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ORIGIN DESIGNATION AND PROFITABILITY FOR SMALL WINE GRAPE GROWERS: EVIDENCE FROM A COMPARATIVE STUDY

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Summary

The concept of profitability has been widely debated in the international scientific economic community but there are few studies which contribute to connecting the profitability of micro and small agro-food holdings in PDO or PGI areas with their ability to stay afloat in a competitive market.

This study compares the economic results of quality wine grape producers in Sicily providing an analysis of the impact and consequences of raised economic performance in local vine-grower economies. Economic indicators were employed to compare the profitability in two PDO areas, verifying if micro and small size farm quite remain competitive in an increasingly concentrated wine market.

Detailed survey data was collected in 2 of the most important Sicilian PDO wine areas, showing the first results of some economic indicators which compare the vine-growing processes in each geographic area and evaluate the profitability of a sample of small grape producers. To evaluate the remuneration of capital and the ability of smallholder to compete in a global market, average farm profitability expressed as farm net value for each homogeneous area was calculated taking into account production costs and total output.

Despite several studies demonstrating that PDO certification increases costs and profits our study reveals how DO does not always ensure adequate profitability for micro and small vine growers.

The production and sale of unprocessed grapes does not provide any value-added products and local producers do not gain additional remuneration for the intangible components of their PDO grapes. Further analysis has required exploring to what extent these results are caused by increasing costs or by an inefficient market structure.

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Introduction

Traditional wines are one of the most significant agro-food products of a rural territory and their point of strength derives from the historical, cultural and social expression of local tradition (Di Vita, 2004). Since Phoenician times, Sicily has retained a well-established reputation in wine production (Caniglia et al. 2008), nowadays being the third most productive region in Italy both for vine-growing surface area and wine production (D'Amico, 2005).

Between the '50^{s} and late '80^{s}, there was an increase in the surface area of vines and wine production in Sicily of which wine production was mainly oriented towards bulk wines, although bottled wine was produced in smaller quantities (Di Vita, 2003*a*).

From the early '90^{s}, Sicilian wine production entered a period of structural reforms, accompanied by significant economic growth in the whole wine sector. New enterprises started up, and wine producers affiliated into large groups so traditional companies started thriving again.

This trend, which occurred with varying intensity in different vine growing areas of the region, applied also to some counties which traditionally had less competitive levels of wine production (Caltanissetta, Agrigento and Ragusa). In fact, with few exceptions, wine producers had already started quality improvement some decades earlier (Di Vita, 2002). The wine industry in Sicily has multiple criteria (Crescimanno et al. 1998; Tudisca, 2007) due to different mountainous and pedological conditions (volcanic soils, Mediterranean red soils, clayey soils and soil with a high calcareous matrix) as well as from different characteristics of farming plantations (vine training, cultivars, irrigation practices, etc.).

Only in the last decade, have Sicilian wine producers understood the logical necessity of increasing production quality to compete with the market challenges of the global market (Di Vita, 2003*b*). For this reason, Sicilian grape producers invested in better quality vineyards (introducing new grape varieties, zonation, precision viticulture) and by introducing modern technologies in harvesting and better grape quality. Furthermore, there has been widespread growth in new PDO[3] designated areas all over the island,

3 According new EU regulation Protected designation of origin (PDO) express the name of a region, a specific place or, in exceptional cases, a country used to describe a wine that complies with the following requirements: (i) its quality and characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors; (ii) the grapes from which it is produced come exclusively from this geographical area, (iii) its production takes place in this geographical area; (iv) it is obtained according production regulations (Reg. CE 491/2009).

but not always the spread of new origin designations has improved local winegrowing economies (D'Amico et al., 2011*a*).

In 2010, Sicilian quality wine production (PDO and PGI wines) reached over 220,000 hectolitres (ISMEA, 2010) representing 1.5% of all regional wine production in Italy.

Table 1 provide a short description of PDO wine sector in Italy by main region producers; the PDO wine areas are located in 13 different regions but three of them (Piedmont and Tuscany and Veneto) concentrate over 56% of PDO surfaces and 53% of total PDO wines.

Currently, Sicily has 29 certified wines, which represent about 6% of all Italian PDO wines, 21 of which are PDOs (76%) and 7 (24%) are PGIs (D'Amico et al. 2011*b*). Of all Sicilian PDO wine grapes growing, 37.7% is grown on less than 2 hectares and 28.0% is between 2 and 5 hectares (Chinnici et al. 2011).

Tab. 1- Wine grape surfaces, wine production and producers in main regions PDO areas

Region	Surface		Wine production *		Wine grape growers	
	hectares	%	000 hectolitres	%	number	%
Piedmont	**49,663**	**18.3**	**2,318**	**15.7**	**17,383**	**15.9**
Tuscany	**41,719**	**15.3**	**1,692**	**11.5**	**7,699**	**7.1**
Veneto	**36,620**	**13.3**	**2,402**	**16.3**	**14,561**	**13.4**
Emilia-Romagna	**23,857**	**8.7**	**1,544**	**10.5**	**11,110**	**10.2**
Lombardy	**21,628**	**7.9**	**681**	**4.6**	**6,206**	**5.7**
Abruzzo	**19,873**	**7.3**	**1,021**	**6.3**	**5,213**	**4.8**
Trentino AA	**14,595**	**5.4**	**959**	**6.5**	**10,369**	**9.5**
Sicily	**9,652**	**3.5**	**227**	**1.5**	**1,493**	**1.4**
Others	***55,226***	**20.3**	**3,882**	**26.4**	**34,774**	**32.0**
ITALY	**272,433**	**100.0**	**14,729**	**100.0**	**108,808**	**100.0**

Source: ISTAT, Italian National Institute of Statistics, 2010
*** Wine production is the mean of last 4 years (2007-2010)**

Detailed survey data was collected (Autumn 2010) in 2 of the most important Sicilian PDO wine areas, Alcamo and Menfi, showing the first results of some economic indicators which evaluate the profitability of wine growing processes in each PDO area.

This study, using detailed survey data collected (autumn 2010) in 2 of the most important Sicilian PDO wine areas, Alcamo and Menfi, shows the first results of some economic indicators which compare the winegrowing processes in each geographic area and evaluate profitability.

This survey analyses the economic results of quality wine grape producers in Sicily evaluating total output, total costs and the farm net value of sampled farms in 2 homogenous PDO areas. It aims at providing some analysis of the impact and consequences of raised economic performance in local vine-grower economies. This study also aims at identifying the main drawbacks for micro and small[4] PDO wine grape growers in competitive markets.

Theoretical background

Many studies have been directed to identify the key management skills for running a successful winery business (Charters et al. 2008; Grant et al. 2011; Pappalardo et al. 2013) and several of them have been carried out to represent actual trend of Italian PDO wine market (Vecchio, 2009; Stasi et al. 2011) but very few studies have estimated and compared the profitability of PDO wine for small vine grape growers, whose results not always seem to be profitable. Several complexities in the market for Italian wine-grapes may explain this dearth of studies.

Policy-makers have long recognized consumers' interest and the importance of Geographical Indications to impact product valuation (Herrmann et al., 2010). Geographical designations represent a useful differentiation tool for farms (Stasi et al., 2011) and it could provide farmers to avoid competition in commodity markets, representing a key option to raise farmers' incomes (Josling, 2006; Deselnicu et al. 2011a; Stasi et al. 2011). In this way, farmers and wine grape growers could have easier access to niche markets through the use of GIs labels, extracting premium prices (Bramley et al. 2009; Deselnicu et al. 2011b).

The concept of profitability has been widely debated in the international scientific economic community but there are few studies linking the profitability of micro and small agro-food holdings in PDO or PGI areas with their ability to compete in the market.

According to Harward & Upton (1961) "profitability is the ability of a given investment to earn a return from its use" which applied to the profitability of agricultural holdings, regional and traditional foods have been conceptualised as a form of cultural and social capital, providing rural areas with social and economic benefits (Tregear et al. 2007; Arfini et al. 2011).

4 *Small enterprises* are defined as enterprises which employ fewer than 50 persons and whose annual turnover or annual balance sheet total does not exceed 10 million euro. *Micro enterprises* are defined as enterprises which employ fewer than 10 persons and whose annual turnover or annual balance sheet total does not exceed 2 million euro. *Medium-sized enterprises* consists of enterprises which employ fewer than 250 persons and which have either an annual turnover not exceeding 50 million euro, or an annual balance sheet total not exceeding 43 million euro (European Commission, 2005).

Some empirical analyses have shown how the "PDO label seems to positively contribute to the sustainability of rural development (Belletti, Marescotti, 2011) and rural employment, mainly through the downstream market channel" (Bouamra-Mechemache, Chaaban, 2010c), as the origin-labelled products and territorial brand contribute to rural development (Lorenzini, 2010). On the other hand the "PDO label seems to have a negative direct economic influence on the number of farmers at the district level" (Bouamra-Mechemache, Chaaban, 2010c), first of all on small holdings, considering that this study showed that "given that the majority of grape growers in the industry are operating on less than 10 hectares, there is no guarantee that the endeavour will be profitable" (Bryant, 2010).

The demand for wine-grapes is often highly elastic and differentiated among qualities (Fuller, Alston, 2012) and the demand for Alcamo and Menfi winegrapes is effectively influenced by global supply and market conditions, making the demands very elastic. PDO producers could "benefit from a price premium on their product which offsets their higher production cost" (Bouamra-Mechemache, Chaaban, 2010a) but without a premium price, growing costs and low profits can reduce the market opportunities for small producers.

Generally "small farms are struggling to retain competitiveness via improved management and low-input systems" (Nehring R. et al. 2009) but at the same time Kirner and Bartel-Kratochvil (2007) show that larger holdings obtain higher incomes from agriculture and forestry but smaller holdings tend to provide greater environmental services per unit of agricultural land. Among these, vineyards are not only an essential component of the landscape in winegrowing regions, but also contribute to preserving them by preventing soil erosion and ensuring the presence of man in areas that are among the most fragile from an environmental point of view and often lacking any real economic alternative.

The survival of micro and small agricultural holdings and their "resistance to marginalization depends mainly on the reinforcement of endogenous resources of development, in combination with public and private initiatives from outside the region" (Bazin, Roux, 1995). Farm profits simply cannot be 'sustained' through continued industrialization of agriculture and "future profits of farmers must also be squeezed from the *farmer's penny*" (Ikerd, 1996).

Over the last five years, high levels of volatility in input costs (fertilisers, fuel and water) have lowered the profitability of Italian farms, leading to many difficulties in managing the negative returns from agricultural activity (Bracco et al. 2008) and only the best equipped farms with access to modern distribution channels as well as the technological ones can save on production costs (Arfini et al. 2010). With failing profits small farms are forced out of the market.

Given these conditions, first of all for Mediterranean countries (Sluiter, de Jong, 2006; Tatony et al. 2004), the risks of decreasing rural employment and increasing land abandonment are critically elevated (Pinto Correia, 2000) and the consequences have not been exhaustively analysed, either in terms of social or economic perspectives.

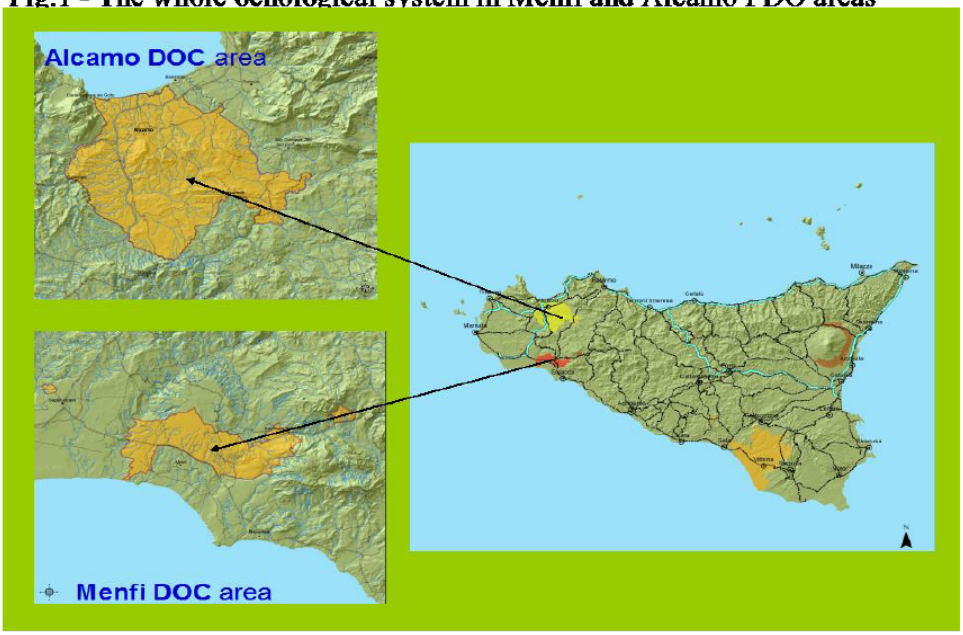
This study seems to confirm previous finding of a recent study that evidence how wine surplus and imperfect price transmission are the main causes determining low farm-gate prices in other Mediterranean wine sector areas (Costa-Font et al. 2009)

Data collection and methodology

The investigation covered the areas of *Menfi PDO* and *Alcamo PDO*. Figure 1 shows the geographic location of these areas and reports their main production breakdown.

The vine grower farms producing *Menfi PDO* wine are located in the municipalities of Santa Margherita di Belice, in the province of Agrigento, and Castelvetrano, in the province of Trapani. While the survey on the quality grape wine producers of *Alcamo PDO* wine was carried out in the municipalities of Alcamo, Castellammare del Golfo and Calatafimi, in the province of Trapani, and in Monreale and Camporeale, in the province of Palermo.

Fig.1 - The whole oenological system in Menfi and Alcamo PDO areas



Area	Certified surfaces (hectares)	Wine-grower holdings (n.)	Certified wine production (hl)
Menfi	393	142	2,745
Alcamo	695	172	20,633

Source: IRVV, 2010.

The structure of sample was mainly oriented to choice representative farms with respect to farm size of whole island as reported in Table 2.

Tab. 2 - Total wine grape growing farms by size in PDO areas in Sicily and structure of sampled farms

Size	Total Farms		Sample Farm	
	number	%	number	%
< 2 hectares	1.007	*67,4*	10	66,7
2-5 hectares	313	*21,0*	3	20,0
> 5 hectares	173	*11,6*	2	13,3
TOTAL	**1.493**	***100,0***	**15**	100,0

Source: ISTAT, Italian National Institute of Statistics, 2010

With specific regard to the technical and economical analysis of the companies involved in quality wine grape growing, 15 representative farms were identified in each area, taking into account the characteristics of the territories as well as some specific attributes of the production units.

Given that there is a great diversity of wine grape growers and to ensure that the sample of farms adequately reflects this heterogeneity, we stratified the universe of farms using four criteria for stratification: regional distribution of land size, PDO area of production, specialized grape wine growing farms and age of vineyard (constant production stage).

Tab. 3 - Characteristics of sampled farms

item	Surface (hectares)	Plants/ha (number)	Age (years)	Altimetry (metres)
Menfi DOC				
mean	**2.0**	**4,116**	**11**	**147**
MIN	0.9	3,800	8	50
MAX	5.1	4,660	16	210
Alcamo DOC				
average	**5.7**	**3,960**	**13**	**265**
MIN	1.4	3,500	9	150
MAX	17.1	4,625	20	550

Source: survey data 2010

The data was collected during 30 face-to-face interviews with vine growers using a survey questionnaire. The structure of the final questionnaire was developed using results and information derived from previous focus group that aimed at selecting the broad items through interviewed directed to producers, technical consultants (agronomists and

agricultural economists), public officers of the Agricultural Regional Department, and producers' association (PDO Committee of each geographic areas. Questionnaires were administered to wine grape producers in each of the two study areas. The questionnaire was divided into two sections. The first one covered technical information about the farms (name, location, setting up of business, distance from markets, etc.), the characteristics of the vineyard (physical environment, altitude, method of cultivation adopted, surfaces, type of grape, age, etc.) and the annual work units (family workers, wage earner workers, etc.).

The second one focused on economics, such as total crop output (mean grape production of last 4 years), sales prices and total costs referring to crop years 2009-2010.

With regard to production costs, the analysis identified three main classes: i. *materials*, ii. *labour and services* iii. *quotas and other duties*. In particular, *materials* includes the cost of all non-capital inputs used during the accounting years, such as fertilizers, pesticides, herbicides, fuel, water and other crop specifics.

Labor and services includes the cost of workers involved in farm production during the accounting year. Family labour is included in the whole labour cost. We calculated labour total cost, by multiplying the number of hours truly worked by the hourly labor costs

Non-farming services refers to incidental costs concerning 'activities carried out by external companies' which include: renting machinery and agricultural vehicles, insurance, mediation for the sale of products, and transport. *Quotas and other duties* includes machinery, equipment, land and building depreciation costs, circulating and current capital, taxes and fees. No direct subsidies were included, because in Italy wine grape growers do not receive direct government subsidies. EU support wine grape sector through indirect subsidies, whose measures are directed to promotion outside the EU, innovation, restructuring and modernisation of the production chain, support for green harvesting, crisis management, etc.

According to White (2008) and Bracco et al. (2008), any missing information was supported with an accurate integration of data provided by technical consultant of producer's management or by market official data (PDO Committee, etc.).

Similarly to other methodologies adopted to enable analysis of farm income (Blanks et al. 2009; European Commission, 2010; European Commission, 2011), the aims of study was to evaluate the remuneration of employed capital and the ability of smallholders to compete in the global market. The economic model used in the analysis essentially rewrites the methodological approach tested since the 70's by the Italian agricultural economists (Di Cocco, 1970). More specifically, to evaluate the profitability of examined sample the analysis used the counting scheme known as equation of profit (De Benedictis, Cosentino, 1979; Panattoni, Campus, 1983), a model widely experienced in the Italian agricultural economic literature. An alternative model could have been FADN methodology, but different approach of data collection did not allow using it.

The average farm net value for each homogeneous area was calculated by subtracting production costs, that include total intermediate consumption (specific costs + farming

overheads) plus depreciation, from total output that include total output crops and crop production (sales, farm use and farmhouse consumption), as follows:

Farm net value = Total output – total costs

$$\mathbf{FNV = [(TO) – (LC + O + I + Q + T)]}$$

FNV = Farm net value
TO = Total Output
LC = Labour and management Costs
O = Overhead
I = interests
Q = Quotas (land use, depreciation of capital, assurance, maintenance quotas)
T = taxes and fees

Results and discussion

Economic indicators - necessary for designing and assessing policies aimed at ensuring the success of a farm as well as for assessing and influencing agro-food markets - were employed to compare the production competitiveness in two PDO areas.

Cost of production - A preliminary analysis of the activity times for in-vineyard management was developed to determine the duration of time worked by growers in each cultivation activity (Pomarici et al. 2005). In the *Alcamo PDO* area, pruning requires more labour hours than other activities, representing 57.6% of all growing activities. The second most labour-intensive activity is grape harvesting (25.4%), and includes both mechanical and manual harvesting. Soil management comes third in labour intensity, with 11.4 %, while the rest can be broken down as follows: grape and soil treatments (3.6%), fertilization (0.9%) and other activities (1.1%), including the ordinary maintenance of trellis and irrigation systems.

As regards the labour intensity required in the *Menfi PDO* area, grape harvesting, mainly by hand, is the most labour-intensive (48.6%), while pruning is 36.0%. The remaining labour activities are distributed in a very similar manner to those in the *Alcamo PDO* area.

The main costing for vine-growing farms, were surveyed and aggregated in Tab. 4. According to a widely used methodology in previous economic analyses (Sturiale, 2006; Bracco et al. 2008), the costings were divided into three classes: i. materials, ii. labor and services and iii. quotas and other duties. The costs were related to surface areas and were expressed as euros per hectare (€/ha).

For the *Menfi PDO* vine growing farm sample, we calculated average total costs of 3,320 €/ha, ranging from 2,598 €/ha to 3,883 €/ha.

The *labor and service* costs are the most expensive (41.5%) averaging 1,370 €/ha and ranging from 1,027 €/ha to 2,200 €/ha. The costs attributable to 'quotas and other duties', represent 37.7% of total costs averaging just over 1,250 € /ha, with a minimum of 873.91 and a maximum of 1,451.20 €/ha.

The cost of purchasing 'materials' (fertilizers, pesticides, fuel, water, electricity, etc) are the least expensive (20.8%) averaging around € 690.00 per hectare, with extremes ranging from 454.00 to 875.50 €/ha.

Tab. 4 - Mean of total cost component of vine-growing sample (2009/10)

Item	Menfi		Alcamo	
	Euro/ha	*%*	*Euro/ha*	*%*
materials	**668.74**	***20.8***	**381.95**	***15.5***
labor and services	**1,376.50**	***41.5***	**1,191.01**	***48.4***
quotas and other duties	**1,255.21**	***37.7***	**887.31**	***36.1***
Total costs	**3,320.34**	***100.0***	**2,460.27**	***100.0***

Source: survey data 2010

The average total costs of *Alcamo PDO* vine growing amount to 2,460 €/ha, with a minimum of 1,983 and a maximum of 2,933 €/ha. *Labour and services* constitute the major cost (48.4%) averaging 1,190 €/ha. *Quotas and other duties* constitute a significant proportion of total costs (36.1%) and they average at 887.31 €/ha. The average cost of *materials* is the least significant (15.5%) at around 380 €/ha.

The difference in costs between the two DOCs are mainly due to different environmental conditions, wine growing techniques and different cultivar (white and red grapes), but in the authors' opinion no significant differential in costs emerges with respect to technical specification of each of two PDO's, that's because every PDO Council Regulation imposes production limits (maximum production per hectare) and very similar specific cultivation rules (soil management, pruning, grape and soil treatments).

Production and total output - The evaluations of grape production were based on average yield, expressed in grape kilograms per hectare (kg/ha) and in grape kilograms per plant (kg/plant). As reported in table 5, production was calculated as the average of the most recent years (2006-2010).

The corresponding market prices of grapes were calculated for weighted average prices. The prices refer to the most recent year (2009/10) and were expressed in euro per kilogram of grapes (Chinnici et al. 2011).

With reference to grape production, the *Menfi PDO* area produces an average of 10,754 kg per hectare, ranging from 9,800 kg/ha to 11,700 kg per hectare. The average plant produces from 2.3 to 3.0 Kg/plant, with an average around 2.6 kilograms per plant.

The weighted average price of grapes fluctuates from 0.27 to 0.39 €/kg averaging 0.32 €/kg, price fluctuations depending mainly on grape quality (sugar levels and grape soundness) and varieties. The most common varieties grown in *Menfi PDO* are Grecanico, Inzolia, Catarratto and Chardonnay for white wines and Nero d'Avola, Sangiovese, Syrah, Merlot

and Cabernet Sauvignon for red wines. As for the total output of the *Menfi PDO* sample, we estimated the average grape production over the last 4 years and the corresponding average price refers to last year (2009/10). The average total output is 3,448 €/ha, fluctuating from 2,954 to 3,846 €/ha. As regards total output per plant, gross production reached an average value of 0.84 Euros per plant, varying from 0.70 to 1.00 €/plant.

Tab. 5 - Production, prices and total output of sample (2009/10)

Area	Production (Grapes)		Average price of grapes	Total Output	
	kg/ha	kg/plant	euro/kg	euro/ha	euro/plant
Alcamo DOC	9,424	2.3	*0.24*	2,413.13	*0.61*
Menfi DOC	10,754	2.6	*0.32*	3,448.56	*0.84*

Source: survey data 2010

The variables related to production, prices and total output of the *Alcamo PDO* sample were evaluated with those previously assumed for *Menfi PDO*.

The production analysis was based on the average results of the sample of companies surveyed (Table 5 taking into account grape production per hectare (kg/ha) and per plant (kg/plant) in the last four years (2006/10) there was an average yield of around 9,400 kilograms, ranging between 9,137 and 10,012 kg/ha.

Taking into account planting density, we calculated average grape yield per plant at around 2.3 kg, ranging from 2.1 kg/plant to 2.8 kg per plant. Prices were expressed in Euros per kilogram of grapes, and calculated as a weighted average, on the basis of local market quotations, in the last 'growing season' examined.

The most common varieties grown in *Alcamo PDO* are Catarratto (80%), Damaschino, Grecanico and Trebbiano grapes, for white wines, and Nero d'Avola (min. 60%) and Frappato, Sangiovese, Perricone Syrah, Merlot and Cabernet Sauvignon for red wines.

The price quotations range between 0.22 €/kg and 0.30 €/Kg, with a weighted average value of 0.24 €/Kg. The lowest prices in this area are for the white grape varieties Catarratto and Trebbiano, while the highest are for the red grapes of Nero d'Avola, Cabernet Sauvignon and Sangiovese.

With respect to total output in the *Alcamo PDO* area, the average is about 2,413 €/ha, varying from 2,185 €/ha to 3,120 €/ha. Total output per plant varies from 0.55 to 0.84 €/ plant, with an average of 0.61 €/plant.

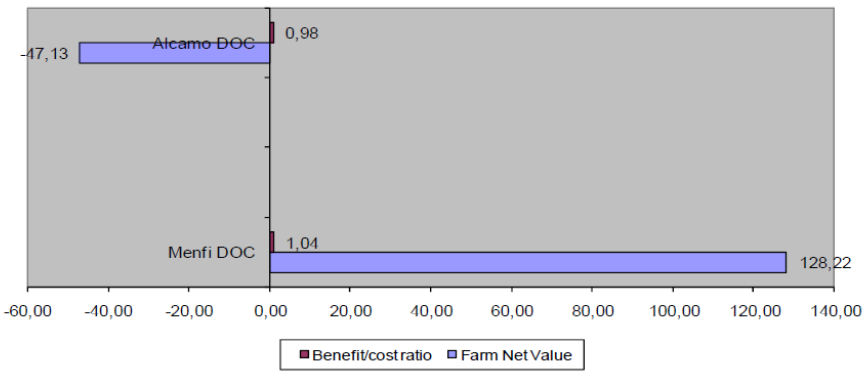
Economic performances - Analysis of the economic performance of quality grape wine production in *Menfi PDO* showed a positive average value of farm net value amounting to 128.22 €/ha by subtracting total production cost (3,320 €/ha) from total output (3,448 €/ha).

This data indicates how quality wine-making in the *Menfi PDO* area has poorly remunerated production factors, although smallholders can make a living with the support of the family work unit. Furthermore, competitive vine-grower associations and cooperatives ensure moderately acceptable price levels, whereas without family or smallholder labour, vine cultivation would be unprofitable.

In Alcamo, the cost of production is lower than in Menfi achieving 2,460 €/ha with a total output equal to 2,413 €/ha

Overall, the data doesn't show positive farm net values for 60 % of the sample, whose mean is -47 Euros per hectare. Even in this area family labour is still prevalent but smallholders, as stated by themselves, are progressively leaving vine-growing because it isn't profitable. Farm net value added and benefit cost ratios have been reported in Figure 2.

Fig. 2 - Farm net value and benefit/cost ratio



The reasons for such low profitability are due to: a low level of market prices and to small farm size. All together, the future development of smallholder viticulture of Alcamo does not look too bright.

Low market price of Alcamo PDO sample is mainly due to wine surplus production, but also different prices of cultivar grapes and low efficiency of supply chain. According to interviewers' declaration, market structure seems to influence this result but further analyses have required testing this hypothesis.

An additional matter of note is that prices that grape producers receive have gradually decreased. Despite it has been verified that the price of PDO product is not subject to the same fluctuations as on wholesale markets and on traditional market (Marescotti, 2003), price of our sample greatly varies according to the quantities year-production and type of grown cultivar.

A second important finding is that micro and small farm size of sample cause a weak bargaining power of producers. Despite organization over the supply chain and market/ bargaining power are not the main object of investigation, qualitative data and information

collected during interviews, confirm that the production and sale of unprocessed grapes does not provide any value-added products, which could be obtained for instance by better coordinating the whole supply chain (processing, bottling, distribution). As directly observed the mismatches between demand and supply for grapes are partly caused by a significant lag between grape prices and bottled wine prices, whose range are included between 5 and 10 Euros.

Another important issue, emerged during the interviews, predicts that small grape growers go out of business resulting occasionally in their farms being taken over by a larger conglomerate but the "gains from consolidation are small in comparison to the gains from growth in farm size, in this circumstance, consolidation serves only to exclude some small farmers from opportunities for income growth" (Monke et al. 1992).

The macroscopic effects of these results reflect the crisis in the family farm model and the progressive drop in rural employment; in both areas family labour is still prevalent and official statistics highlight (Unioncamere, 2009) how in any areas Sicilian smallholders are progressively leaving vine-growing because it is not profitable[5].

Given the lack of government intervention, especially when demand and price of the product do not allow producers to reach an adequate profitability, a differentiation of cultivar and a better organisation of supply chain, by facilitating the flow of information over the chain, could constitute an effective solution,

Concluding remarks

This study has looked into the vine-growing economy of Sicily by analysing a representative sample of two different wine producer areas. The survey was carried out in the *Menfi PDO* and *Alcamo PDO* areas with the aim of evaluating the profitability of wine grape production.

The analysis highlights differing economic results for two sample areas but the data shows how the performance indicators are both below the national average for the vine-growing sector (D'Amico et al. 2010; D'Amico et al. 2011*a*). This condition highlights the difficulties for small vine grape growers to compete with the market.

In both areas, small farms are scale-inefficient because of a historical lack of access to support services and infrastructure as well as the limited availability of capital and land compared with large farms, whose managerial ability seems to work better by using capital towards production methods more intensively. Moreover, poor production profitability in the sample areas is due to: the low sale prices of grapes and a lack of economies of scale. "The introduction of innovative technologies, as well as the increase in average farm size, have a positive effect" on decreasing the level of costs but profits remain low when the reduced "number of vines will only reduce the growers' market power, and hence profit margin" (Bryant, 2010).

5 The Italian wine sector, from 2005 to 2009, register a considerable reduction in the number of wine grape growers; a large part of producers is moving toward more complex business organization, outsourcing the bottling process to specialized companies. In the last 6 years the number of Sicilian wine grape growers decreased around 8% (Unioncamere, 2010).

Although limited, there I some profitability in the *Menfi PDO* area. By contrast, there are many difficulties in the *Alcamo PDO* area, where the lack of profitability in vine growing has a negative effect on farm net values, Results show that the current pricing system pays a very low price for a better-quality product and low prices and a surplus production (first of all in Alcamo area) are main components that seem to influence this result; further analysis have required to explore to what extent these results are caused by a increasing costs or by a an inefficient market structure.

Given that traditional cultivar of Alcamo actually seem not so appreciated in the market, to get a better remuneration of capital is necessary to increase the farm-gate prices of grapes and the differentiation of production seems to be the best solution for wine grape growers. As suggested by Golan and Shalit (1993) a quality-based pricing production could be useful to reduce the production of poor-quality wines by giving farmers a correct and powerful incentive to provide the most required grapes by market. Furthermore, given that the long-run food security of a community depends on the sustainability of its agriculture (Ikerd, 2002) organic and sustainable winegrowing could be a profitable alternative for wine producers. Recent studies suggest organic wine production allows small producers to maintain their income, precluding the abandonment of their agricultural activity (Brugarolas et al. 2010) offering a viable alternative to traditional production systems, constituting profitable opportunities in domestic and foreign markets (Vastola, Tanyeri-Abur, 2009).

Nevertheless, we observed that local producers do not gain additional remuneration for the intangible components of their PDO grapes Designation of origin (DO) is a significant quality attribute influencing consumer choice and it's also one of the most important intangible components of quality because regional foods incorporate and valorise many local assets with special or indigenous characteristics of the area (Brunori, Rossi, 2000; Treager et al. 2007). But, despite several studies demonstrating that PDO certification increases costs and profits (Arfini et al. 2010, Bouamra-Mechemache, Chaaban J., 2010*b*) our study reveals how DO by itself does not always ensure adequate profitability for small wine grape growers.

These findings might infer market failure or otherwise poor market efficiency, requiring stronger support from government policies to better regulate market mechanisms, for example through policies oriented towards adequate information. In a perfectly efficient market, stock prices would have to reflect all the available information on raw materials and origin.

All these factors suggest an unfavourable forecast for the future development of vine-growing in Alcamo and Menfi, giving rise to different hypotheses on the persistence of negative economic results due to low profitability, with negative future socio-economic scenarios for wine grape growing and agricultural land. In the near future, depending on societal values and political goals, we could see an implosion of vine-growing in Sicily, and possibly in many wine grape areas of the European Union, with a decrease in the number of vine-growing holdings and their going out of business, a progressive decrease in rural employment and a significant development in land conversion to non-agricultural sectors such as renewable energy and residential estates.

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