ITALIAN AGRICULTURE BETWEEN NEW AND OLD CAP, WHAT PERSPECTIVES.

THE CASE STUDY OF PIEMONTE REGION

Fusco D.[1], Giordano P.[2], Moretti V.[3], Pierangeli F.[4]

[1] Istat, dafusco@istat.it
[2] Istat, pgiordano@istat.it
[3] Istat, vmoretti@istat.it
[4] Inea, pierangeli@inea.it

Abstract

The aim of the paper is to investigate main structural characteristics of Piemonte farms with an attention to those already existing at the previous Census (2000), analyzing the rule played by the CAP supports by different sectors. The paper provides a Multiple Correspondence Analysis (MCA) and a Cluster Analysis (CA) run on an innovative dataset produced by the matches between three different sources: Agricultural Census 2010, Agricultural Census 2000 and CAP Payments. Finally, the paper contributes to the current discussion on the CAP 2014-2020 trying to figure out the potential impact at farm level by cluster obtained in the analysis.

1. Introduction

After more than two years since the Commission reform proposals were issued, in June 2013, the political deals on the Multiannual Financial Framework (MFF) 2014-2020 and on the new legal framework of the future Common Agricultural Policy (CAP) were achieved. Member States must face important choices on the two Pillars of the CAP. So, it is worthy to analyze the structural dynamics experienced by the agricultural sector on the eve of the national and/or regional implementation of the agricultural policy until 2020, taking into account the general reduction of financial resources at EU- and National level.

The aim of the paper is thus to investigate the main structural characteristics of Piemonte farms with a particular attention to those farms already existing at the time of the previous Census (2000), to analyze the rule played by the CAP supports by different sectors and, moreover, to study the regional impact of new CAP support. The paper provides a MCA and a CA analyses run on an innovative dataset produced by the matches between three different sources: Agricultural Census 2010, Agricultural Census 2000 and CAP Payments done during the triennium 2008/2010 by the regional Payment Agency on the first Pillar (Council Regulation (EC) No 73/2009) and second Pillar (Council Regulation (EC) No 1698/2005).

2. The case study: Piemonte Region

Piemonte Region has been chosen as a case study for two main reasons; 1) Piemonte is a region with specialized farms and consequently, with limited mixed farms. Regional farms are more specialized (both for crops and livestock), more competitive, more efficient; 2) it is one of the top ten Italian regions in term of number of farms, Utilized Agricultural Area (UAA), Total Area (TA) and Livestock Units (LU) (ISTAT, 2012). According to 2010 Agricultural Census, in Piemonte Region there are 67,148 active farms, representing 4.1% of Italian ones; 1,458,075 hectares of TA and 1,068,766 hectares of UAA, both covering about 8% of the national values. Furthermore the region represents about 6% of the national Gross Value Added (GVA). Piemonte is a region with specialized farms and consequently, with limited mixed farms.

In 2010, farms with crops amount to 66,747 units. More than 50% of UAA is devoted to arable land. In 2010, livestock farms are nearly 20,000, about 1/3 of the regional total. Cattle herds represent the main livestock in term of number of farms (13,234 farms representing the 67% of the total livestock farms). Farms devoted to organic farming and/or certified organic farms amount to 2,034 (3.6% of the regional total compared with 2.7% of the national total). The average size of the farms involved in the organic area is 11 hectares (18 hectares at the national level), lower than that of total farms (conventional and organic), for which the average value of UAA is 15 hectares. The gainful activities related to the farms are carried out

by about 10% of total farms. The 49% of regional farms sell their products to commercial enterprises, 13% to industrial companies.

Comparing 2000-2010 Census data, a strong decrease occurred in the number of farms (-36.8%) together with a lesser decrease of the UAA (-2.5%) and TA (-10.9%). The number of farms decreases but increases their average size: at the same time, average farm size has been increased in last ten years, from 10 hectares in 2000 to 15 hectares in 2010 of UAA.

3. Methodology

The database was formed by matching (for the first time in Italy) three databases as follow:
- V° General Agricultural Census (2000).
- VI° General Agricultural Census (2010).
- Data base of Piemonte Region the Regional Agency of agricultural payment (Arpea) data, monitoring of single payment scheme and regional Rural Development Program (RPD) co-financed by European Agricultural Fund for Rural Development (EAFRD) 2007-2013.

The matching (Newcombe, H. B.,1988) was carried out considering 3 key variables: 1) Unique Farm Code; 2) Address of the headquarter; 3) Name of the farm. It leaded to a final matrix with 18 variables and 67,148 observations.

For the research the following structural variables were used:

1. Altimetric area	10. Presence of other gainful activities related to the farm
2. Legal status	11.Use of land managed with organic method
3. Management system	12. Class of standard output
4. Land ownership	13. Sale of own agricultural products
5. Land free use	14. Annual Work Unit (AWU)
6. Land rent	15. Type of farming
7. Educational level of the farm manager	16. Presence at V° General Agricultural Census (2000)
8.Class of holder age	17. Use of CAP funds - single payment scheme of the first pillar
9. Class of Utilized Agricultural Area (UAA)	18. Use of RDP funds - second pillar of CAP.

To synthesize the variables' information, it was decided to use MCA (Di Franco, G. 2006)[1]. The first three factors obtained were considered since they explain, after appropriate evaluation of Benzécri (1992)[2], 71.8% of the total inertia. On these factors, to achieve an optimization of the allocation of Piemonte farms, a CA was applied by using the factorial coordinates - considered as new indicators - which allow a more detailed discrimination of observations. So, using an aggregation based on a number of mobile centers[3], through the reading of the value tests and the inertia, both intra-and inter-group have formed 5 groups.

---

[1] This procedure was carried out through the use of the SPAD software (*système portable pour l'analyse des données*) which allows to apply all the statistical procedures developed within the French school of data analysis (*analyse des donèes*) by Jean Paul Benzécri.

[2] Benzecrì proposes the following equation for a revaluation of the eigenvalues: $X^1_i = (X_i-1/p)^2$, where X^1_i is the eigenvalue revalued of the factor "i", X_i is the eigenvalue of the original factor "i" and "p" is the number of active variables considered.

[3] The procedure uses a mixed algorithm that produces a hierarchical ascending classification with Ward's criteria on the results of a previous non-hierarchical aggregation performed on a number of mobile centers set by the user or randomly selected.

4. Results

First Factor was called "Farm dimension" (main modalities as below):

Negative half-axis	Positive half-axis
Presence of trading	Absence of trading
UAA between 20 and 40 hectares	UAA less than 1 hectare
UAA more than 50 hectares	AWU less than 1
Standard output more than 100,000 euros	Standard output less than 2,000 euros
AWU more than 2	Not using of CAP funds (first and second pillar).
Using of CAP funds (first and second pillar).	

Second Factor was called "Generation replacement" (main modalities as below):

Negative half-axis	Positive half-axis
Holder age less than 34 years	Type of farming: livestock (not cattle)
Educational level: upper secondary degree	Holder age more than 74 years
Absence of CAP aids (first pillar)	Educational level: primary school
Absence at Census 2000	Using of CAP aid (first pillar)
Absence of trading	Presence at Census 2000
	Presence of trading
	Type of farming: cereal crops.

The modality trajectories of variables "Presence at Census 2000", "Use of CAP funds - first pillar", "Use of RDP funds" are related to these factors, particularly to the second one. On the positive half-axis there is the presence of CAP aid (first pillar), RPD aid and at the Census 2000, whereas on the positive half-axis there is the absence of CAP aid (first pillar), RPD aid and at the Census 2000 (Figure 1).
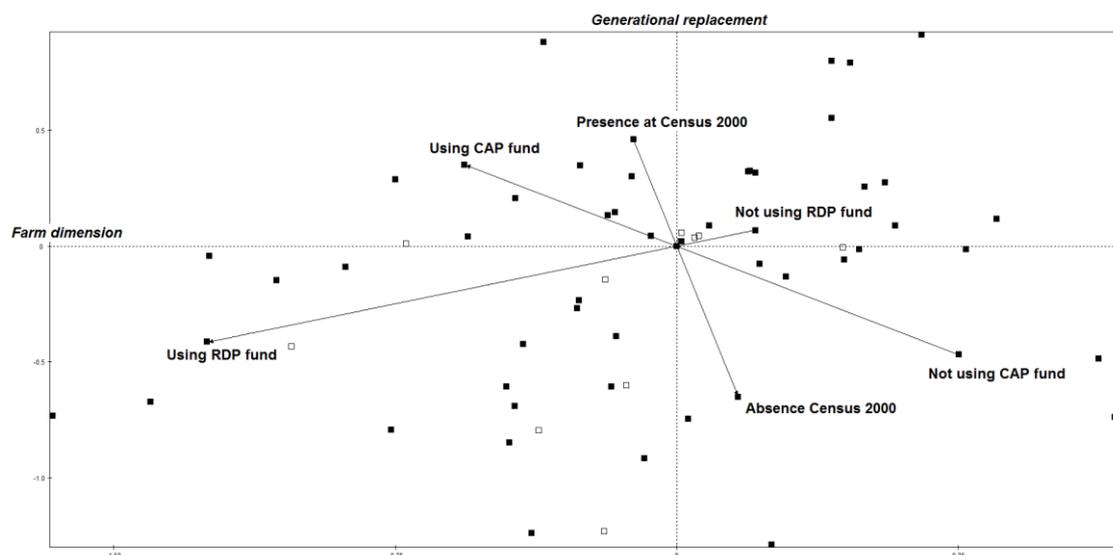

Figure 1. The representation of the first two factors.

Third factor was mainly characterized by Altimetric area and Type of farming:

Negative half-axis	Positive half-axis
Standard output less than 2,000 euros	Type of farming: vineyard
Type of farming: cereal crop	Altimetric area (hill)
UAA more than 50 hectares	AWU between 1 and 2
Altimetric area (plain)	Standard output between 25,000- and 50,000 euros
Absence trading	

Since these three factors explain the 71,8% of inertia, it was decided to consider them for clusters. Further consideration have leaded to the choice of the following 5 clusters.

Cluster 1: Small farms and self-consumption: the 19% of the farms belong to this cluster; very little farms both for size (less than one hectare of UAA) and socio-economic aspects (standard output less than 2.000 euros and less than 1AWU) are included, while 72% are new farms. More than 90% of these farms didn't request/obtain CAP aids both for direct payments under the first pillar and for rural development measures under the second pillar.

Cluster 2: "Weak" vineyard: it includes more than 20% of the farms. These farms are characterized by permanent crops, especially vineyard. They are located in hills areas. These farms were already surveyed in the 2000 Census. The lack of orientation to 1st pillar of CAP support is mainly related to its productive specialization. Also these farms have a small size (between 1 and 5 hectares), but they are economically bigger than farms in cluster 1, with standard output between 4.000 - 8.000 euros or 8.000 -15.000 euros. The physic and economic size are constrained by the farm structure, characterized by an individual legal status and the high age of the holder (70-74 years), as well as a low use of tenant farming.

Cluster 3: Viticulture of excellence: the 22% of farms is in this cluster; they are characterized by medium sizes, but a very important economic dimensions (standard output 25.000-100.000 euros). In this group farms with a strong viticulture vocation - especially for DOC/DOCG wines - are concentered. Another type of farm of this cluster is horticulture, usually with small size and high profitability. In social terms, this farms need just 1 or 2 AWU. Very interesting is the age of the holders (35-44 years and 45-49) and the relatively new establishment of these farms which didn't exist at Census 2000. Given the scarce supply of land and the shortage of farms launched in the market, it could be probably due to inheritance and anticipated inheritance or to changes of legal status and denomination within the family, instead of establishment of new farms. Moreover, these farms seem to be familiar with the design process typical of rural development programs.

Cluster 4: Cereal crops specialization: the 21% of total observations is in this cluster; these farms are specialized in cereals crops (mainly rice and grain maize). They are especially placed on plain area, with medium size and economic dimension (5-19 hectares, 4.000-15.000 euros of standard output). They are also characterized by old holders and by the pre-existence at the Census 2000. The 95% of these farms are oriented to the first pillar of the CAP aid, without participation to the rural development processes.

Cluster 5: Livestock Specialization: the 17% of farms are grouped in this cluster; these farms have very large size (more than 20 hectares) and standard output (more than 50.000 euros); they are specialized in cattle livestock and placed in plan areas. These farms have a more complex legal status (company) than the farms in the other clusters and a different age of holders (less than 34 years and 40-49 years). They trade farm products and use one or two AWU. They were present at the Census 2000 and are oriented to CAP aid, both under the first pillar and the second one.

5. Discussions

The study of the structural characteristics of Piemonte Region farms by MCA and CA, leaded to the identification of 5 cluster. The farms present in three of these groups were already existing at the 2000 Census.

Starting from these results, it's possible to figure out the major effects that the future CAP (2014-2020) may yield on the farms, with particular attention to Direct Payments. In any case, these conclusions are drawn while Member States are still taking important decision on the implementation of the new CAP.

Farms gathered in the first group *Small farms and self-consumption,* didn't submit any support request during the last years and probably they will not do it in the future, even though Member State would decide to provide support under the Small Farmer Scheme . Indeed, Italy (likely) chooses to establish the Small Farmer Scheme, with derogation from lump-sum payment and the grant for participating farmers equals to the value to be allocated under Basic Payment and Greening. Thus, farms in the cluster will not have the minimum requirements for receiving direct payments (total payments over 250 euro in 2015 and 2016 and over 300 from 2017).

Farms in the second group *"Weak" vineyard* differently from the current situation might receive aid on the first pillar, following Member State decision. Indeed vineyard could become eligible to direct payments from 2015. Instead, it seems unlikely the development of a stronger attention to measures on the second pillar, unless the RPD 2014-2020 strategy would decide and succeed to satisfy a policy latent demand mostly linked to diversification.

For farms in the third cluster - *Viticulture of excellence* - the possibility to benefit the allocation of payment entitlements is higher than the previous group, due to their larger dimensions. However, they might be much more oriented to policy instruments available by Rural Development Programmes.

The farms of the fourth group, *Cereal crops specialization,* will benefit from the convergence of payment entitlements likely experiencing an increase of their entitlements value. Moreover - following Member State decision – these farms could benefit from a voluntary - coupled support. However, these farms will face the *greening* commitments in terms of diversification and ecological focus area.

Finally, concerning the fifth cluster - *livestock specialization, -* farms might experience a sharp decline of their unit value. However, part of this production sector might benefit of important voluntary coupled support (milk and milk product and beef).

The analysis here highlighted represents just a first exercise. More investigations should be done on the potential impact of CAP support. An important activity will concern the structural characteristics of farms reported at the Census 2000 and closed down before 2010. Furthermore, it would be interesting to apply this model to the other Italian Regions; moreover, after the decisions of Member States, it would be useful to evaluate, for each group/cluster identified, the financial impact between the current SPS and the future CAP.

Acknowledgements

6. References

Benzécri, J. P. (1992). *Correspondence Analysis Handbook*. New York: Dekker.

Di Franco, G. (2006). *Corrispondenze multiple e altre tecniche multivariate per variabili categoriali.* Francoangeli eds., Milano.

ISTAT (2012). *6° Censimento Generale dell'Agricoltura in Piemonte. Risultati definitivi.* ISTAT pbl., Roma.

ISTAT (2012). C*aratteristiche strutturali delle aziende agricole.* ISTAT pbl., Roma.

Newcombe, H. B. (1988). *Handbook of Record Linkage: Methods for Health and Statistical Studies, Administration, and Business.* Oxford: Oxford University Press.