Typical and traditional productions:
Rural effect and agro-industrial problems
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The determinants of 'typical' production: an empirical investigation on italian POD & PGI products[**]

ABTRACT

The paper investigates the supposed links between Italian typical products and their origin, in order to outline their territorial characteristics and identify the determinants of their development.The hypothesis to be tested is that these products are indeed "typical rural products" and therefore are distributed in the country accordingly.Discriminant analysis is used to explore the relationship between the regional distribution of an 'indicator variable' measuring the 'intensity of typical production' and the level of rurality of the regions.

1. INTRODUCTION

As is stated in the prolegomena of the EU Reg. 2081/92 "it has been observed in recent years that consumers are tending to attach greater importance to the **quality** of foodstuffs rather than to quantity; this quest for specific products generates a growing demand for agricultural products or foodstuffs with an **identifiable geographical origin**".
Indeed, the search for quality is one of the most important consumer trends of the 1990s and the importance of product quality in consumer behaviour is expected to further increase.
But "quality is a jewel with many facets" [8] and, therefore, it is important to understand with which facet we are concerned.
In this study we will investigate Italian typical food products, that is products which, according to EU Regulation 2081/92, exhibit a "specific quality, reputation or other characteristics attributable to that geographical origin" and the production, processing and preparation of which meet precise requirements set out in a specification. We will

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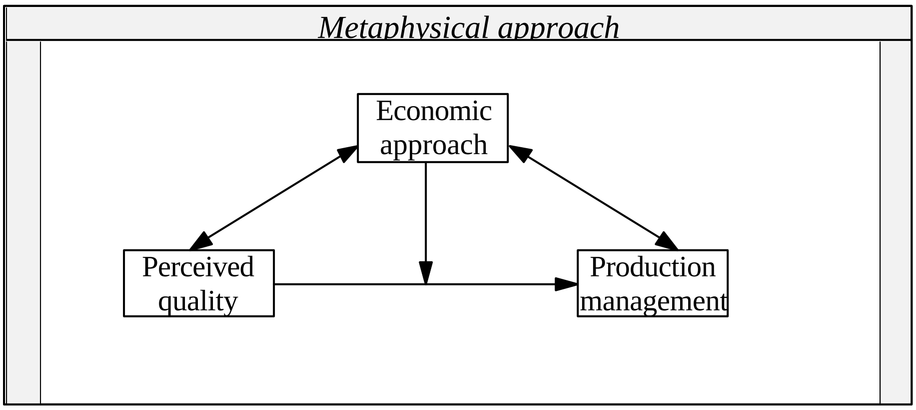
investigate the supposed links between these products and their origin, in order to outline their territorial characteristics and identify the determinants of their development.
The hypothesis we would like to test is that these products are indeed “typical rural products” and therefore are distributed in the country accordingly. Lack of data is a major problem in conducting the study; nevertheless, with the help of multivariate statistical analysis we can draw some significant conclusions.

2. CONCEPTS OF QUALITY

Food preferences depend on many different factors: personal, socio-economic, educational, cultural, religious and regional factors. The definition of food quality, therefore, is strictly dependent on these factors which influence the preferences.
According to Steenkamp [17] four approaches to quality can be identified: metaphysical, production, economic and marketing.
The first approach conceive "quality as a unanalyzable property that an individual can learn to recognize only through experience. So each individual has dissimilar quality perception only because it had different experiences in its life and not because product quality diverges.
In this perspective, the qualitative aspects are frequently different form the quantitative one. The metaphysical approach concentrates on the main point of quality idea and has had an incisive influence on the matter.
The production management approach mainly refers to the "standardised manufacturing procedures, quality control and quality costs" [17]. It is opposite to the first one because for this approach quality is a measurable and describable thing through technical specification.
In the first phase you determine the specific characteristics that product should have while in a second phase you measure the variance from what specified before and what you have obtained. So, any difference indicates a decrease in quality.
In this context four fundamental parameters, in mutual and reciprocal relationships, permit to obtain and maintain the product quality: quality of design, quality of production continuity of service and customer service after sale.
The third approach to quality studies various topics from an economic perspective, "such as quality competition, market equilibrium when products vary in quality, and consumer behaviour with respect to products that differ in objective quality when consumers have complete knowledge of market and when they are imperfectly informed” [17].
The focus of this approach is the market in all its aspects. Quality is a cardinal element of strategy integration among firms and in consumers choices orientation. Relationship between product quality and price is investigated, under the assumptions of both perfect and imperfect information.
The perceived quality approach focuses on the quality perception process and it is the most prominent approach in marketing and consumer behaviour research. Quality is neither absolute nor objective because it is a subjective concept; it is dependent on the perceptions, needs and objectives of each consumer.
In spite of this, it is possible define in quantitative terms the value that consumers attribute to some products.

In conclusion each of the four approaches are valuable because they point out different aspects of quality; although they have been developed rather independent to each other, they are related in some way.
Figure 1 shows that the perceived quality approach can serve as input to the production management approach; according to the last, the product specifications should be based on the needs of the consumer. According to Steenkamp (1991, p. 97) "it expresses the link between marketing/marketing research and production/R&D". The relationship between these two approaches is influenced by the economic approach, for quality relates also to costs and to the level of profits of the firm. At the same time, the economic approach could learn a lot from the other two approaches, in developing better theories on the behaviour of the firm. The metaphysical approach is rather abstract, but "provides a bedding in which the other approaches are situated" [17].

Figure 1. Relationships between the four approaches to product quality



Source:[17].

3. QUALITY AS GEOGRAPHIC ORIGIN

3.1 European legislation

The CAP considers the quality of agrofood products by differentiating them in industrial and typical1.
In both cases, EU approach to quality is in term of a production management approach, where quality is intended as a standard set of characteristics which can be measured, observed and certified.
In the case of typical products, these characteristics reside either in a geographic origin (EU Reg. 2081/92) or in a traditional recipe consolidated in time (EU Reg. 2082/92).
In this paper we will concentrate on the former.

[1] In the case of industrial products the final peculiarities are determined only by the type of production process; therefore it is essential to harmonise the qualitative standards according to UNI EN ISO rules.

According to EU Reg. 2081/92 we can distinguish two different types of geographical description:

a) protected designations of origin (PDO);

b) protected geographical indications (PGI).

An agricultural product or foodstuff bearing such an indication:

?? must exhibit a link between product or foodstuff characteristics and geographical origin;

?? must meet certain conditions set out in a specification;

?? must be registered at Community level.

According to article 3 of the Regulation, names that have become generic may not be registered.

Article 2 of the Regulation explicitly defines PDO and PGI.

By "designation of origin" it is intended the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff:

- originating in that region, specific place or country, and
- the quality or characteristics of which are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors, and the production, processing and preparation of which take place in the defined geographical area.

By "geographic indication" it is meant the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff:

- originating in that region, specific place or country, and
- which possesses a specific quality, reputation or other characteristics attributable to that geographical origin and the production *and/or* processing *and/or* preparation of which take place in the defined geographical area.

According to article 4, to be eligible to use a *protected* designation of origin (PDO) or a *protected* geographical indication (PGI) an agricultural product or foodstuff must comply with a *specification*.

The product specification shall include at least:

1. the name of the agricultural product or foodstuffs, including the designation of origin or the geographical indication;
2. a description of the agricultural product or foodstuff including the raw materials, if appropriate, and principal physical, chemical, microbiological and/or organoleptic characteristics of the product or the foodstuff;
3. the definition of the geographical area;
4. evidence that the agricultural product or the foodstuff originates in the geographical area;
5. a description of the method of obtaining the agricultural product or foodstuff and, if appropriate, the authentic and unvarying local methods;
6. the details bearing out the link with the geographical environment or the geographical origin;
7. details of the inspection structures;
8. the specific labelling details relating to the indication PDO or PGI, whichever is applicable, or the equivalent traditional national indications.

This regulation leads to important consequences.
Firstly, the legal protection reserves the use of geographic indications ad designations of origin only to local producers that meet the standards set up in the specification. Secondly, it aims in preventing depopulation of rural regions by helping farmers to safeguard their incomes. Quality as geographic origin is therefore very different from "industrial" quality; not in terms of the approach to quality - which is the same and is based on compliance to standards and specifications - but in terms of the implied farming systems.
If "industrial quality" (such as HACCP and EN ISO 9000 applied to food products) implies larger economies of scale and the globalization of agricultural production, the farming system associated to the production of typical food products is intrinsically localised and regional; the physical and socio-economical environment where the products and raw materials originate matters, as does a successful partnership between farmers, processors, wholesalers, and - eventually - retailers, organised in local agro-industrial districts.

3.2 The situation in Europe and Italy

The list of PDO/GI products officially registered by the European Commission is presented in Figure 2[2].

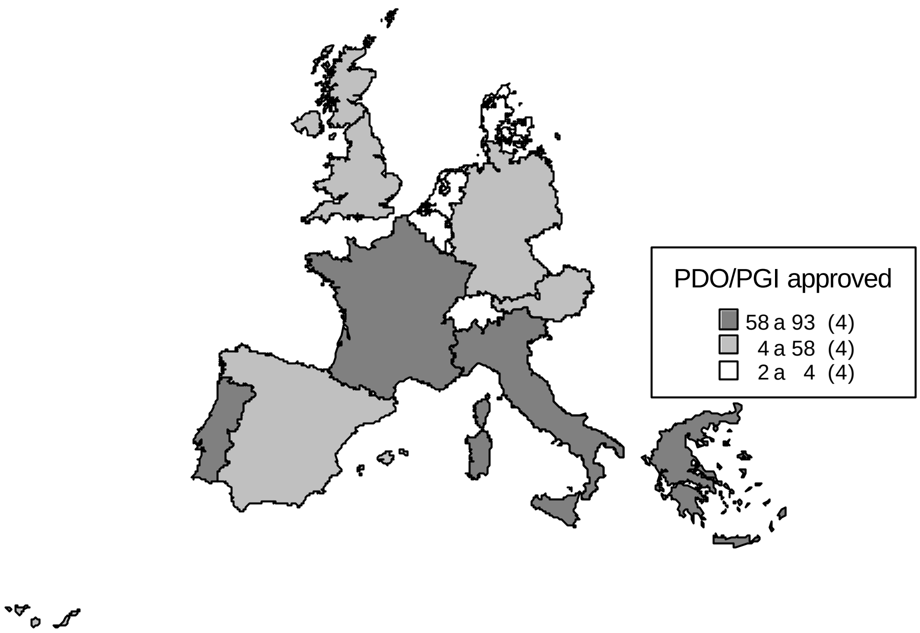
Figure 2. PDO/PGI products by sector and country

	Cheeses	Olive oil	Olives	Fats	Fruit & vegetables and cereals	Fish and other seafood	Products from processed meats	Fresh meats and chitterlings	Other meats products	Bakery and confectionery products	Essential oils	Mineral waters	Ciders	Beers	Total
Austria	1	1			2										***4***
Belgium	1			1			1								***3***
Denmark	2														***2***
France	37	3			8			41	2	1	1				***93***
Germany										2		31			***33***
Greece	20	16	8		11	1			1	1					***58***
Italy	30	5			15		16								***66***
Luxembourg		1					1	1	1						***4***
Netherlands	2				1										***3***
Portugal	10	5			18		1	18	9						***61***
Great Britain	8				1			5					3	3	***20***
Spain	11	4			10		5	4	1	2					***37***
Total	***122***	***35***	***8***	***1***	***66***	***1***	***24***	***69***	***14***	***6***	***1***	***31***	***3***	***3***	***384***

[2] In this work we have considered the PDO and PGI products together, being both expression of the "quality as geographic origin" approach contained in EU Reg. 2081/92.

We can see that all principal food sectors have at least one registered typical product. Most of the registrations concern cheeses, followed by fresh meats and fruit & vegetables. Germany is a singular case, having only mineral waters among the registered products.
Figure 3 shows the distribution of registered PDO/PGIs in the European union. France is the nation with the highest number of registrations (93), followed by Italy (66), Portugal (61) and Greece (58). Belgium, Denmark, Luxembourg and Netherlands are the countries that seem less interested, in accordance with their intensive agricultural systems.
As expected, the majority of EU Reg. 2081/92 achievements concern Mediterranean countries; this is most probably due to the different approach to food and food quality between Northern and Southern countries of Europe. Regional food disparities in the Mediterranean hinges upon culture, inclination of territory and traditions.
In Italy the registered PDO/PGI products reflect the specificity of Italian agriculture: most of them are cheeses, products from processed meats (salame, ham, sausaages, etc.) and fruit & vegetables.
The interest for PDO/PGI is quite high in Italy, given the fact that the Italian Ministry of Agriculture has even a specific web page for it (http://www.inea.it/miraaf/udi/dop-igp/index.htm), and this is one of the few pages run by the Ministry!
At the same time, it must be observed that some regions (as Umbria) so far have not presented any request of registration, even if these regions are not lacking typical products. This should be taken into account when interpreting the empirical results presented in the remaining paragraphs.

Figure 3. Registered PDO/PGIs in EU



4. DATA DESCRIPTION AND METHODOLOGY

4.1 Data and variable selection

The variables used in our study come from different sources; we have used REGIO Eurostat data for the information of macroeconomical, sociological and environmental nature, while the data on agricultural value added and gross production rely on INEA Yearbook. Data on PDO/PGI come from EU, the Italian Ministry of Agriculture and the Agricultural Commission of the lower house (Camera dei Deputati) of the Italian Parliament [3]. All data refer to 1992, except data on PDO/PGI (1996) and when otherwise indicated.
Unfortunately, there are no available data on the turnover of the products which have applied for registration under the 2081/92 Regulation, nor for those who has been registered. Therefore, in order to apply multivariate statistical techniques, we have built a

indicator variable of the regional typical products Gross Output, using data on application for registration weighted by 1995 sub-sectoral Gross Output figures[3].
The indicator variable for the *j*th region is:

$$(1) \qquad IT_j = \sum_i (GO_{ij}^{PDO/PGI})$$

where $GO_{ij}^{PDO/PGI}$ is the Gross Output for the sub-sector (meat, milk products, etc.) to which the *i*th PDO/PGI of the region *j* belongs. In other words - given that the true weight of each PDO/PGI applications is unknown, for we don't have data on the actual turnover of the typical products - we have considered instead the *total* Gross Output of the sub-sector to which each product belongs. Of course this is far from being a *proxy* of the actual turnover, but has minor scaling problems than just considering the unweighted number of applications. [4]
We have chosen to use the total number of applications in building our indicator variable in order to asses the interest and the potentials that the EU Reg. 2081/92 has raised in the various regions; the actually registered products reflect other considerations and could not be considered a good starting point.
In order to investigate the determinants of geographically linked production systems, the (predictor/explanatory) variables selection procedure has been guided by a critical assessment of previous theoretical and empirical studies on rurality, considering that "the agricultural sector is an *integrated* part of the national economy" [7].
Theoretical expectation is for typical productions to be mainly based in rural regions, where "authentic and unvarying local methods" of small-scale production originate.
These regions are generally characterised by[5]:

- high share of agricultural value added on the total (AGR_VA_TOT)[6];
- low value added per worker in all sectors (agriculture[AGR_VA_WU], industry [IND_VA_WU] and services [TER_VA_WU]);
- high level of unemployment [UNEMPL];
- low population density [DENSITY];
- high percentage of holdings operating in Less Favoured Areas [LFA], as defined by EEC Directive 75/268 (CEC, 1994).
- high level of food consumption on total consumption [FOODCONS].

[3] Source: INEA (ed.), Annuario dell'Agricoltura Italiana, Il Mulino, Bologna, 1995
[4] PGIs have been considered in all the regions where production and/or processing and/or preparation are allowed, while PDOs have been assigned to the region where all stages take place, without taking into account the fact that, in some cases (e.g. most of the ham products), the raw material can be originated in a different region.
[5] For example, the EU Objective 5B, concerning locally defined policies for rural areas development support, uses as criteria for the delimitation of these areas: high agricultural employment rate and/or low population density and/or low agricultural value added per agricultural worker. For more details on rurality classifications see [18].
[6] Variables abbreviations in brackets.

We have also included some other variables in order to further distinguish rural regions with strong local traditions and low level of modernisation of the food sector by others:

- importance of organic farming expressed in terms of share of regional UAA [BIO];
- share of food retailers on total retailers [FOODSHOPS];
- share of supermarkets on total food shops [SUPMKT];
- share of eating-out expenses on total food consumption [EATOUT].

Finally, some variables expressing some environmental conditions have been included, to reinforce the dichotomy among "urban" and "rural" regions:

- level of air pollution as measured by a crude *proxy* such as number of cars per inhabitant [CAR_POP];
- share of cancer deceased over total [CANCER_TOT].

To avoid obvious scaling problems, UAA has been also included among the set of predictor/explanatory variables.

4.2 Multivariate Analysis

We used a Bayesian approach to (Crisp) Discriminant Analysis to assess the discriminating power of the predictor variables expressing level of rurality.

Let $$X=\begin{bmatrix}\mathbf{X}_1\\ \vdots\\ \mathbf{X}_r\end{bmatrix}=\begin{bmatrix} x_{111} & x_{121} & \cdots & x_{1q1}\\ \vdots & \vdots & \vdots & \vdots\\ x_{n_1 11} & x_{n_1 21} & \cdots & x_{n_1 q1}\\ \hline \vdots & \vdots & \vdots & \vdots\\ \hline x_{11r} & x_{12r} & \cdots & x_{1qr}\\ \vdots & \vdots & \vdots & \vdots\\ x_{n_r 1r} & x_{n_r 2r} & \cdots & x_{n_r qr}\end{bmatrix}$$ be a matrix of n observations clustered in r groups, each containing n_k units described by q variables. Each submatrix $\mathbf{X}_k$ is formed by q variables measured over the n_k units of group k and x_{ijk} is the value of the j-th variable for i-th unit of group k (where $j=1,...,q$; $i=1,...,nk$; $r=1,...,k$). The typical problem to solve with discriminant analysis is the definition of a decision rule to assign a new unit to one of the r groups, when the q variables are considered.

The approach that we have used is based on a probabilistic valuation of a new unit to belong to one of the r groups. Bayes' rule is the framework used to obtain a discrimination between units, and it can be described as follows:

$$(2)\quad P(G_k|D)=\frac{P(D|G_k)P(G_k)}{\sum_{k=1}^{r}P(D|G_k)P(G_k)}$$

$P(G_k)$ is the prior probability of a case to belong to a particular group when no information about it is available, and it summarises the nonsample information about G. Hinging on normality assumption about $\mathbf{X}_k$'s distribution, the conditional probability of the discriminant score D, $P(D|G_k)$, can be calculated for the new unit assuming that it belongs to group k.

$P(G_K|D)$ is the posterior probability which is estimated using the Bayes' rule. This estimate summarises the prior information and the sample information to evaluate how likely a new unit belongs to each of the k groups. The decision rule classifies the new unit in the group for which the posterior probability is the largest [15]. The SPSS+ statistical package was used to perform the analysis.

For a fuzzy generalisation of this approach see [18].

5. Empirical results

Three groups discriminant analysis has been performed on the 20 Italian regions; the regions were classified as *leading* (Group 2), *intermediate* (Group 1) and *poor* (Group 0) 'typical' producers, according to the level of the indicator variable *IT*. Five regions were classified in the leading group (Piedmont, Lombardy, Veneto, Emilia Romagna and Apulia), six in the intermediate (Valle d'Aosta, Latium, Campania, Calabria, Sicily and Sardinia) and the remaining nine in the poor group (Table 1 and Figure 4).

Figure 4. Poor, Intermediate and Leading Regions

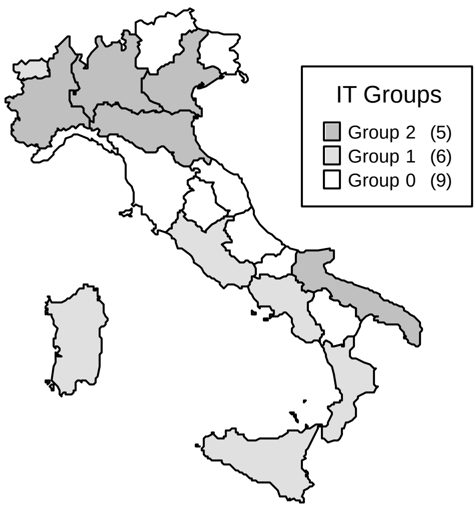


Table 1. Values of IT and corresponding Group

Regions	*IT*	Group
Piedmont	7.381.093	2
Lombardy	34.853.213	2
Veneto	5.895.782	2
Emilia Romagna	17.844.083	2
Apulia	6.059.326	2
Valle d'Aosta	1.476.589	1
Latium	1.091.830	1
Campania	1.195.013	1
Calabria	1.873.332	1
Sicily	2.618.474	1
Sardinia	1.529.669	1
Trentino Alto Adige	694.057	0
Friuli Venezia Giulia	343.752	0
Liguria	24.736	0
Tuscany	773.922	0
Umbria	493.625	0
Marche	448.165	0
Abruzzo	355.373	0
Molise	26.499	0
Basilicata	54.743	0

At a first glance is clear that some regions cannot be considered neither 'rural' nor 'marginal'. The leading group account for around 52% of Italian Gross Agricultural Output; in terms of the discriminating (predictor) variables, the leading group exhibits significantly higher agricultural valued added per worker, share of food over total retailers, and share of supermarkets on total food shops, while exhibiting significantly lower food consumption over total consumption and lower unemployment. The significance tests for equality of group means have been carried upon in terms of U Statistics (Wilks' lambda) and one-way ANOVA F tests at 0.95 significance level. For all other variables, except UAA, the hypothesis that group means are equal is not rejected (Table 2).

Table 2. U-statistic and univariate F-ratio for testing equality of group means

Variable	U Stat.	F	p-value
AGR_VA_TOT	0,991	0,078	0,925
FOODSHOPS	*0,566*	*6,520*	*0,008*
AGR_VA_WU	*0,548*	*7,025*	*0,006*
IND_VA_WU	0,877	1,194	0,327
TER_VA_WU	0,778	2,422	0,119
ORGANIC	0,860	1,389	0,276
CAR_POP	0,933	0,613	0,553
DENSITY	0,840	1,620	0,227
UNEMPL	*0,658*	*4,414*	*0,029*
FOODCONS	*0,670*	*4,196*	*0,033*
EATOUT	0,867	1,305	0,297
LFA	0,710	3,472	0,054
UAA	*0,549*	*6,983*	*0,006*
SUPMKT	*0,624*	*5,133*	*0,018*
CANCER_TOT	0,715	3,392	0,058

For what concerns the intermediate and poor typical producers' groups, the comparison of group means for the various discriminating variables shows that the intermediate group is indeed more 'rural' than the other. It exhibits significantly lower agricultural value added per worker (the lowest among the three groups), higher share of food consumption over total consumption, and almost double unemployment. Besides, its share of supermarkets over total food shops is significantly lower than the other two groups, a clue for a less developed agro-food sector.

The three groups are well defined, showing quite good crisp boundaries; this can be easily perceived by visual inspection of the *IT* data (Table1), but is confirmed by Table 3. Group 0 and Group 2 have a negative mean for one function and a positive one for the other, while Group 1 has positive means for both functions and exhibits the highest value for both functions compared with the two other groups.

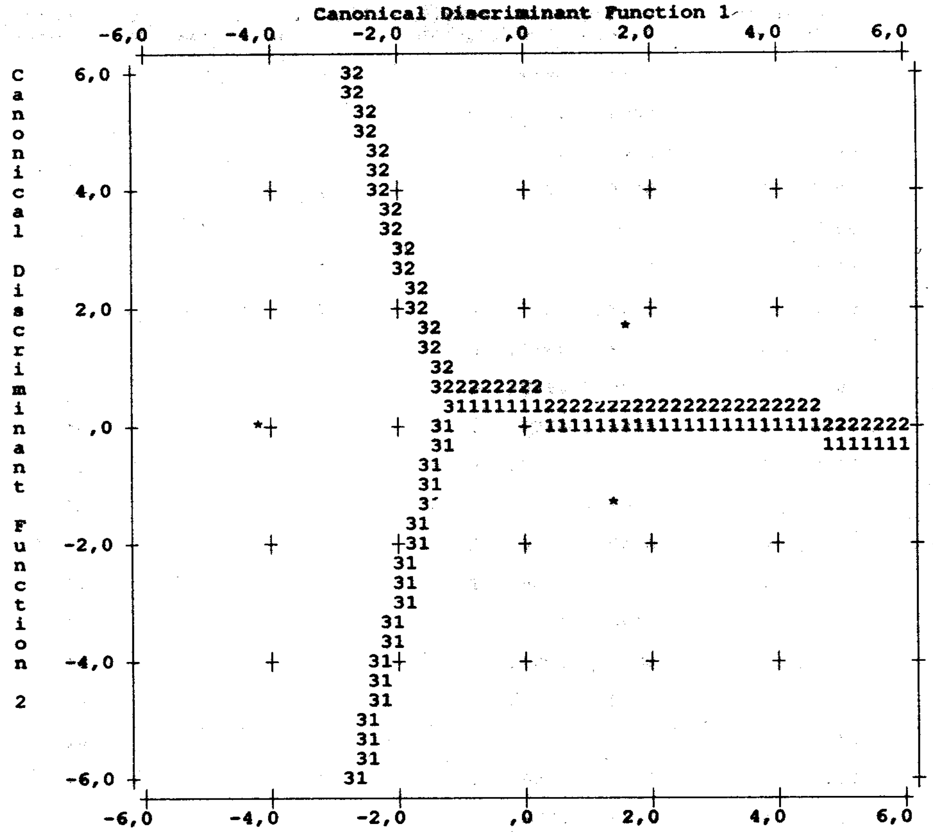
Table 3. Canonical discriminant functions evaluated at group means (centroids)

Group	Func 1	Func 2
0	1,30283	-1,20273
1	1,51727	1,73602
2	-4,16582	0,08169

The first discriminant function accounts for 78,8% of the total between-groups variability, while the second one accounts for the remaining 21,2%. The chi-squared test based on

Wilks' lambda reject the null hypothesis that the means of the discriminant functions are equal, so that both functions remain in the analysis. The plot of the two dimensional representation of the three regions' groups and relative centroids is reported below (Figure 5) and shows that the model originates a quite sharp distinction among leading, intermediate and poor 'typical' producers regions.

Figure 5. Territorial Map



Legend: * indicates a group centroid; 3 indicates the boundary of group 2, 2 of group 1, and 1 of group 0.

Variable selection was performed using a stepwise procedure which uses minimisation of Wilks' lambda7.

The final model results in the following variables to be included in two discriminant functions:

[7] At each step the variable that results in the smallest Wilks' lambda (i.e. the ratio of the within-groups sum of squares to the total sum of squares) for the discriminant function(s) is entered. Entry and removal of variables are based on a F statistic which measures the significance of change in Wilks' lambda when a variable is entered or removed from the analysis.

?? importance of organic farming expressed in terms of share of regional UAA (BIO);
?? level of air pollution as measured by a crude *proxy* such as number of cars per inhabitant (CAR_POP);
?? unemployment rate (UNEMPL);
?? total regional UAA (UAA).

By observing the discriminant function coefficients, we may clear up the picture.

Table 4. Discriminant functions coefficients

	Unstandardized		Standardized	
Variables	**Func 1**	**Func 2**	**Func 1**	**Func 2**
BIO	2,2929	-0,1940	2,1969	-0,1859
CAR_POP	0,0012	0,0236	0,1195	2,3424
DISOC	0,2750	0,5819	1,1443	2,4212
UAA	-0,0072	0,0016	-2,5399	0,5619
Constant	-0,1327	-17,4487	-	-

Using the unstandardized coefficients and the variables in the original units, it is possible to compute two scores for each region, one for each function.

Using the Territorial Map and the two functions coefficients, it is now possible to understand the role of the discriminating variables selected. For low values of Function 1 discriminant score (less than -3), the region belong to Group 2 no matter what value Function 1 exhibit. For higher values, discrimination between Group 1 and 2 relies upon Function 2.

A relatively high share of organic UAA and high unemployment will reduce the likelihood of the region to be member of Group 2, while Function 1 is highly respondent to the scaling factor given by the UAA: large regions will be more likely member of Group 2. The standardized8 coefficients confirm that the organic UAA and total UAA have similar but contrasting impact on the likelihood of being a member of Group 2.

In other words, the 'leading' regions are such mainly because are large and highly intensive agricultural regions. It is well known that most ham products applications, although accountable to different regions, were prepared by a large meat consortium in Lombardy; in general, we could obviously expect that large regions have a larger number of applications, especially if they have a modern and well organised agricultural sector. This is what Group 2 represent, and UAA is the main determinant of its large *IT9*.

If we now turn back to the Territorial Map, in order to classify the regions in either Group 1 or Group 0, we need to use Function 2. Negative discriminant scores will indicate that the region is likely to be a member of Group 0; on the contrary, positive values would make us classify the region in Group 1.

[8] These are standardized to adjust for the unequal means and standard deviations of the predictor variables; in other words, to account for different measurement units.

[9] In order to further test this assumption, we have performed a two-groups discriminant analysis, where Group 1 and 0 were assembled in one new group. In that case the only variables to have a significant Wilks' lambda were the share of food shop on total shops and, indeed, UAA. But the last variable had the smallest Wilks' lambda and, performing a stepwise selection procedure, it was the only variable included in the model.

Standardized coefficients indicate that, again, larger UAA is correlated with larger *IT*; but this time, the higher unemployment rate is, the higher the likelihood that the region belongs to the intermediate group (Group 1). Somewhat puzzling is the coefficient of the *proxy* variable for pollution (CAR_POP) and of the organic UAA (although the absolute value of this last coefficient is quite small). To further investigate the reason behind these findings, we can exa mine the correlations between the values of the function and the values of all the variables (including those not included in the model: Table 5).

Table 5. Structure matrix

Variables	Func 1	Func 2
EATOUT	-,37707*	-0,21905
FOODSHOPS	-,27950*	0,08417
AGR_VA_TOT	0,14150*	0,11977
SUPMKT	-0,1389	-,45323*
UNEMPL	0,14715	0,45050*
UAA	-0,26824	0,42525*
FOODCONS	0,24676	0,27749*
BIO	0,07287	0,26353*
IND_VA_WU	-0,2091	-,23262*
CANCER_TOT	-0,11267	-,15639*
TER_VA_WU	-0,1343	-,15185*
AGR_VA_WU	-0,0341	-,14700*
CAR_POP	-0,08197	-,11984*
LFA	-0,04916	-,11438*
DENSITY	0,07171	,07845*

*** denotes largest absolute correlation between each variable and any discriminant function**

The variable CAR_POP, which has a positive standardized coefficient, is negatively correlated with high scores of Function 2. Besides, the variable BIO is positively correlated, while its coefficient was negative. This occurs because the former variable is positively correlated with CANCER_TOT and negatively correlated with AGR_VA_TOT; while the larger share of organic UAA (BIO) occurs in larger reagions, and therefore BIO is correlated with total UAA
(Figure 6). Thus the individual coefficients are not meaningful.

The role of the other variables is much less relevant, partly due to the correlation among them. In any case, Group 1 (the most 'rural') - represented by high values of function 1 and positive values of Function 2 - is indeed correlated with variables which indicate a low level of modernization of the food sector (negative correlation of SUPMKT with both Func. 1 and Func. 2) and, in general, with variables indicating a a higher level of rurality. The sign of the correlations concerning EATOUT, AGR_VA_WU, IND_VA_WU, TER_VA_WU, CANCER_TOT are negative, while those of

AGR_VA_TOT and FOODCONS are positive, as expected. The only inverted signs are those of LFA and DENSITY, which exhibits the two lowest absolute values of the correlations with the two functions.

Figure 6. Classification results

Regions	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discrim. Scores Func 1	Func 2
Piedmont	2	2	0,4343	1	1	0	-4,85	1,1771
Lombardy	2	2	0,6885	1	0	0	-4,7455	-0,5589
Veneto	2	2	0,1994	0,9986	0	0,0014	-2,8798	-1,1717
Emilia Romagna	2	2	0,7479	1	1	0	-3,9294	0,8063
Apulia	2	2	0,9645	1	0	0	-4,4243	0,1557
Valle d'Aosta	1	1	0,6891	0,8908	0	0,1092	2,0674	1,071
Latium	1	1	0,3121	0,8265	0	0,1734	0,166	1,0268
Campania	1	1	0,2651	0,9998	0	0,0002	1,8091	3,3391
Calabria	1	1	0,7306	0,8351	0	0,1649	1,3533	0,9608
Sicily	1	1	0,5507	0,9959	0	0,0041	2,5076	2,1967
Sardinia	1	1	0,9475	0,984	0	0,016	1,2002	1,8217
Trentino Alto Adige	0	0	0,0408	0,9995	2	0,0004	-0,6526	-2,807
Friuli Venezia Giulia	0	0	0,8291	0,9887	1	0,0113	1,913	-1,1526
Liguria	0	0	0,3886	0,999	1	0,001	2,4164	-2,0091
Tuscany	0	0	0,1206	0,5035	1	0,4963	0,138	0,4925
Umbria	0	0	0,6114	0,9449	1	0,0551	2,1004	-0,6129
Marche	0	0	0,821	0,9925	1	0,0075	1,9238	-1,2966
Abruzzo	0	0	0,4454	0,9989	1	0,0011	0,2013	-1,8386
Molise	0	0	0,324	0,9976	1	0,0024	2,7048	-1,7401
Basilicata	0	0	0,3855	0,7048	1	0,2952	0,9805	0,1398

The discriminating power of the variables combined in the two functions is, nevertheless, very good: we obtain a 100% correct classification of regions by the use of our discriminating variables

6. CONCLUSIONS

In this paper a first attempt to study the determinants of the spatial distribution of the typical products in Italy was presented.
Although the available data are far from being satisfactory, some conclusions can be drawn from the discriminant analysis we performed.
Three well bounded groups were used in the analysis; the 'leading' group, with the highest level of the indicator variable we used to measure the absolute importance of typical products in each region, is represented by the large, industrialised agricultural regions of Northern Italy. Here, the high levels of typical production is mainly explained by the scaling factor UAA.
Among the remaining regions, high level of typical production is associated with a high level of rurality of the regions and a low level of modernisation of the food sector.
These first results need to be tested by further analysis, using actual figures on typical production and introducing other variables related with the structure of the agro-food

sector. Unfortunately, most of the relevant data are not available and need to be acquired by direct investigation.

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Figure 7. Variables correlation matrix

	FOODCONS	*AGR_VA_TO*	*FOODSHOP*	*UAA*	*BIO*	*SUPMKT*	*LFA*	*DENSITY*	*CANCER_TO*	*CAR_POP*	*AGR_VA_WU*	*IND_VA_WU*	*TER_VA_WU*	*EATOUT*
FOODCONS	1													
AGR_VA_TO	0,639	1												
FOODSHOP	-0,405	-0,452	1											
UAA	0,130	0,275	0,509	1										
BIO	0,274	0,234	0,059	0,636	1									
SUPMKT	-0,684	-0,174	0,118	-0,113	-0,182	1								
LFA	0,219	0,185	-0,464	-0,400	-0,088	-0,337	1							
DENSITY	-0,013	-0,377	0,760	0,213	-0,086	-0,118	-0,420	1						
CANCER_TO	-0,846	-0,702	0,557	0,007	-0,083	0,588	-0,362	0,299	1					
CAR_POP	-0,835	-0,769	0,211	-0,239	-0,141	0,365	-0,101	-0,082	0,718	1				
AGR_VA_WU	-0,458	-0,123	0,570	0,458	0,151	0,493	-0,534	0,375	0,659	0,198	1			
IND_VA_WU	-0,529	-0,785	0,480	0,132	0,103	0,122	-0,200	0,340	0,622	0,642	0,367	1		
TER_VA_WU	-0,713	-0,787	0,776	0,032	-0,202	0,202	-0,353	0,564	0,767	0,640	0,445	0,658	1	
EATOUT	-0,836	-0,810	0,538	-0,126	-0,361	0,375	-0,113	0,250	0,730	0,736	0,319	0,729	0,805	1