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ANALYSIS OF THE FACTORS USED BY FARMERS TO MANAGE RISK. A CASE STUDY ON ITALIAN FARMS

JEL classification: ???????

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Abstract. *The study analyses the strategies Italian farmers use to cope with the risks that face their production. We develop cross-sectional and longitudinal analyses as well as analyses of correlation that underline the main differences between the way farms adapt their structure and management towards risk. The expected output is an analysis of farms' approach to risk management in relation to the risk exposure. The present study is the result of research conducted by INEA "Research and technical support on natural disasters, climatic and phytosanitary risks in agriculture and related policies", funded by the Italian Ministry of Agricultural Food and Forestry Policies. The main aim of this analysis is to explore the potential and the limitations of economic tools for climatic risk management in agriculture of new CAP 2013-2020 in relation to farms' needs, possible or necessary policies and future directions in the context of the Italian experience (National Solidarity Fund for natural disasters in agriculture, legislative decree n. 102/2004). The chosen approach for the analysis of demand considers the climatic risk at the level of farms' approach to hedging risks in terms of the use of technical tools (agricultural practices, pesticides, fertilizers, irrigation) and economic/financial instruments (insurances, etc.). The results show a preference of technical tools and a strong need of a more integrated policy scheme, arising also from a new system and the potential synergies between risk management tools and other rural development measures of a more structural and management nature. The latter can contribute to a reduction of risk exposure and of the farms' vulnerability, first and foremost through agro-climatic-environmental measures, production diversification, irrigation infrastructures, technological and management innovations and formation-information-consultancy.*

Keywords: *climatic risk management, policy assessment, CAP sustainability, agriculture and climate change, insurance schemes.*

1. Context

The present study is the result of research conducted by INEA "Research and technical support on natural disasters, climatic and phytosanitary risks in agriculture and related policies", funded by the Italian Ministry of Agricultural Food and Forestry Policies. The Institute has been studying climate trends and implications in agriculture from more than 10 years. A specific activity has been active since 3 years ago on developing economic tools for climatic risk management,

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in particular within the National solidarity fund for natural disasters in agriculture that helps farmers through economic aids for insurance premiums and compensation funds. The research activity has been implemented with new scenarios and demands of CAP 2013-2020 that introduced in the II pillar (rural development) some risk management tools.

With these purposes in mind, the study presented in this report aims to make a scientific contribution to the debate by analysing the demand for risk management tools in agriculture in Italy.

Agriculture in the Mediterranean Basin has a higher degree of exposure and vulnerability to climatic risk as compared to other areas for the following reasons:

- It is based on the quality of production rather than on quantity;, that is, production is concentrated on commodities with high added value and with significant economic relevance in terms of exports. Therefore, equal damages in quantitative terms, correspond to higher economic loss;
- Environmental and climatic conditions of Mediterranean countries, most notably Italy, are extremely heterogeneous. This factor renders production more diverse and rich but also entails higher risks for the territorial specificity of production.

Given these considerations, risk management on farms has always represented an important element and, in certain cases, a decisive factor for the farms' very existence.

Concerning in particular the economic risk management tools, they are considered useful, compared, for instance, with structural or infrastructural investments, for their flexibility and adaptability at the stage of definition as well as application (contracts with subject and objectives that can be modified in time and space). In the context of climate change, such characteristics are even more important (and indeed useful) given the uncertainty associated with the effects and impacts on production. This is because economic tools are adaptable in terms of objectives and substance as different scenarios may unfold.

The analysis of such issues in the international context demonstrates that the diffusion of risk management in agriculture through these economic tools, primarily insurances, is based on the possibility of benefiting from supportive public policies (Pontrandolfi and Nizza, 2011). In most cases, public support is in fact targeted to the specific needs in each context: extreme climatic events in the EU and North America, and more recently also in Australia, as well as the objectives of agriculture and development in South America, are all important examples (the most frequent being agricultural insurance).

The topic of risk management in agriculture has always been at the margins of the European debate. The main reasons lie primarily in the structure of EEC/EC/EU intervention, which, for nearly half a century, has effectively ensured the presence of mechanisms to stabilize the markets; second, the subsequent development of hedging instruments within individual Member States (MS), particularly those covering production risks, have created prospects for intervention that have not evolved according to common paths. Many of these instruments have developed along very different trajectories, This diversity of instruments available, the ongoing process of EU enlargement and the specific features of the various kinds of agricultural production have led to a complex and heterogeneous set of risk management systems in different Member States which differ in the instrumentation available and the degree of coverage that these practices achieve.

With the phasing out of guarantees provided by the CAP to European farmers in terms of stabilizing markets, the issue of risk management tools is gradually acquiring an ever more important role. This is reflected in a series of innovations that first appeared in the 2009 'Health

Check' and then in the Commission regulation for rural development policy 2014-2020 (reg. 1305/13). It is now possible to use part of the EU funds in order to promote farmers' access to risk management tools.

This innovation therefore concerns only the allocation of resources and not the definition of the specific instruments to be applied in the MS concerned. The forecast in question seeks to promote the management of production risks through incentives for insurance policies and participation in mutual funds to cover direct losses from specific events impacting negatively on the quantity and quality of farm production, such as poor weather, crop and animal diseases, environmental accidents and so forth.

The European Commission's new regulation on rural development policy 2013-2020 (reg. (CE) 1305/13) introduces a collection of measures for risk management in agriculture, providing support for:

- crop, animal and plant insurance premium subsidies for plans that cover financial losses caused by extreme climatic events or by animal/plant diseases or parasitic infections;
- mutual funds to pay financial compensation to farmers for losses;
- an income stabilization tool, in the form of financial contributions to mutual funds to compensate farmers that have suffered a loss of over 30 percent of their income.

Referring to the Italian experience, several issues need to be deepened and expanded in order to define the future CAP and to evolve the risk management system. In particular the most critical and common points are:

- the lack of preliminary analysis on risk conditions (parameters, risk levels and interrelations) and risk assessment that explain and justify the choices made on policies and public aid;
- the lack of analysis on demand for risk management tools, with policies oriented more to the market supply (insurances); this tendency can create an inefficiency and ineffectiveness of policy and the tools (economic aids even for not-insurable risks, consequent unbalance between contributions to premiums and ability of companies to indemnify damages, insufficient financial coverage of damages);
- a low level of integration among the available risk management strategies (a reduction of exposure and vulnerability, transferring and acceptance) and a policy focus confined to the transfer of risk.
- risk management through economic tools should represent just one component of a wider strategy. Only a multilevel approach (at farm and territorial levels, with management and structural measures) will ensure the effectiveness of policies in the long term.

In light of these considerations, it is important to evaluate the contributions that economic tools for risk management can bring in the new context of CAP, in relation to farms' needs and approaches. Moreover, it is crucial that, when designing these tools, consistency with other key agricultural objectives is ensured with other CAP subsidies.

The chosen approach for the analysis of demand considers the farms' approach to hedging risks in terms of the use of technical tools (agricultural practices, pesticides, fertilizers, irrigation) and economic/financial instruments (insurances, etc.). The research analyses the strategies Italian farmers use to cope with the risks that they face in production through cross-sectional and longitudinal analyses as well as analyses of correlation that underline the main differences between the way farms adapt their structure and management towards risk.

2. Methodology and dataset

The database is taken from the *Italian farm accountancy data network* (FADN)[1] for farm characteristics at the provincial/regional level. Data on insured farms are also available.

The indicators describing the choices to manage risk at the farm level include different tools for risk management, technical and financial instruments. In particular, the indicators chosen for the analysis are:

Technical tools:

- diversification (numbers of different crops, mix crop-animals, etc.)
- use of chemical inputs (pesticides and nutrients)
- irrigation (presence and systems)
- advice service (presence and type of service)
- farm certification
- costs for maintenance
- investments in new techniques and machines

Financial tools:

- savings
- insurance
- type of trade (wholesale, retail, consumers, cooperative regular VAT, cooperative special VAT, industry)
- cash level of the farm
- EU payments.

The dataset used for the analysis is the *Italian farm accountancy data network* (FADN-RICA), which provides very precise information at the individual scale (the main mission of FADN is farm accountancy). This national sample is stratified according to the region, the economic dimension and the specialization of the farm. It provides outstanding information regarding the annual accounting of Italian farms. A precise study of the operating expenses allows to identify and to measure with precision the roles of different risk management tools that are used by farmers to cope with risk, either technical or financial, *e.g.* crop diversification and crop insurance.

Given the need for a longitudinal analysis, the sample is made up of 3,213 professional Italian farms that are continuously surveyed between 2005 and 2012. This balanced sample allows for comparisons among years and for a study of the dynamics of Italian farms regarding risk management.

Within the FADN database, the choice of the variables takes into account (Appendix 1):

- The structure of the farm, considering its total, cultivated and irrigated area.
- The equipment of the farm through the mechanization, investments and amortizations.
- The activity of the farm, given total and sold production, as well cost structure.
- The financial structure of the farm including fixed and operating capital as well as land owned.

[1] The Farm Accountancy Data Network (FADN) has been created to satisfy the information needs of the European Union relating to the business operation of agricultural enterprises. INEA manages the database for Italy (www.inea.it).

- Risk management tools such as crop insurance, consultancy and CAP payments.
- Crop production, considering both its characteristics (cultivated area, income, number of crops and cost structure) and operating expenses (seeds, water, chemical inputs, crop insurance, consultancy and certification).
- Livestock (area, income and expenses, number of product, insurance and certification).
- Transformed products (income and number of products).

Specific categories

The analysis is carried out at the national level. However, for the sake of precision, the analysis may be broken down according to the main regions, farm production and economic dimension. The detail of these categories is provided below (tab. 1). The regions are grouped according three main areas:

- North: Valle D'Aosta, Piemonte, Lombardia, Trentino, Alto Adige, Veneto, Friuli Venezia, Giulia, Liguria and Emilia Romagna.
- Centre: Toscana, Marche, Umbria and Lazio.
- South and Islands: Abruzzo, Molise, Campania, Calabria, Puglia, Basilicata, Sicilia and Sardegna.

Farm production is also grouped according to these main categories:

- Specialization in field crops.
- Specialization in fruits and vegetables.
- Specialization in meat.
- Mix.

Tab. 1 - Repartition of Italian farms of the sample in 2012 according to their region and specialization

Region	Field crops	Fruits/Vegetables	Meat	Mix	Total
1. North	409	645	372	41	1,467
2. Centre	235	165	106	33	539
3. South/Islands	381	506	254	66	1,207
Total	1,025	1,316	732	140	3,213

Source: Elaboration INEA on FADN data

The economic dimension is also taken into account through the European Dimension Units (EDU) ranked in 7 classes. UDE 1 and 2 are not relevant due to the very low number of observations. UDE 4, 5 and 6 are the most numerous (tab. 2).

Tab. 2 - Repartition of Italian farms of the sample in 2012 according to their UDE and specialization

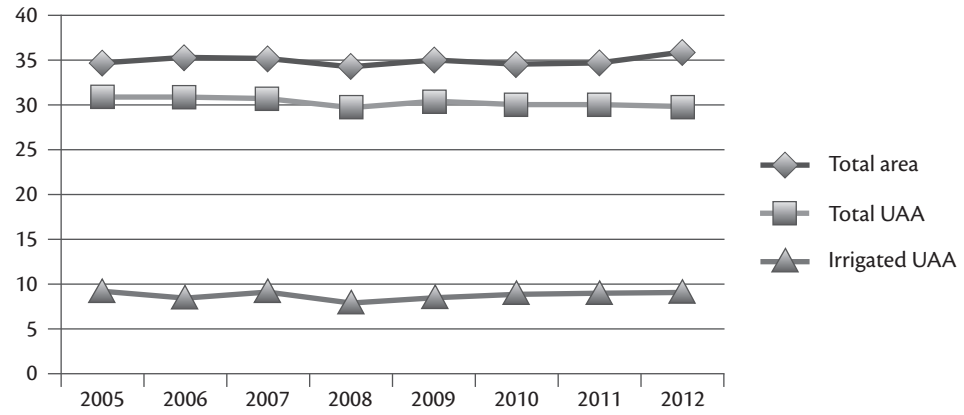
UDE	Field crops	Fruits/Vegetables	Meat	Mix	Total
1	0	0	0	0	0
2	67	57	2	2	128
3	335	307	74	43	759
4	207	334	134	37	712
5	188	291	163	32	674
6	205	302	272	21	800
7	17	18	40	2	77
8	6	7	47	3	63
Total	1,025	1,316	732	140	3,213

Source: Elaboration INEA on FADN data

3. Analysis of data

From a very general point of view, the structure of Italian farms of the sample has not changed much between 2005 and 2012 (graph 1). Over that period, the total area has only increased by 3.5 % while the total usable agricultural area (UAA) rose at the same time from the same proportion. The irrigated UAA remains quite stable and represents on average 30% of the UAA in 2012. This result seems to indicate that the CAP did not affect the fundamental structure of Italian farms over the last years.

Graph 1 - Structure of Italian farms between 2005 and 2012 according to the sample (all farms, mean values in ha)

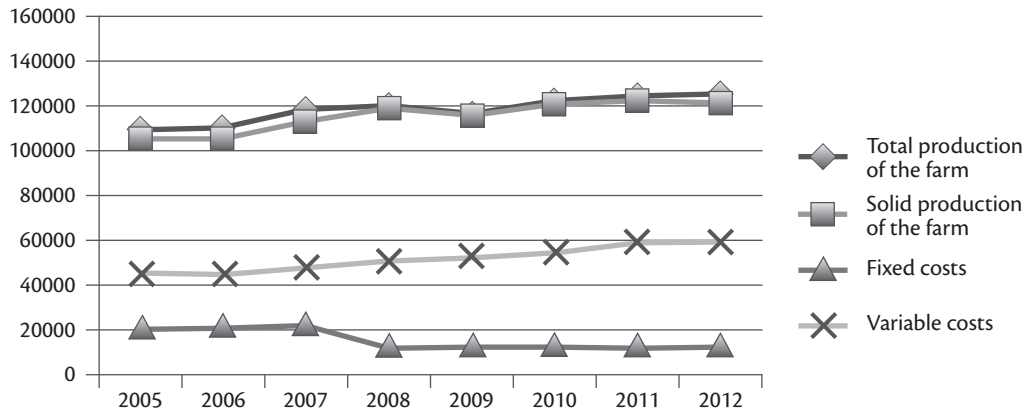


Source: Elaboration INEA on FADN data

By contrast, the financial analysis of the same farms reveals notable changes (graph 2). The total and marketed production increased respectively by 14% and 16%. The most important change comes from the costs structure, which evolved towards a more flexible model. Fixed costs dropped by 37% while variable costs increased by 30% over the period. One should notice that variable costs include risk management practices such as buying crop insurance policies or chemical inputs. As a result, Italian farms reduce their break-even point, thus becoming less sensitive to changes in their income level while protecting it at the same time. Yet, amortizations are generally greater than investments regarding machinery, which may lead to a progressive obsolescence of production factors.

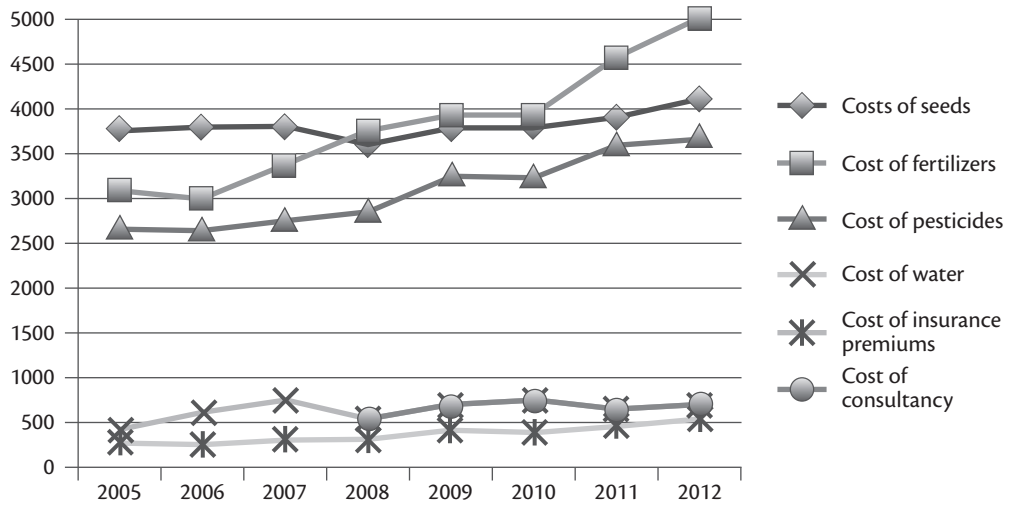
Charges devoted to risk management are classified among variable costs due to their optional and activity-dependent characteristics (graph 3). Observing in detail the structure of variable costs shows that expenses in risk management tools have notably increased. For instance, the costs of fertilizers and pesticides, which are commonly used to protect crop yields, respectively increased annually by 6% and 4%. Crop insurance premiums have increased by 2.2 times while the number of farms subscribing crop insurance policies rose by 1.5 times since 2005, when the reform of the national crop insurance system was implemented. Morevoer, between 2008 and 2012, consultancy costs increased by 35%.

Graph 2 - Financial analysis of Italian farms between 2005 and 2012 according to the sample (all farms, mean values in €)



Source: Elaboration INEA on FADN data

Graph 3 - Evolution of expenses for crop production between 2005 and 2012 according to the sample (all farms, mean values in €)



Source: Elaboration INEA on FADN data

Water is a particular kind of input: while it is essential for crop production, it is subject to pressures on its availability due to drought episodes and its use and related cost is fixed by specific policies, because of the public nature of water resources, so the cost is not subject to market dynamics. Over the period of study, the cost of water remained quite low compared to other inputs. It increased annually by 6% but this trend hides wide disparities among years, with the highest expenses being made in 2009 and not within the driest years.

The results clearly exhibit two trends that are amplified overtime: 1) Italian farms get significantly more coverage against natural hazards in the crop sector, whatever the intrument considered; 2) technical tools are prefered to financial tools, mainly for their flexibility and a limited cost per unit. For instance, an application of chemical inputs on crops can be done on request, while crop insurance subscripton needs to be done before the season begins. Given the relative stability of the structure of the farms included in the sample, we can infer that farmers combine rather than they substitute risk management tools.

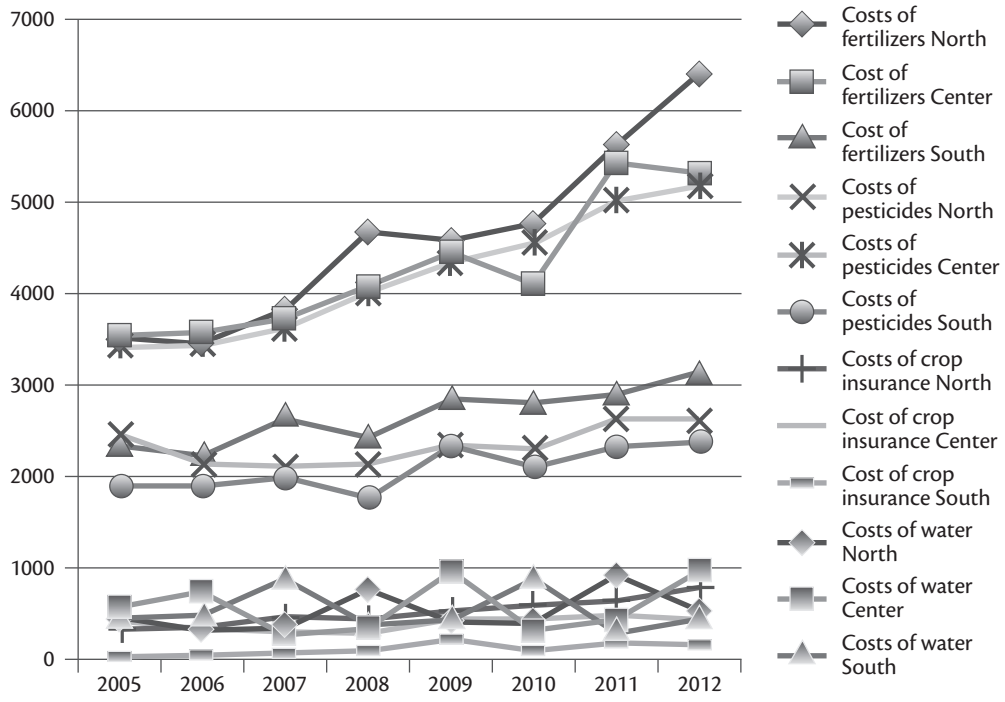
Geographic distribution

There exist strong regional disparities among Italian farms. Farms located in the Centre of the country are much larger (40 ha in 2012) than those located in the North and the South (respectively 27 ha and 29 ha in 2012). However, total production in the North and the Centre are somehow comparable while the South has very low levels of production. Moreover, farms located in the north of Italy use the most fertilizers, pesticides and crop insurance. Despite these structural differences which denote a higher productivity when moving northward, we notice the same trends overtime that at the national scale, *i.e.* the stability of UAA and increases in total production. Indeed, the evolution of the cost structure is similar with a decrease in fixed costs and an increase in variable costs. In line with that result, one can also notice that the

main expenses made for managing crop risk are dramatically increasing in all areas (graph 4).

The dynamics in the use of risk management tools differs among the location: the use of fertilizers increase the most in the North, the use of pesticides increase the most in the Centre and the use of crop insurance policies increase the most in the Centre. Despite huge annual variations, the cost of water remains broadly stable on average between 2005 and 2012, except in the Centre where it increases by 75% over the period.

Graph 4 - Evolution of expenses for crop production for Italian farms of the sample between 2005 and 2012 according to their location (all farms, mean values in €)



Source: Elaboration INEA on FADN data

Differentiation in production

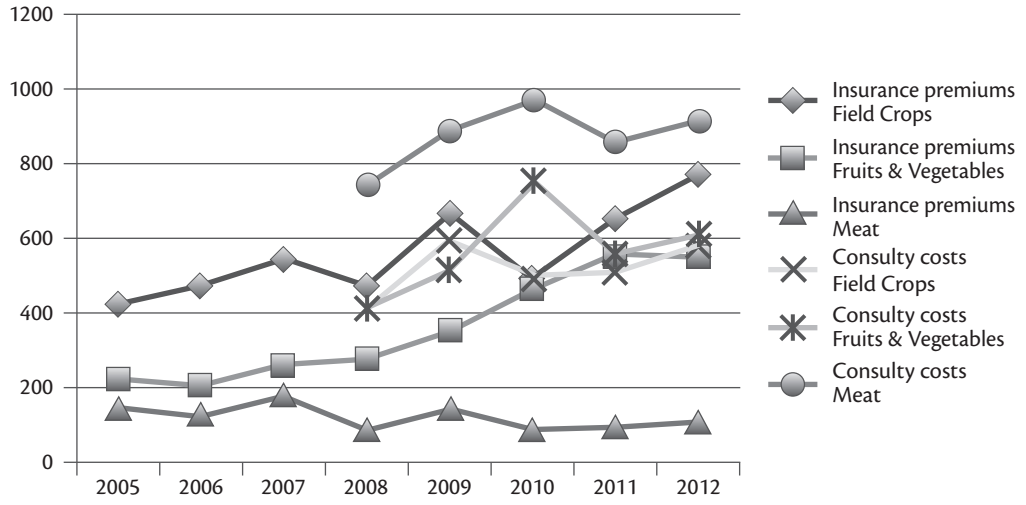
We differentiate four main types of farm production (field crops, fruits & vegetables, meat and mix). Studying the mix of production, which combines both crops and animals, leads to results difficult to analyse. The reason is the small number of farms classified in this category. Then, we compare the evolution of expenses devoted to crop or cattle insurance and to consultancy. These two instruments, whose use is strongly encouraged within the CAP for risk management, are available for all types of production. While insurance is used to hedge yield risk, consultancy aims at helping the farmer to adopt optimal practices.

The structures of farms that cultivate field crops and those that grow fruits and vegetables are clearly different (graph 5). The former are associated with a greater UAA and owned land as well as greater resulting production. As a result, farms cultivating field crops are the most

insured. One must also note that crop insurance policies were primarily designed for this category of farms, which explains the strong and continuous increase of crop insurance subscription since 2003. The recent development of crop insurance policies devoted to fruits and vegetables offers these sectors a new opportunity to hedge their risks. Consultancy costs follow generally a positive and similar trend regardless of the crop considered. It also appears that farmers devote annually the same amount of funds to crop insurance and consultancy. Moreover, the use of these two instruments does not appear to be correlated, probably because they do not cover the same kinds of risks.

Meat production can also be insured and benefit from consultancy. However, the costs of both instruments remain very low. Since at least 2008 breeders have spent more money in consultancy than in livestock insurance. Such behaviour may be explained by the relative inefficiency of current insurance tools in relation to the needs of farmers.

Graph 5 - Evolution of insurance and consultancy costs for Italian farms of the sample between 2005 and 2012 according to their production type (all farms, mean values in €)



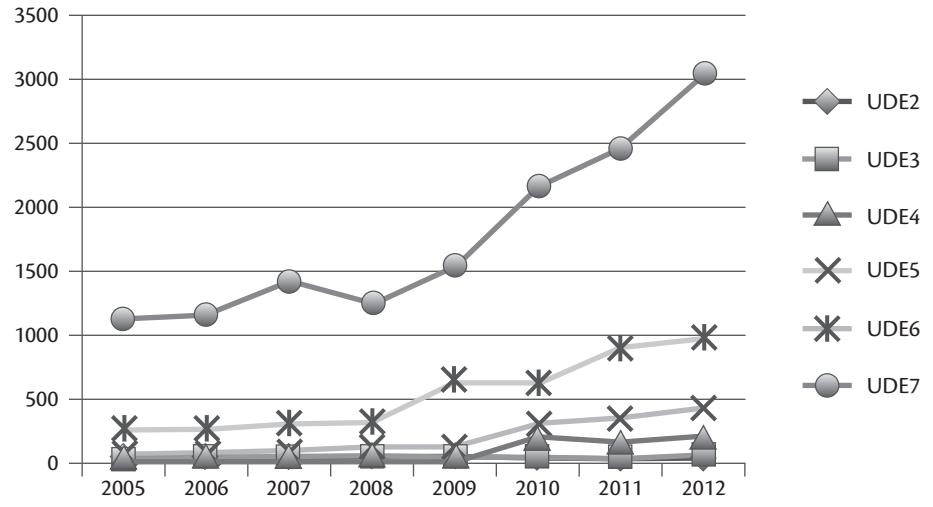
Source: Elaboration INEA on FADN data

Size matters

We study in this subsection the influence of farm size (measured by its economic dimension) on risk management strategies. The results offer a contrasted view of crop insurance practices (graph 6). Except for the minority of farms belonging to UDE2 and UDE8, expenses in crop insurance are strongly increasing over the period 2005-2012 (*e.g.* +764%, *i.e.* +31% annually, for UDE4 which includes a large number of Italian farms).

However, such an increase is mainly due to a very low starting point (the legislative reform of 2004 started in 2005). In fact, only the biggest farms (UDE7 and UDE8) fully benefit from crop insurance with expenses rising annually by 18% and 13%, respectively. Similar observations can be made regarding the costs of consultancy as well as chemical inputs: medium farms are the most dynamic regarding risk management but only rich farms can afford the cost of the coverage.

Graph 6 - Evolution of crop insurance premiums for Italian farms of the sample between 2005 and 2012 according to their economic dimension (all farms, mean values in €)



Source: Elaboration INEA on FADN data

3.1 Combination of risk management strategies

Descriptive statistics can be complemented by an analysis of the relationships between risk management strategies because farmers have the choice to use simultaneously many instruments. A convenient way to study dependencies among costs devoted to risk hedging (indicators described before), is to compute coefficients of correlations. The indicators determine the degree to which two variables movements are associated, with a range comprised between -1 (perfect negative correlation, *i.e.* perfect substitution of instruments) and 1 (perfect positive correlation, *i.e.* perfect complementary of instruments), 0 meaning no correlation at all. The significance of the correlation coefficient (CC) is measured at the 5% level (denoted with a star in the tables), which is the standard confidence interval in statistics. Throughout the analysis, the large number of observations in the sample guarantees significance for most associations, even with very low correlation coefficients.

Animals

Regarding animal breeding, the number of products is almost independent of the sold production (CC = 0.1789, close to 0) but rather is linked to the farmed area (CC = 0.8427, close to 1). The same relationship is observed between the level of insurance premiums and the area (tab. 3). One should notice that crop insurance and certification are quite independent because these strategies correspond to different aims, *i.e.* protection versus valorisation of the production.

Tab. 3 - Matrix of correlation between livestock revenue and risk management tools according to the sample (all farms, all years)

Correlation Coefficient (CC)	Sold production	Operating expenses	Number of products	Area (UBA)	Insurance premiums	Being certified
Sold production	1.0000					
Operating expenses	0.8966*	1.0000				
Number of products	0.1789*	0.1340*	1.0000			
Area (UBA)	0.8427*	0.8509*	0.2166*	1.0000		
Insurance premiums	0.2702*	0.3443*	0.1094*	0.2778*	1.0000	
Being certified	0.0423*	0.0241*	0.1787*	0.0410*	0.0241*	1.0000

Note: * indicates a correlation significant at the 5% level.
Source: Elaboration INEA on FADN data

Crops

We notice that the costs of seeds, fertilizers and pesticides are largely linked to the sold production (tab. 4). Therefore, farms make such expenditures according to the level of income they are expecting. Conversely, the relation between the sold production and the number of crops is very weak, which appears to be a choice linked to the cultivated area.

Crop insurance, consultancy and certification appear to be used independently of both the production structure (cultivated area, number of crops) and the context of risk management (chemical inputs). They are employed in specific contexts and not systematically. For instance, 18% of all Italian farms sell at least one certified product. This proportion varies among sectors but it systematically remains stable overtime.

Both the intensity of the correlations and their significance level are preserved among farm specialization, location and dimension.

Tab. 4 - Matrix of correlation between crop revenue and risk management tools according to the sample (all farms, all years)

Correlation Coefficient (CC)	Sold production	Operating expenses	Number of different crops	Area (UBA)	Variable costs	Variable cost margin	Cost of seeds	Cost of fertilizers	Cost of pesticides	Cost of water	Crop insurance premiums	Cost of consultancy	Being certified	Miscellaneous costs
Sold production	1.0000													
Operating expenses	0.8349*	1.0000												
Number of different crops	0.0797*	0.0708*	1.0000											
Area (UBA)	0.3910*	0.3673*	0.2008*	1.0000										
Variable costs	0.8478*	0.9847*	0.1063*	0.4381*	1.0000									
Variable costs margin	1.0000*	0.8465*	0.1002*	0.4251*	0.8478*	1.0000								
Cost of seeds	0.6337*	0.7954*	0.0378*	0.1860*	0.7614*	0.6665*	1.0000							
Cost of fertilizers	0.6797*	0.7420*	0.1254*	0.5763*	0.7593*	0.6978*	0.4349*	1.0000						
Cost of pesticide	0.7029*	0.7102*	0.0868*	0.3991*	0.7216*	0.7222*	0.3785*	0.7042*	1.0000					
Cost of water	0.3810*	0.4195*	0.0248*	0.2168*	0.3846*	0.3607*	0.2756*	0.3670*	0.3864*	1.0000				
Crop insurance premiums	0.2875*	0.3398*	0.0184*	0.1084*	0.3386*	0.2592*	0.1108*	0.2223*	0.3152*	0.2107*	1.0000			
Cost of consultancy	0.2940*	0.3725*	0.1420*	0.4209*	0.4041*	0.3128*	0.1383*	0.4581*	0.3506*	0.1200*	0.0952*	1.0000		
Being certified	0.0128*	0.0172*	0.0799*	0.0076*	0.0206*	0.0045*	0.0328*	0.0245*	0.0362*	0.0270*	0.0317*	0.0060*	1.0000	
Misvellaneous costs	0.5267*	0.6948*	0.0100*	0.0402*	0.6472*	0.4745*	0.3789*	0.2920*	0.3139*	0.1510*	0.2643*	0.0374*	0.0092*	1.0000

Note: * indicates a correlation significant at the 5% level.
Source: Elaboration INEA on FADN data

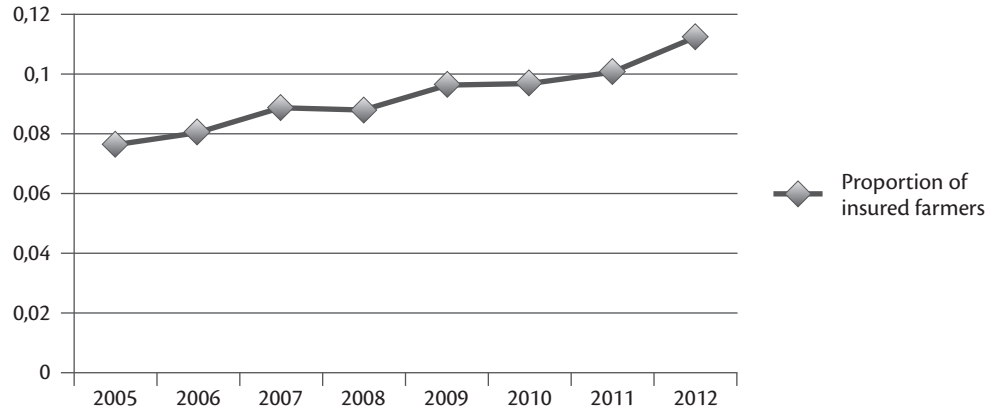
3.2 Focus on the influence of crop insurance in farm management

In this sub-section, we focus more specifically on crop insurance subscription in order to understand which farms are insured and the consequences in terms of farm income and risk management.

Insured farmers

Thanks to a changing institutional context (cfr. parr. 1.1 and 2.1), farmers who decide to subscribe to crop insurance policies are more numerous each year (graph 7).

Graph 7 - Proportion of insured farms of the sample between 2005 and 2012 (all farms, in %)



Source: Elaboration INEA on FADN data

This regular increase concerns all regions and specialities, however we can notice strong disparities according to our sub-classifications (tab. 5). For instance, being in the North of Italy doubles the probability of insuring the crops. Not surprisingly, farms specialized in field crops or fruits and vegetables are more willing to insure their crops than farms that mix their production because the latter are more diversified. The economic dimension is finally a discriminant indicator because the larger is the farm the more it is insured.

Tab. 5 - Proportion of insured farmers of the sample according to their location, specialization and economic dimension (all farms, all years, in %)

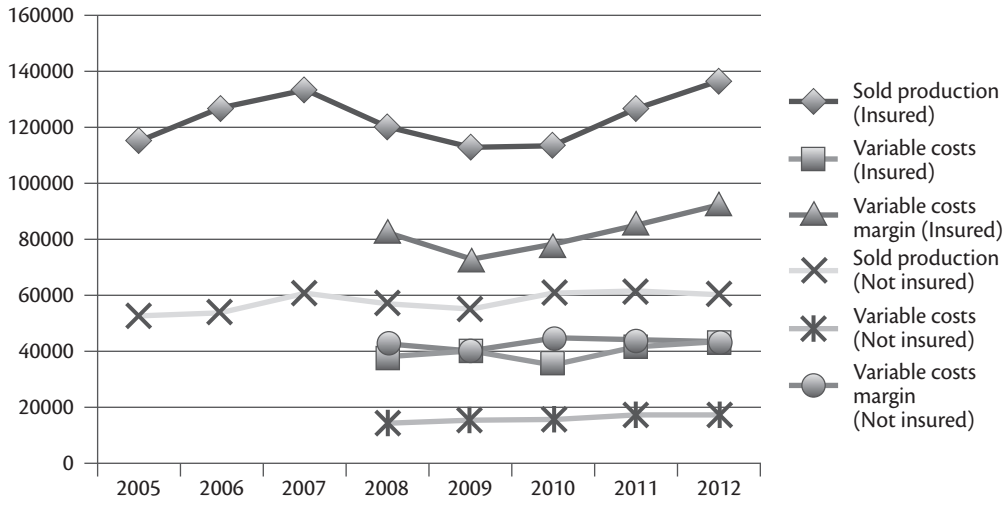
		Insured	Not insured
Region	North	12,1%	87,9%
	Centre	9,0%	91,0%
	South	5,8%	94,2%
Specialization	Field crops	10,9%	89,1%
	Fruits/Vegetables	12,5%	87,5%
	Meat	1,6%	98,4%
	Mix	4,1%	95,9%
Economic dimension	UDE2	4,5%	95,5%
	UDE3	4,6%	95,4%
	UDE4	6,1%	93,9%
	UDE5	9,2%	90,8%
	UDE6	13,1%	86,9%
	UDE7	15,4%	84,6%
	UDE8	13,9%	86,1%

Source: Elaboration INEA on FADN data

When considering the detail, it appears clear that insured farms benefit from higher sold production which is quite volatile over time (graph 8). The charges induced by crop insurance premiums and the costs associated with other risk management strategies lead to an increase in variable costs after 2010 but this increase is more than compensated by a rise in the sold production. As a result, insured farms benefit from a higher variable cost margin. This indicator, which is computed as the difference between the sold production and the sum of variable costs, is associated with economic performance.

Non-insured farms benefit from a more stable sold production (+2% annually), which may justify their choice to avoid insurance. Yet, the level of variable costs increases at a higher rhythm (+4% annually), which leads to a continuous decrease of the variable cost margin since 2010. This result denotes a decreasing competitiveness of non-insured farms

Graph 8 - Financial analysis of insured and non-insured farms of the sample between 2005 and 2012 (all farms, in €)



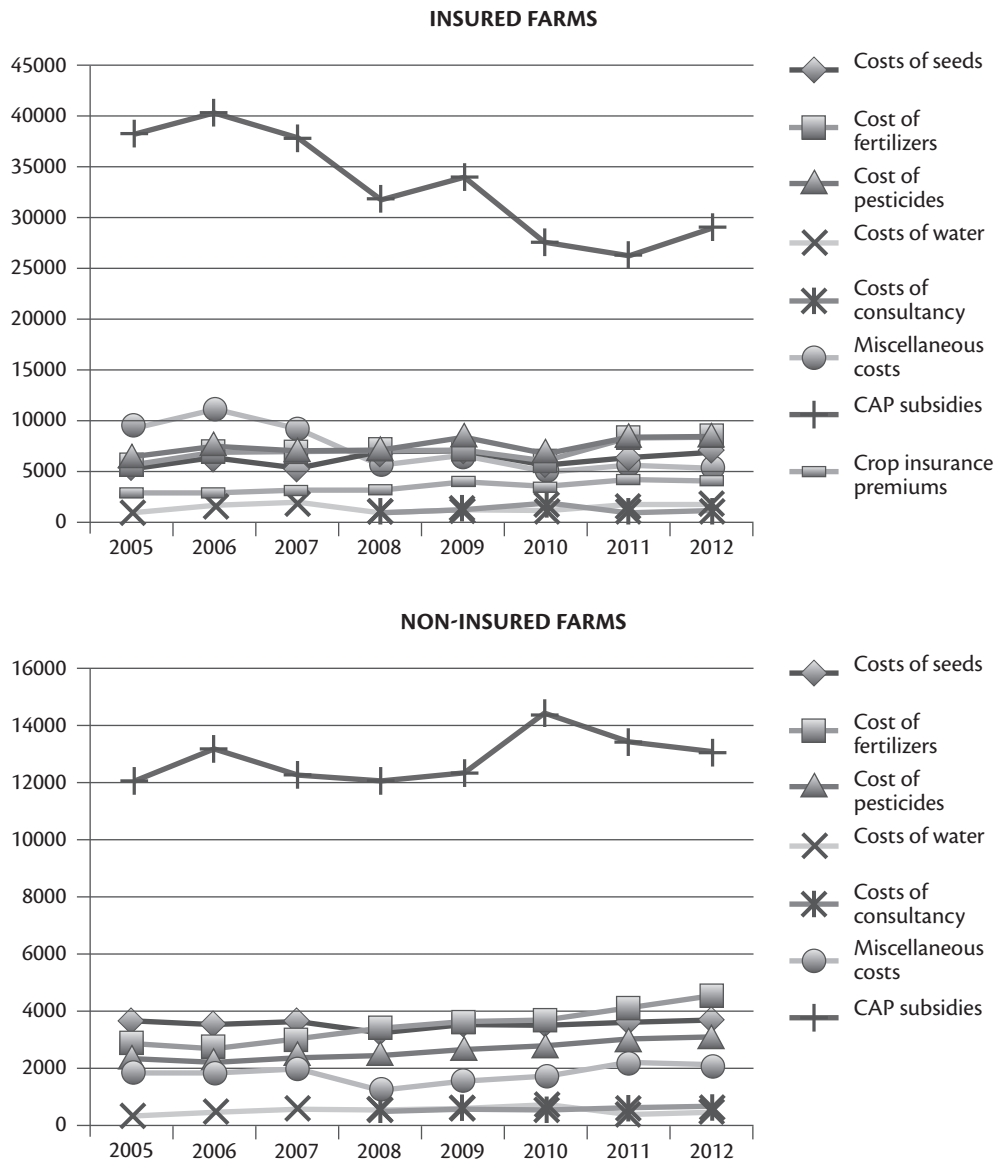
Source: Elaboration INEA on FADN data

Being insured and risk management

Insured farmers benefit from higher CAP payments, because their farms are fundamentally larger (graph 9). Yet, these payments are very irregular. After a continuous pace of growth, they continuously decreased after 2006, despite a slight increase in 2009 and 2012. Non-insured farms are in an opposite situation because the CAP payments they receive increased by 10% between 2005 and 2012. CAP payments therefore seem more and more targeted toward small farms. The result is that European subsidies cover on average 100% of variable costs for non-insured farms while they only cover between 70% and 100% of such costs for insured farms.

Given that context, it is not surprising to observe that non-insured farms increase their level of variable charges as CAP subsidies increase. Over the period 2005-2012, all charges increased, especially pesticides and fertilizers. Although very small, consultancy costs increased too. Facing a drop in CAP subsidies, insured farms tried to stabilize their variable costs by reducing drastically miscellaneous costs in favour of identified risk management tools. Between 2008 and 2012, the value of consultancy costs increases by 26%, while insurance premiums rise by 44%. A dichotomy between insured and non-insured farms can be observed regarding expenses in seeds: Being insured, a farmer is incentivized to select more expensive plants.

Graph 9 - Evolution of expenses for crop production between 2005 and 2012 for insured and non-insured farms of the sample (all farms, mean values, in €)



Source: Elaboration INEA on FADN data

4. Conclusions

Taking into account the methodological approach and the dataset, it is possible to find significant elements that should give cause for thought for the design of the risk management tools in the new CAP.

The following key points suggested by the analysis show that in perspective it may be more effective to rethink the policy design rather than adjust it each time it is necessary, that is each year.

Italian farms benefit from a wide range of instruments able to help them to face risks. While their use is globally growing, such trends must be discussed and placed in the context of contrasted regions, productions and economics dimensions.

The behaviour of farms seems not to have really changed in order to adapt to climatic risks. The structure of farms does not seem to be affected by the CAP during the period 2003-2012

In fact, only large and rich farms can afford all additional expenses required to hedge risk (crop insurance, pesticides, fertilizers, water and consultancy). They do so without changing their production structure overtime.

In case of a drop in the sold production, those farms having a higher proportion of variable costs are able to reduce their variables charges, thus getting more flexibility.

Among the instruments used to hedge risks, the technical ones, use of chemical inputs and water, are the most employed.

Insurance is marginally used, both to cover crop and animal yields, despite a trend favourable to its development.

The population of crop-insured farmers exhibits a different behaviour compared to non-insured producers that is characterized by the development of alternative forms of risk management (consultancy and certification) and the regression of other forms of hedging.

The trends of variable costs of the farms exhibit a clear preference for technical tools instead of financial tools in order to hedge risk. This creates also a stronger pressure on the environment (pesticides, fertilizers and water).

Policy measures should have the objective to invert these trends, improving or finding new tools more appropriate and convenient for farmers.

In order to be efficient, the allocation of public funds for economic risk management tools should not be horizontal, but rather strongly based on a territorial analysis of the demand, considering exposure (to what and where), vulnerability (major damages) and farm structure.

The livestock sector is affected by damages, but little answers are given to hedge risk for phytosanitary risk. Farms seem uninterested in the current financial tools.

Within the crop sector, the trend of costs of pesticides shows the lack of alternative and enough flexible management tools for phytosanitary risk.

Sanitary risks need a management designed at an upper scale, for instance through mutual funds.

Despite the exposure and the vulnerability of their territory, the trends of crop insurance costs are positive only for big farms in income and size. The other categories where the great part of Italian farms is inserted show a decrease in trend.

Policy should re-think the scheme for insurance subsidies or introduce more adequate tools in order to encourage risk hedging in medium-small farms (for instance, investing more in advice systems or other financial tools).

The integration gives opportunities to use the potential synergies between risk management tools and other rural development measures of a more structural and management nature. First

and foremost, these include agro-climatic-environmental measures, production diversification, irrigation infrastructures, technological and management innovations and formation-information-consultancy.

The effectiveness of this integration can be achieved only if the actions are applied at a collective level (groups of farms).

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