

# The effects of the Health Check of the Common Agricultural Policy on Italian olive tree farming<sup>1</sup>

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## 1. Introduction

Over the last fifteen years, the European agriculture had to deal with a constantly changing Common Agricultural Policy (CAP). The Mac Sharry reform in 1992, the Agenda 2000 and the Mid-Term Review in 2003 (also known as Fischler reform) are the main examples. The CAP has been deeply simplified to meet new international market equilibriums, stricter budget constraints, and incoming consumers' needs. The Fischler reform imposed that the largest part of the economic aid for farmers had to be transferred through a Single Payment Scheme (SPS), decoupled from supply.

This simplification process continued with the Health Check process (Commission of the European Communities, 2007; Commission of the European Communities, 2008a; Commission of the European Communities, 2008b).

On 20 November 2008, the European Union Council agreed

## Abstract

The decoupling process of the CAP's direct payments is affecting the Italian olive oil sector's structure and competitiveness. The shift of the single payment scheme from the historical to the regional model, as recommended in the Health Check final agreement, might further affect this sector and threaten the existence of the olive-growing farms mainly in less productive areas.

This work aims to analyse the potential effects of the latest CAP reform on olive growers' behaviour and economic performance in southern Italy. The object area is the Apulia region, which is one of the most important olive-growing regions in Italy.

To analyze the economic impact of the reform, we adopt a simulation scheme of the farm economic balance based on the definition and characterization of Representative Olive-growing Farms (ROFs).

The analysis demonstrates that the regionalization of the entitlements would imply an income reduction for all farms, which is stronger in the «complete approximation» scenario, and for those farms located in marginal areas.

**Key-words:** olive oil enterprise, CAP reform, marginal area, Italy.

## Résumé

*Le processus de découplage des paiements directs de la PAC est en train de changer la structure et la compétitivité du secteur de l'oléiculture italienne. Le changement du régime de paiement unique du modèle historique au modèle régional, tel que recommandé dans le dernier accord Health Check, pourrait affecter le secteur et menacer la survie des exploitations oléicoles dans les zones marginales.*

*L'objectif de cette étude est d'analyser les effets de la dernière réforme de la PAC sur le comportement et la performance économique des oléiculteurs de l'Italie du sud. La zone d'étude est la région des Pouilles qui est l'une des régions oléicoles les plus importantes d'Italie.*

*Pour analyser les effets économiques de la réforme, nous avons utilisé un système de simulation d'entreprise basée sur l'identification et la caractérisation des Exploitations Oléicoles Représentatives (EOR).*

*L'analyse montre que la régionalisation des titres aurait pour résultat une réduction des revenus de toutes les exploitations oléicoles, plus élevée pour le scénario dit de «rapprochement complet», et des exploitations oléicoles situées dans les zones marginales.*

**Mots-clés:** exploitations oléicoles, réforme de la PAC, zones marginale, Italie.

upon a final compromise about the Commission Health Check proposals (Commission of the European Communities, 2008b). The agreement gives to the Member States the possibility to convert the historic support model into a regional model. If the Italian government will implement this reform, there will be relevant economic consequences on the national olive-growing sector.

From a general standpoint, the decoupling criterion offers farmers the opportunity to receive fixed aids in place of variable payments. Farmers can plan their activities and choose those products that have a higher market demand, avoiding misleading resource allocations. Nonetheless, the decoupling criterion seems to offer fewer opportunities to olive-growers than to others. Olive differs from other crops for some peculiar features (perennial nature of production, late first

production, etc.) that heavily constraint the structural flexibility of the farmers and their ability to take advantage of market opportunities. Furthermore, in Italy, tree pulling out has been banned since 1951, with just a few exceptions (National Law no. 144, 14 February 1951) limiting crop replacement.

The Italian olive farming systems are particularly susceptible to this problem. The olive-growing area accounts for 8% of the national UAA, but olive-growers are 47% of the total number of farmers. Olive-growing is more important in southern regions (e.g. Apulia, Calabria and Sicily),

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where the olive-growing area is 79% of the national olive-growing area. Moreover, the national olive-growing sector, particularly in southern Italy, has to face the increasing competitiveness of southern Mediterranean Countries, a serious risk for many farms especially for those in marginal areas and for those using traditional cultivation techniques.

This research, through a case study analysis in the Apulia region, aims to evaluate the current economic performances of olive-growers and to forecast the effects on their income of three possible scenarios that could emerge from the implementation of Health Check final agreement (HC). The article is structured in four paragraphs and conclusions. In the second paragraph the main features of the HC will be presented. In the third paragraph the theoretical approach and the adopted methodology will be explained. Results will be discussed in the fourth paragraph. Finally, some policy recommendations will be provided to support decision-making processes by regional and national policy makers.

## 2. The CAP reform process and the Health Check final agreement

The Fischler Reform (Regulation EC n. 1782/03) deeply changed the CAP. The driving principle, as widely known, is to decouple farm aids, which separates the economic supports from the farm supply. The decoupling principle has been applied by transferring all the various farm level supports schemes into a Single Farm Payment (SFP).

Even though the new Regulation was first applied to a restricted set of commodities (arable crops, beef and sheep, dairy products), it was then extended to tobacco, sugar, wine, fruits and vegetables, and olive oil.

The olive oil was reformed by the Regulation EC n. 864/2004 and by the Regulation EC n. 865/2004. While the regulation let the Member States apply a quota of coupled support (maximum 40%), the Italian Government decided for a fully decoupled historic model and planned a financial support for quality, traceability, market, and environmental programs. These programs are managed by the Producer Organisations (POs) in exchange of a 5% of the direct payments.

In Italy, the new policy for the olive-growing sector started in the olive year 2005/2006 (Ministry of Agriculture, 2005). Apart from the limits imposed by the financial discipline, thought to keep spending under control, no other expenditure containment measures were provided to limit the national expenditure ceiling for the olive-growing sector. So, the olive-growing farmers are actually benefiting from about 95% of the payments received in the four olive year's reference period (from 1999/2000 to 2002/2003).

In 2007, after a few years from the enforcement of the olive oil reform, the European Commission started the assessment of the 2003 CAP reform implementation – the so-called Health Check – to evaluate any possible need for further changes. On 20 May, the European Commission presented to the European Parliament some legislative proposals related to the Health Check of the CAP to further sim-

plify it, make it able to seize new market opportunities, and meet new challenges (as climate change, water management and the bio-energy sector).

On 20 November, the Council of the European Union reached a final agreement on the Commission's proposals. The reform relates to three regulations: the Regulation no. 1782/2003 on the SPS, the Regulation no. 1234/2007 about the Single Commodity, and the Regulation no. 1698/2005 on rural development. While the former was substantially rewritten, the others were only partially modified. For the purposes of this work we will only briefly consider the adjustments related to the first of the above-mentioned Regulations, and we will discuss in detail the changes in the SPS model.

After the experience of the last few years, it has been considered desirable, if not necessary, to adjust the SPS model. Member States have been allowed to adapt their SPS model introducing entitlements towards flat-rate payments, in order to make the SPS more effective, efficient and simple. Essentially, the new regulation simplifies and strengthens the modalities of implementation of two key instruments of the previous reform: the SPS and the compulsory modulation.

With regard to the SPS, the Commission provides the opportunity for the Member States that have adopted the historical model to retain the *status quo*, but at the same time the Commission points out that «[...] as time goes by it will become more difficult to justify differences in this support, especially in the historic model. It seems therefore appropriate to allow MS to adjust their chosen model towards a flatter rate during the period from 2009 to 2013» (Commission of the European Communities, 2007).

The Member State that adopted the historic model may decide, by 1 August 2009, to apply the SPS at regional level, beginning in 2010. In this case there are two possible implementations schemes: the so-called «regionalization» and the «approximation» of the SPS (Frascarelli, 2008).

By choosing the «regionalization», once the «regions» defined, the Member States will have to split the national budget ceiling between the regions. A share of no more than 50% of the regional budget ceiling would be distributed among all farmers, including those that in the previously applied historical model did not own entitlements (because in the reporting period they were not receiving direct payments). The remaining part (at least the remaining 50% of the regional budget ceiling) will be distributed among the historical beneficiaries (that is to say, those who had entitlements) in proportion to the historically accrued rights. The number of entitlements per farmer shall be equal to the number of hectares the farmer will declare in 2010. Under this scenario, it will be possible to proceed, after the regionalization and from 2011, to the approximation of the entitlements' values. This approximation has to be carried out over two years.

The «approximation» criterion works only for those farmers who hold the entitlements and it must be applied to

an appropriate geographical level identified by objective and non-discriminatory criteria such as the institutional or administrative structure and/or the regional agricultural potential. The Member States may enforce the policy using different intensities: they can point to reduce disparities in the value of entitlements, or they can completely cancel the differences giving all farmers the same value of entitlements («complete approximation»). To avoid excessive consequences on farmers' income, the regulation requires that the approximation have to be achieved gradually and within at least three years. During this phase, the loss of value of each title must not annually exceed 50% of the difference between its initial and final values.

With regard to the modulation, it will become compulsory and progressive in order to balance the distribution of financial resources between the first and second pillars of the PAC. The final agreement provides for an increase in the basic modulation rate from 5% to 10% over a four-year period (2009-2012). A progressive element (+4%) is introduced to further reduce the amount of aids for those farmers who receive payments over 300,000 €. Under a 5,000 € franchise, no direct payments reduction is applied.

It is widely recognized that, if applied in Italy, both regionalization and approximation would generate a significant redistribution of support among farms, and among sub-regional areas within the «regions» as well, as a consequence of the different production systems and of the differences in productivity levels (over years used as reference for the calculation of the entitlements «on the historical basis»). The redistribution will be greater in the biggest «regions» when following a per-hectare payment uniformity (Anania, 2008). Also, the redistribution will be higher in those «regions» where there was a high crop variety when the SPS was introduced.

To assess the implications of the transition from the historical model to the regional one, there are at least two issues that we believe have to be carefully considered:

a) the redistribution of resources from the olive-growing sector to other sectors;

b) the impacts of these changes on the (often) precarious revenues of olive growers, who could in some cases decide to abandon their farm.

To understand the changes in both the direct payments and the resulting transfer from the olive-growing sector to other sectors, assuming complete approximation of the entitlements at administrative regional level, we estimate an average support reduction of 47% per hectare, from 905 to 477 € per hectare, with a «drain» of resources of about 132 million € only in Apulia. Less serious consequences would have the «regionalization» option, assuming again the administrative regional level as the reference region, that would lead to a reduction of the average title of «only» 25%, from 905 to 675 € per hectare, with a loss of 71 million € for the Apulian olive-growing sector.

Obviously, it is not easy to predict what will be the effects of the HC on the olive-growing farms' profitability and ability to resist to this exogenous shock. Unpredictability is mainly due to the great variability of the farms' structure and organizational models that characterize this sector. Particularly in Apulia, farms greatly vary in size, olive groves features, production techniques, management system and marketing strategies. All these factors lead to a wide variability in the economic performances that make it necessary to differentiate by area and farm type when analyzing the possible «micro» impacts of the HC.

### **3. The theoretical approach and the methodological approach**

#### **3.1 The Representative Olive-growing Farms (ROFs): an analytical tool to evaluate economic performances**

The economic agricultural farms' performances, the return on inputs, and the evolutionary pathways of the farming systems are all determined by a combination of exogenous and endogenous factors. The first set of factors includes the context's features (physical, economic and social characteristics), and the agricultural and rural policies. The second set includes the structural and organizational characteristics of the farming systems, the technical and managerial entrepreneurs' abilities, the production technologies, the relations of farms with input and output markets (Cafiero, Cembalo, Cioffi, 2005).

As regards the olive oil sector, Italy is characterized by a broad differentiation that reflects the range of natural, social and institutional local features, so it is possible to recognize more than one regional and sub-regional olive farming systems. Furthermore, there is a great variety of olive-growing farms depending on the economic size, the structural characteristics, the organizational features, and on the managerial and relational abilities.

For these reasons, in order to test the possible impacts of the HC on the case study area (Apulia region), it has been decided to use a research methodology that is structured around four different stages:

- zoning Apulia to identify different homogeneous olive-growing areas;
- identifying and characterizing farm typologies that prevail in each homogeneous area;
- carrying out balance analysis to evaluate the current economic performances of each farm typology;
- simulating, by using balance analysis, the different scenarios with respect to the different options provided by the HC.

By zoning the region, it is possible to grasp the characteristics of the context and to cluster Apulia in sub-provincial areas, homogeneous for type of olive cultivation. The choice of a provincial level enables to account for both social and institutional differences, and for the most relevant



political-administrative competences in agriculture. An expert classification has been performed combining the official olive-growing statistics (ISTAT, 2000; INEA, 2006; AGEA, 2006) with information gathered through a structured questionnaire. The survey was conducted by a panel of experts that operate in the five provinces of Apulia. The criteria included in the survey are: pedoclimatic and agroeconomic conditions, prevailing farm characteristics (age of the trees, cultivars, plantation density, etc.) and main cultivation techniques.

To define the endogenous features of the olive-growing sector, the most representative farm typologies have been identified within each homogeneous area (De Gennaro, Caseri, Roselli, 2007). This process resulted in a set of farm models (hereinafter referred to as ROF: Representative Olive-growing Farm) that meet the structural, organizational, and relational features and the cultivation techniques that prevail within each homogeneous area. To identify the ROFs of each area, we referred to the Farm Accountancy Data Network parameters of both the TF (Type of Farming) and the ESU (European Size Unit), using data from the National Census of Agriculture (ISTAT, 2000).

Regarding the TF, it has been decided to limit the analysis to the «TF – specialist olives», i.e. those farms that derive more than two-thirds of their total standard gross margin (SGM) from olive growing. These farms represent, in fact, the greatest quota of the Apulian olive growers: 70% of total olive-growing farms and 76% of UAA cultivated with olive. Regarding the economic dimension (ESU), we decided to ignore too small farms (less than 1 ESU). Finally, four typological classes were identified for each homogeneous area:

- 1) small-sized farms (TF: Olive-growing; ESU: 1 - 4, farms with a SGM between 1,200 and 4,800 €)
- 2) small to medium-sized farms (TF: Olive-growing; ESU: 4 - 8, farms with a SGM between 4,800 and 9,600 €);
- 3) medium to large-sized farms (TF: Olive-growing; ESU: 8 - 16, farms with a SGM between 9,600 and 19,200 €);
- 4) large-sized farms (TF: Olive-growing; ESU: more than 16, farms with a SGM exceeding standard 19,200 €).

The identified ROFs were subsequently characterized on the basis of the information resulting from the official available statistics (ISTAT, 2000; INEA, 2006; AGEA, 2006) and, above all, through structured questionnaires and interviews of technical experts from different provincial olive-growing areas. The survey data include prevalent characteristics of each farm typology and homogeneous area and their average production. Input and output prices (oil olives, olive oil and wood production) refer to the olive year 2005/2006.

The collected information (see Table 1 for a brief summary), namely structural and organizational data, cultivation techniques, purchased input, marketed output and marketing strategies, and the relational position within the supply-chain were used for the balance analysis using a specific software, «Bilagro», enabling to draw farm budgets (Marenco, 2005).

Table 1 – ROFs variables.

Variables
Economic Size Unit(ESU)
Specialisation (TF)
Localization (homogeneous sub-provincial olive-growing's areas)
Total UAA (Ha)
Olive UAA (Ha)
Irrigated UAA (Ha)
Crop assortment (crops other than olive)
Type of holding management
Total labour (Annual Working Unit (AWU))
Family labour (AWU)
Agricultural machinery and equipment
Olive's cultivation features
Cultivation techniques
Supply-chain position (market relations and marketing strategies)

The balance analysis was carried out according to a classic outline (De Benedictis, Cosentino, 1979) and it is based on the following main criteria:

- the use of machinery and labour was calculated as hours attributable to the individual farming operations;
- the hourly labour cost was calculated as full farm cost (including the contribution charges) for each province;
- the family labour cost and the cost of other inputs owned by farmers have been estimated using the opportunity cost criterion;
- the cost of machinery was calculated according to the annual costs of fuel, lubricants, replacements, maintenance and insurance;
- the olive trees replacement cost was calculated by assuming a duration of 100 years, while the machinery and equipment duration varied with the kind of machine and/or equipment;
- the land interest rates, as well as those on capital, have been calculated applying a 3% rate.

The balance analysis was structured in two stages. In the first stage, the current economic performances of each farm typology were assessed. Subsequently, in the second stage, the effects of three different possible scenarios for the HC were simulated.

To assess the current economic performance of olive-growing farms, we evaluated the Family Farm Income<sup>2</sup> (FFI), the Entrepreneurial remuneration Income<sup>3</sup> (EI), the incidence of Single Farm Payments (SFP) on income (both on FFI and EI), and the olive and olive oil total production costs (explicit and implicit production costs). Finally, to simulate the effects of different HC scenarios, the effects on profitability were calculated as percentage variation in FFI and in SFP.

<sup>2</sup> Remuneration to fixed factors of production of the family (work, land and capital) and remuneration to the entrepreneur's risks (loss/profit) in the accounting year.

<sup>3</sup> Remuneration to the entrepreneur's risks (loss/profit) in the accounting year.

### 3.2 The policy scenarios

In the past, the EU support policy for the olive oil sector significantly affected the farms' economic performance (the production function), the choice of the final output (extra-virgin olive oil, virgin olive oil or lampant olive oil), and the farming system (intensive or extensive techniques).

This analysis assesses short-term impacts of three HC scenarios on the economic performance of each ROF:

- the «maintaining the *status quo*» scenario;
- the «complete approximation of entitlements» scenario;
- the «regionalization of 50% of regional budget ceiling» scenario.

We use a static farm models that only simulates changes of EU support on fixed crop choices, cultivation techniques and market conditions. It is reasonable to assume that farms do not respond instantly to changes in the economic scenario, so that in the short term farms do not change their operating framework. Within a certain number of years, farms will adjust to reach the highest possible level of income, given the qualitative and quantitative characterization of farm resources and constraints. The analysis, then, only allows understanding the impact of policy changes on the ROFs, highlighting the differences of responses to the SPS variation.

To calculate the actual average value of entitlements given to olive-growing farms in Apulia, differentiating by province and homogeneous area, we used data supplied by AGEA (National Agency for the management of aids in agriculture) about the average olive-growing area eligible for SPS and the average budget reference allocated to the olive-growing farms during the decoupling procedure (olive year 2005/2006). Currently, the budget provided as entitlements to the olive oil sector in Apulia is of nearly 279 millions euros, for a reference olive-growing area of 308 thousands hectares, and an average regional entitlement value of 905 €/ha.

The «maintaining the *status quo*» is the scenario that provides for the continuation of the support that has been given to the olive oil sector since the 2005/2006 harvesting season, but with an increasing modulation rate according to the HC.

The «complete approximation of the entitlements» is the scenario that provides for the levelling of entitlements between all farmers who benefited from the historic SPS. We assumed that reference regions chosen by the Italian Government match with the regional administrative level, and that the levelling of entitlements, in 2012, would result in a value of entitlements equal for all the «historical» farms. To estimate the value of the payments under this scenario, we used the AGEA data, in order to estimate both the total Apulian budget ceiling and the «total historic area».

The «regionalization of 50% of regional budget ceiling» scenario was constructed assuming that regionalization is implemented by 50% of the regional budget ceiling, while the remaining 50% is allocated proportionally to the value of the entitlements of the historic farmers-beneficiaries of the SPS, and that the reference regions adopted by the Italian Govern-

ment are administrative regions. The option for a future two-stage entitlements approximation was neglected. For this scenario, the value of the entitlements for each ROF was estimated using AGEA and ISTAT data, and to estimate the total Apulian budget ceiling, we assessed the current average value of entitlements of each ROF, the «historic area» and the future eligible area in 2010.

For all the three scenarios, we applied the compulsory modulation scheme planned for 2012 to calculate the net value of entitlements of each ROF.

## 4. The analysis

### 4.1 Apulian olive tree farming

Apulia is one of the Italian regions mostly characterized by the presence of olive groves that can be found in every municipality and that occupy 30% of the total regional UAA, corresponding to 339 thousand hectares (ISTAT, 2000).

The olive regional heritage consists of approximately 42 million olive trees (AGEA, 2008) and the farms involved in this production were, according to census data, over 269 thousand (76% of the total number of farms) in 2000. According to data provided by AGEA (AGEA, 2008), there were just over 300 thousands farms with olive groves for oil production during the reference period used to establish the value of the entitlements (harvesting seasons 1999/00, 2000/01, 2001/02, 2002/03), 225 thousands farms were awarded with entitlements in olive year 2005/2006. The former farms cultivate with olive an area, used to calculate the entitlements, of about 308 thousands hectares, i.e. approximately 41 million trees.

In the year 2000, the average size of olive-growing farms in Apulia (1.2 ha), although higher than the national average (0.89 ha), was very low and it was even smaller than the previous census (1.4 ha). The intense fragmentation is the main feature of olive cultivation: many small holdings, often farmed on a part-time basis. Of all the farms that grow olive trees, about 73% of them have a dimension of less than 2 olive UAA hectares, and almost 95% have a size of less than 10 olive UAA hectares. However, given the allocation of the area to olive trees, farms smaller than 2 hectares only cover 33% of the area, and for farms smaller than 10 hectares the percentage rises to 68% of the regional olive-growing area.

Most of the olive-growing farms (70%) are specialized (TF specialist olives) and they cultivate about 76% of the regional area established with olives. 83% of these farms are smaller than 4 ESU, they cultivate nearly 37% of the specialized olive UAA, and directly run with the predominant or exclusive use of the family labour. On the other hand, farms larger than 40 ESU are less than 0.7% and they hold more than 18% of the specialized olive area. The remaining 16% of farms have a size between 4 and 40 ESU and they cultivate nearly 45% of the olive-vocated area.

The Apulia region includes many olive-growing areas that differ according to several aspects: from natural, social and

institutional conditions to the wide plurality of farm typologies, production techniques and oil qualities. In this work, we present the results of the economic analysis of ROFs and an assessment of the effects of three HC scenarios in the province of Foggia.

## 4.2 Results

### 4.2.1 Olive tree farming in the Province of Foggia: the homogeneous olive-growing areas and the ROFs

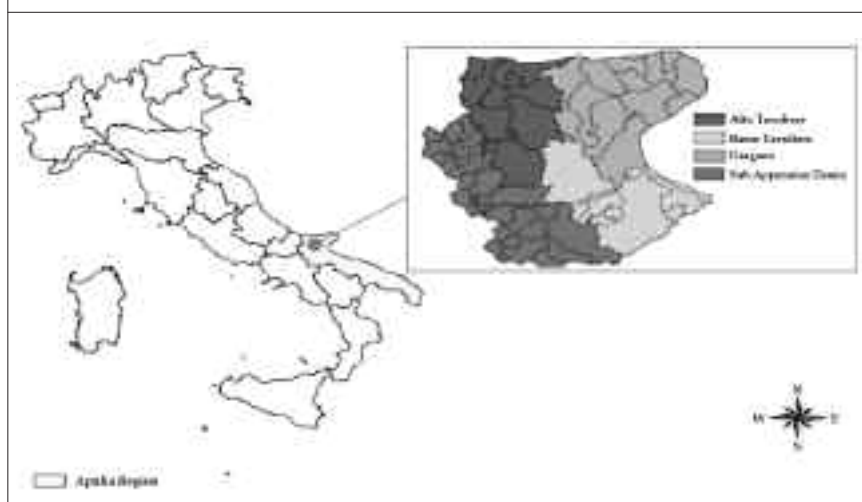
According to the National Agricultural Census (ISTAT, 2000), olive growing in the Province of Foggia involves more than 34 thousand farms, covering almost 50 thousand hectares, 15% of the regional olive-growing area, and counting about 8 million trees (AGEA, 2008). Almost all of these farms produce olives for oil production (98%).

We focused on the specialized olive-growing farms. Specialized olive-growing farms account for more than 18 thousand units (52% of the total) and cover more than 29 thousand hectares (60% of the total olive-growing area). The specialized farms smaller than 4 ESU reach 77% covering 30% of the specialized olive-growing area of the Province of Foggia (Table 2). 28% of specialized olive-growing farms are smaller than 1 ESU (5 thousand units) with a per-capita gross income of 1.200 euros. The contribution to the local production of these amateur farms is negligible, and therefore they were excluded from the analysis. Only 4% of the sample accounts for farms larger than 16 ESU, and the rest of it (19%) includes 4 to 16 ESU farms.

Applying the previously described methodological approach, four homogeneous olive-growing areas were identified in the Province of Foggia (Figure 1):

1. Alto Tavoliere;
2. Basso Tavoliere;
3. Gargano;
4. Sub-Appennino Dauno.

Figure 1 – The homogeneous olive-growing areas in the Province of Foggia.



Subsequently, for each homogeneous area, four different ROFs were identified and characterized (sixteen ROFs in the whole province).

In the province of Foggia, a large share of the specialized olive-growing farms (more than 40%) and a large share of the olive-growing area (51% of the olive UAA) are localized in the hilly area of Gargano. The Gargano area is followed by the Alto Tavoliere and Basso Tavoliere areas, that

together sum up to 43.5% of farms and 42.6% of the olive UAA. Finally, the Sub-Appennino Dauno area includes 16% of farms and only 6.5% of the olive-growing area.

Table 3 summarizes some of the structural characteristics of the 16 ROFs identified in the homogeneous ar-

Table 2 – Specialized olive-growing farms and UAA cultivated with olive for each economic size class and homogeneous area in the province of Foggia.

	ESU (ROF)					Total	%
	<1*	1-3gr (small size)	4-16gr (small to medium)	16-32gr (medium to large)	>32		
<b>Alto Tavoliere</b>							
Farms (No)	911	2,350	434	227	95	4,057	22,5
Farms (%)	22,1	57,9	11,7	5,6	2,3	100	
Olive UAA (Ha)	272	2,025	1,088	971	1,127	5,482	18,3
Olive UAA (%)	4,96	36,94	19,84	17,71	20,16	100	
<b>Gargano</b>							
Farms (No)	1,704	3,321	1,223	625	381	7,254	40,2
Farms (%)	23,1	45,8	16,9	8,6	5,1	100	
Olive UAA (Ha)	451	3,136	2,953	2,926	5,737	15,202	50,9
Olive UAA (%)	7	20,6	19,4	19,2	37,2	100	
<b>Sub-Appennino Dauno</b>							
Farms (No)	1,905	1,261	148	30	10	3,554	16,4
Farms (%)	38,9	42,7	5	1	0,1	100	
Olive UAA (Ha)	372	988	306	133	132	1,828	6,3
Olive UAA (%)	28,1	51,7	15,9	6,9	6,8	100	
<b>Basso Tavoliere</b>							
Farms (No)	948	1,913	470	241	217	3,789	21
Farms (%)	23	50,5	12,4	6,4	5,7	100	
Olive UAA (Ha)	271	1,719	1,095	1,115	3,073	7,284	24,3
Olive UAA (%)	3,7	23,5	15,1	15,3	42,3	100	
<b>Province of Foggia</b>							
Farms (No)	5,668	8,843	2,123	1,123	783	18,014	
Farms (%)	28,1	49	12,8	6,2	3,9	100	
Olive UAA (Ha)	1,365	7,837	5,442	5,144	10,868	29,877	
Olive UAA (%)	4,6	26,3	18,2	17,2	31,7	100	

\* This farms have been excluded by the analysis



areas. The olive grove density varies between homogeneous areas and type of farming. The Gargano area is the only one presenting irregular olive groves often realized by grafting wild olive trees, meanwhile the other areas present regular groves and younger olive trees. The most popular cultivars in the province of Foggia are: Peranzana and Coratina; to a lesser extent Ogliarola Garganica, Roton-della and, finally, Leccino and Nocellara. Almost all of farms cultivate olives for oil production. Only those farms in the Tavoliere areas, given the presence of the Peranzana variety, produce table olives, usually 20% of the whole production. Irrigation is only present in the Tavoliere areas, in all identified ROFs except for the small Alto Tavoliere ROF. In recent years, the use of equipment (such as pneumatic scissors) has been spreading to facilitate mechanical pruning, thus greatly reducing the working hours. Only large farms prune every year, while all the others are used to prune in alternate years. The use of tools that fa-

cilitate the manual olive picking (hand shakers) is also spreading. Although the use of tractor-mounted shakers is increasing, their use remains a practice of a limited number of larger farms. Only small farms located in the Gargano area harvest manually. In small and small-medium sized ROFs, workers receive a share of the production as remuneration for their work. These kinds of agreements are mostly used for the pruning and, above all, the harvesting phases when most of workers are under temporary contracts. The ROFs' position within the supply chain depends on the input and output marketing that in turn depends on the efficiency of the market strategies and relationships.

In the small and in medium to small-sized farm typologies, machineries are absent and therefore the use of contractors for mechanical operations is common. Mechanization is widespread in all the other types of olive farm typologies identified. In the large to medium-sized and large-sized ROFs tractors are common and the number of machines and equipment available increases as the farm size increases. Part-time farming characterizes all the farms but the relevance of farmers' income coming from other activities decreases as the economic dimension increases. Finally, another feature that distinguishes the different ROFs is the use of external labour that increases with the growth of the business size.

#### 4.2.2 ROFs' balance analysis at the status quo

To evaluate the economic performance of each of the ROF within each homogeneous area, we calculated the following indexes: FFI, EI, incidence of SFP on the FFI and the cost of production of olives and oil (Table 4).

The FFI is always positive and, as expected, it grows proportionally to the economic dimensions of the ROF. The ROF with the highest net farm income is the large «Basso Tavoliere» ROF which reaches 50 thousand euros. The ROF with the lowest FFI is the medium to small-sized ROF in the Gargano area. The highest FFI per hectare can be found in the small «Tavoliere Basso» ROF (Figure 2) and the lowest in the medium to small-sized «Sub-Appennino Dauno» ROF.

The area with the highest levels of profitability per hectare is the Basso Tavoliere while the one with the lowest levels is the Gargano. These results depend on several technical factors (e.g. soil fertility, age of olive groves, olive grove density and use of irrigation practice) influencing the levels of production and the product quality, and on economic factors (e.g. the farm size, the participation on cooperatives) determining the production costs and the final prices.

Looking at the farm income (EI), seven ROFs out of sixteen (medium-small, medium-large and large-sized «Gargano» ROFs, medium-small, medium-large and large-sized «Sub-Appennino Dauno» ROFs; medium to large-sized «Alto Tavoliere» ROF) show a negative index value, and they fail to reward the production factors

Table 3 – Main characteristics of ROFs identified in the province of Foggia.

	ROFs			
	small size	small to medium size	medium to large size	large size
<b>Alto Tavoliere</b>				
Olive grove density (trees per hectare)	179	179	179	238
Cultivar	Peranzana, Coratina	Peranzana, Coratina	Peranzana, Coratina	Peranzana, Coratina
Irrigation	no	yes	yes	yes
Harvesting technique	manual with hand shakers	manual with hand shakers	manual with hand shakers	Tractor-mounted shakers
Destination of olive and/or olive oil	olive oil self-consumption and sale	olive oil self-consumption and sale	olive and olive oil sale	olive and olive oil sale
<b>Basso Tavoliere</b>				
Olive grove density (trees per hectare)	238	238	238	238
Cultivar	Coratina	Coratina	Coratina	Coratina
Irrigation	yes	yes	yes	yes
Harvesting technique	manual with hand shakers	manual with hand shakers	manual with hand shakers	tractor mounted shakers
Destination of olive and/or olive oil	olive oil self-consumption and olive oil sale	olive oil self-consumption and olive oil sale	olive oil self-consumption and olive oil sale	olive oil sale
<b>Gargano</b>				
Olive grove density (trees per hectare)	156	156	156	156
Cultivar	Ogliarola Garganica, Coratina	Ogliarola Garganica, Coratina	Ogliarola Garganica, Coratina	Ogliarola Garganica, Coratina
Irrigation	no	no	no	no
Harvesting technique	manual with hand shakers	manual with hand shakers	manual with hand shakers	manual with hand shakers
Destination of olive and/or olive oil	olive oil self-consumption and sale	olive oil self-consumption and sale	olive oil self-consumption and sale	olive oil sale
<b>Sub-Appennino Dauno</b>				
Olive grove density (trees per hectare)	179	179	179	238
Cultivar	Coratina, Roton-della	Coratina, Roton-della	Coratina, Roton-della	Coratina, Roton-della
Irrigation	no	no	no	no
Harvesting technique	manual with hand shakers	manual with hand shakers	manual with hand shakers	tractor-mounted shakers
Destination of olive and/or olive oil	olive oil self-consumption and sale	olive oil self-consumption and sale	olive oil self-consumption and sale	olive oil sale

owned by the farmer and his family as much as their opportunity cost. These types of farms are the most dependent on the aid provided by the CAP, since they have the highest incidence of subsidies on income.

tion costs and selling price translates into underpaid inputs owned by the farmer family.

These results are even more negative compared to 2005/2006 (the olive year of reference for the balance analysis), when the olive oil market was characterized by higher prices. According to the ISMEA agricultural markets research, in the province of Foggia, in January 2009, the selling price of extra-virgin olive oil was 2.46 €/kg on average. Comparing this new selling price with the average production cost, it emerges a generalized weakening of the analyzed olive-growing olive farm typologies.

Only two ROFs, the large sized ROFs in the Alto Tavoliere and Basso Tavoliere areas, can reward all the inputs to their market price or opportunity cost. Moreover, we must not forget that in the same period, the price of some inputs (especially fertilizers) sharply raised.

### 4.2.3 Analysis of three possible HC scenarios

The balance analysis was also used to evaluate the effects of three possible implementations of the CAP reform: 1) maintaining the status quo, 2) complete approximation of entitlements, 3) regionalization of 50% of regional budget ceiling. The indices used to measure the effects of short-term scenarios are the percentage change in the SFP and FFI (Table 6).

Results show that the best scenario for the olive oil sector is to maintain the status quo. Farm payments would not change for all farm types

except for the large ones. Only these farms will suffer a small reduction of SFP and a slightly lower FFI as a result of the highest rate of modulation (shifted from 5 to 10%).

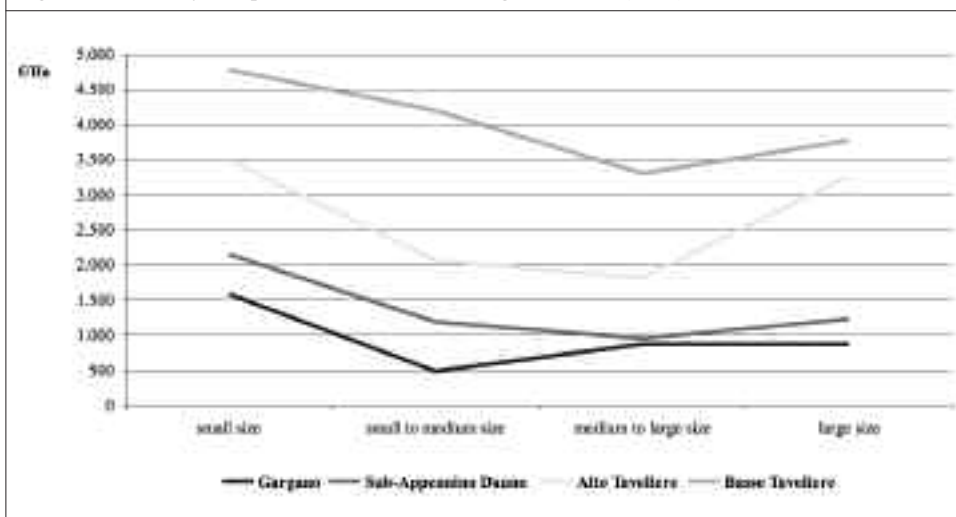
The more detrimental scenario is the complete approximation of the entitlements. With this scenario, olive-growing farms in the Province of Foggia would suffer a general aid reduction (from a minimum of 3.4% in the small to medium «Sub-Appennino Dauno» ROF, to a maximum of 60.7% in the large «Basso Tavoliere» ROF). Also the FFI would decrease, from a minimum of 1.1% in the small «Sub-Appennino Dauno» ROF, to a maximum of 121.1% for the medium «Gargano» ROF).

If we consider the percentage of aid reductions, the most disadvantaged area in this scenario would be the most productive in the Basso Tavoliere area, but in terms lower FFI the most negative effects would in the Gargano area. In the status quo this last homogeneous area, which focuses the

Table 4 – ROFs' economic performances at the status quo.

	FFI €)	SI €)	SFP €)	SFP/FFI (%)	Olive oil prod. costs (€/ton)	Olive oil prod. costs (€/kg)
<b>Gargano</b>						
small size	1,824	1,824	885	3709.00	884	3.02
small to medium size	1,329	1,329	1,787	13191.00	1,172	6,202,777%
medium to large size	1,301	5,673	3,387	2806.00	1,194	8.01
large size	19,112	7,331	10,681	16106.00	941	4,211%
<b>Sub-App. Dauno</b>						
small size	2,272	1,081	812	1805	881	1,180,688%
small to medium size	2,410	-327	1,899	4406.00	881	4.58
medium to large size	1,312	-5,797	2,33	1770.00	862	5.20
large size	15,208	-4,888	6,816	2108.00	780	4.20
<b>Alto Tavoliere</b>						
small size	5,408	1,229	817	1883	881	3.55
small to medium size	4,148	1,094	1,644	3806.00	792	1,186,555%
medium to large size	4,116	5,301	3,964	7808.00	871	4.40
large size	11,218	21,898	8117	2706	851	6,173%
<b>Basso Tavoliere</b>						
small size	4,201	3,603	807	2281	880	3.16
small to medium size	9,888	9,821	2,817	2603.00	841	1,147,666%
medium to large size	11,874	3,674	4,908	4604.00	791	3.02
large size	49,988	33,38	14,332	2804.00	540	1.87

Figure 2 – Trend of FFI per hectare in each homogenous area (€/Ha).



Finally, we estimated the total average cost of production per ton of olives and per litre of olive oil (Table 3). The total average production cost per litre of olive oil (Figure 3) shows a bell-shaped trend, ranging from 2.2 euros in the large «Basso Tavoliere» ROF, to 6.03 euros per litre in the medium-large «Gargano» ROF. The total average cost per litre of olive oil could be considered as the price that would pay-back all the production factors at their market price or according to their opportunity costs.

Comparing the total average production costs and the effective selling price of the olive oil<sup>4</sup> in each ROF (Table 4), it is clear that only some ROFs pay back the production factors at their market price. In the Gargano area, none of ROFs is able to reach this result. The gap between produc-

<sup>4</sup> Calculated for each ROF as a weighed mean of the selling prices in each channels used to market the olive oil.



Figure 3 – Trend of olive oil production costs in each homogenous area (€/litre).

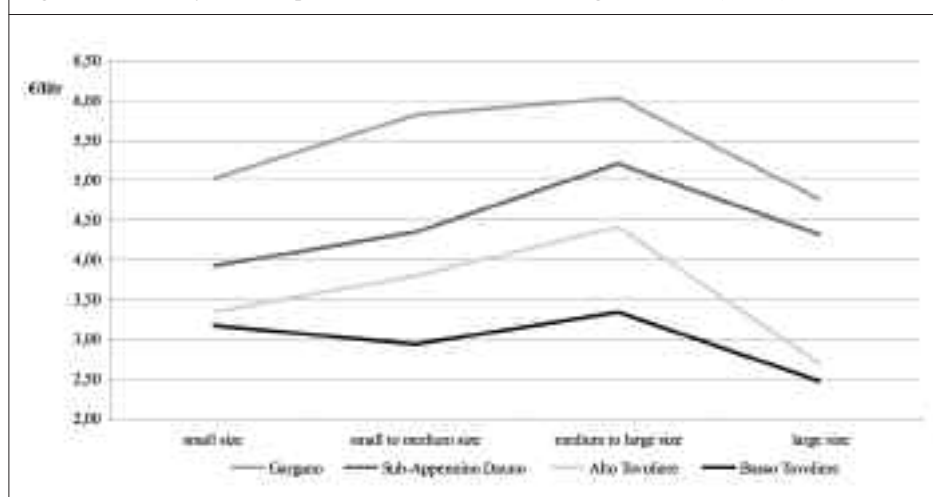


Table 5 – Gap between market price and production costs of olive oil (€/litre).

Homogeneous area:	ROFs			
	small size	small to medium size	medium to large size	large size
Gargano	-0.02	-2.92	-2.37	-1.19
Sub-Appennino Dauno	0.58	-0.59	-1.76	-0.96
Alto Tavoliere	1.15	-0.20	-1.32	0.047916667
Basso Tavoliere	0.05	0.42	-0.00	0.061805556

most of the olive-growing in the province of Foggia, suffers the worst economic performance and higher levels of dependence on income support policies, so that the effects of relevant aid reductions on the farm income would be more drastic than in other areas.

The regionalization scenario would have less negative impact than the approximation scenario, although still marked, on all the ROFs. The SFP variation would range from a minimum of 1.6% in the small to medium «Sub-Appennino Dauno» ROF, to a maximum of 41% in the large «Basso Tavoliere» ROF. The FFI reductions would range from 0.7% in the small to medium «Sub-Appennino Dauno» ROF to a maximum of 85.7% in the medium to large «Gargano» ROF. The impact on FFI would be more consistent, again, in the Gargano homogeneous area.

Based on these results, combined with the assessment of the economic performance of the different ROFs, we can state that all the reform scenarios other than maintaining the status quo would exacerbate the difficulties of the sector, with stronger negative effects on revenues affecting marginal areas.

## 5. Concluding remarks

Through this study we evaluated the current economic performances of the olive-growing sector in one province of the Apulia region, and the effects on farm revenues of three possible scenarios of the HC reform.

The analysis of the current profitability of the olive farms showed the difficult conditions the sector is currently fac-

ing. Only certain types of farms located in the most productive areas can reward the inputs at market prices. All the other companies show a gap, more or less important, between the total average cost of production and the final price of the olives and/or the olive oil, underpaying the production factors owned by the farmers' families. The origin of the economic difficulties in the sector can be addressed to structural and organizational constraints that negatively impact the production costs and the selling prices of olives and oil.

The evaluation of the three possible scenarios of the CAP reform clearly shows that the most favourable option is to maintain the status quo, while the most detrimental is the complete approximation of entitlements scenario.

The three scenarios have different effects according to the types of farms and the homogeneous area. The income reductions will be more relevant in medium-sized farms that more than others are struggling to reach an economic equilibrium, and in homogeneous areas characterized by lower levels of productivity. Farms located in

more productive areas, since they currently own the highest levels of payments, are those who will suffer the largest support reductions.

The income support reduction provided so far to olive-growing farms would also imply a higher income instability resulting from the twofold effect of uncertainty of market prices and of lower level of guaranteed income. In other words, farms would be more vulnerable to the market fluctuations. In this regard, it should be pointed out that the unexpected situation of the global and national agriculture in 2007, the general and substantial rising of prices of many agricultural products (cereals, soybean, milk, etc.) have not involved the olive oil sector, which is undergoing strong and negatively-sloped price trends.

Within this difficult market scenario, given the current level of income support, not all olive-growing farms currently surviving with low margins of profitability will be able to face further direct payments reductions. These farms probably will not be able to face an increasingly competitive market.

A policy instrument to offset the reduction of farm support could come from the Article no. 68 of the new regulation (former Art. 69) that has a more flexible application and a broadened scope. The member states may indeed take up to 10% of the total regional ceiling:

- to grant an additional annual payment to farmers who undertake in the following areas: specific types of farming, agricultural products quality improvements, improved marketing;
- to grant a per-head or per-hectare payment, to address specific disadvantages that affect farmers in the dairy, beef,

Table 6 – Percentage variation in FFI and SFP for each policy scenario.

	Mediterranean North-Care		Central-mountainous		JFF regionalization	
	SFP	FFI	SFP	FFI	SFP	FFI
POLICENTRALI (MAREMMA) (%)						
Baseline						
small size	0	0	-14.8	-17.1	-20.2	-7.8
small to medium size	0	0	-33.1	-38.3	-28.3	-31.8
medium to large size	0	0	-43.2	-121.1	-30.4	-45.3
large size	-1.8	-2.1	-47.2	-48.0	-34.2	-37.2
North Apennines Tuscany						
small size	0	0	-8.0	-1.2	-4.3	-8.8
small to medium size	0	0	3.6	1.8	-1.6	2.7
medium to large size	0	0	18.1	-16.7	17.8	-31.2
large size	-1.4	-6.7	-53.0	-17.0	-51.8	-34.1
North Umbria						
small size	0	0	33.8	8.1	18.2	3.1
small to medium size	0	0	-34.0	-23.2	-15.7	-1.8
medium to large size	0	0	-42.5	-39.2	-39.8	-39.2
large size	-1.1	-0.4	-47.8	-11.1	-46.8	-8.7
North Umbria						
small size	0	0	-54.1	-11.8	-28.7	-8.5
small to medium size	0	0	-44.1	-14.2	-28.7	-3.3
medium to large size	0	0	-28.8	-24.1	-27.2	-15.0
large size	-1.6	-1.8	-28.7	-17.1	-41.8	-11.8

sheep and goat meat and rice sectors, in economically vulnerable or environmentally-sensitive areas;

c) to increase the entitlements amount and/or their number, in those areas subject to restructuring and/or development programs, in order to prevent the land abandon or to address specific disadvantages for farmers in those areas;

d) to provide a compensatory payment on crop insurance;

e) to provide a mutual fund for animal or plant diseases.

In particular, option c) could be a useful policy instrument to promote olive groves restructuring in mountainous and hilly areas, in order to avoid the activity abandonment by olive growers. Olive growers actually play an important role preventing hydrogeological damage and offer a fundamental contribution to defining the rural landscape. These aspects are addressed in a rather superficially way in the new Regulation, not consistent with the implicit aim of sustainability. The criterion for the redistribution of direct payments does not really take into account the positive externalities that these kinds of farms offer to the community. This is especially true for olive groves that are crucial for the characterization of Mediterranean landscapes and that make a large use of techniques with low environmental impact, including an effective ecological and sustainable crop management.

On the basis of these considerations, it seems clear that it is not possible to give an unambiguous and definitive judgment on the effects of the reform on the sector's stability. Much will depend on the policy choices that will be taken in the incoming months.

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