REGIONAL DIVERSITY IN THE FRUIT SECTOR IN THE EUROPEAN UNION

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1. Introduction

This paper examines the diversity of the fruit and citrus oriented farms in the European Union (EU).

Fruit production is widely spread through the EU and is particularly important within the South of the EU (CEC, 1994: 71)[1]. The study of the CEC (CEC, 1993: 116-123) showed that income of the permanent crops oriented farms, which include fruit oriented farms, are among the lowest farm incomes in the EU and show a declining trend in their relative position among other types of farming in the EU. EUROSTAT data show that Italy, France, Spain and Germany are the most important producers of fruits in the EU in absolute terms.

There are big differences in the agriculture sector of the EU according to geographical areas. In spite of the long prevailing CAP, disparities in farm income between countries are greater than differences in income for the whole economy (CEC, 1994: 56). These differences are explained by the considerable distortions of competition subsisting in the agricultural common market (Bureau and Butault, 1992). Within each Member State differences between regions are also very pronounced. The CEC (1985) found that the "region" factor is the most pronounced when income disparities between farms in the Community are studied. Considering that regional disparities are complex and interact with many farm and socio-economic factors, we believe that an analysis at a regional level is better than at a country level. An analysis with total country averages would be distorting.

Loyat (1987) and the CEC (1990a) classified farms of the EU according to their financial situation. The use of single-year

data is one of the weaknesses of these studies. A second weakness is that they studied the whole variety of agricultural production of the EU. When the purpose is to analyse the significant regional groups in a particular agricultural production, the inclusion of the whole agricultural production would be misleading. Moreover, Loyat (1987) excluded Greece, Spain and Portugal from his study.

We believe that this study will be interesting for researchers and will provide useful information for policymakers to plann the effects of their policies in different regions of the EU.

2. Methodology

Several variables were used in order to get a complete characterisation of the economic and financial situation of the farms. Factor analysis was performed on these variables. Few factors with eigenvalues greater than 1 were extracted to summarise the information of these variables. Factors with eigenvalues lower than 1 were excluded, because they explain less variation in the overall data than one of the original test scores and is no better than a single variable (Manly, 1994). Principal component analysis was used as the default extraction method in the SPSS 4.0 utilised (Norusis and SPSS, 1990). In order to find more meaningful factors three orthogonal rotations were attempted: varimax, quartimax and equamax.

Factors were used as the classification criteria to perform a cluster analysis. The default average-linkage between-groups method in the SPSS 4.0 was the agglomerative hierarchical clustering method used in our analysis, the most generally used

in cluster analysis (Manly, 1994; Aldenderfer and Blashfield, 1984). Distances were measured, taking the (standardised) values of factors, with the Euclidean distance function:

$$d_{ij} = \sqrt{\sum_{k=1}^{p} (x_{ik} - x_{jk})^2} \qquad (1)$$

where x_{ij} is the value of variable X_k for individual i, x_{jk} is the value of the same variable for individual j and p is the number of the variables. For our purpose variables should be replaced for factors. In spite of the limitations of this measure, it is the most widely used in a clustering context, and when it is calculated with standardised variables, it is far more satisfactory than that calculated from the raw data (Everitt, 1993).

One of the unsolved problems in cluster analysis is to determine how many groups should be considered. In addition to the inspection of the dendogram graphic, a formal procedure approach to the problem is to examine the squared Euclidean distance between clusters at every stage of agglomeration, stopping agglomeration as soon as the increase between two adjacent steps becomes significantly larger (Norusis and SPSS, 1990; Aldenderfer and Blasfield, 1984).

Clusters obtained contain regions with farms of similar characteristics. The mean and standard deviation values of the rotated factor score for every cluster give an interpretation of their characteristics.

3. Data

The farm accountancy data network (FADN) provides the most complete and detailed source of data referring to the financial and economic situation of farms at regional level of the EU.

A full description of FADN procedures and methodology can be found in CEC (1988a, 1988b, 1990b). FADN collects accounting data from individual farms in the EU to assess the situation of the agriculture sector on a microeconomic level. Every farm is classified with a code indicating a type of farming. EUROSTAT (1986) contains the classification schedule for all agricultural production. Some statistical information is usually published with country and type of farming group level. The group labelled "permanent crops" aggregates fruits, olives and combinations of permanent crops[2]. We did not find interesting to study this type of farming group because it includes very heterogeneous productions. More detailed information is only available upon specific request. FADN Division of the General Directorate VI in Brussels generously provided us with accounting data from 1986 to 1994 of the type of farming 32, which includes fruit and citrus oriented farms. We did not consider data from 1992 to 1994, because data of Spanish regions were not available for this period. FADN recorded available data of this type of farming for 41 regions[3] from 1986 to 1991. Data for the last recent members of the EU were not available for the whole period, and they were excluded from our work. However, unlike Spain, the production of fruits is tinny in these countries. Thus, we studied fruit sector in the EU with data of fruit and citrus oriented farms of 41 regions.

4. Variables

Farm performance can be measured in different ways and it is a question of judgement as to whether a farm which is performing well by one criterion and poorly by another is, in fact, a good performer or not (Campbell, 1981). So, various perspectives should be employed in the assessment of farm performance. We considered a wide set of variables in order to get a complete characterisation of the economic and financial situation of the farms. These variables were selected according to those employed in previous studies (Loyat, 1987; CEC, 1990a), to the findings of the study on economic indicators of the CEC (1991), and to data available through by FADN. The resulting twenty indicators of size, efficiency, income, stability, subsidies, debt and investment are shown in table 1. They are defined according to FADN methodology.

As can be seen, several indicators of structural and size characteristics, as well as of income, were used, because different perspectives are necessary to assess the situation of family farms (CEC, 1991).

(Insert table 1 approximately here)

It has been known from many years that single-year data show a marked variability, because farm activity suffers from very pronounced random effects (King, 1927; Milhau, 1961). Research

by Cordts, Deerberg and Hang (1984) and the CEC (1991: 84) found that farm income variability is reasonably reduced when a three-year period is considered. To mitigate the effect of random factors, variables used in our study are the mean values of the observations of the last three available years i.e., 1989, 1990 and 1991.

We considered seven variables representative of structural characteristics, where different measures of size were included. We considered important their inclusion in our study, because Barkaoui, Butault and Rousselle (1991) found that structural factors explained the greatest part of income and economic situation of farms.

Two coefficients of variation were employed to measure the variability of output and income. They were calculated with data from 1986 to 1991. The CEC (1993) found that the variability of these items was important in some countries of the EU (CEC, 1993).

Five different indicators of income, usually applied to the assessment of farm income (CEC, 1991), were selected.

Two measures of efficiency, found useful when looking at farm business (CEC, 1991), were considered.

The amount of subsidies received by farms was also considered, because subsidies are an important share of income in some farms (CEC, 1994).

Finally, currently used indicators of financial status and investment were considered.

Land values were excluded from asset values in order to avoid distortions coming from regional prices and criterions of valuation of land.

5. Findings

Four factors with eigenvalues greater than 1 explain 86.3% of the variation of the twenty original variables considered. The fifth factor has an eigenvalue of 0.63, which is markedly lower than the four factors chosen. A quartimax rotation yielded more meaningful factors than the alternative varimax and equamax rotations. The quartimax rotation of the principal components factor matrix yielded the factor loadings of the original variables shown in table 2. As we can see, all variables have a minimum communality value of 0.64.

(Insert table 2 approximately here)

Factor 1 (size) offers a marked positive relation with all indicators of size, indebtedness and instability of income, together with a negative relation with family farm income to annual work unit and family farm income before interests to total output. High scores in this factor involve big farms with necessity of external capital, land and work, and showing high instability in income. Small family-owned farms will have low scores in this factor. Factor 2 (performance) characterises profitability and productivity of farms, and also the efficiency in the use of their assets. High scores in factor 3 (capital intensiveness) show farms with high endowment of capital per hectare, suffering great instability in production value. Factor

4 (subsidies) characterises the level of subsidies received by farms.

The 41 regions clustered in 7 groups when we stopped the agglomeration procedure after the 35th step. Table 3 shows the regions included in these clusters. Graphic 1 displays a dendogram representation of this agglomeration procedure. To avoid language problems, the regions are listed under their own language names, as is usually done in EUROSTAT and CEC reports. To enhance the interpretation of each cluster, means and standard deviation of every factor for the seven-cluster solution are reported in table 4. Additional information about cost structure of the seven clusters is also displayed in table 5.

(Insert table 3 approximately here)

(Insert graphic 1 approximately here)

Farms of the northern continental regions (cluster 1) are highly performers, big in size and scarcely subsidised. This cluster includes Denmark, Holland, Belgium, two German regions and the North Italian Alto-Adige region. Farms in this cluster are between the most efficient and profitable of the EU, in spite that they receive low subsidies. They are modern farms with medium-size utilised agricultural areas. They have a high economic size because they are very efficiently managed. They

are oriented to quality-based products.

(Insert table 4 approximately here)

(Insert table 5 approximately here)

Almost every Greek, Portuguese, Italian and Spanish regions form cluster 2, that we named Mediterranean regions. All of their factor scores are under the average of the EU, but not markedly different. Their small traditional farms with low performance and capital intensiveness are in a disadvantageous competitive position. They need an intense process of modernisation and restructuring, but their unfavourable leverage effect is a handicap. They suffered high interest rates and lack of credit facilities.

Cluster 3 includes the south-weastern French regions of Aquitaine and Midi-Pyrenees. Its factor scores show big, very subsidised and low-performer farms. Their farmers manage extensive land-use farms. Their high costs, specially financial and rent costs, result in low farm income. These farms are very indebted. Almost a third of their income come from subsidies. Their survival is jeopardised in a context of liberalisation and reduction of subsidies.

Cluster 4 includes the south-eastern French regions of Languedoc-Roussillon, Provence-Alpes-Côte d'Azur and Rhône-Alpes. They consist of high-performer, subsidised and big-sized farms. They got the highest income of the fruit and citrus oriented farms in the EU, together with cluster 1 regions. A shortcoming of these farms is that they depend on subsidies for almost ten percent of their income.

Clusters 5 and 6 correspond to the Italian Val d'Aosta and the Portuguese Açores-Madeira. These are two marginal and atypical regions. They consist of high intensive capital and land-use farms of small size. Performance is markedly low in farms of Açores-Madeira. They are in the most critical situation, because their incomes, the lowest of the EU, consist almost entirely of subsidies.

Cluster 7 corresponds to East Anglia. This cluster contains the biggest average farm size, the lowest performers and the less subsidised relative to their size. Their income and profitability are low and very unstable. They suffer from high specific and external costs. Specific costs are high because these farms are involved in complementary activities of commercialisation and transformation. Their external costs reflect high financial interest rates and big amounts of work employed. The leverage effect is very unfavourable. Usually they also suffer from land rent expenses in order to get big utilised agricultural areas. The traditionally liberalised agriculture sector in the United Kingdom resulted in few big farms. However, their fruit oriented farms are bad performers, get low profits, and more than ten percent of their income come from subsidies.

Table 6 shows that French farms have higher subsidies than farms of other regions, a fact which is also confirmed with FADN data of the following years. When subsidies are excluded from farm income, performance of the Açores-Madeira and south-western French regions decrease substantially. However, there is not a pronounced variation in the overall performance classification, because fruits are between the less subsidized products in the agriculture of the EU. FADN data show that subsidies in fruit oriented farms of the EU are usually less than half of the

subsidies in the average of all orientations. Data of the Commission of the EU show that expenses and loans for fruit and horticulture are a small part of the total outlays of the Guarantee Section of the European Agricultural Guidance and Garantee Fund. They are mainly spent in compensatory payments for prices. The amounts of fruit intervened were low in the period studied, but they increased substantially in the following three years. Consequently, subsidies of fruit oriented farms increased in these years. French fruit oriented farms persistently show greater subsidies than other farms of other regions, in spite that farm output and subsidies fluctuate. One explanation for this fact is that French farms are bigger than farms of the Mediterranean regions. On the other hand, they produce fruits intervened with compensatory payments. Finally, about 50% of the subsidies received by French farms in the period studied were investments grants. French farms benefited from grants of the EU that were complemented by the French Government.

(Insert table 6 approximately here)

Different output mix of fruit farms of different regions is a limited explanation for differences in performance. Table 7 shows production of some important fresh fruits in the EU. France is the main producer of apples, Italy of pears, peaches and nectarines, and Spain of oranges. There are also important regional characteristics that should be considered. Farms of the Mediterranean regions usually have rind fruits in their mix, because they are often the only fruits that are cropped in non-irrigated land. They offer low efficiency and decrease the

average performance of these regions. However, we believe that this is not the most important reason to explain differences in performance between regions. As the CEC (1994) pointed out, farm backwardness can not be considered separately of backwardness in all sectors of the regional and country economy. We could obtain data of fresh fruit oriented farms (type of farming coded 3211 in FADN) for the region of Catalonia. We repeated the statistical procedure adding this data as a new region to the 41 prior regions. The Catalonian farms of this type of farming presented more advantageous factor scores than Catalonian farms of the wider type of farming 32, but both were grouped in the same cluster. These results support the assumption that regional agriculture can not be considered separately of the characteristics of the whole economy in the region.

(Insert table 7 approximately here)

We believe that farm size and productivity are the most important factors influencing performances of different regions. South-western French farms of our study had on average 21.1 hectares of utilised agricultural area in the period studied, while 11.7 the northern continental and 7 the Mediterranean. In the frame of the existing family farm predominance in Western agriculture, large farms allow economies of size due to large-scale production. Larger farms can advantageously adopt technological advances and innovations. Larger size entails better capital and technological endowments, which result in better farm performance and viability. Table 7 shows very pronounced differences between countries in productivity, which reflect both, differences of size and product mix. Differences

in prices, than can be seen in table 7, reflect some factors influencing averages, such as for example different output mix and the fact that in Italy and Spain a small part of farm production is sold through co-operatives. Differences in prices between countries exist, but are lower than those reflected in table 7. This conclusion is suggested by the mitigated differences that can be observed in the prices of "Golden Delicious" published annually by The Commission of the EU. Agricultural fluctuations should also be taken into account. For example, Holland offered exceptional low prices in 1994.

Cluster procedure was also repeated excluding the atypical and small regions of Val d'Aosta, Açores e da Madeira and Hamburg. The remaining regions grouped essentially in the same clusters of the first agglomeration procedure, revealing that no distortions were introduced either with the inclusion of these small and atypical regions. Taking this into account, we preferred to maintain all regions provided by FADN and show full results for them.

6. Conclusions and discussion

Fruit and citrus oriented farms play an important role in the Mediterranean regions of the EU.

Based on data prior to the CAP reform and the Uruguay round of the General Agreement on Tarifs and Trade (GATT), our study revealed seven differentiated clusters in the EU.

The fruit and citrus oriented farms of almost all Greek, Portuguese, Italian and Spanish regions have similar

characteristics and problems. This is the cluster with the most number of regions. The social impact of fruit and citrus oriented farms in these countries, especially in some regions, is great. These farms show an unfavourable situation in the frame of an environment of agricultural liberalisation. They need an intensive process of modernisation and restructuring, which entails serious social consequences. In fact, this process is already going on. They have no credit facilities to afford this process. Farms of Val d'Aosta and Açores-Madeira respectively, are in a less favourable position, but their importance and incidence are smaller. The farms of the East Anglia region have the biggest size and get low performance. The French south-western regions form another cluster. Their extensive, inefficient and indebted fruit farms obtain low incomes depending for one third on subsidies. They seem to have no good perspectives in the new environment.

Two clusters are clearly the best performers and seem to have good perspectives. On the one hand, we found the French south-eastern regions. They have the weakness of their dependence on subsidies and of their high indebtedness. On the other hand, northern continental regions corresponding to the efficient, high income and quality-based products of cluster 1, seem to have a better chance.

It will be interesting to compare this scenario with the new situation after 2000, when the cuts in tariff schedules agreed in the GATT Uruguay round should be accomplished, to test the real consequences of the agricultural policies in the EU.

In spite of regional diversity, a cut off North/South, not perfectly defined, exists. But perhaps a more clear division core/periphery, as stated in CEC (1990a), should be outlined.

Some recommendations for policymakers can be deduced from our analysis.

In the pursuit of greater efficiency and effectiveness of public spending we would argue that the groups of regions outlined in this article represents a workable framework for the targeting policies. The variety of situations found in our study shows that different policies are needed.

Some regions, such as Mediterranean and Val d'Aosta, need measures of reinforcing the restructuring process now in progress in order to get more competitive sizes for their farms. This implies policies for regional development that exceed agriculture limits. Nevertheless, measures such as reinforcement of pre-retirement, investment encouragement and financial support to improve the competitive dimension of farms would be desirable.

Support to alleviate financial burdens, cost related to employees and land disposal would be needed for French south-western regions and England East. Temporary measures focused on debts and its correlated costs would be especially necessary in French south-western regions.

No more than the gradual process of dismantling of the protection now going on seems to be necessary for French south-eastern and northern continental regions. Support to develop marketing and its correlate strategies in these regions would generate spillovers useful for the whole sector of the EU.

Finally, it should be assumed that regional backwardness in agriculture is usually coupled with backwardness in all sectors of the regional economy, which implies that agricultural policies should also be reinforced with general economic policies, specially when less favoured regions are concerned.

Notes

[1] We will employ the abbreviation CEC to designate the Commission of the European Communities, and OOPEC for the Office for Official Publications of the European Communities.

[2] They correspond to types of farming 32, 33 and 34 respectively.

[3] Belgium, Denmark and Holland are recorded as a single region.

References

Aldenderfer, M.S. and Blashfield, R.K. (1984). *Cluster Analysis,* Newbury Park: Sage.

Barkaoui, A., Butault, J.P. and Rousselle, J.M. (1991). 80% de la dispersion des revenus expliqués par les facteurs structurels. *Agreste-Cahiers* 8: 23-30.

Bureau, J.C. and Butault, J.P. (1992). Productivity Gaps, Price Adventages and Competitiveness in E.C. Agriculture. *European Review of Agricultural Economics* 19(1): 25-48.

Campbell, D. (1981). Some Issues in the Assessment of Farm Performance. *Quarterly Review of the Rural Economy* 3(1): 47-57.

Commission of the European Communities (1985). Income Disparities in Agriculture in the Community. *Green Europe* 208: 1-16.

_____(1988a). *Red de información contable agrícola. Recopilación de: reglamentos, disposiciones de aplicación, informaciones. Fascículo III: la ficha de explotación*, Luxembourg: OOPEC.

_____(1988b). *Définition des variables utilisées dans la présentation des résultats standards du RICA (niveau 1 et 2) RI/CC 882 rev. 3*, Brussels: Comite Communautaire du Reseau d'Information Comptable Agricole.

_____(1990a). *Une analyse financière des entreprises agricoles dans la Communnauté Européenne*, Luxembourg: OOPEC.

_____(1990b). *Red de información contable agrícola. Vademécum de metodología*, Luxembourg: OOPEC.

_____(1991). *The Calculation of Economic Indicators Making use of RICA (FADN) Accountancy Data*, Luxembourg: OOPEC.

_____(1993). *Farm Incomes in the European Community in the*

1980s, Luxembourg: OOPEC.

_____(1994). *The Agricultural Income Situation in Less Favoured Areas of the EC*, Luxemburg: OOPEC.

Cordts, W., Deerberg, K.H. and Hanf, C.H. (1984). Analysis of the Intrasectorial Income Differences in West German Agriculture. *European Review of Agricultural Economics* 11(3): 323-342.

Eurostat (1986). *Structures des exploitations. Méthodologie des enquêtes communautaires, Thème 5, Série E*, Luxemburg: OOPEC.

Everitt, B.S. (1993). *Cluster Analysis*, London: Edward Arnold.

King, J.S. (1927). *Cost accounting applied to agriculture as an aid to more productive farming*, London: Oxford University Press.

Loyat, J. (1987). La structure financière des exploitations agricoles dans les pays de la CEE. *Économie Rurale* 181: 73-79.

Manly, B.F.J. (1994). *Multivariate Statistical Methods a Primer*, London: Chapman & Hall.

Milhau, J. (1961). *Tratado de economía agrícola. Tomo I: los mercados agrícolas y la teoría económica*, Barcelona: Bosch Casa Editorial.

Norusis, M.J. and SPSS Inc. (1990). *SPSS/PC+ Statistics 4.0 for the IBM PC/XT/AT and PS/2*, Chicago: SPSS Inc.

Table 1. *List of the original variables used for factor analysis and their labels*

Indicators of size and structure:	
ESU	Economic size (in European size units)
UAA	Utilised agricultural area
AWU	Labour inputs (in annual work units)
FWU_AWU	Family work units to annual work units
TO$	Total output
A_L	Total assets less land value
Indicators of efficiency:	
TO_UAA	Total output to utilised agricultural area
TO_TA	Total output to total assets
Indicators of stability:	
STABTO7Y	Total output stability index (coefficient of variation of total output from 1986 to 1991)
STABFFI7	Family farm income stability index (coefficient of variation of total output from 1986 to 1991)
Indicators of income:	
FFI	Family farm income
FFI_FWU	Family farm income to family work unit
FNVA_AWU	Farm net value added to annual work unit
FFI_NW	Percent of family farm income to net worth
FFIBINT_	Percent of family farm income before interests to total output
Indicators of the level of subsidies:	
TOTSUB	Amount of total subsidies received
Indicators of financial status:	
INDEBTED	Debt to assets ratio (in percentage)
@RENT_IN	Percent of rent and financial charges to gross margin
Indicators of investment and capital intensiveness:	
INVR	Investment rate (Percent of gross investment to total assets)
@TA_L_U	Total assets less land value to utilised agricultural area

Notes:

Money values in ECU

Variables follow FADN methodology

Table 2. *Quartimax rotated factor matrix of the fruit sector in the European Union*

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Communality
ESU	.89074	.28901	-.08985	-.14214	.90522
UAA	.89572	-.07689	-.21808	.01428	.85600
AWU	.88835	.25812	-.04726	-.04310	.85989
FWU_AWU	-.76572	-.20246	.03943	-.10714	.64035
TO$	.84661	.50697	.02387	-.10024	.98439
A_L	.89268	.31657	.17529	-.14272	.94818
TO_UAA	.22748	.74500	.45107	-.20240	.85121
STABTO7Y	.02838	-.03883	.92661	.08772	.86862
STABFFI7	.79191	-.14767	.44415	-.17899	.87823
FFI	.38204	.89041	.03193	-.06509	.94404
FFI_FWU	.33751	.89566	.01089	-.09389	.92505
FNVA_AWU	.42846	.86113	.01135	-.10357	.93598
FFI_NW	.16647	.85405	-.09576	.33416	.87795
TO_TA	.58852	.61321	-.04896	.43802	.91664
FFIBINT_	-.78038	.31891	-.23917	-.14776	.78973
TOTSUB	.49798	.00890	-.06136	.78738	.87180
INDEBTED	.71314	.48102	-.01161	.41329	.91090
@RENT_IN	.80079	.17744	-.06559	.23968	.73450
INVR	.50239	.49978	.00579	.39507	.65829
@TA_L__U	.00874	.17920	.92810	-.10990	.90563
Eigenvalue	10.54204	3.07651	2.38340	1.26062	
Variation (percent)	52.7	15.4	11.9	6.3	
Cumulated variation	52.7	68.1	80.0	86.3	
Factor name	Size	Capital intensiveness			
		Performance		Subsidies	

Note: All coefficients of the variables in the factors with values over |0.6| are underlined.

Table 3. *Detail of clusters obtained after the 35th step in the agglomeration procedure*

Cluster 1: North continental
- Denmark
- Holland
- Niedersachsen
- Hamburg
- Belgium
- Alto-Adige

Cluster 2: Mediterranean regions
- Ipiros Peloponnissos
- Sterea Ellas Nissi
- Makedonia Thraki
- Basilicata
- Thessalia
- Puglia
- Abruzzo
- Sardegna
- Campania
- Sicilia
- Calabria
- C. Valenciana
- Andalucía
- Lombardia
- Lazio
- Piemonte
- Veneto
- Emilia R.
- Trentino
- Aragón
- Baleares
- Catalunya
- Toscana
- Tro-Os-Montes e da Beira
- Alentejo e do Algarve
- Entre Douro e Minho
- Ribatejo-Oeste

Cluster 3: France South-West
- Aquitaine
- Midi-Pyrenees

Cluster 4: France South-East
- Languedoc-Roussillon
- Provence-Alpes-Cote d'Azur
- Rhone-Alpes

Cluster 5:
- V. D'Aosta

Cluster 6:
- Açores e da Madeira

Cluster 7:
- England East

Note: Belgium, Denmark and Holland are recorded as a single region.

Table 4. *Factor scores for every cluster of the fruit sector in the European Union*

	CLUS7						
	1	2	3	4	5	6	7
	North continental	Medite-rranean regions	France South-West	France South-East	Val d'Aosta	Açores Madeira	England East
SIZE							
Mean	.69616	-.47233	1.89533	.73551	-.50090	-.52431	4.07617
Standard Deviation	.61265	.37396	.34725	.24901	.	.	.
PERFORMANCE							
Mean	1.49116	-.33085	-.69946	1.52129	-.34956	-.86742	-1.63115
Standard Deviation	.84415	.56064	.30823	.70447	.	.	.
CAPITAL INTENSIVENESS							
Mean	.23973	-.29395	-.03609	-.03182	5.03195	2.36952	-.44158
Standard Deviation	.39533	.46832	.60382	.12670	.	.	.
SUBSIDIES							
Mean	-.84238	-.07560	2.26967	1.69325	-.22491	.38342	-2.60644
Standard Deviation	.26837	.60505	.17379	.45413	.	.	.

Note: underlined |mean values| ≥ 0.5 (they were found to significant differences at 5% confidence level with Scheffe test.

Table 5. *Leverage effect and cost structure (in percent of the total output) for every cluster in the European Union. Mean values for the period 1989-1991.*

	CLUS7							TOTAL
	1	2	3	4	5	6	7	
	North continental	Medite-rranean regions	France South-West	France South-East	Val d'Aosta	Açores Madeira	England East	
Leverage effect								
Mean	1.15	.99	1.97	1.39	1.00	1.00	.53	1.08
Standard Deviation	.10	.03	1.09	.13	.	.	.	.30
Specific costs								
Mean	15.8	14.5	17.1	14.9	18.9	18.4	30.6	15.5
Standard Deviation	3.7	4.0	7.1	1.3	.	.	.	4.5
Overhead costs								
Mean	17.2	11.5	25.3	19.7	6.6	11.1	17.7	13.6
Standard Deviation	5.6	4.1	1.5	2.1	.	.	.	5.5
Depreciation								
Mean	12.5	17.3	16.1	11.1	31.0	18.5	11.3	16.4
Standard Deviation	3.5	6.5	3.3	1.7	.	.	.	6.3
External costs								
Mean	16.0	11.6	28.5	20.4	4.9	29.4	34.8	14.6
Standard Deviation	1.5	5.7	.2	1.8	.	.	.	7.5
Tax balance								
Mean	.8	1.2	3.4	1.3		.1	.8	1.2
Standard Deviation	.9	1.1	1.1	.4	.	.	.	1.1
Subsidies								
Mean	-.5	-5.4	-5.5	-3.3	-.5	-16.6	-1.0	-4.5
Standard Deviation	.3	5.8	1.0	.6	.	.	.	5.4

Note: these variables are not included in the factor analysis
Source: FADN

Table 6: *Income and subsidies for every cluster in the European Union. Mean values for the period 1989-1991.*

Farm average (in Ecu)	North continental	Mediterranean regions	France South-West	France South-East	Val d'Aosta	Açores Madeira	England East
Family Farm Income	39141	8584	12812	35729	8684	1779	9815
Family Farm Income to Family Work Unit	26286	7601	8356	24388	7209	1995	8991
Subsidies received	476	719	4158	2985	182	1174	1245
Family Farm Income less subsidies	38665	7865	8654	32744	8502	605	8570
Family Farm Income less subsidies to Family Work Unit	25810	6882	4198	21403	7027	821	7746

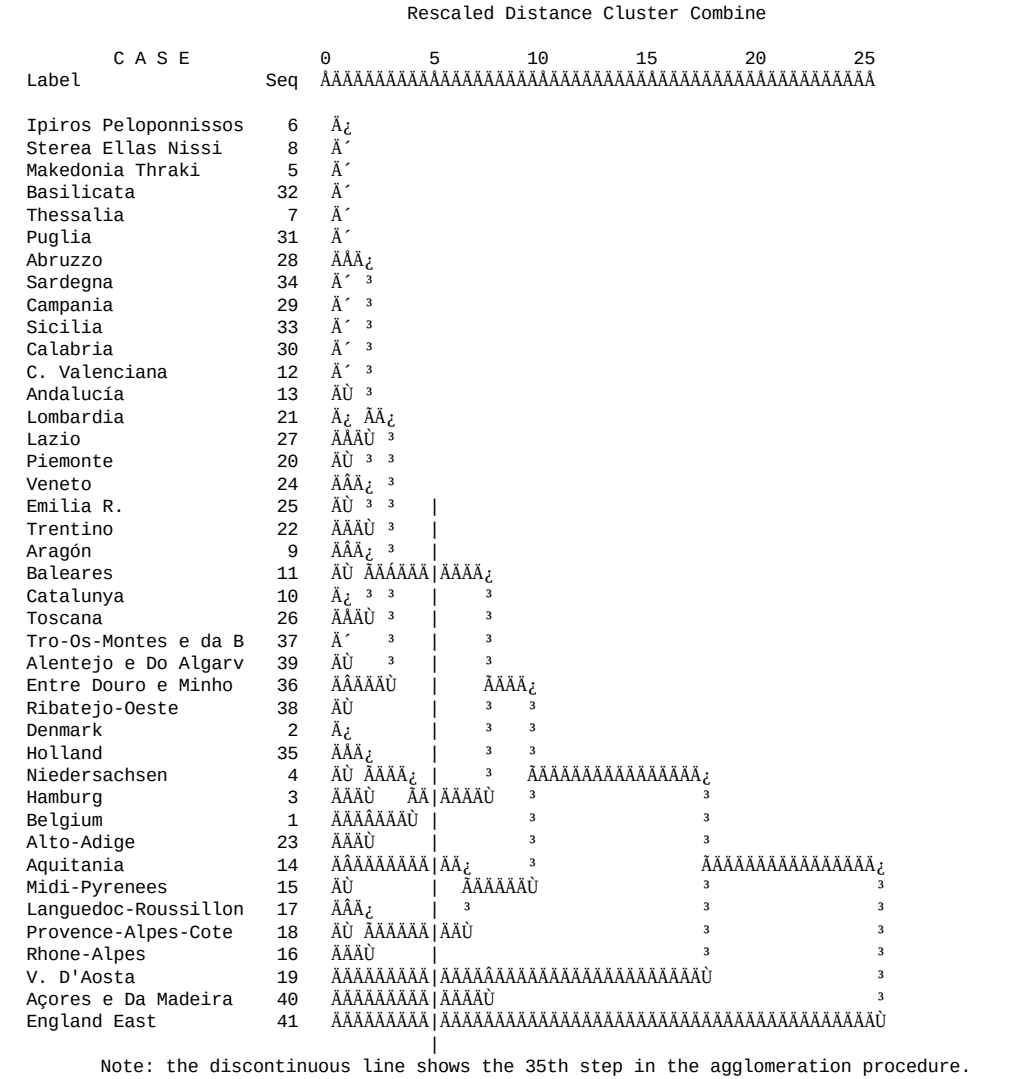
Source: FADN

Table 7. *Fruit and citrus production in the European Union in 1994*

	Apples				Pears				Peaches and nectarines			Oranges			
	Production		Productivity	Selling prices	Production		Productivity	Selling prices	Production		Productivity	Production		Productivity	Selling prices
	1000 Tones	%	100 kg/ha.	Ecu/100 kg	1000 Tones	%	100 kg/ha.	Ecu/100 kg	1000 Tones	%	100 kg/ha.	1000 Tones	%	100 kg/ha.	Ecu/100 kg
Belgium	502	5.4	551	29.48	154	5.7	387	38.15							
Denmark(1)	38	0.4	181	38.66	6	0.2	142	40.35							
Germany	2007	21.7	563	36.11	362	13.4	1818	45.26	20	0.5	1148				
Greece(1)	318	3.4	208	33.58	73	2.7	190	52.8	1127	25.6	230	875	15.5		26.95
Spain(1)	747	8.1	184	30.24	543	20.1	126	29.32	865	19.6	113	2698	47.9	198	18.08
France	2166	23.5	308	45.88	343	12.7	223	49.07	517	11.7	148	1	0.0	150	
Ireland(1)	9	0.1	80			0.0									
Italy	2228	24.1	291	29.34	910	33.7	173	40.56	1786	40.5	158	1871	33.2	158	26.2
Luxembourg(1)	6	0.1	506			0.0									
Holland	675	7.3	410	27.34	165	6.1	288	37.99							
Portugal	208	2.3	85	41.59	115	4.3	87	34.59	91	2.1	65	189	3.4	94	30.97
United Kingdom	332	3.6	174	57.66	28	1.0	77	56.3							
UE 12	9236	100.0			2699	100.0			4406	100.0		5634	100.0	5634	
Austria	334		526	40.33	82				11		193				
Finland	2		33	116.30											
Sweden(2)	18		96		3		105								

1 Data of productivity are referred to 1993
2 Every data are referred to 1993
Source: EUROSTAT and CEC

Graphic 1. *Dendogram using average linkage (between groups)*



Note: the discontinuous line shows the 35th step in the agglomeration procedure.