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**DYNAMIC TENDENCIES IN ITALIAN AGRICULTURE:  
A study of regional performance through differential analysis**

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***Abstract***

*The aim of this paper is to analyse the evolution of Italian regional agricultural systems during the period 1972-1990. The study is carried out by means of differential analysis. On comparing regional data with national data, this technique allows the overall variations in agricultural production value and in factor purchase expenditure to be divided into "price-effect" and "quantity-effect". Quantity-effect, in turn, may be divided into "yield-effect" and "area-effect".*

*These values may successively be summarised in a relative productivity variation which expresses the differential between the performance of each region and that of national agriculture.*

*The differing regional typologies may be interpreted by comparing them with the regional evolution and distribution of the effects of the national and Common Agricultural Policy, of the enlargement and liberalisation of the national and international markets and of the technological and social-economic changes.*

## ***1. Introduction***<sup>1</sup>

The aim of this work is to identify the principal tendencies in the development of regional agricultural systems, by taking into consideration both the sectors as a whole and the separate product divisions. This type of study, carried out by means of differential analysis, permits us to explain the different typologies in terms of relative variations in price and quantity (in turn divided into relative variations in yield and area)<sup>2</sup>.

The results allow us to relate the different regional strategical paths to the change in the intervention tendencies of national and Common Agricultural Policy, to the evolution of the agricultural structures of production and of the economic system and also to the role of international markets. In order to assert itself on the market, in fact, each product of a given region must confront itself both with the competition (external) of similar products in other regions as well as with that (internal) of other products which may be cultivated within the same region. The relative variations in supply thus constitute a way of measuring the competitive potential of the given product in the given region. Similarly, supply remaining the same, the technological and competitive success of a region is determined by the cost of purchasing the factors of production. Output remaining the same, the relative variation in the expense accrued for the purchase of input in a given region measures its efficiency in the use of production factors.

## ***2. Methodology***

Gross Agricultural Output or the expenditure on factors of production may be expressed, in a country, with the use of the following formula:

$$(1) \quad Y = \sum_i p_i q_i$$

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<sup>1</sup> Research supported by National Research Council of Italy, Special Project RAISA, Sub-project n.1, Paper n.XXX

<sup>2</sup> See A. Bartola, F.Sotte, A.Fantini, R.Zanoli (1994), "La politica agraria delle regione italiane: nuovi orientamenti nelle Marche" (*Italian regional agricultural policy: new trends in the Marche*), Quaderno di Ricerca n. 33 Dipartimento di Economia, Università di Ancona. See also: A. Bartola, A. Fantini, "Politica agraria e specializzazione dell'agricoltura italiana" *Agricultural policy and specialisation in Italian Agriculture*, in: *Economic policy in the agricultural sector*, in: La politica economica nel settore agricolo, atti del XXII Convegno di studi della Società Italiana di Economia Agraria, Pisa, 1986, Il Mulino-Inea, 1988.

where  $p_i$  and  $q_i$  represent respectively price and quantity indexes relative to the region  $i$ -th with reference to the entire production or to the overall expenditure made on all agricultural input.

The share of the region  $i$ -th may be expressed as follows:

$$(2) \quad W_i = \frac{p_i q_i}{\sum_i p_i q_i}$$

The relative variation is as follows:

$$(3) \quad \frac{\delta W_i}{\delta t} = \frac{\left( \frac{\delta p_i}{\delta t} q_i + \frac{\delta q_i}{\delta t} p_i \right) Y - \frac{\delta Y}{\delta t} p_i q_i}{Y^2}$$

or else, with simple transformations:

$$(4) \quad \frac{\delta W_i}{\delta t} = \frac{\left( \frac{\delta p_i}{\delta t} q_i + \frac{\delta q_i}{\delta t} p_i \right)}{Y} - \frac{1}{Y} \cdot \frac{\delta Y}{\delta t} p_i q_i$$

By multiplying the first term on the left-hand side of the equation by  $p_i q_i / p_i q_i$ , the following is obtained:

$$(5) \quad \frac{\delta W_i}{\delta t} = \frac{p_i q_i}{Y} \cdot \left( \frac{\frac{\delta p_i}{\delta t}}{p_i} + \frac{\frac{\delta q_i}{\delta t}}{q_i} - \frac{\frac{\delta Y}{\delta t}}{Y} \right)$$

Since  $\delta x/x = \delta \log x$ , the following is true:

$$(6) \quad \frac{\delta W_i}{\delta t} = \frac{p_i q_i}{Y} \cdot \left( \frac{\delta \log p_i}{\delta t} + \frac{\delta \log q_i}{\delta t} - \frac{\delta \log Y}{\delta t} \right)$$

Since the aim is to explain the relative variation in Gross Agricultural Output, or of expenditure, that is  $\delta W_i$ , it is necessary to split  $\delta \log Y$  into an aggregate component of price and an aggregate of quantity,  $Y$  being the aggregative function of all of the regional products. If function (1) is differentiated over time the following is obtained:

$$(7) \quad \frac{\delta \left[ \sum_i p_i q_i \right]}{\delta t} = \left[ \sum_i p_i \frac{\delta q_i}{\delta t} \right] + \left[ \sum_i q_i \frac{\delta p_i}{\delta t} \right]$$

By dividing by  $\sum_i p_i q_i = \mathbf{p}' \mathbf{q}$  ( where  $\mathbf{p}$  and  $\mathbf{q}$  represent respectively the vector of price and quantity), the following identity is obtained:

$$(8) \quad \frac{\delta \log Y}{\delta t} = \frac{\delta \log(\mathbf{p}' \mathbf{q})}{\delta t} = \sum_i W_i \frac{\delta \log q_i}{\delta t} + \sum_i W_i \frac{\delta \log p_i}{\delta t}$$

where  $W_i = \frac{p_i q_i}{\mathbf{p}' \mathbf{q}}$  with  $i = 1, 2, \dots, n$ .

The (8) splits up the rate of change of the Gross Agricultural Output or expenditure into two components: the first one represents the quantity rate of change, the second the price rate of change, both of them being weighed against the given region's share.

By integrating both the members between times 1 and 2 the following is obtained:

$$(9) \quad \log \frac{\mathbf{p}(2)' \mathbf{q}(2)}{\mathbf{p}(1)' \mathbf{q}(1)} = \int_1^2 \left[ \sum_i W_i \frac{\delta q_i}{\delta t} \cdot \frac{1}{q_i} \right] dt + \int_1^2 \left[ \sum_i W_i \frac{\delta p_i}{\delta t} \cdot \frac{1}{p_i} \right] dt$$

The first term to the right hand side of the equation is the natural logarithm of the Divisia quantity index, while the second term is the natural logarithm of the Divisia price index<sup>3</sup>. The result is that (8) may be written in the following way:

$$(10) \quad \frac{\delta \log Y}{\delta t} = \frac{\delta \log P}{\delta t} + \frac{\delta \log Q}{\delta t}$$

where P and Q are respectively the Divisia price and quantity indexes. Therefore, the following is true:

$$(11) \quad \frac{dW_i}{dt} = W_i \left[ \left( \frac{d \log p_i}{dt} - \frac{d \log P}{dt} \right) + \left( \frac{d \log q_i}{dt} - \frac{d \log Q}{dt} \right) \right]$$

Since Divisia indexes are defined in a continuous form, they are useless in applied research, since discrete data alone are generally available. . Therefore, discrete approximations of Divisia index are more appropriate; because index numbers are defined over discrete intervals, this seems very reasonable. There are numerous solutions available: the most frequently used are the Theil-Tornqvist indexes which, between times 1 and 2, are defined as follows<sup>4</sup>:

$$\text{Theil-Tornqvist quantity index: } Q_T = \prod_i \left( \frac{q_i^1}{q_i^2} \right)^{(w_i^2 + w_i^1)/2}$$

$$\text{Theil-Tornqvist price index: } P_T = \prod_i \left( \frac{p_i^1}{p_i^2} \right)^{(w_i^2 + w_i^1)/2}$$

<sup>3</sup> See W. E. Diewert. "The Economic Theory of Index Numbers: a Survey", in A. Deaton (ed.), *Essays in the Theory and Measurement of Consumer Behaviour*, Cambridge University Press, Cambridge, 1981, pages 163-208 and P. Pierani, P. Rizzi, "Produttività totale dei fattori e progresso tecnico nell'agricoltura italiana: un confronto Nord-Sud", (*Total Factor Productivity and technical Progress in Italian Agriculture: a comparison between North and South*), Quaderno del Dipartimento di Economia Politica, n. 130, Siena, October 1991

<sup>4</sup>See W. E. Diewert as above

Since the logarithms of the Divisia indexes are required in the calculation, the indexes will be considered approximate in logarithm form.

$$(12) \quad \log Q_T = \frac{W_i^2 + W_i^1}{2} \cdot \sum_i \log \frac{q_i^1}{q_i^2}$$

$$(13) \quad \log P_T = \frac{W_i^2 + W_i^1}{2} \cdot \sum_i \log \frac{p_i^1}{p_i^2}$$

If this procedure is followed, all of the terms of (11) are easily calculable. By extending the same procedure, it is possible in turn to divide the quantity-effect into two components: a yield-effect and an area-effect. Since in fact  $q_i = \sum_i s_i y_i$ , by repeating the analysis which has been made up until now, we may show that:

$$(14) \quad \frac{\delta \log Q}{\delta t} = \frac{\delta \log S}{\delta t} + \frac{\delta \log Y}{\delta t}$$

where S and R respectively are Divisia indexes of the cultivated area and of the yield approximated by of the Theil-Tornqvist indexes S and R. The (11) becomes as follows:

(15)

$$\frac{\delta W_i}{\delta t} = W_i \left[ \left( \frac{\delta \log p_i}{\delta t} - \frac{\delta \log P_T}{\delta t} \right) + \left( \frac{\delta \log s_i}{\delta t} - \frac{\delta \log S_T}{\delta t} \right) + \left( \frac{\delta \log y_i}{\delta t} - \frac{\delta \log Y_T}{\delta t} \right) \right]$$

From which, by passing into the discrete, the share variation between times 1 and 2 is obtained:

$$(16) \quad \Delta W_i = \left( \frac{W_i^2 + W_i^1}{2} \right) \left[ (\Delta \log p_i - \Delta \log P_T) + (\Delta \log s_i - \Delta \log S_T) + (\Delta \log y_i - \Delta \log Y_T) \right]$$

This is the mathematical expression used in the present study.

Therefore, the regional share variation in Gross Agricultural Output is the result of the sum of the three effects, that is the three terms in square brackets: price-effect, area-effect, yield-effect; each one of these represents the relative variation registered by the single region net of the national variation (weighted by the average share between the two years). Similar research may be carried out, in a give spatial environment, at a sectorial level from the point of view of output and input.

A useful classification of the evolution paths of the single regions and of the various sub-sectors may be made by inserting the results on a position sheet: these latter have the advantage of permitting useful display. VP is used to indicate price-effect, VQ for quantity-effect, VY for yield-effect and VS for area-effect.

As regards the supply of products, first of all the regions will be placed on a competitiveness sheet in relation to price and quantity effects, as is illustrated in figure 1, where obviously the terminology used in each quadrant is for synthesis purposes only.

*Figure 1 - Competitiveness Variations Sheet*

|                               |     |     |                                   |
|-------------------------------|-----|-----|-----------------------------------|
|                               | +VP | +VP |                                   |
|                               | -VQ | +VQ |                                   |
| <b><i>Market oriented</i></b> |     |     | <b><i>High competitive</i></b>    |
|                               | -VP | -VP |                                   |
|                               | -VQ | +VQ |                                   |
| <b><i>Low competitive</i></b> |     |     | <b><i>Production oriented</i></b> |

The positive price effect indicates that the region is characterised by a market capacity which is above the average, either because its traditional specialisation were supported by the price variations, or else because it adapted its productive systems to the products and qualities most appreciated on the market, or even because it has a better bargaining capacity. The quantity effect, on the contrary, is a concise indicator which may be more easily analysed with the help of the production intensity sheet in figure 2. If the quantitative variations are mostly due to variations in yields, the results are to be associated with cases of production intensification resulting from technical change or from

increased usage of purchased inputs. If, however, these depended on the area-effect, the result would be determined more by the choice made by the farmers relating to the increase in area cultivated (or, more realistically, to less land retirement) and they would be connected with the competition on the land which is employed for uses other than agricultural ones<sup>5</sup>.

*Figure 2. Production Intensity Sheet*

|                                    |            |            |                                |
|------------------------------------|------------|------------|--------------------------------|
|                                    | +VY<br>-VS | +VY<br>+VS |                                |
| <i>Modern intensive</i>            |            |            | <i>Modern competitive</i>      |
|                                    | -VY<br>-VS | -VY<br>+VS |                                |
| <i>Traditional low competitive</i> |            |            | <i>Traditional competitive</i> |

As far as the factors of production are concerned, the competitiveness variations must be interpreted in different terms through the use of the efficiency variations sheet. Efficiency is maximum when, given the level of output, both quantity-effect and price-effect are negative. In figure 3, the trend towards quantity may be associated with the pursuit of economic efficiency, or rather with the use of relatively lower priced factors, to the detriment of technical efficiency. On the other hand, if the price-effect is positive and the quantity-effect negative, it is clear that the tendency is towards technical efficiency, to the detriment of economic efficiency<sup>6</sup>.

<sup>5</sup> Obviously if the same methodology were used to study single sub-sectors, and not the entire regional agricultural sector, the area-effect would englobe even the competition (internal) between different types of crops and so it would include the redistributive effects determined by the farmers on the land.

<sup>6</sup> One must remember that the results arising from differential analysis express only relative positions (in this case, compared to the national average). When a territorial or sectorial adjustment leads to the closing of the gaps and towards re-equilibrium, it is the initially less efficient productive regions or sub-sectors that show (relatively) more positive variations in efficiency.

Figure 3 - Efficiency Variations Sheet in the Expenditure on Input

|  |     |  |
|--|-----|--|
| <i>Price oriented</i><br><i>(Technical efficiency)</i> | +VP | +VP  |
|  | -VQ | +VQ  |
|  |     | <i>Low efficiency</i>                                    |
| <i>High efficiency</i>                                 | -VP | -VP  |
|  | -VQ | +VQ  |
|  |     | <i>Quantity oriented</i><br><i>(Economic efficiency)</i> |

When considered separately, the information available on output and on input are insufficient in order to define a global indicator of the relative regional performances. When both output and input are considered jointly, productivity variation index in terms of value may be calculated by using the following expression:

$$(17) \quad IP_i = W_i^* - S_i^*$$

where  $W_i^*$  is the variation in the share of Gross Agricultural Output of a  $i$ -th region and  $S_i^*$  is the expenditure share variation.  $IP_i$  expresses, in terms to be related to the entire nation, the productivity variation in resources used in agricultural production; therefore it is a concise and complete performance index<sup>7</sup>. Therefore, a region which presents  $IP_i > 0$ , registers an increase in productivity in value of the factors compared to the national agriculture globally. In the opposite case, if  $IP_i < 0$ , the global productivity variation of factors will be lower than the national average.

### 3. The evolution of agriculture in the Italian geographical areas

The following application aims at presenting the results of the use of the differential analysis method to the Italian geographical areas as a whole. The purpose is

<sup>7</sup> It is to be noted that  $IP_i$  is not an indicator of efficiency variation since it does not take the variation in factor use into consideration, given the output quantity; so, one does not move along a given isoquant, but rather among the isoquants. Also, if not all of the factors of production are contemplated, (in our case there were elements missing for considering capital and self-employment),  $IP_i$  is not even a relative measurement of the total factor productivity variation, but rather it expresses the relative variation in productivity in terms of value of the aggregate of factors included in  $S_i$ .

mainly that of providing a global vision of the local determinants of Italian agricultural development. The results which will be reported refer to a period of 18 years from 1972 to 1990<sup>8</sup>. The total agricultural output is made up of eight aggregates of products, defined according to the availability of data as well as to their aim at merging in the same group and also to the intensity of labour utilisation. These aggregates are: cereals; vegetables (with potatoes and legumes); industrial crops (sugar beet, soya, tobacco, flowers etc.); fruit and citrus fruits; wine grapes; olives; traditional breeding (cattle, sheep and goats)<sup>9</sup>; factory breeding (pigs, poultry, and rabbits).

Due to the impossibility to split up the quantity-effect of industrial breeding, the study had to be carried out in two phases: in the first, around which this work is concentrated, the first seven sub-sectors were taken into account excluding the industrial breeding, and their area and yield effects; in the second, only the industrial breeding were compared with the rest of the agricultural sector.

Finally, an aggregation of six categories were used for the input: fertilisers, pesticides, seeds, fodder and other forms of input for animal breeding; other primary products and services; wages<sup>10</sup>.

At the top of Table 1 you can find the variations in Gross Agricultural Output shares for the Italian geographical areas during the considered period of time: one can note how the North (especially the North-East) registers an overall relative expansion, while, the Centre and especially the South, on the contrary, are losing weight. The tendency towards the strengthening of dualism between the North and South, over the whole period, appears particularly accentuated during the two six-year periods of 1972-78 and 1984-90, whereas there is a notable closing of the gap during the period from 1981 to 1984. If 1984

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<sup>8</sup> In this brief presentation of the study results, in which the illustrative purpose of the methodology is prevalent, the analysis will be carried out on the variations observed during the whole period. The research period however was further divided into six three-year sub-periods. The regional or product shares used during the course of the work were calculated on the three-year averages of production and of the use of the factors of production, centred on the indicated year. These are expressed in thousandths. The analysis was carried out per geographical area and per region: North-East (Valle d'Aosta, Piedmont, Lombardy, Liguria), North-East (Trentino, Friuli, Veneto, Emilia-Romagna), Centre (Toscany, Marche, Umbria, Latium), South (Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicily, Sardinia). All of the data are taken from Istat sources.

<sup>9</sup> The area of the traditional breeding takes in both rotated and permanent fodder. The latter were made homogenous to the former by means of a standardization which was carried out region by region on the basis of average yields.

<sup>10</sup> Due to lack of specific statistical information, neither fixed capital nor self-employment, that is, the two aggregates which constitute the most important shares of the fixed factors, were included in the factors of production. Therefore, from here onwards, reference will be made to variable factors only.

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is considered to be the turning point year of the CAP, this is in no way comforting. The North-South gap in Italian agriculture is not compensated but rather widened, even if, considering the whole period, the loss of weight in the Mezzogiorno is less severe.

The combined examination of figures 4 and 5 shows us the determinants of the above results. First of all, we notice how the agriculture of the North-East tends to be both high-competitive and modern-intensive, since its performance is pulled up by prices and by yields, while the reduction of land is particularly high. Also the South, which is placed in the market-oriented quadrant, as regards prices, shows to be in a good position compared to the rest of the country, but where quantity is concerned it is undoubtedly in difficulty, caused in particular by the increase in the technological gap expressed as slackening dynamics of yields<sup>11</sup>. The traditional-competitive position of the South indicates that the loss in position could be greater if it hadn't been compensated by the high area-effect (less loss in land).

The Centre and the North-West are together in the same quadrants: production-oriented and modern-intensive. These two geographical areas are in fact penalised on the market and in the use of land while the yield-effect is positive. However, while the North-West reaches an overall global result, the Centre loses a little weight.

The efficiency variations sheet of the use of factors of production, in figure 6, shows a somewhat unexpected situation compared with what has been observed up until now as far as production is concerned. The two geographical areas of the North are characterised by an overall positive result (saving in expenditure) determined by the quantity-oriented tendency: lower prices and higher quantities of input. On the contrary, the Centre and especially the South demonstrate relatively increasing expenditure and a behaviour which tends towards technical efficiency.

The overall effect of the variations on input (VIN) and on output (VOUT) is shown in figure 7. In the first quadrant, where both the two geographical areas of the North are to be found, we can see contemporarily a relative growth in the product share and a decrease in the share of variable factors used<sup>12</sup>. The South is to be found in the third quadrant, showing that agriculture in the South is characterised by an overall relative loss

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<sup>11</sup> The analysis per subperiod shows that the yield-effect was particularly adverse in the South and that the worst performance was reached during the last three year period considered, that is 1987-90.

<sup>12</sup> One can see that the axis of the coordinates was appropriately inverted: the negative values appear on the upper part, corresponding to greater savings in expenditure.

in productivity. This is due to the simultaneity of the two above-mentioned negative effects: the increase in expenditure on variable output is principally due to higher prices; the long-awaited higher technical efficiency is in fact dissipated, at least in the light of the negative results quoted in terms of unitary yields.

What we have seen up until now, allows us to sketch quite a clear picture of the redistributive effects on the large geographical areas of Italian agriculture over the long period of eighteen years. Despite this, within the geographical areas, the performance of the single areas appears so differentiated that it is difficult to find some sort of regularity. Figure 8 attempts to display the values of  $IP_1$  and the relative variations in output and input contemporarily. It is difficult to find neighbouring regions with comparable results: each region is a separate regional model. If however, the analysis is shifted and the long-term movements are divided into three year components, each region shows a particular course whose determinants may be analysed on examining, product by product, the contribution to overall variations in output and by examining, factor by factor, the contribution to overall variations in input. This type of analysis goes beyond the objectives and limits of this study<sup>13</sup>. However, here, what may be interesting would be to attempt to redefine the similarities in the evolutive paths between the regions<sup>14</sup>.

Taking figures 4 and 7 together, but concentrating in particular on the latter, roughly two groups of regions may be easily identified in the North. On the one hand Lombardy, Trentino A.A. and Emilia-Romagna prove to be the most dynamic component due to an agriculture which is directed towards an expansion based on quantities produced in the case of Trentino and Lombardy and to the control of costs in the case of Emilia-Romagna and Lombardy<sup>15</sup>. On the other hand, Veneto and Liguria lose weight. However, the particular circumstances of these two regions at the beginning of the study period must be taken into consideration: since 1972 the first one was characterised by a particularly developed agriculture, while in the second, a process of rapid concentration mainly on the

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<sup>13</sup> In the work of Bartola et al. which was mentioned in footnote 1, this was applied to the study of the Marche regions's agriculture.

<sup>14</sup> A detailed analysis of the territorial dynamics carried out also at provincial level, even if with the use of different methodologies during different time periods, may be found in the Guglielmo Tagliacarne Institute "Divari territoriali dello sviluppo agricolo nel decennio 1980-1990" *Territorial gaps in agricultural development during the ten year period from 1980 to 1990*, Franco Angeli, Milano, 1994.

<sup>15</sup> The increase in quantities is motivated in a different way: in Lombardy and Trentino the yield-effect is prevalent, in Piedmont it is the area-effect. Trentino, which is the region which shows most progress, also shows in fact a good market capacity.

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flower-growing productions of the Riviera del Ponente (Western coast) had been put into practice<sup>16</sup>. In the North the use of variable factors generally grew in quantity. This increase, in the case of Piedmont and Friuli substantially compensated the rise in products.

The negative area-effect was a constant in the Centre of Italy. This may surely be linked with the disappearance of share-cropping<sup>17</sup>, with the abandonment of the most unworkable land in the Apennines and with the diffuse characteristic development of the typical industrial and tertiary activities which created a certain pressure to use the land for different activities other than for agriculture. Tuscany and Latium present the worst results: the reason in the former region being that of a bad yield-effect and in the latter because the increase in quantity and value of variable input, that is associated with a good yield-effect, corresponds to a very low competitive capacity.

Finally, the South shows the greatest heterogeneity. Practically all of the quadrants on the competitiveness sheet are occupied and even neighbouring regions present overall opposite results. On the one hand we consider the cases of Puglia and Sicily and those of Calabria, Campania, and Sardinia on the other. The former ones are some of the most dynamic Italian zones due to the excellent quantity and market performance in the case of Puglia and the considerable reduction in expenditure in the case of Sicily; the others, especially Campania, on the contrary, is one of those which is in most difficulty. Even in the diversity of results there is a constant which characterises all of the Southern zones: none of them, except Molise, show a positive yield-effect, therefore the quantitative results are determined alone by the variations in area. This aspect may be considered particularly significant because it indicates a difficulty, in all of the areas, to compete with the rest of the Country in terms of modernisation of production systems<sup>18</sup>. On looking at the results from the point of view of factors of production, first of all we notice that all of the quadrants on the graph are occupied and how, compared with the results of production performance, some regions find themselves in surprising positions. In particular, Puglia, which is the region that shows the best overall results, is also the region that shows itself to be most efficient as far as factors are concerned. On the contrary,

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<sup>16</sup> Of all of the regions of the North, it is Veneto which has the most disappointing results due both to the loss of market position and to a major loss in agricultural land.

<sup>17</sup> Share-cropping was typically to be found in the Marche, Tuscany and Umbria regions.

<sup>18</sup> Moreover, one must consider beforehand that the regions characterised by great technological and structural backwardness should benefit more as far as yield-effect is concerned, since they could emulate the most advanced ones.

Campania unites the worst results with the worst expenditure dynamics, especially because of the input prices. The case of Calabria however is coherent with the expectations: output and input seem to move in the same direction, even if in quantitatively different measures.

The variety of behaviours in the Southern regions is shown in figure 7 where the extreme cases of Puglia and Campania (and even the single cases of the other regions) indicate how the Southern question is presented in a differentiated way and the existence of regional experiences which are rewarded by success thus making the comparison with the evident phenomenon of overall backwardness even more striking, particularly in some regions.

As has already been underlined, industrial breeding was excluded from the analysis carried out up to this point. Its presence would have partially modified the judgement that has already been forwarded. In particular, it would have appeared that the regions of the North had benefited more compared to those regions of the Centre-South. The first group, with the exception of Emilia-Romagna, are generally characterised by a positive quantity effect and the second are characterised by a positive price-effect which nevertheless does not compensate the decrease of share in quantity terms. The case of Sicily is particularly negative.

#### ***4. The evolution of Italian agricultural products***

By using a different approach to that used for regional analysis, the research may be directed towards the study of the performance of different agricultural products. For this purpose figures 9 and 10 were prepared which allow us to examine how two different categories of products are easily identifiable from the competitiveness point of view.

On the one hand there are the basically capital-intensive and labour-saving activities (industrial crops, industrial breeding and cereals) which are characterised by good quantitative performances and by prices which tend to drop either because of the trend towards product standardisation of cereals and industrial crops, and for the reduction in EEC protection especially after 1984. What is particularly evident is that there is vast improvement in industrial crops, especially after 1984, because of the large increase in the areas.

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On the other hand there are the basically labour-intensive crops and those of Mediterranean agriculture (fruit and vegetables, wine, olive oil) which have lost weight in quantity terms mainly due to the relative loss in yield. In the case of wine in particular, there is also a relative loss in area due to the profound restructuration which was in process during these years to keep the productions under control so as to improve the qualitative content. The price-effects are in fact positive but not enough, and this is where the problem lies, to cause an increase in the relative weight of these product in national agriculture. Obviously this is also the effect of insufficient market capacity on Italian agriculture and especially the insufficiency to improve its typical and qualitatively more interesting products<sup>19</sup>.

The traditional breeding products (mainly bovine) are characterised by a positive price-effect, even if low, while, especially after 1984, there was a tendency towards a fall in quantity. The first effect is no doubt due to Community protection on milk and meat, which anyway, compared with other products, would seem not to have favoured in particular the breeding farms. The loss in position as far as quantity is concerned is linked with the Community measures to control the supply. Nevertheless it is interesting to notice how the change in livestock diets has determined a remarkable decrease in the areas compensated however by an equally consistent increase in yield. From the factors side (figure 11), it is important to notice that, for various inputs, the expenditure share variation is determined by rather different behaviours. In particular, it shows the dynamics of paid labour, which is characterised by quite a positive price-effect, this being cancelled, by the quantity-effect which acts in the opposite direction. It is important to point out the considerable quantitative increase in the use of fodder, favoured by an obviously negative price-effect. The increase in the use of fodder partly causes the decrease in areas where fodder products are cultivated. Seeds, pesticides, and fertilisers show similar behaviour differing however in the slight increase in quantity balanced by a very slightly negative price-effect.

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<sup>19</sup> One must keep in mind that even if the different agricultural products considered in this work are present in all of the Country (except olive trees), the typically mediterranean crops are nevertheless characteristic of Southern agriculture and at the same time of the more labour-intensive exploitations characterised by family farm management.

### 5. *Some concluding remarks*

Even if carried out at a general level, this study of the Italian agricultural situation has produced results of some interest. The difficulty of restoring the regional performances to a common model of behaviour is an often underrated characteristic of our country, which especially abroad, is unknown. On the contrary, this is an Italian uniqueness which would have been more evident if it had been possible to extend the analysis to a more disaggregated territory. As some recent studies have shown, both the natural (territorial, climatic etc.) and social-economic regional diversification in Europe are notably less important<sup>20</sup>.

Regional diversity, on the other hand, is not to be considered a priori as a limitation; it becomes one especially if one expects to restrict agricultural variety pushing local agricultural systems and mass, standardised markets to compete with each other and if the agricultural policies provide undifferentiated support and consequently are not adapted to local features. Instead, diversity may be considered a resource. The key to success, which has already led to improved results in these past years in many Italian regions-including the Southern ones- , is to be found in the proven capacity to exploit, via suitable public and private choices, local peculiarities and the integration between agriculture, the other economic sectors, territory and environment.

For this reason Italian agriculture needs a regional policy and a rural development policy. The choices of the European Union regarding these two guidelines, in this light, appear to be of particular importance for our Country. The major problems unfortunately are still to be found at national level.

Despite the founding of the Regional institutions since 1970, decentralisation of the agrarian policy still has to be carried out; on the other hand the Regional institutions themselves, quite often, behaved in turn as having centralised authority. At the same time, the agricultural policy is still kept isolated, as happened recently, following the abolition by referendum vote of the Ministry for Agriculture and the founding of the Ministry of

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<sup>20</sup>In various recent experiences, of which some are still in course, directed at clustering together European regions on the basis of different sets of structural variables and on agricultural economic performance, there is a common element to be found. While the agricultures of the other European Countries, even the larger ones, tend to be concentrated in only a few clusters, the Italian regions belong to almost all of the main European typologies. See for example: A.Bartola, F.Sotte, S.Sorci, "Un'analisi regionale dell'agricoltura nella CEE" (*A regional analysis of EEC agriculture*), *Rivista di Politica Agraria*, n.3 1993.

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Agricultural Food resources and Forestry which integrated agriculture into the agribusiness, but however in this way it lost the opportunity to attribute a sole authority with the competence involving rural development. Obviously, however, these conclusions require further in-depth study.

Passing now to evaluate the methodology applied, above all it is important to underline its flexibility which allows to break down and to study thoroughly the analysis relating to both the spatial and time comparison. Within the limits of this paper, it has been only partially possible to present the potentiality of differential analysis as a supply of quantitative elements in order to interpret the evolution of local agricultural systems. As already mentioned, this paper refers to both the long-term and short-term variations in single productions and in single factors of production within each region. The interpretative picture may be enriched and in fact the conclusions are fruit of in-depth studies, all of which have not been carried further in these pages.

In addition, behavioural differences over time and space may be considered either via simple observations as well as via the use of the results of differential analysis as summary data to carry out further quantitative analysis: for example with the use of suitable statistical-econometric instruments in order to test the existence of cause and effect relationships between the dynamics of agriculture and practiced agricultural policies, the performance of the other economic sectors and the relationship between agriculture, territory and environment. Obviously the extension of the analytical objectives clashes with the availability of necessary information, but this is a problem which is common to all regional analysis and, in fact, it was precisely this limitation which prevented us from carrying out an analogous research on the regions of all of Europe.

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