

THE FARM SIZE, THE USE OF THE RESOURCES FOR AGRICULTURAL PRODUCTION AND THE IMPORTANCE OF THEM TO THE REGIONAL DEVELOPMENT IN GREECE IN 1981

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Abstract

The agriculture in Greece was and continues to be an important economic and social sector. This paper examines the basic role of agriculture in the regional economic development in Greece through the use of principal component analysis (PCA) and the SPSS package. Determinants of the differential development rates of the regions and provinces (nomos in Greece) are identified. The basic variables such as per capita output, output per hectare, farm labour size, rented land, farm size inequality etc. and the components such as productivity of the farm, inequality degree of trading that influences the RED in the regions and provinces (nomos in Greek) are analysed. The results indicate that where the agricultural farms are operated in the traditional family way without dynamic cultivations or cattle-breeding, they are in a disadvantageous position with respect to those regions and nomos where the agricultural farms are operated in an enterprising way, high degree of trading, modern technology, dynamic cultivations and good organization. In the regions and nomos with traditional agriculture, the structure in general is low and the rate of development is low also, where the more modern regions have a better structure, the rate of development is good, the per capita regional income is high and other economic and social indexes are also high.

1. Introduction

Greece is a regional country of the European Economic Community (EEC) with special problems (Manolopoulos 1983,1992, 1990 Report). Greece has the lowest per capita income and the highest percentage of occupation in the original sector (Agriculture, forestry, fishery) than the other countries. The labour force in the original sector is 1.037.000 or 28,9% of the total labour force (1) (EEC, Report 1986). In 1983 according to the same report Greece had farms with the smallest average physical size, equal to 4.1 hectares.

Agricultural participation in the Gross National product (GNP) was 16,8% in 1984, which was the highest in the EEC. Yet in 1985 Greece had the highest percentage of participation in Agricultural product of the total exports (29%) (Manolopoulos 1983,1992 EEC report, Markogiannakis 1986).

Consequently, the importance of Agriculture in the development of Greece is obvious and in the future. Agriculture will continue to play an important role in the development of Greece.

The role of Agriculture in RED in Greece and the basic factors and variables are examined in this paper. In the first part the historical analysis of Greece after 1821 AD is introduced and the evolution of factors which operated in the historical process and contributed to the Agriculture frame and Regional Economic Development in Greece are examined. Thereafter an empirical analysis is used to examine the relationship between the Agriculture sector and RED by the method of principal component analysis (PCA). (Johnston 1960, Rummel 1974, Harry 1976, Koutsogiannis 1984).

2. Historical-review of agriculture and red in Greece

In 1821 the total Greek population was 3 million according to Zurien (Zographos 1983). At the same time in Greece were living 111.340 Turks. The ratio was 13 3/4 Greeks to every Turk. In 1828 the Greek population was reduced by 28% .From the rest that survived the revolution 400.000 were living in Peloponissos, 172.000 in Evia and Sterea Ellada and 176.6000 in the islands. The freed territory was estimated to be 48.593.000 Stremmata (note: 10 stremmata = 1 hectario), 22.220.000 of which were in Peloponissos, 24.078.000 in Sterea Ellada-Evia and 2.315.000 in the Kyclades. The population density was higher in the islands than in Sterea Ellada. (Peloponissos 22,75 people/km², Sterea Ellada-Evia 11,75 people/km², islands 80,5 people/km²).

After Greece achieved independence in 1828, it attempted to apply the same legal system of Germany and Russia. This brought opposition from the peasants. The prime minister Kapodistrias, could not solve the

problem of the distribution satisfactory of farms that were occupied by Turks, to the Greek people. The farmers were the majority of the population. There were also merchants, shepherds, artists and in the islands sailors. The national farm property was important. Out of 8.541.586 of the total cultivated soil the national land was 70,5% and the rest private. The distribution of the cultivated national land was achieved under the laws (L. 10/2/1832 – L. 24/6/1843 – L. 20/2/1848 – L. 6/10/1856).

The government of Komoundouros introduced some agricultural reforms (L. 25/3/1871). In 1879 there were 254.000 farms that were run by farmer families. In 1881 Thessalia and Ipiros were freed and the National farms increased to 265.000. The average distribution farm size was from 20 to 80 stremmata. In 1909 the military coup in Goudi brought prime minister Eleftherios Venizelos to power. He applied agriculture reforms and distributed large farms (tsiflikia) to those without property. In 1912 the first Agricultural cooperative was established. In 1912 and 1913 the two Balkan wars freed Thessaloniki, Ioannina, Hios, Samos, Mitilini, Crete. Because of the war between Greeks and Turks in 1922, 1.500.000 refugees came from Minor Asia to Greece and the population grew to 6.204.674 in 1928. At the same time the farm land increased. To these refugees 12.000.000 stremmata of earth were distributed. Of those, 6.730.000 were cultivated by 130.000 farm families. The farm land of each family was usually divided and the divisions were separate from each other and therefore mechanisation was difficult and productivity low, while the debt to the Agricultural Bank of Greece was growing. Life in rural regions was bad and the majority of the farmers emigrated abroad, mainly to the U.S.A. (Glytsos 1988, Manolopoulos 1992). The Second World War 1940-1944 had catastrophic consequences for Greece and especially for rural regions. 7% of the Greek population died and agricultural productivity lowered by 70%. Many villages were desolated, navigation was decreased by 70%, means of Communication were almost not existed, coinage was almost totally debased. Help from abroad in the period 1944-46 was 4.600.000 dollars. 4.000.000 \$ of this came from the U.S.A. but only 21% was invested development of the country toward. In the next years, until 1970 the rural population was decreased because of emigration to the urban centres, of Athens and Thessaloniki and also abroad, mainly to West Germany. The city population increased while a small decrease in the small farms and a small increase in the large farms were observed. (National Statistics Service of Greece 1961, 1971, 1981) (NSSG).

3. The role of agriculture to RED

There are nine regions in Greece. These are Sterea Ellada and Evia, Peloponissos, Ionian Islands, Epirus, Thessalia, Macedonia, Thrace, Aegean Islands, Crete. Every region is divided to smaller sub-regions, the provinces (nomos in Greek). Based on this classification the regional development programmes are implemented and collection of valid statistical materials and other information is made. In recent years some regions, i.e. Crete, began to apply the Mediterranean integrated programmes (MIP). The regions have several differences, i.e. per capital income product, and other indexes that determined the rate of development and the conditions of life. (Alonso 1968, Friedman 1966, Hirschmann 1958, Richardson 1972, Myrdal 1957). The first region according to population is Attica where over 1/3 of the total Greek population lives. The Second region is Macedonia and Peloponissos and Thessalia; follows next (National statistic services of Greece, 1961, 1971, 1981) (NSSG). The synthesis of population is different between the regions. Attiki has a mainly urban population, while in Epirus and other regions rural population is dominant. The role of agriculture in regional economic development has a different importance between the regions (Griffin 1974, Mellor 1967, Soonrane 1988, Lapping, Faister 1982, Bachman, Christensen 1967). Agriculture contributed 15,9% to the GNP in 1981. The Eastern part of the Sterea Hellada and Cyclades regions contributed 4,6%, the central and the western part of Macedonia region 20,7%, the Peloponissos, Thessalia and western part of Sterea Hellada regions 31,1%, the eastern part of Macedonia region 32,4%, the Crete 27,7%, the Epirus 24,4%, the Thrace region 36,9% and the Aegean islands region 14,4% (Centre of planning and economic research "KEPE" 1986, NSSG 1961, 1971, 1981). All regions except East Sterea Hellada, Cyclades, central and western Macedonia and the Aegean islands regions have over 50% of their population active in agriculture. The region of Attiki has 60% of the export trade, 47% of the industrial employment, 65% of the services, 85% of the dynamic companies. This centralisation has caused serious problems in the region of Attiki and the rest of the country as well. There is an unbalanced regional economic development. It is a phenomenon that has been explained in analogous conditions and by others researchers (Hart 1977, Lee 1989, Brown, England, Goetz 1989, Brown, Brewer, Boxley, Beale 1982, Dignan, Haynes, Conway, Strestha 1989). This urbanisation mainly in Athens (Attiki) and secondly in Thessaloniki causes other problems, such as unemployment, pollution, traffic, deteriorating life conditions. The other regions and especially the

mountainous and semi-mountainous rural regions lost their precious work force, which could offer to have a balanced development. (Manolopoulos 1985,1992)

4. Empirical analysis

In the following part of this paper the relationship between Agriculture structure and rural economic development is examined. The important variables that contribute to the development of the Greek rural region, i.e. the size distribution of the agricultural farms, the per farm hectare, the per capital output is determined. The differences between the regions are also examined. The method of principal component analysis (PCA, Johnston 1960, Harman 1976, Rummel 1974, Koutsogiannis 1984, Statistical package social sciences programm SPSS) because of the large number of statistical data is applied. The sources of information are the national statistical service of Greece (NSSG), the Agricultural bank of Greece (ABG) and the National Center for programming and research (KEPE 1981). The aforementioned important variables are:

- 1) per capita output, $X_1 = \frac{\text{total agricultural output value}}{\text{farm population number}}$
- 2) output per hectare, $X_2 = \frac{\text{total agricultural output value}}{\text{farm land hectare}}$
- 3) farm output size, $X_3 = \frac{\text{total agricultural output value}}{\text{farm units number}}$
- 4) farm physical size, $X_4 = \frac{\text{farm land hectare}}{\text{farm units number}}$
- 5) farm labour size, $X_5 = \frac{\text{number of farm workers}}{\text{farm units number}}$
- 6) private land, $X_6 = \frac{\text{hectareage of privately owned farm land}}{\text{farm land hectare}}$
- 7) rented land, $X_7 = \frac{\text{hectareage of rented land}}{\text{farm land hectare}}$
- 8) waged labour, $X_8 = \frac{\text{number of waged farm workers}}{\text{number of farm workers}}$
- 9) live stock share, $X_9 = \frac{\text{live stock output value}}{\text{total agricultural output value}}$
- 10) farm size inequality $X_{10} =$ This is the Gini coefficient

Three methodological aspects must be given particular attention. First is the calculation of private and rented land. Private land belongs to physical and legal persons. The majority are physical persons. They do not work their farms for several reasons (age, illness, immigration, preference to have another work in a different field other than agriculture). Contracts are made on the basis of trust bad relationship, friendship, neighborhood etc. and are usually by word of honour rather than legal, written contract. Some times the contract is in writing as an official contract or unofficial agreement. The period under rent differs but usually is from 2-5 years. The reward is in money or in kind (Morts or mesiako) and the rent depends on the fertility of the land, type of cultivation distance from the village or street and whether the farm is plan, mountainous or in-between. The tenants give to the owners part of the product (35%-50%) if the contract is in kind (Manolopoulos 1983, 1985). In cases where the owner is a legal person (public municipality or church) the reward in kind is about 20-25%. The second important aspect is the variable waged labour, X_7 . The calculation was made according to NSSG (table VIII-5). According to this table farm is run by the other owners and other workers. It is assuming that Persons belonging to the same family, who help their farmer father, in several works, i.e. plowing, irrigation, digging, harvesting etc., we assume that are not being paid. It is assumed that of the total number of the seasonal workers in agriculture, half of them work for the entire year and the other half is not employed at all. The third point is the estimation of the farm size inequality. There are several indices, i.e. the Gini coefficient, the Theill index, the standard deviation of logarithms of the land/farms ratio, the coefficient of variation = standard deviation/mean etc.

It is applied the Gini coefficient , G , in the form:

$$G = \frac{E_{\text{Lorenz}}}{\frac{1}{2} 100 \cdot 100} = \frac{E_{\text{Lorenz}}}{5.000}$$

$$\text{and } E_{\text{Lorenz}} = \frac{1}{2} \left[\sum_{i=1}^{k-1} X_i Y_i + 1 - \sum_{i=1}^{k-1} X_i + Y_i \right]$$

where L = number of classes, El = area of lorentz

Xj = distribution of frequencies of the number farms

Yj = distribution of frequencies of the total farm area(hectares)

Table 1 shows the mean and the standard deviation of the ten variables (X1, X2, X3,... X10), while table 2 shows the correlation coefficient of these variables. As it is seen from table 2 there is a high positive conflation between the variables per capita output (X1) and farm output size (X3) and smaller positive correlation between output per hectare (X2) and farm output size (X3). There is a low negative correlation between the variables in the following pairs: per capita output (X1) and live stock share (X9), farm output size (X3) and live stock share (X9), per capita output (X1) and private land (X6), farm output size (X3) and private land (X6), farm physical size (X4) and private land (X6). There is a maximum negative correlation between the variables private land (X5) and rented land (X6). Tables 3 and 4 show the component variance (Eigenvalues) and communalities of the components. As it is seen from tables 3 and 4 the first four components (factors) represented 63.7% of the total variance. The first has eigenvalue (component variance =CV) 3.59031 or 35.9% of the total component variance=TCV. The second has CV=2.20740 or 22% of the TCV. The two first components have 56% of the TCV. The third has CV=1.4161 or 14.2% of the TCV. The sum of the first three components is 72,2% of the TCV. The fourth component has CV 1.15274 or 11.5% of the TCV. The rest six components have CV lower than 5.9% or 16.3% of the TCV.

We applied and combined two tests. The first test is the eigen value test and second is the screen test. Then it is keeping the four first components because according to first test they have eigenvalue larger than one (1) and according to the second test the eigenvalue line tends to become parallel to the horizontal axis (x), as it is seeing from figure 1. Table 5 shows the component loadings. These four components are named respectively:

- 1) Productivity of the farm P1
- 2) Proportion of the rented farm P2
- 3) Inequality degree of trading P3
- 4) Per hectare output farm physical size P4

The four components according of the naming of the variable or variables that have the larger loading in this component are named. Identification of these components requires the examination of their loadings on the original variables (Shown in table 5). As we see, the first component is heavily loaded against the variables: Farm output size (X3), per capita output (X1) and live stock share (X9). The first component is positively correlated with the other variables: Rented land (X7), waged labour (X8), farm labour size (X5), output per hectare (X2) and farm physical size (X4), while it is negatively correlated with the variables private land (X6) and farm size inequality (X10). The second component is heavily loaded against the variables rented land (X7) and private land (X6). This component is positively correlated with the variables:

Farm output size (X3): per .capita output (X1), live stock share (X9), farm size inequality (X10), farm labour size (X5), output per hectare (X2) and farm physical size (X4), while it is negatively correlated with the variables waged labour (X8), private land (X6). The fourth component is heavily loaded against the variables: output per hectare (X2) and farm physical size (X4). This component is positively correlated with the variables: Farm outsize (X3), per capita output (X1), live stock share (X9), private land (X6), farm size inequality (X10) and farm labour size (X5), while it is negatively correlated with the variables: farm physical size (X4), waged labour (X8) and rented land (X7). From table 6 we are calculated the normalized scores on the four main components for each nomos of Greece (see table 7). Then the spatial distribution of the principal component scores (see Maps 1, 2, 3, 4) are analyzed. It becomes evident from table 7 and from the maps 1, 2, 3, 4 that the first component productivity of farms (P1) has the higher scores in nomos Imathia, Larissa, Karditsa, Pella and Biotia, while the lowest scores have the nomos Samos, Thesprotia, Dodekanisos, Hios and Evritania. Larger regions such as Macedonia and Thessalia have the highest scores while the Aegean islands (Dodekanisa, Kyklades, Lesvos, Samos, Hios) and Epirus have the lowest scores. The nomos with the highest scores of P1 principal component have the highest scores in the variables: farm output size (X3) and per capita output (X1), while have a small live stock share (X9) score. On the other side the nomos with lowest principal component scores have the lowest scores in the variables (X1) and (X3), the third variable (X9) is high. The second component (P2) proportion of the rented land has the highest scores in the

nomos Drama, Serres, Kavala, Kozani, Xanthi, while the lowest scores were in the nomos Iraklio, Messinia, Lasithi, Lefkada and Corfu (Kerkyra). Larger region such Macedonia has the highest scores, while the lowest scores the regions of the Ionian islands, the Aegean islands and Crete. The explanation of these results are attributed to the fact that in the aforementioned nomos with the highest scores the cultivation of tobacco, natural or artificially irrigated, covers a high percentage of cultivated land. This fact in combination with the high proportion of immigration to western Europe, the difficulty of an alternative cultivation, the supply of agricultural work by the family members, the structure of agriculture (small and scattered cultivated land) and the high demand for a labour force in the tobacco plants, forces the majority of the agricultural families to rent the area of the agricultural land of their neighbours. The nomos with the lowest scores are characterised by farmers that cultivate agricultural land their own. Additional income come from tourism. Tourism was developed recently in these nomos (mainly islands) and the villagers are employing in services for tourism during the summer period. The third component (P3) iequality degree of trading has the highest scores in the nomos of Halkidiki, Attiki, Biotia, Evia, Larissa, while the lowest scores in the nomos Rodopi, Florina, Evritania, Arkadia. Speaking in larger territories the highest scores belong to the Sterea Ellada and East Thessalia regions, while the lowest scores belong to the east Thraki, central Pelloponissos and west Macedonia regions. In the nomos with the highest scores there are two kinds of owners (dualism). The very few that have large area of agricultural land and the majority that have small and scattered area of agricultural land. The existence of a two sector agriculture has been explained as a result of bimodal strategies of agricultural development (Johnston and Kilby). This is owned to historical and other reasons. In Attiki which is the largest urban center of Greece, cultivation is done by corporations that employ the work force. In the nomos with the lowest scores agriculture continues to operate a high degree in the traditional way and the proportion of working force population in agriculture is high. The fourth component per hectare output-farm physical size (P4) has the highest scores in the nomos Ioannina, Attiki, Preveza, Kavalla, Pella, while the lowest scores in the nomos Grevena, Halkidiki, Arcadia, Kilkis and Evros. The main characteristics of the nomos with the highest scores are cultivations with high productivity per hectare or animal breeding and are well organized. They have fruit trees, wines, poultry farms, cow-farms and pig-farms. The nomos with the lowest scores have traditional agriculture without modern technology and some of these are mountainous and isolated regions. In conclusion, the regions and nomos where the agricultural farms are operated in the traditional family way without dynamic cultivations or cattle breeding are in a disadvantaged position with respect to those regions and nomos where the agricultural farms are operated in an enterprising way with high degree of trading, with modern technology, with dynamic cultivations, with cattle-breeding and good organisation. In the regions with traditional agriculture the structure in general is low and the rate of development is low too, while the more modern regions have a better structure, the development is good, the per capita regional income is higher as well as other economic and social indexes. It is important to apply rural planning in developing countries to be improvement the access of rural populations to a range of urban functions.(Belsky, Rondinelli, Rietveld).

5. Conclusions

1. Agriculture in Greece after 1821 was the main (basic) economic and social sector and farmers were the majority of the population. There were also merchants, shepherds, artists and island sailors. 2. The national land was 70,5% while the private 29,5%. During the years the state made agricultural reforms and distributed large farms (tsiflikia) to these without property. 3. Living conditions in rural regions were bad and the rural population was decreased because of emigration to the urban centers, mainly in Athens, Thessaloniki, abroad mainly to western Europe, USA etc. 4. There are nine geographical and administrative regions in Greece. Every region is divided in smaller subregions (nomos). The "nomos" in Greece were 51 (52 with Agion Oros). 5. Regions and nomos have several differences in per capita income, regional products, productivity and other indexes, that determined the rate of development. 6. Over of 1/3 of the total Greece population is living in Attiki. Attiki has over 60% of the export trade, 47% of the industrial employment, 65% of the services, 85% of the dynamic companies etc. This centralisation has caused serious problems in the region of Attiki as well as to the rest of the country. 7. The role of agriculture in the regional economic development differs in importance. Agriculture contributed 15,9% to the GNP in 1981. The eastern part of the Sterea Ellada region and the Cyclades region contributed 4,6%, the Central and Western part of Macedonia region 20,7%, Peloponissos, Thessalia and the Western Sterea Ellada regions 31,1%, East Macedonia region 32,4%, Crete region 27,7%, Epirus region 24,4%, Thraki region 36,4% and Aegean islands region 14,4%. An economic integration to the EEC and a common market will operate at the end of 1992. That means that the competition will increase among the countries, the regions and the corporations. It is necessary to improve

the structures of the economy, the investments and to create opportunities for new jobs especially for young people, and generally to apply an essential decentralization to the regions and nomos. 8. There is relationship between agricultural structure and rural economic development. 9. We determine the important variables that contributed to the development of the greek rural regions. There are: the per capita output, output per hectare, farm output size, farm physical size, farm labour size, private land, rented land, waged labour, live stock share and farm size inequality. 10. We apply the method of PCA and SPSS program, determine and evaluate the components: productivity of farm P1, proportion of the rented land P2, inequality degree of trading P3 and per hectare output-farm physical size P4. 11. The regions and nomos where the agricultural farms are operated in the traditional family way without dynamic cultivation, cattle breeding is in a disadvantaged position with respects those regions and nomos where the agricultural farms are operated in an enterprising way, a high degree of trading with modern technology, dynamic cultivations, cattle breeding and good organisation. 12. An unbalanced regional economic development exists. In the regions with traditional agriculture, the structure generally is low and the rate of development is low too, while the modern regions have a better structure .development is good, the per capita regional income is higher and other economic and social indexes are also high. 13. The problematical regions in Greece are mainly the mountainous and semi-mountainous rural regions. These regions have lost the precious work force, especially young people who could contribute to the development of the regions and to a balanced development. Thraki and Epirus are considered the poorest regions in the EEC. 14. Except for agriculture that will continue to be a basic sector in these regions, the agricultural industries must also be developed. 15. The development of tourism in these regions will help regional economic development, but we must be very careful because in the Aegean and Ionian islands, disorganised tourism has created ecological and other problems.

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Tables

Table A: Data used in the principal component exercise

a/a	PCOUT	PHOUT	PFOUT	PFHEC	PFWOR	PRILAN(%)	RENTED	LABOUR	LIVES
	X1	X2	X3	X4	X5	X6	X7	X8	X9
1	148104.05	16900.28	428828.83	25.37	1.34	82.84	17.16	7.67	27.45
2	250491.26	13951.92	345097.17	24.73	.48	87.24	12.76	8.25	53.09
3	257024.46	11890.78	591575.03	49.75	.71	25.98	14.02	6.56	21.62
4	128023.95	12768.72	368605.46	28.87	.57	92.87	7.13	11.44	63.61
5	52975.52	10153.16	218837.34	21.55	1.04	89.94	10.06	3.73	66.68
6	153556.35	8850.87	433061.49	48.93	.98	87.94	12.06	7.10	24.03
7	57589.83	7782.79	196934.78	25.30	.76	88.26	11.74	6.61	56.76
8	174785.52	14360.26	565548.60	39.38	1.13	90.63	9.37	4.90	18.71
9	89292.17	6420.24	312219.50	48.63	1.12	88.55	11.45	5.50	44.55
10	136186.12	12790.37	434366.89	33.96	.97	92.75	7.25	4.15	25.46
11	125403.16	10083.61	393198.11	38.99	1.07	85.68	14.32	8.83	23.25
12	186564.92	16133.53	579050.91	35.89	1.03	92.11	7.89	6.15	28.68
13	121896.35	9969.40	357350.84	35.84	.98	89.46	10.54	9.38	20.82
14	146382.51	11124.08	385347.52	34.64	1.09	94.29	5.71	10.36	25.32
15	110881.02	16614.43	407294.63	24.51	1.17	88.53	11.47	5.67	22.82
16	71978.03	15703.79	251569.31	16.02	.94	96.45	3.55	2.21	27.66
17	64290.26	11220.42	252113.77	22.47	.70	82.24	17.76	6.35	43.68
18	67531.81	9118.66	208718.42	22.89	1.10	95.24	4.76	4.35	26.38
19	96611.71	17808.85	332095.41	18.65	.97	91.89	8.11	4.41	34.97
20	57120.60	7726.10	233358.15	30.20	.82	86.62	13.38	3.21	69.84
21	83788.75	19848.59	370452.34	19.35	.81	85.96	14.04	6.01	72.07
22	120127.96	17920.94	471958.96	26.34	.95	84.12	15.88	6.12	56.18
23	198765.52	15574.67	636305.31	40.86	1.52	81.31	18.69	8.80	23.70
24	254543.74	10984.66	625536.52	56.95	.96	79.38	20.62	14.38	26.23
25	135399.10	7960.41	289284.37	36.34	.71	84.41	15.59	6.11	30.94
26	143487.82	17318.38	477852.52	27.59	1.21	83.01	16.99	7.52	40.56
27	97041.37	5336.50	334975.09	62.77	.83	76.12	23.88	7.23	38.18
28	180728.18	13234.24	558551.60	42.21	1.20	45.27	54.73	3.70	32.20
29	252164.32	21076.54	651408.70	30.91	.87	70.16	29.84	13.79	15.77
30	229407.62	12535.85	521811.78	41.63	.81	67.60	32.40	8.12	36.78

a/a	PCOUT	PHOUT	PFOUT	PFHEC	PFWOR	PRILAN(%)	RENTED	LABOUR	LIVES
31	152170.42	19104.67	573085.46	30	1.06	64.58	35.42	4.78	21.45
32	94436.38	7668.10	345615.54	45.07	.78	67.71	32.29	3.89	39.34
33	142749.43	8340.75	481389.74	57.72	.90	66.55	33.45	8.93	32.65
34	116217.85	9197.20	423414.55	46.04	.72	65.61	34.39	7.20	32.76
35	236129.14	20297.14	687242.67	33.86	1.21	69.81	30.19	4.07	23.49
36	176936.70	16991.31	537252.64	31.62	1.25	69.67	30.33	3.45	22.90
37	172221.36	14284.04	559204.64	39.15	1.37	61.20	38.80	7.80	30.93
38	122352.92	9220.56	507987.59	55.09	1.14	72.76	27.24	1.88	38.89
39	101518.45	5226.69	295396.32	56.52	.60	66.98	33.02	21.78	32.77
40	178085.19	9378.61	511627.96	54.55	1.06	76.01	23.99	5.03	29.26
41	143249.37	14349.20	488125.86	34.02	1.52	70.98	29.02	2.18	31.44
42	149505.65	11002.63	447472.30	40.67	1.50	82.06	17.94	2.95	31.42
43	76671.38	10585.13	253914.05	23.99	.46	76.13	23.87	7.05	52.51
44	62020.34	8355.46	293623.26	35.14	.79	76.15	23.85	4.04	51.55
45	70052.43	6519.59	183763.41	28.19	.74	77.95	22.05	10.20	52.63
46	47389.16	8366.01	128887.54	15.41	.59	89.72	10.28	3.52	50.22
47	54228.05	7251.28	153954.71	21.23	.64	80.92	19.08	2.46	36.20
48	158000.71	13147.51	381302.70	29	.95	94.15	5.85	10.34	13.78
49	132246.79	11337.77	301682.47	26.61	.87	91.16	8.84	11.96	22.31
50	89474.54	9316.01	259985.80	27.91	1.21	89.62	10.38	3.92	46.93
51	115670.53	13368.97	314500.49	23.52	.82	93.75	6.25	5.02	32.46
	133009.23	12073.95	399269.39	34.64	.96	81.38	18.62	6.69	35.76

Table 1: Mean and standard deviation of the ten variables (X1, X2, X3,..., X10)

	Mean	Std. Dev.
X1	132989.5098	57690.75750
X2	12071.92157	4096.87927
X3	399269.3922	141474.3872
X4	34.64373	11.90489
X5	.96118	.25671
X6	81.37882	10.89678
X7	18.62118	10.89678
X8	6.68745	3.64688
X9	35.76235	14.40338
X10	.50118	.05501

Number of cases = 51

Table 2: Correlation matrix

Correlation matrix:

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	1.00000									
X2	.47139	1.00000								
X3	.85094	.58698	1.00000							
X4	.38534	-.39759	.45912	1.00000						
X5	.24913	.36829	.50665	.12778	1.00000					
X6	-.27505	-.02446	-.43037	-.45539	-.12219	1.00000				
X7	.27505	.02446	.43037	.45539	.12219	-1.00000	1.00000			
X8	.28623	-.08705	.11276	.28721	-.28065	-.06149	.08149	1.00000		
X9	-.52935	-.24223	-.52655	-.29670	-.40790	.09842	-.09842	-.16843	1.00000	
X10	.25203	-.13890	.05911	.15899	-.31845	-.31884	.31884	.28935	.05933	1.00000

Table 3: Component variance (Eigenvalues)

Variable	Communality	Factor	Eigenvalue	Ptc of var.	Cum. Ptc.
X1	1.00000	1	3.59031	35.9	35.9
X2	1.00000	2	2.20740	22.1	58.0

Variable	Communality	Factor	Eigenvalue	Ptc of var.	Cum. Ptc.
X3	1.00000	3	1.41810	14.2	72.2
X4	1.00000	4	1.15274	11.5	83.7
X5	1.00000	5	.59235	5.9	89.6
X6	1.00000	6	.50329	5.0	94.6
X7	1.00000	7	.39688	4.0	98.6
X8	1.00000	8	.11746	1.2	99.8
X9	1.00000	9	.02146	.2	100.0
X10	1.00000	10	.00000	.0	100.0

Table 4: Communalities and Eigenvalues of the first, second, third and fourth factor (components)

Variable	Communality	Factor	Eigenvalue	Ptc of var.	Cum. Ptc.
X1	.86553	1	3.59031	35.9	35.9
X2	.94598	2	2.20740	22.1	58.0
X3	.92236	3	1.41810	14.2	72.2
X4	.89725	4	1.15274	11.5	83.7
X5	.75781				
X6	.95849				
X7	.95849				
X8	.70892				
X9	.66965				
X10	.68406				

Table 5: Component loadings of the first, second, third and fourth component*Varimax Rotation 1, Extraction 1, Analysis 1, Kaizer Normalization**Varimax converged in 7 iteration**Rotated Factor Matrix:*

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
X3	.86930	.37663	-.06479	.14365
X1	.85920	.20278	.25810	.13992
X9	-.78633	.07279	.10947	.18453
X7	.13298	.96423	.04612	-.09454
X6	-.13298	-.96423	-.04612	.09454
X10	-.02642	.36237	.73072	.05652
X8	.31665	-.11755	.72262	-.26955
X5	.51359	.11828	-.69107	.04966
X2	.50909	.02053	-.13619	.81721
X4	.40882	.38568	.08523	-.75770

Table 6: Factor score coefficient matrix

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
X1	.30478	-.03633	.20108	.11176
X2	.14301	.02549	.03545	.58010
X3	.26998	.07197	-.01881	.08990
X4	.14675	.04391	-.05670	-.53258
X5	.15518	.03174	-.43045	-.07038
X6	.09215	-.44946	.04487	.02691
X7	.09215	-.44946	-.04467	.02691
X8	.18322	-.18687	.45089	-.14258
X9	-.32578	.17183	.06251	.20846
X10	-.04817	.15121	.45234	.18072

Table 7: Normalized scores of the X1, X2, X3, X4,..., X10 variables and of the P1, P2, P3 and P4 components

a/a*	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	P1	P2	P3	P4
1	1.08	1.18	0.21	-.78	1.46	.13	-.13	.27	-.58	.53	.65	-.14	-.16	.99
2	2.04	.46	-.33	-.83	-1.85	.54	-.54	.43	1.20	2.16	-.14	-.21	2.54	1.60
3	2.15	-.04	1.36	1.27	-.96	.42	-.42	-.04	-.98	2.16	1.34	-.87	1.68	-.13
4	1.09	.17	-.22	-.48	-1.50	1.05	-1.05	1.30	1.93	.35	-.59	-.88	1.62	.67
5	-1.39	.47	-1.29	-1.10	.31	.79	-.79	-.81	2.15	-1.84	-1.56	-.56	-1.34	.24
6	.36	-.79	.24	1.29	.08	.60	-.60	.11	-.81	-.02	.64	-.87	-.02	-1.28
7	-1.31	-1.05	-1.43	-.98	-.77	.63	-.63	-.02	1.46	-.02	-1.53	-.45	.23	-.12
8	.72	.56	1.18	.40	.65	.85	-.85	-.49	-1.18	-.20	1.24	-.79	-.47	-.02
9	-.76	-1.38	-.62	1.18	.62	.66	-.66	-.33	.61	-1.65	-.38	-.66	-1.32	-1.79
10	.06	.17	.25	-.06	.04	1.04	-1.04	-.70	-.72	.53	.38	-.83	-.03	.15
11	-.13	-.49	-.04	.37	.42	.39	-.39	.59	-.87	-.02	.46	-.60	-.01	-.82
12	.93	.99	1.27	.11	.27	.98	-.98	-.15	-.49	.35	1.12	-.79	.22	.64
13	-.19	-.51	-.30	.10	.08	.74	-.74	.74	-1.04	-.38	.44	-1.06	.07	-.84
14	.23	-.23	-.10	0	.50	1.18	-1.18	1.01	-.73	-.93	.77	-1.52	-.08	-.68
15	-.38	1.11	.06	-.85	.81	.66	-.66	-.28	-.90	-1.29	.48	-.85	-1.05	.60
16	-1.06	.89	-1.04	-1.56	-.08	1.38	-1.38	-1.23	-.56	-.93	-.46	-1.33	-.93	.99
17	-1.19	-.21	-1.04	-1.02	-1	.08	-.08	-.09	.55	.35	-1.17	-.02	.42	.48
18	-1.14	-.72	-1.35	-.99	.54	1.27	-1.27	-.64	-.65	-.93	-.50	-1.37	-1.04	-.44
19	-.63	1.40	-.47	-1.34	.04	.96	-.96	-.62	-.05	-1.47	-.16	-1.01	-.87	1.20
20	-1.32	-1.06	-1.17	-.37	-.54	.48	-.48	-.95	2.37	-.20	-1.85	.02	-.36	-.05
21	-.85	1.73	-.20	-1.28	-.58	.42	-.42	-.19	2.52	-.02	-1.12	.07	.31	2.17
22	-.22	1.43	.51	-.70	-.04	.25	-.25	-.16	1.42	-.56	-.25	.01	-.16	1.44
23	1.14	.85	1.68	.52	2.15	-.01	.01	.58	-.84	-.56	1.73	-.14	-.77	-.03
24	2.11	-.27	1.60	1.87	0	-.18	.18	2.11	-.66	.89	1.83	-.09	1.57	-1.08
25	.04	-1.00	-.78	.14	-.96	.28	-.28	-.16	-.33	1.07	-.39	-.22	.81	-.53
26	.18	1.28	.56	-.59	.96	.15	-.15	.23	.33	-.75	.45	-.16	-.51	.97
27	-.62	-1.64	-.45	2.36	-.50	-.48	.48	.15	.17	-.93	-.35	.33	-.48	-2.46
28	.83	.28	1.13	.64	.92	-3.31	3.31	-.82	-.25	1.80	.07	3.47	-.14	.50
29	2.07	2.20	1.78	-.31	-.35	-1.03	1.03	1.95	-1.39	-.75	1.98	.29	.99	1.21
30	1.67	.11	.87	.59	-.58	-1.26	1.26	.39	.07	.53	.54	1.17	.85	.16
31	.33	1.72	1.23	-.39	.38	-1.54	1.54	-.52	-.99	.16	.62	1.45	-.40	1.31
32	-.67	-1.08	-.38	.88	-.69	-1.25	1.25	-.77	.25	-.02	-.89	1.29	-.37	-.94
33	.17	-.91	.58	1.94	-.23	-1.36	1.36	.61	-.22	-.38	.27	1.10	-.05	-1.64
34	-.29	-.70	.17	.96	-.92	-1.45	1.45	.14	-.21	.71	-.35	1.36	.50	-.75
35	1.79	2.01	2.04	-.07	.96	-1.06	1.06	-.72	-.85	-1.11	1.52	.93	-.99	1.29
36	.76	1.20	.98	-.25	1.12	-1.07	1.07	-.89	-.89	-.56	.76	.99	-1.09	.82
37	.68	.54	1.13	.38	1.58	-1.85	1.85	.30	-.34	.16	.70	1.71	-.54	.18
38	-.18	-.70	.77	1.72	.69	-.79	.79	-1.32	.22	-.56	-.02	1.05	-1.37	-1.18
39	-.55	-1.67	-.73	1.84	-1.38	-1.32	1.32	4.13	-.21	2.16	-.07	.67	3.05	-2.19
40	.78	-.66	.79	1.67	.38	-.49	.49	-.45	-.45	-1.11	.69	.38	-.92	-1.38
41	.18	.56	.63	-.05	2.15	-.95	.95	-1.24	-.30	1.80	.24	1.42	-.72	.76
42	.29	-.26	.34	.51	2.08	.06	-.06	-1.02	-.30	-.20	.47	.15	-1.44	-.47
43	-.98	-.36	-1.03	-.89	-1.92	-.48	.48	.10	1.16	1.44	-1.57	.69	1.41	.73
44	-1.23	-.91	-.75	.04	-.65	-.48	.48	-.73	1.10	.35	-1.39	.76	-.13	-.29
45	-1.09	-1.36	-1.52	-.54	-.85	-.31	.31	.96	1.17	1.80	-1.49	.42	1.45	-.24
46	-1.48	-.90	-1.91	-1.62	-1.42	.77	-.77	-.87	1.00	-.38	-1.88	-.63	-.03	.36
47	-1.37	-1.18	-1.73	-1.13	-1.23	-.04	.04	-1.16	.03	-.93	-1.59	-.07	-.64	-.27
48	.43	.26	-.13	-.47	-.04	1.17	-1.17	1	-1.53	-.38	.97	-1.60	.43	-.14
49	-.01	-.18	-.69	-.67	-.35	.90	-.90	1.44	-.93	-.56	.39	-1.41	.61	-.32
50	-.75	-.67	-.98	-.57	.96	.76	-.76	-.76	.78	-.02	-.77	-.46	-.78	-.09
51	-.30	.32	-.60	-.93	-.54	1.13	-1.13	-.46	-.23	.53	-.25	-.97	.36	.70

* **PROVINCES (NOMOS) OF GREECE: STEREA ELLADA AND EVIA** (1. ETOLIA AND AKARNANIA, 2. ATTIKI, 3. BIOTIA, 4. EVIA, 5. EVRITANIA, 6. FTHIOTIDA, 7. PHOKIDA), **PELOPONNISOS** (8. ARGOLIDA, 9. ARCADIA, 10. ACHAIA, 11. ILIA, 12. KORINTHIA, 13. LAKONIA, 14. MESSINIA), **IONIAN ISLANDS** (15. ZAKYNTHOS, 16. KERKYRA (KORFU), 17. KEFALLINIA, 18. LEFKADA) **EPHROS** (19. ARTA, 20. THESSALOTIA, 21. IOANNINA, 22. PREVEZA), **THESSALIA** (23. KARDITSA, 24. LARISSA, 25. MAGNISIA, 26. TRIKALA) **MACEDONIA** (27. GREVENA, 28. DRAMA, 29. IMATHIA, 30. THESSALONIKI, 31. KAVALA, 32. KASTORIA, 33. KILKIS, 34. KOZANI, 35. PELLA, 36. PIERIA, 37. SERRES, 38. FLORINA, 39. HALKIDIKI), **THRAKI** (40. EVROS, 41. XANTHI, 42. RODOPI), **AEGEAN ISLANDS** (43. DODEKANISA, 44. CYCLADES, 45. LESVOS, 46. SAMOS, 47. HIOS), **CRETE** (48. IRAKLIO, 49. RETHYMNIO, 50. LASSITHI, 51. CHANIA)