depends on several factors:
  expected indemnity, risk level and availability of alternative risk management tools;
  age, experiences, education, farm size, diversification of production, debt use, geographic position, yield risk, experiences and tenure

(Barry et al., 2003, 2004; Boehlje and Eidman, 1984; Makki and Somwaru, 2001; Shaik et al., 2008; Smith and Baquet, 1996; World Bank, 2011)

Note that these factors depend on local context and depend on the farmers experiences about insurance tools (learning by doing).
International literature review highlights:

• A controversial role of subsidies:
  
  Glauber (2004), Goodwin and Smith (2012) and Coble and Barnett (2013) point out some inefficiencies of government sustain in USA to agriculture insurance.

Note that the government action may depend on political objectives rather economic goals, both in the US and in the EU.
BACKGROUND

The CAP 2014-2020:

• risk management instruments moved from the 1 Pillar (prices support) to the 2 Pillar (income stabilization)

• insurance sustain remain as facultative instruments for MS

• that will inevitably lead to discordant development and, probably, economic distortions of this new tool

• risk management is no longer in Pillar 1 but is not yet really in Pillar 2, aside from theoretical measures without “practical” guidelines for MS

• the mutual fund dedicated to production risks may include climatic events.
BACKGROUND

The CAP 2014-2020: future development

Source: EC, 2016
RESULTS: the agricultural risk management in Italy

Crop, animal and plant **insurance** (Article 37)

**Mutual funds** for adverse climatic events, animal and plant diseases, pest infestations and environmental incidents (Article 38)

**Income stabilisation tool** (Article 39)

RESULTS: the agricultural risk management in Italy

National Solidarity Found

EX-ANTE

Insurance coverage support

EX-POST

Compensatory action
RESULTS: insured value trend per kind of policies in Italy

![Graph showing insured value trend per kind of policies in Italy from 2005 to 2015. The graph compares single-risk, combined risk, and multiple perils policies.]
## RESULTS: Italian subsidized agricultural insurance

<table>
<thead>
<tr>
<th>Years</th>
<th>Policies n.</th>
<th>D%</th>
<th>Insured Value (.000 €)</th>
<th>Insured Value D%</th>
<th>Premiums (.000 €)</th>
<th>Premiums D%</th>
<th>indemnified value (.000€)</th>
<th>indemnified value D%</th>
<th>Premium / Insured Value</th>
<th>Loss ratio [g]/[e]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>213.292</td>
<td>-</td>
<td>3.810.222</td>
<td>-</td>
<td>269.124</td>
<td>-</td>
<td>159.984</td>
<td>-</td>
<td>7,06%</td>
<td>59,45%</td>
</tr>
<tr>
<td>2006</td>
<td>216.171</td>
<td>1,35%</td>
<td>3.982.341</td>
<td>4,52%</td>
<td>265.033</td>
<td>-1,52%</td>
<td>145.975</td>
<td>-8,76%</td>
<td>6,66%</td>
<td>55,08%</td>
</tr>
<tr>
<td>2007</td>
<td>241.857</td>
<td>11,88%</td>
<td>4.690.900</td>
<td>17,79%</td>
<td>292.888</td>
<td>10,51%</td>
<td>184.626</td>
<td>26,48%</td>
<td>6,24%</td>
<td>63,04%</td>
</tr>
<tr>
<td>2008</td>
<td>272.082</td>
<td>12,50%</td>
<td>5.858.133</td>
<td>24,88%</td>
<td>317.210</td>
<td>8,30%</td>
<td>272.711</td>
<td>47,71%</td>
<td>5,41%</td>
<td>85,97%</td>
</tr>
<tr>
<td>2009</td>
<td>233.668</td>
<td>-14,12%</td>
<td>5.586.167</td>
<td>-4,64%</td>
<td>317.210</td>
<td>0,00%</td>
<td>234.781</td>
<td>-13,91%</td>
<td>5,68%</td>
<td>74,01%</td>
</tr>
<tr>
<td>2010</td>
<td>217.072</td>
<td>-7,10%</td>
<td>5.865.181</td>
<td>4,99%</td>
<td>285.502</td>
<td>-10,00%</td>
<td>169.259</td>
<td>-27,91%</td>
<td>4,87%</td>
<td>59,28%</td>
</tr>
<tr>
<td>2011</td>
<td>210.207</td>
<td>-3,16%</td>
<td>6.559.088</td>
<td>11,83%</td>
<td>338.797</td>
<td>18,67%</td>
<td>215.824</td>
<td>27,51%</td>
<td>5,17%</td>
<td>63,70%</td>
</tr>
<tr>
<td>2012</td>
<td>214.711</td>
<td>2,14%</td>
<td>6.826.556</td>
<td>4,08%</td>
<td>321.658</td>
<td>-5,06%</td>
<td>231.022</td>
<td>7,04%</td>
<td>4,71%</td>
<td>71,82%</td>
</tr>
<tr>
<td>2013</td>
<td>216.015</td>
<td>0,61%</td>
<td>7.287.692</td>
<td>6,76%</td>
<td>377.230</td>
<td>17,28%</td>
<td>268.254</td>
<td>16,12%</td>
<td>5,18%</td>
<td>71,11%</td>
</tr>
<tr>
<td>2014</td>
<td>206.394</td>
<td>-4,45%</td>
<td>7.953.260</td>
<td>9,13%</td>
<td>485.591</td>
<td>28,73%</td>
<td>322.009</td>
<td>20,04%</td>
<td>6,11%</td>
<td>66,31%</td>
</tr>
<tr>
<td>2015</td>
<td>165.115</td>
<td>-20,00%</td>
<td>7.443.942</td>
<td>-6,40%</td>
<td>402.133</td>
<td>-17,19%</td>
<td>232.977</td>
<td>-27,65%</td>
<td>5,40%</td>
<td>57,94%</td>
</tr>
</tbody>
</table>
RESULTS: market share

Market quotes of insured products (2015)

- Farm structures: 75%
- Livestocks: 12%
- Crops: 13%
RESULTS: market share

Market quotes of insured products (2015)

- Wine grapes: 27%
- Arable: 2%
- Tomato: 4%
- Fruit: 67%
RESULTS: market share

Market quotes of geographical areas (2015)

85% contracts in the North of Italy
RESULTS: market share

Market quotes of geographical areas (2015)

> 50% contracts in the North-Est of Italy
RESULTS: literature survey

• the participation rate in Italy is high for large firms and the trends in costs for insurance premiums are positive only for large companies in terms of income and size; the classes in which fall the majority of Italian companies show a decreasing trend. (Pontrandolfi, 2014; Santeramo et al., 2016)

• the vulnerability maps do not match those of exposure (Pontrandolfi, 2014)

• the participation rate is negatively correlated with crop diversification, which is a form of risk management. (Santeramo et al., 2016)

• therefore the more specialized farms are the more interested in purchasing insurance products, but these are the more riskily farms (adverse selection problem)
RESULTS: literature survey

- trend of farms show a clear preference for risk management through **technical tools** (adoption of pesticides, fertilizers and water) rather than financial; this also creates greater environmental pressure (Pontrandolfi, 2014)

- **negative effects on environment** with crop insurance programs; input use (in particular fertilizer) is expected to increase for some cereal crops in particular areas (Capitanio and Adinolfi, 2009, 2010; Capitanio et al., 2014, 2015) (**moral hazard problem**)


RESULTS: literature survey

- in summary in Italy we can find some problems common to other market

- the analyzes are still few and the results about specific cases, and are therefore difficult to generalize

- the findings should change in the years if the farmers can develop a knowledge about the insurance tools
CONCLUSIONS: THE SWOT ANALYSIS

Strengths

• experience of public authorities
• collaboration among private insurance companies, public authorities, farms organization
• data base of risk (to develop)
CONCLUSIONS: THE SWOT ANALYSIS

Weaknesses

• national level implementation do not allows good diversification for insurance portfolio
• adverse selection (territorial concentration of contracts)
• land (marginal) use and inputs intensification
• structure and organization of farms (too small)
• reduced turnover in farm management (high age of farmers)
CONCLUSIONS: THE SWOT ANALYSIS

Weaknesses

• financing difficulties of farms

• no-knowledge of farmers of insurance instruments (learning by doing)

• no clear definition of goals by policy makers

• no adoption of a good tool mix:
  if n goals ⇒ n tools ≥ n goals
  (every tools can have some correlated effects)

• inefficient distribution of financial resources
CONCLUSIONS: THE SWOT ANALYSIS

Opportunities

- diversified agricultural activities on a differentiated territory (possible diversification of risk)
- part time – extra farms revenues
CONCLUSIONS: THE SWOT ANALYSIS

Threats

• moral hazard

• adverse section

• some main risks drive the farmers choice (hail)

• market failure without public sustain (market depend by policies)
CONCLUSIONS: FUTURE RESEARCH

• Quantitative research
  – using statistical date
  – using sample analysis: e.g.: choice experiment to evaluate Willingness to pay of farmers
THANK YOU FOR YOUR ATTENTION

Contacts:

Gianluigi Gallenti
Department of Economic, Business, Mathematical and Statistical Sciences Bruno de Finetti” (DEAMS), University of Trieste – Trieste (Italy)
E-mail: gianluigi.gallenti@deams.units.it