RURAL DISTRICTS AND GENERATIONAL TURNOVER IN ITALIAN REGIONS TOOLS TO PROTECT THE RURAL SPACE

GALLUZZO N.
Ph. D. in Food Science
Rieti
Italy
nicoluzz@tin.it

Paper prepared for presentation at the 118th seminar EAAE

(European Association of Agricultural Economists)

'Rural development: governance, policy design and delivery'

Ljubljana, Slovenia, August 25-27, 2010

Abstract

Aim of this paper was to find some correlation, using a model of linear regression, between rural development and rural district in two different period of study. The analysis is divided in two parts to compare two different stages of application of II pillar of Common agriculture policy from 2000-2006 to 2007-2013. European funds, allocated to guarantee a generational turnover, are something of very important for rural development in Italy and the rural district is able to be a centre of propulsion for a well balanced growth of rural areas and it can be an element of attraction for farmers.

Keywords: rural districts, rural areas, L.e.a.d.e.r., certified quality food, cooperative credit banks.

JEL code: Q18, Q19.

1. Introduction

Italian rural districts are a fundamental tool that give value to the rural areas by reducing their marginalization and revitalizing some mountainous areas, and other ones located in high hills, producing a significant generational turnover in many farms. The Italian legislator has proceeded, with the Legislative Decree 228/2001, to a formal recognition of the district in the primary sector, assigning it an independent function and value and disconnecting it from the industrial sector. Nevertheless, at the moment, only few Italian regions (5 on 20) have predisposed specific laws and regulations to manage and finance rural districts.

In literature, some studies have broadly shown that one of the most important factors for the development of the district in Italy was the diffusion on the territory of some basic social-economic conditions (Becattini, 2000). Particularly, the presence of a banking system of proximity, represented by banks, which have a cooperative structure, has been a fundamental element to bring about the affirmation, the location and the productive-territorial specialization of these productive structures as districts, not only in the industrial sector but also in the primary sector (Zanetti, 2008; Fratta Pasini, 2008; Galluzzo 2008; Galluzzo 2009).

It is very important to underline as agriculture has had an essential role in the growth of districts, supplying the necessary resources to their start even if, in mature industrial districts, links and functional relationships between activities of the primary sector and those of industry are absent and have an inadequate possibility to keep in circulation, and in exchanging, in a reciprocal way, the information among farms (Cecchi, 1988). The productive specialization and the need of outsourcing some productive functions, connected with transformation and sale of products, all the same, has developed an integration between industrial world and primary sector with the expansion of agro-industrial and rural districts (Cecchi, 2001).

The Common agricultural Policy (Cap), in particular the second pillar, both during the time of programming 2000-2006 and in that following 2007-2013, through specific actions, has attempted to increase the economic development of Italian rural areas. In this case the aim of rural districts is to assure a territorial success, which has to increase the value of certified quality food and the farms able to guarantee, through agritourism and other different activities, the growth of agricultural productive framework, which are capable at guaranteeing a harmonic development of rural areas, especially in those behind mountainous chains, with positive and general effects on economy and on environment.

2. Objective and methodology

The aim of this analysis was to compare the application of the Common agricultural Policy in all Italian regions in two different periods of time: from 2000 to 2006, the first planning time, and from 2007 to 2013, the second interval of rural planning time, but, in this case considering the triennium 2007-2009 only, and verifying what actions of the Cap have been the most important on the development of rural and/or agro-industrial districts.

The present research was divided in two parts, necessary to compare effects and consequences of the application of the CAP in the two periods of study analysed, defining a model of multiple regression, treated with the least ordinary squares, to used variables. The regressors have included the Usable agricultural surface, the general amount in every Italian region of the funds allocated for

assuring the generational turnover, the overall value of the funds assigned by the Common agricultural Policy with the II pillar and, in particular, by the Regional Rural Development Programme and the number of cooperative credit banks in the different Italian regions.

The following phase was to construct an another model of multiple regression to carry out to independent and dependent variables as variations of percentage in the two periods of study. The model of multiple regression has allowed to verify if the per cent variations of the independent variables, like as increase of farms with agritouristical activity, which is a proxy variable of the multifunctionality in agriculture, included in this dataset, the amount of the allocated funds able to guarantee to the Italian farms a generational turnover and found disbursed in the II pillar of the Cap, had an effect on the dependent variable as development of rural districts in Italy.

The model of multiple regression in which it has been included and estimated all the analysed social and economic variables in its algebraic form of matrix can be so expressed (Verbeek, 2006):

$$\mathbf{y} = \mathbf{X\beta} + \varepsilon \qquad (1)$$

where **y** and ε are vectors with n-dimensions and **X** has dimension n x k.

In analytical terms, the model of multiple regression in its general formulation can be made explicit in this way:

$$y = \alpha_0 + \alpha x_1 + \beta x_2 + \gamma x_3 + \delta x_4 + \varepsilon_{jt} \qquad (2)$$

α_0 constant term
x_1, x_2, x_3,x_4 independent variables
α, β, γ, δ estimated indicators of the model
ε_{jt} term of statistic error.

Basis assumptions, to use a multiple regression model, are:

a) Statistic error ε_i has conditional average zero that is $E(u_i \mid X_i) = 0$;

b) (X_i,Y_i), $i = 1,....., n$ are extracted as distributed independently and identically from their combined distribution;

c) (X_i, ε_i) have no fourth moment equal to zero;

d) there is not correlation among regressors and random noise so that the value between β expected and β estimated are the same.

The last phase of this study analized, through the utilization of a choice model, applied only during the triennium 2007-2009, the role of the dependent variable generational turnover on the dataset of independent variables (funds disbursed by the II pillar, funds allocated by the IV axle L.e.a.d.e.r., quality food productions and number of agritouristic farms).

The choice model Logit has allowed to appraise the impact that some social and economic variables and other ones of Common agricultural Policy have had on the generational turnover in Italian farms and on the development of rural districts.

The model Logit is a binary model in which the probability of success is given by the value of the function of distribution of a casual standardized logistics variable Φ(.) in correspondence of an opportune linear combination of regressors, in such way to estimate if some interactions exist among dependent variables, necessarily categoric variables, and independent variable, that are not categorical variables with an error that is distributed like a standardized logistics. Formally the binary model can be wrote in this way:

$$\text{Prob}\,(Y_i=1) = \Phi\,(\beta X_i) \qquad \forall\ i = 1, 2, 3,4\ldots\ldots n \qquad (3)$$

Y_i has a binary value 1 or 0;
X_i is a vector of independent variable;
Φ is a function of distribution of cumulative likelihood;
β is a vector of estimated parameters.

The function of distribution of a casual standardized logistics variable $\Phi(.)$ belongs to a parametric family that, in the case of the models Logit, is estimated as a logistics function, with an opportune linear combination of regressors, that has the advantage to have an analytical expression and to be symmetrical like a normal function. The model Logit has been used to value the probability that an Italian region had an incidence of the assigned funds to increase the generational turnover on the general amount allocated by the Program of Rural Development from 2007 to 2013 above national average, equal to 5%, attributing a value of 1, in other cases 0, if the value was below the average. The parameters of Logit model have been got with the method of the maximum generalized likelihood.

Table 1. Multiple regression model used in the first time from 2000 to 2006 (Source: elaboration on data www.istat.it e www.reterurale.it).

Variable	***Coefficient***	***Std error***	***T statistic***	***p-value***	***Significant***
Constant	0,360632	0,254637	1,4163	0,17713	ns
Usable agricultural surface	6,24227e-07	5,60192e-07	1,1143	0,28268	ns
Cooperative credit banks	-4,54033e-05	8,53254e-05	-0,5321	0,60244	ns
Fund of generational turnover	2,95414e-08	1,10559e-08	2,6720	0,01741	**
EU funds	1,87925e-013	5,98482e-013	0,3140	0,75784	ns
Dependent variable	Rural districts				
R^2	0,504662				
Log-likelihood	-12,85562				
F statistic (4, 15)	3,820581	p-value	0,024640		
Significant: ** at 5%					

Table 2. Multiple regression model used in the first time from 2007 to 2009 (Source: elaboration on data www.istat.it e www.reterurale.it).

Variable	***Coefficient***	***Std error***	***T statistic***	***p-value***	***Significant***
Constant	2,15779	0,796184	2,7102	0,01613	**
Usable agricultural surface	-5,49009e-06	1,63022e-06	-3,3677	0,00423	***
Cooperative credit banks	0,000724357	0,000174039	4,1620	0,00083	***
Fund of generational turnover	5,26513e-08	1,46319e-08	3,5984	0,00263	***
EU funds	2,83097e-09	9,14308e-010	3,0963	0,00737	***
Dependent variable	Rural districts				
R^2	0,542761				
Log-likelihood	-36,34306				
F statistic (4, 15)	11,65446	p-value	0,000167		
Significant: *** at 1%; ** at 5%					

3. Results

The results with the application of multiple regression model, during the time 2000-2006, showed as the rural districts had suffered in a significant way from the independent variable funds allocated by the European Union in the Regional Development Rural Programmes to stimulate a lot of actions able to allow the installation of the young generations in agriculture (*Tab.1*).

In the triennium 2007-2009 the multiple regression model underlined as the development of the rural districts, dependent variable, had again some positive effects from many of the independent

variables as presence on the rural territory of the cooperative banks, of the European community funds allocated by the European Union in the II pillar and, in particular, of the financial funds allocated with a specific function of guarantee for a generational turnover in Italian farms (*Tab.2*); the independent variable Usable agricultural surface has underlined a negative correlation with the dependent variable development of the Italian rural districts. This demonstrates as the district can be a positive tool to revitalize and to develop the Italian regions characterized by surfaces with a specific destination of agricultural use but with a agricultural use of modest and reduced extended rather than in regions where it is possible to find farms with ample cultivable surfaces, in which agriculture has given origin to a process of consolidated growth of farms able to assure a meaningful business earning capacity.

The application of multiple regression model, put to practical use in two periods of observation, has been underlined as there has been an increase in the values of R^2 that pass from 0.50, in the first period of observation, to 0.54 in that following, which points out to us a best adaptation of the model to the statistical data; the same thing is observed with the value of R^2 corrected that, particularly in the last analysed annuity, results to have been not so much influenced by the increase of number of variables included in the model. Particularly, the statistic F results greater than 1 with value of p-value less than 0.01 points out a good significance of the model.

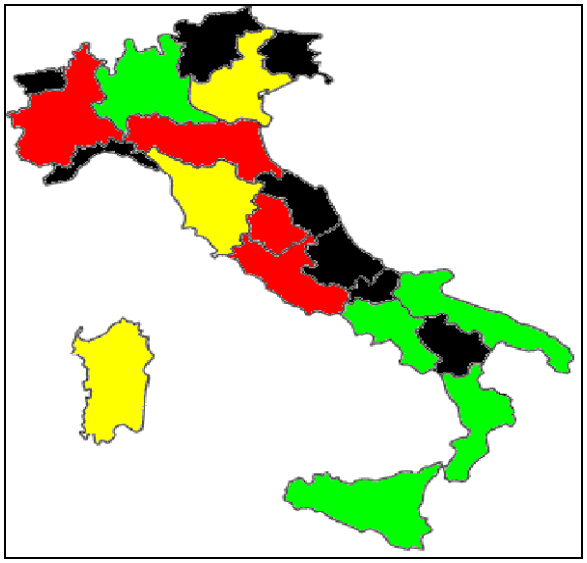
Table 3. Multiple regression model used in the per cent variation from 2000 to 2009 (Source: elaboration on data www.istat.it e www.reterurale.it).

Variable	***Coefficient***	***Std error***	***T statistic***	***p-value***	***Significant***
Constant	1,44964	0,5304	2,7331	0,01474	**
Farms	4,51168	1,71922	2,6243	0,01841	**
Fund of generational turnover	-0,0854865	0,0281122	-3,0409	0,00779	***
EU funds	1,97609	0,510974	3,8673	0,00136	***
Dependent variable	Variation of rural districts (%)				
R^2	0,422997				
F (3, 16)	10,66052		p-value (F)	0,000428	
Log-likelihood	-35,61371				
Significant: *** at 1%; ** at 5%					

The multiple regression model exclusively used on percentage variations, that happened in the two periods of programming, had the values of R^2 and R^2 corrected show a fairly good adaptability of the model to the data; nevertheless, the analysis of the parameters underlined as an increase of rural and agro-industrial districts in the Italian primary sector has directly been correlated by both the European funds allocated by The European Union and that from the development of agritouristic farms in the rural areas (*Tab. 3*). An increase of the funds, disbursed by Common agricultural Policy (second pillar), fundamental to stimulate the generational turnover, has not connected with the growth of the active districts in the primary sector. This shows as the development in the rural areas of the districts in the primary sector has not suffered again of generational turnover ascribed to the precedent period of application of Rural development programme 2000-2006 called Agenda 2000.

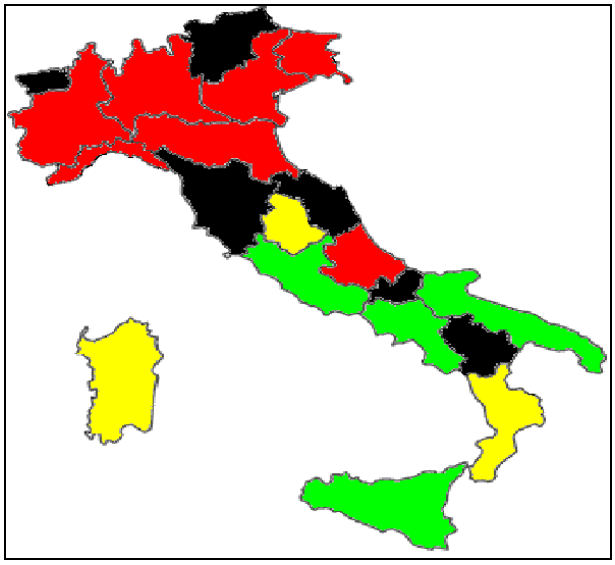
The application of parameters resultant of the multiple regression model during the second period 2007-2013, has allowed to get a cartographic representation in the Italian regions, defining some coloured classes in function of the variance from the average (± 25% and ± 50%); in this case it was possible to create 4 different classes of comparison and it has been possible to individualize as the development of the districts has interested, primarily, the southern regions. This result is ascribed to a limited diffusion of the usable agricultural surface and to a greater allocation of the European community funds; in the northern Italian regions the most greater diffusion of the rural district is to seek in the presence and diffusion on the territory of cooperative credit banks (*Graph 1*). The application of the multiple regression model, applied only to the per cent variation that is verified in the two periods of observation, with the aim to classify the Italian regions, has allowed to obtain 4 classes in function of the variance from the average (*Graph 2*). This analysis has been confirmed as the development of the districts is located in the southern Italian regions where there has been an increase of the allocated funds by the II pillar of the Cap. In these regions it is possible to observe a

large number of farms with limited surfaces, in terms of usable agricultural surface, and a very interesting and significant development of agritouristic farms, even if the growth of farm holidays farms, compared to other Italian regions, was above the value analysed in the regions of the Centre and North of Italy.



< -50%
from -50% to 0 %
from 0% to 25%
> 50%

Graph 1. Rural districts in Italy in the second period, from 2007 to 2009, using a multiple regression model in different groups in function of the variance from the average.



< -50%
from -50% to 0 %
from 0% to 25%
> 50%

Graph 2. Development of rural districts in Italy during two observation time of study, applied the per cent variation in two periods of observation in function of the variance from the average.

To estimate the relationships that have been among the actions of Common agricultural Policy, able to support the generational turnover in agricultural farms and to guarantee rural development, a model Logit has been used comparing it to an another choice model as Probit (*Tabb.4-5*). The dichotomous variable has allowed to define some Italian regions with a rate, above or below the 5%, of incidence of allocated funds to increase the generational turnover on the general amount payed out by the Rural Development Programme 2007-2013 in every Italian region. The independent variables, connected with rural areas have been: the agricultural surface, working farm holidays farms, the amount of European funds allocated by the IV Axle L.e.a.d.e.r., the total amount of European community funds for the rural development and the number of certified quality food. The application of the model Logit has been underlined as an incidence of the contribution payed out to support the growth of generational turnover in Italian farms on the general amount allocated by Rural Development Programme from 2007 to 2013 above (1) or below (0) the per cent value of 5%. This is directly correlated with the usable agricultural surface, with the funds allocated by L.e.a.d.e.r. program and correlated in an indirect way with the total funds allocated from the European Union to improve the economical situation in rural areas with the diffusion in these areas of farm-holiday farms. The certified quality food has not been a variable able to create a significant generational turnover, that has just involved few Italian regions with farms of reduced dimensions and with a short productive performances (*Tab. 4*). This analysis showed a direct correlation among the dependent variable and the independent variables agricultural surface, certified quality food and allocated funds by the IV Axle L.e.a.d.e.r.; instead, there has been a negative correlation among the variable development of agritouristic farms and availability of community funds with a percentage of incidence able to ensure the generational turnover in agriculture. This was born entirely as the IV axle L.e.a.d.e.r. is a fundamental tool to guarantee the generational turnover and the protection of rural space, with the accomplishment of actions directed to improve the fitness of human habitation and the profitability of

rural areas; the agritourism has shown to have a little power of attraction toward young generations and it was not able to increase the generational turnover.

Table 4. Results of application of Logit model (Source: elaboration on data www.istat.it).

Variable	*Coefficient*	*Std error*	*Z statistic*	*p-value*	*Significant*
Constant	-7,89554	3,12063	-2,5301	0,01140	**
Usable agricultural surface	0,00273859	0,00124714	2,1959	0,02810	**
Farm-holiday farms	-0,0112008	0,00555887	-2,0149	0,04391	**
L.e.a.d.e.r. funds	5,76235e-07	2,7321e-07	2,1091	0,03493	**
EU funds	-1,27116e-07	5,99892e-08	-2,1190	0,03409	**
Certified quality food	0,0340769	0,0954935	0,3569	0,72120	
R^2 0.64					
PCP 85%					
LR statistic 17.991					
Likelihood 0.0030					
Significant: ** at 5%					

Table 5. Results of application of Probit model (Source: elaboration on data www.istat.it).

Variable	*Coefficient*	*Std error*	*Z statistic*	*p-value*	*Significant*
Constant	-4,84851	2,13034	-2,2759	0,02285	**
Usable agricultural surface	0,00168095	0,000851164	1,9749	0,04828	**
Farm-holiday farms	-0,00686103	0,00380969	-1,8009	0,07171	*
L.e.a.d.e.r. funds	3,53631e-07	1,86996e-07	1,8911	0,05861	*
EU funds	-7,80355e-08	4,10191e-08	-1,9024	0,05712	*
Certified quality food	0,020478	0,06157	0,3326	0,73944	
R^2 0.65					
PCP 85%					
LR statistic 18.09					
Likelihood 0.0028					
Significant: ** at 5%; * at 10%					

The formulation of Logit model has been:

$$P(p=1) = \beta_0 + \beta_1 AS_i + \beta_2 FH_i + \beta_3 LEA_i + \beta_4 EF_i + u_i \qquad i=1,\ldots n \qquad (4)$$

P is the likelihood of Italian regions with an incidence of generational turnover above or below the average;
AS Usable agricultural surface;
FH number of farm holidays farms;
LEA funds allocated by L.e.a.d.e.r. project;
EF total amount of European funds.

The comparison among the statistic significances has underlined a greater effectiveness of the model Logit compared to the other statistical model Probit even if, in terms of R^2, the values of the two models have been similar enough (0.64 versus 0.65), index of a good adaptation of the model to the data. It is possible, analizing in detail the model Logit, to underline a good ability to describe the phenomenon, with some values of PCP, or rather the per cent ratio between the observed Y and the calculated Y, equal to 85% (*Tab. 5*).

4. Conclusions

This analysis has shown that the district is a very important economic functional structure for the protection of territory and rural areas where there has been a strong drop in usable agricultural surface. The European community funds have represented, above all through many actions financed by interventions called “pacchetto giovani” which are able to increase the generational turnover and to provide incentives for farm restructuring, an important tool for the development of rural and agro-industrial districts.

This research has confirmed what has been quoted by other authors about the role and function of cooperative credit banks, that are something of necessity but not sufficient, for the development of rural districts because they are able to acknowledge direct stimulus from the territory, producing a profitable and mutual exchange of information.

For the future it is possible that the Common agricultural Policy can become a tool that, supporting actions on the II pillar, will be able to assure a rural development that keep in mind other actions, that are put in practice in an interdisciplinary and indirect way to guarantee a cohesive and harmonic development of the rural space, and the rural district can give some effective and efficient solutions through the growth of imitation effects and very important actions of cooperation through the project L.e.a.d.e.r., that is a specific project for small rural areas like the Italian ones.

The funds allocated by the European union, through the Rural Development Programmes, with the aim to guarantee the generational turnover in Italian farms, unfortunately are not enough to improve the competitiveness of productive structures; they have shown to be a fundamental and strategic incentive to stimulate the development of Italian rural districts. In this case, it is important not to forget that in Italy the average age of farmers is above that of other European farmers and this has had and has some consequences in the business productive flexibility towards the market and the increase of productivity and competitiveness of farms.

In conclusion, it is important to remember that the rural district, according to the last intentions of the Italian legislator, is not a tool without any other effects, except for this to increase the value of rural territory, but it is a versatile strategic lever that, if it is well managed, can increase the bargaining power of rural areas and turn into a propulsive tool for the development. In fact, the district becomes an autonomous managerial tool with a legal status and juridical and functional status that can be successful because it is able to carry out many strategies both for territory and for farms, through the enforcement of a specific taxation, producing some areas that can be attraction centres and centres of propulsion for a well balanced growth of rural areas and it can also be an element of attraction for other young farmers.

References

Becattini, G. (ed) (2000). *Il distretto industriale.* Rosemberg & Sellier, Italy: Torino.

Cecchi, C. (1988). Distretto industriale: l’agricoltura dalla complementarietà alla dissociazione. *La questione agraria* 32: 91-123.

Cecchi, C. (2001). Le radici locali della ruralità. In Basile, E., Cecchi, C. (eds), *La Trasformazione post- industriale della campagna*. Torino: Rosemberg & Sellier, 173-199.

Fratta Pasini, C. (2008). Dalla dimensione locale alla strategia localistica: le banche popolari nell’economia italiana. In Fortis, M. (eds) *Banche territoriali, distretti e piccole e medie imprese*. Bologna: Il Mulino, 119-128.

Galluzzo, N. (2008). L’ammodernamento nel settore primario e il distretto rurale: una concreta opportunità?. *Agriregionieuropa* 12: 48-51.

Galluzzo, N. (ed) (2009). *Agriturismo e distretti per la valorizzazione delle aree rurali. Aspetti generali e applicativi su alcuni casi di studio*. Aracne editrice, Italy: Rome.

Verbeek, M. (ed) (2006), *Econometria*. Zanichelli, Italy: Bologna.

Zanetti, E. (2008). La relazione tra banche popolari e distretti industriali: il caso di UBI banca. In Fortis, M. (eds), *Banche territoriali, distretti e piccole e medie imprese*. Bologna: Il Mulino, 129-143.