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Regional specialization of Greek prefectures for the time period 1981 – 2001

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Abstract

It is generally acceptable that Greece faces intense regional inequalities. Indeed, in Greece there are two important urban centres – poles, Athens mainly, and Thessaloniki (in smaller degree though). In these two cities the larger part of industrial activity, as well as, tertiary sector activities, is assembled. On the contrary, in the other Greek regions not only the economic activities but the infrastructures have been developed in smaller degree.

Moreover, as it is well known, two Greek regions (Northern Aegean, Epirus) are considered to be two of the poorest regions in the European Union. This fact constitutes a reluctant factor to the effort of Greek to increase the standard of living of the citizens. In addition, the last two decades, a significant decrease of the contribution of primary sector to the GDP with simultaneous increase of the contribution of the tertiary sector is observed. The particular change involves important changes in the national economy.

The aim of this paper is the study of the specialization of Greek prefectures as well as territorial behaviour of 13 sectors of economic activity using employment data and methods of regional analysis such as Gini – Hirschman coefficient, Location Quotient coefficient (LQ), Coefficient of Location (CL), Coefficient of Specialization (CS) and analysis of deviation – participation.

Key words: Greece, regional development, employment, regional analysis, regional specialization.

Introduction

Since the end of Second World War, the reconstruction of destroyed states has began aiming at the improvement of standard of living of the citizens and at the limitation of poverty. Fundamental objective of development effort for that time period was the increase of Gross Domestic Product (GDP), in other words, the achievement of high rates of growth of product.

Therefore, for a long period, particularly after the Second World War, the terms growth and development considered to be similar. However, with the term economic growth we mean the increase of product, which is caused by the increase of quantity of inputs that is used in the production and their higher efficiency (Reppas, 1997).

However economic development does not only mean increase of product but is a multidimensional process, which is referred to more permanent changes, in the structure of production, as well as, in the technological and the socio-economic frame in which the product is produced and distributed (Koutsoumaris 1993, Lamprianidis 2001). Indeed, the term development is used mainly in order to express the achievement or the objective of more positive changes in the basic elements of socio-economic activity.

The repercussions from the economic crisis of '30s, the effort for rectification of economies from the Second World War and the elimination of interregional inequalities had as result the extensive intervention activity of state. Thus the regional development and the interregional equilibrium began to constitute one of the basic aims of institutions that organize and materialise development programs.

According to Consolas (1997) through the regional development the entire development (economic, social and cultural) of every region in a country is achieved since their productivity is increased and differentiated while their social, institutional and land-planning organisation is developed.

Indeed, the survey of regional differentiations and inequalities of a country is a multidimensional issue. The diachronic convergence or divergence of regional economies and more specifically the rural regional economies also reflects the effectiveness of the developmental policy.

The post – war development of Greece

During the reconstruction of Greece after 1950 the structural changes that took place in very small periods affected all the sectors of socio-economic life, not only those that were nominated as national (industry, shipping), but those that functioned as additional. The fundamental objective of the development effort of the country under review was the industrialisation and the development of the shipping. The rural sector (agriculture, livestock-farming, forests, fishery) is introduced to the post – war period as additional sector. The structural characteristics of the rural sector and its place in the economy and society of Greece are distinguished by intense inconsistency. While its role is downgraded compared to the industry and the shipping, nevertheless it presented important development.

Furthermore as far as the industrial policy is concerned, according to Petrakos et al. (1993) from the estimate of effects of developmental policies in the levels of industrial employment the following conclusion is resulted: “The policies of infrastructures, not only in national level but also in local and in urban level, have the most significant contribution to the size of the total industrial employment. Their effect is positive for the most sectors, without statistically important differentiations between various categories of industries. The manufacture of infrastructures is not considered to change drastically the structure of the production and the level of development of a region. However, it is possible to form the essential conditions so that this to become possible through the combined effect of other policies as well as, of other factors”.

Moreover, according to Koutroumanides and Loukakis (1993), the enlargement of territorial distribution of employment in Industry – Services led to the following conclusion: “The concentration of dynamic industrial sectors (Chemical, Metallurgy, Machines etc.) is observed on the axis Thessaloniki – Athens with a few extensions in Kavala, Kozani (Chemical, Derivatives of Oil – Carbon). In this axis, concentrations of the sectors Wholesale Trade, Brokers, Banks, Transports are observed. The concentrations of dynamic industrial sectors and services in the urban centres on axis Thessaloniki – Athens show that there is an attraction between the industrial dynamic sectors and the urban development because the specialised services are developed in this area”.

The Greek state in order to limit the regional inequalities established a set of enactments, which provided tax motives as well as assistance to the investments for

the establishment of industries in all the regions except Attica, and particularly in the frontier regions. The most important enactments are: Law 949/1949, Law 2176/1952 «for the support of regional industry», Law 3213/1955, Law 4002/1959, Law 4458 «for industry areas», Law 147/1967, Law 1078/1971, Law 1312/1972, Law 289/1976, Law 849/1978, Developmental Law 2601/1998 and the new Developmental Law 3299/2004.

The industrialisation of country at the '60s and the '70s, the development of the tertiary sector and the more rapid development of these sectors compared to the rural sector had as result the reduction of the contribution of this sector in the GDP. Thus in 1965 the rural sector constituted the 23.2% of produced GDP while in 1990 hardly 11.49 %. The contribution of individual subsector to the total rural GDP approximately are; cultivation and cattle – breeding 95.0 %, fishery 3.9% and forestry 1.1% (Ziogas 2000).

The integration of Greece in the EEC in 1981 and the application of CAP had as result the stationarity of the private investments, the progressive degradation of its competitive place in international and in the community market and in enlargement of commercial deficit of rural products. Fundamental cause of this development was the letdown of investments not only from the state, but also from the farmers that would aim at as the structural adaptation of Greek rural economy in the new competitive environment (Maravegias 1992, 2000). Furthermore, according to Ziogas (2000) the medium annual rates of change show that for all the structural characteristics, Greece has made smaller improvements after the integration in the EU than before.

Materials and Methods

The aim of this paper is the quantitative regard and analysis of development in level of prefecture, through a set of coefficients. In the bibliography, a large number of coefficients are reported, with which the degree of development is evaluated, because they can, in a descriptive level, show the differences that exist between the territorial units of (regions or prefectures). Thus, depending on the coefficients, that are used each time for the measurement of development in regional level, the differentiation between the regions is realised. A region is classified as developed with a concrete number of coefficients, while according to some other coefficients it can be classified as less developed or even reversely.

Thus a number of variables as indicators of regional structure and development were decided to be used. According to the existing information and the published statistical data that exists the coefficients that were selected was judged as the most representative for the investigation of regional inequalities not only diachronically but interregionally.

Indeed the Gini – Hirschman Coefficient was used to describe the facts not only for the static differentiation of the regions but the dynamic development of interregional inequalities. Moreover, the Location Quotient Coefficient was used to show comparisons between activities and region indirectly, relatively to national sizes, the Coefficient of Specialization that measures the degree of concentration of activities in specific area the Coefficient of Location that gives information on the degree of concentration between various places of a specific activity and the analysis of deviation – participation.

The analytic description of coefficients, which was used in the present paper, is the following (Papadaskalopoulos 1994, 1995);

a) Gini – Hirschman Coefficient

The Gini – Hirschman Coefficient gives us a quantified estimation for the observed degree of concentration, which is defined as follows:

$$GH = 100 \sqrt{\sum_i^n \left(\frac{A_r}{A_n} \right)^2} \quad (1), \text{ where}$$

A_r : The value of characteristic A in the region r.

A_n : The value of characteristic A in the country.

n: The number of regions.

The value of the Gini – Hirschman coefficient oscillates between 100, in case of perfect concentration and $100 \sqrt{n}$ in case of a normal distribution.

b) Location Quotient Coefficient, (LQ)

The Location Quotient Coefficient defined as follows:

$$LQ = \frac{A_{ir}}{A_r} \bigg/ \frac{A_{in}}{A_n} \quad (2), \text{ where}$$

A_{ir} : the employment of sector i in the region r.

A_r : the employment of region r.

A_{in} : the employment of sector i in the country.

A_n : the employment of the country.

This indicator compares the participation of a region in the employment of a sector with the participation in the total employment of the country.

The interpretation of the Location Quotient Coefficient according to Papadaskalopoulos (1995) is the following:

- a) If $LQ = 1$ then the activity i , is developed in the region as in the country.
- b) If $LQ > 1$ then the activity i , is more developed in the region than in the country.
- c) If $LQ < 1$ then the activity i , is less developed in the region than in the country.

c) Coefficient of Specialization (CS)

The Coefficient of Specialization defined as follows:

$$CS = \frac{1}{2} \sum_i \left| \frac{A_{ir}}{A_r} - \frac{A_{in}}{A_n} \right| \quad (3)$$

which oscillates from 0 to 1.

The Coefficient of Specialization, measures the sector – based or sectoral specialization of the regions.

The interpretation of the Coefficient of Specialization is the following:

- a) If $CS = 0$ then the region r , is not specialized concerning the national distribution of activities, in other words the sector – based structure of the region, is identical to the sector – based structure of the country.
- b) If $CS = 1$ then the region r , is specialized, in other words the sector – based structure of the region differs from the corresponding national.

d) Coefficient of Location (CL)

The Coefficient of Location defined as follows:

$$CL = \frac{1}{2} \sum_i \left| \frac{A_{ir}}{A_{in}} - \frac{A_r}{A_n} \right| \quad (4)$$

which oscillates from 0 to 1.

The interpretation of the Coefficient of Location is the following:

- a) If $CL = 0$, then the activity i , is located in the regions at a way identical with the location of the set of activities.
- b) If $CL = 1$, then the activity i , is located in the area at a way completely different from the set of activities.

e) Analysis of deviation – participation

The analysis of deviation – participation is one from the basic methods of analysis and planning in the regional science, which used for:

- a) The determination of causes of changes of regional sizes.
- b) The classification of regions.
- c) The evaluation of the applied regional policy.
- d) The indirect determination of regional development model.
- e) The choice of means of regional policy at territorial unit.

The analysis of deviation – participation is realised using the following equations:

$$M_r = E\Sigma_r + O\Sigma_r + \Delta\Sigma_r \quad (5)$$

$$E\Sigma_r = A_{ro} \left(\frac{A_{nt}}{A_{no}} \right) - A_{ro} \quad (6)$$

$$O\Sigma_r = \sum \left[\left(\frac{A_{int}}{A_{ino}} - \frac{A_{nt}}{A_{no}} \right) A_{iro} \right] \quad (7)$$

$$\Delta\Sigma_r = \sum \left[A_{irt} - A_{iro} \left(\frac{A_{int}}{A_{ino}} \right) \right] \quad (8), \text{ where}$$

M_r : The change of employment in the Prefecture r .

$E\Sigma_r$: The component of national participation of the prefecture r .

$O\Sigma_r$: The component of compulsory deviation of the prefecture r .

$\Delta\Sigma_r$: The component of differential deviation of the prefecture r .

A_{ir} : The employment of sector i in the prefecture r .

A_{in} : The employment of sector i in the country.

A_r : The total employment of the prefecture r .

A_n : The total employment of the country.

o : The first year of the analysis.

n : The last year of the analysis.

Results

According to the equations (1) to (8) mentioned above, Gini – Hirschman coefficient, Location Quotient coefficient, Coefficient of Location, Coefficient of Specialization and analysis of deviation – participation for the years 1981, 1991 and 2001, were estimated aiming at the estimation of the most significant prefectures in order to achieve regional development. These results are presenting on Tables 1 to 8.

Table 1: Gini – Hirschman Coefficient

Sector	1981		1991		2001	
	Higher value	Lower value	Higher value	Lower value	Higher value	Lower value
Products of Agriculture, Hunting and Forestry	Prefecture of Aitolokarnania (5.496)	Prefecture of Kefallonia (0.383)	Prefecture of Aitolokarnania (5.738)	Prefecture of Chios (0.309)	Prefecture of Larissa (5,191)	Prefecture of Lefkada (0,219)
Fishery	Region of Attiki (11.508)	Prefectures of Grevena, Evritania, Pella and Trikala (0.000)	Prefecture of Thessaloniki (12.299)	Prefecture of Grevena (0.014)	Region of Attiki (13,225)	Prefecture of Karditsa (0,038)
Mines and Pits	Prefecture of Evia (19.413)	Prefecture of Evritania (0.000)	Prefecture of Kozani (28.742)	Prefecture of Lefkada (0.037)	Prefecture of Kozani (23,602)	Prefecture of Lefkada (0,017)
Manufacturing Industries	Region of Attiki (41.701)	Prefecture of Lefkada (0.049)	Region of Attiki (37,448)	Prefecture of Lefkada (0.077)	Region of Attiki (45,763)	Prefecture of Evritania (0,058)
Electrical Energy, Water and Natural Gas	Region of Attiki (41.334)	Prefecture of Lefkada (0.037)	Region of Attiki (37.737)	Prefecture of Lefkada (0.085)	Region of Attiki (34,483)	Prefecture of Lefkada (0,078)
Constructions	Region of Attiki (33.835)	Prefecture of Lefkada (0.126)	Region of Attiki (29,709)	Prefecture of Lefkada (0,221)	Region of Attiki (37,997)	Prefecture of Evritania (0,211)
Wholesale and Retail Trade	Region of Attiki (41.690)	Prefecture of Evritania (0.120)	Region of Attiki (39,907)	Prefecture of Lefkada (0,128)	Region of Attiki (46,010)	Prefecture of Evritania (0,093)

Hotels and Restaurants	Region of Attiki (30.885)	Prefecture of Grevena (0.148)	Region of Attiki (28,702)	Prefecture of Lefkada (0,182)	Region of Attiki (32,561)	Prefecture of Grevena (0,212)
Transport, Storage and Communications	Region of Attiki (43.371)	Prefecture of Kastoria (0.140)	Region of Attiki (44,582)	Prefecture of Grevena (0,171)	Region of Attiki (52,530)	Prefecture of Evritania (0,110)
Services of Financier Mediation	Region of Attiki (55.522)	Prefecture of Lefkada (0.061)	Region of Attiki (52,441)	Prefecture of Lefkada (0,073)	Region of Attiki (62,331)	Prefecture of Evritania (0,081)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (62.461)	Prefectures of Xanthi, Rodopi, Pieria, Florina, Kozani, Kastoria, Thesprotia, Karditsa, Lefkada, Viotia, Evia, Arcadia, Lakonia, Chios, Samos (0.00)	Region of Attiki (50,114)	Prefecture of Lefkada (0,105)	Region of Attiki (56,222)	Prefecture of Evritania (0,067)
Education	Region of Attiki (31.792)	Prefecture of Kefallonia (0.177)	Region of Attiki (35,149)	Prefecture of Lefkada (0,181)	Region of Attiki (38,514)	Prefecture of Evritania (0,131)
Other services	Region of Attiki (45.881)	Prefecture of Zakynthos (0.177)	Region of Attiki (43,751)	Prefecture of Lefkada (0,156)	Region of Attiki (48,620)	Prefecture of Evritania (0,152)

Table 2: Location Quotient coefficient (LQ)

Sector	1981		1991		2001	
	Higher value	Lower value	Higher value	Lower value	Higher value	Lower value
Products of Agriculture, Hunting and Forestry	Prefecture of Karditsa (2.61)	Region of Attiki (0.06)	Prefecture of Rodopi (3.37)	Region of Attiki (0.08)	Prefecture of Rodopi (3.81)	Region of Attiki (0.11)
Fishery	Prefecture of Lesvos (8.36)	Prefectures of Grevena, Evritania, Pella and Trikala (0.00)	Prefecture of Kyklades (7.13)	Prefecture of Kastoria (0.02)	Prefecture of Lefkada (7.74)	Prefectures of Karditsa and Trikala (0.04)
Mines and Pits	Prefecture of Kozani (12.31)	Prefecture of Evritania (0.00)	Prefecture of Kozani (23.34)	Prefecture of Ilia (0.07)	Prefecture of Kozani (23.38)	Prefecture of Ilia (0.06)
Manufacturing	Prefecture of Kastoria	Prefecture of Lefkada	Prefecture of Kastoria	Prefecture of Lefkada	Prefecture of Kastoria	Prefecture of Lefkada

Industries	(2.37)	(0.20)	(2.74)	(0.25)	(2.19)	(0.37)
Electrical Energy, Water and Natural Gas	Prefecture of Kozani (7.93)	Prefecture of Thesprotia (0.10)	Prefecture of Kozani (10.52)	Prefecture of Rodopi (0.29)	Prefecture of Kozani (12.77)	Prefecture of Chalkidiki (0.52)
Constructions	Prefecture of Ioannina (1.59)	Prefecture of Kastoria (0.37)	Prefecture of Kyklades (2.04)	Prefecture of Rodopi (0.44)	Prefecture of Kyklades (2.50)	Prefecture of Pella (0.62)
Wholesale and Retail Trade	Prefecture of Thessaloniki (1.39)	Prefecture of Evritania (0.41)	Prefecture of Thessaloniki (1.30)	Prefecture of Kozani (0.34)	Region of Attiki (1.54)	Prefecture of Rodopi (0.58)
Hotels and Restaurants	Prefecture of Dodekanissa (5.08)	Prefecture of Kastoria (0.41)	Prefecture of Dodekanissa (4.63)	Prefecture of Rodopi (0.48)	Prefecture of Dodekanissa (3.84)	Region of Attiki (0.99)
Transport, Storage and Communications	Prefecture of Chios (1.82)	Prefecture of Kastoria (0.24)	Prefecture of Chios (1.88)	Prefecture of Kastoria (0.39)	Prefecture of Chios (2.20)	Prefecture of Rodopi (0.46)
Services of Financier Mediation	Region of Attiki (1.81)	Prefecture of Rodopi (0.22)	Region of Attiki (1.62)	Prefecture of Rodopi (0.35)	Region of Attiki (2.09)	Prefecture of Rodopi (0.35)
Real Estate Services, Services of Renting and Enterprising Services	Prefecture of Drama (2.93)	Prefectures of Xanthi, Rodopi, Pieria, Florina, Kozani, Kastoria, Thesprotia, Karditsa, Lefkada, Viotia, Evia, Arcadia, Lakonia, Chios and Samos (0.00)	Region of Attiki (1.55)	Prefectures of Rodopi and Florina (0.32)	Region of Attiki (1.89)	Prefecture of Rodopi (0.45)
Education	Prefecture of Thessaloniki (1.51)	Prefecture of Fokida (0.61)	Prefecture of Ioannina (1.40)	Prefecture of Kilkis (0.55)	Prefecture of Ioannina (2.07)	Prefecture of Chalkidiki (0.69)
Other services	Region of Attiki (1.50)	Prefecture of Karditsa (0.42)	Region of Attiki (1.34)	Prefecture of Pella (0.54)	Prefecture of Evros (1.68)	Prefecture of Pella (0.60)

Table 3: Coefficient of Location (CL)

Sector	1981		1991		2001	
	Higher value	Lower value	Higher value	Lower value	Higher value	Lower value
Products of Agriculture, Hunting and	Region of Attiki (0.14360)	Prefecture of Kastoria (0.00005)	Region of Attiki (0.15400)	Prefecture of Kastoria (0.00003)	Region of Attiki (0.13229)	Prefecture of Chios (0.00029)

Forestry						
Fishery	Region of Attiki (0.09559)	Prefecture of Florina (0.00025)	Region of Attiki (0.11361)	Prefecture of Florina (0.00018)	Region of Attiki (0.08287)	Prefectures of Arcadia and Grevena (0.00004)
Mines and Pits	Region of Attiki (0.09276)	Prefecture of Samos (0.00029)	Prefecture of Kozani (0.14016)	Prefecture of Grevena (0.00012)	Prefecture of Kozani (0.11296)	Prefecture of Argolida (0.00008)
Manufacturing Industries	Region of Attiki (0.05537)	Prefectures of Evia and Kilkis (0.00041)	Prefecture of Thessaloniki (0.05096)	Prefecture of Xanthi (0.00013)	Region of Attiki (0.07983)	Prefecture of Pella (0.00001)
Electrical Energy, Water and Natural Gas	Region of Attiki (0.0535)	Prefecture of Fokida (0.00007)	Prefecture of Kozani (0.05972)	Prefecture of Dodekanissa (0.00002)	Prefecture of Kozani (0.05941)	Prefecture of Lassithi (0.00006)
Constructions	Region of Attiki (0.016046)	Prefecture of Florina (0.000002)	Region of Attiki (0.01605)	Prefecture of Aitolokarnania (0.00001)	Region of Attiki (0.04100)	Prefecture of Pieria (0.00016)
Wholesale and Retail Trade	Region of Attiki (0.05532)	Prefecture of Chios (0.00009)	Region of Attiki (0.03777)	Prefecture of Chios (0.00003)	Region of Attiki (0.08106)	Prefecture of Kastoria (0.00001)
Hotels and Restaurants	Prefecture of Dodekanissa (0.02534)	Prefecture of Evritania (0.00011)	Prefecture of Dodekanissa (0.02698)	Prefecture of Lefkada (0.00002)	Prefecture of Dodekanissa (0.02164)	Prefecture of Grevena (0.00001)
Transport, Storage and Communications	Region of Attiki (0.06373)	Prefecture of Fokida (0.00009)	Region of Attiki (0.06242)	Prefecture of Evritania (0.000002)	Region of Attiki (0.11366)	Prefecture of Thesprotia (0.000003)
Services of Financier Mediation	Region of Attiki (0.12448)	Prefecture of Thesprotia (0.00059)	Region of Attiki (0.10447)	Prefecture of Fokida (0.00016)	Region of Attiki (0.16266)	Prefectures of Chios and Fokida (0.00002)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (0.15909)	Prefecture of Kefallonia (0.00009)	Region of Attiki (0.09208)	Prefecture of Evritania (0.00039)	Region of Attiki (0.13212)	Prefecture of Kefallonia (0.00012)
Education	Prefecture of Thessaloniki (0.03859)	Prefecture of Xalkidiki (0.00002)	Prefecture of Thessaloniki (0.02031)	Prefecture of Evritania (0.000005)	Region of Attiki (0.04358)	Prefecture of Evritania (0.00001)
Other services	Region of Attiki (0.07627)	Prefecture of Samos (0.00016)	Region of Attiki (0.05796)	Prefecture of Fokida (0.00001)	Region of Attiki (0.09411)	Prefecture of Kastoria (0.00001)

Table 4: Coefficient of Specialization (CS)

Sector	1981		1991		2001	
	Higher value	Lower value	Higher value	Lower value	Higher value	Lower value
Products of	Prefecture	Prefecture	Prefecture	Prefecture	Prefecture	Prefecture

Agriculture, Hunting and Forestry	of Karditsa (0.21284)	of Magnesia (0.00221)	of Rodopi (0.20768)	of Evia (0.00032)	of Rodopi (0.20764)	of Kozani (0.00507)
Fishery	Prefecture of Lesvos (0.01343)	Prefecture of Fthiotida (0.00009)	Prefecture of Kyklades (0.01264)	Prefecture of Florina (0.00016)	Prefecture of Lefkada (0.01557)	Prefecture of Arcadia (0.00003)
Mines and Pits	Prefecture of Kozani (0.03663)	Prefecture of Argolida (0.00028)	Prefecture of Kozani (0.06210)	Prefecture of Ioannina (0.00007)	Prefecture of Kozani (0.03268)	Prefecture of Argolida (0.00003)
Manufacturing Industries	Prefecture of Kastoria (0.14232)	Prefecture of Evoia (0.00490)	Prefecture of Kastoria (0.14265)	Prefecture of Xanthi (0.00244)	Prefecture of Kastoria (0.07561)	Prefecture of Pella (0.00012)
Electrical Energy, Water and Natural Gas	Prefecture of Kozani (0.02555)	Prefecture of Fokida (0.00011)	Prefecture of Kozani (0.04271)	Prefecture of Dodekanissa (0.00001)	Prefecture of Kozani (0.05640)	Prefecture of Lassithi (0.00009)
Constructions	Prefecture of Kastoria (0.03080)	Prefecture of Viotia (0.00002)	Prefecture of Kyklades (0.04338)	Prefecture of Aitolokarnania (0.00003)	Prefecture of Kyklades (0.06759)	Prefecture of Pieria (0.00147)
Wholesale and Retail Trade	Prefecture of Evritania (0.02945)	Prefecture of Kavala (0.00147)	Prefecture of Kastoria (0.05003)	Prefecture of Magnesia (0.00038)	Region of Attiki (0.04239)	Prefecture of Pieria (0.00033)
Hotels and Restaurants	Prefecture of Dodekanissa (0.06671)	Region of Attiki (0.00014)	Prefecture of Dodekanissa (0.08161)	Prefecture of Ioannina (0.00046)	Prefecture of Dodekanissa (0.09789)	Prefecture of Kozani (0.00014)
Transport, Storage and Communications	Prefecture of Chios (0.03274)	Prefecture of Evia (0.00078)	Prefecture of Chios (0.03204)	Prefecture of Evritania (0.00005)	Prefecture of Chios (0.04149)	Prefecture of Thesprotia (0.00008)
Services of Financier Mediation	Region of Attiki (0.01568)	Prefecture of Korinthia (0.00271)	Prefecture of Rodopi (0.00708)	Prefecture of Thessaloniki (0.00051)	Region of Attiki (0.01488)	Prefectures of Chios (0.00017)
Real Estate Services, Services of Renting and Enterprising Services	Prefecture of Drama (0.00097)	Prefecture of Thessaloniki (0.00002)	Prefecture of Florina (0.01384)	Prefecture of Kerkyra (0.00312)	Region of Attiki (0.02720)	Prefecture of Iraklio (0.00058)
Education	Prefecture of Thessaloniki (0.00943)	Prefecture of Xalkidiki (0.00013)	Prefecture of Kilgis (0.01287)	Prefecture of Kozani (0.00008)	Prefecture of Ioannina (0.03427)	Prefecture of Evritania (0.00035)
Other services	Prefecture of Karditsa (0.03586)	Prefecture of Kavala (0.00310)	Prefecture of Pella (0.03836)	Prefecture of Thessaloniki (0.00035)	Prefecture of Evros (0.06144)	Prefecture of Kilgis (0.00091)

Table 5: Analysis of deviation – participation

Sector	1981 – 1991		1991 – 2001		1981 – 2001	
	Higher value	Lower value	Higher value	Lower value	Higher value	Lower value
Products of Agriculture,	Region of Attiki	Prefecture of Karditsa	Prefecture of	Region of Attiki	Region of Attiki	Prefecture of Aitolokarnania

Hunting and Forestry	(121176.79)	(- 15550.71)	Fthiotida 4204,50)	(-19719,32)	(103582.64)	(- 24038.65)
Fishery	Region of Attiki (122949.73)	Prefecture of Lefkada (1031.59)	Prefecture of Chios (-30,99)	Region of Attiki (-19981,20)	Region of Attiki (104740.77)	Prefecture of Florina (873.18)
Mines and Pits	Region of Attiki (122316.24)	Prefecture of Lefkada (951.53)	Prefecture of Lefkada (-119,97)	Region of Attiki (-21253,64)	Region of Attiki (102419.33)	Prefecture of Fokida (402.56)
Manufacturing Industries	Region of Attiki (34808.50)	Prefectures of Kastoria (- 539.63)	Prefecture of Rodopi (141,95)	Prefecture of Thessaloniki (-84567,72)	Prefecture of Iraklio (6913.98)	Prefecture of Thessaloniki (- 64104.98)
Electrical Energy, Water and Natural Gas	Region of Attiki (124665.60)	Prefecture of Lefkada (987.24)	Prefecture of Florina (204,41)	Region of Attiki (-21573,79)	Region of Attiki (104984.34)	Prefecture of Dodekanissa (836.87)
Constructions	Region of Attiki (91062.56)	Prefecture of Evritania (905.52)	Region of Attiki (18296,33)	Prefecture of Thessaloniki (-23371,32)	Region of Attiki (108996.72)	Prefecture of Evritania (441.89)
Wholesale and Retail Trade	Region of Attiki (208852.91)	Prefecture of Lefkada (1292.02)	Region of Attiki (10018,51)	Prefecture of Thessaloniki (-66985,84)	Region of Attiki (226303.58)	Prefecture of Evritania (1085.24)
Hotels and Restaurants	Region of Attiki (135357.16)	Prefecture of Lefkada (1089.65)	Prefecture of Kyklades (888,28)	Prefecture of Thessaloniki (-24282,17)	Region of Attiki (143251,49)	Prefecture of Evritania (1184,82)
Transport, Storage and Communications	Region of Attiki (118269.35)	Prefecture of Lefkada (870.75)	Prefecture of Zakynthos (2,39)	Prefecture of Thessaloniki (-24148,06)	Region of Attiki (109944,99)	Prefecture of Evritania (641,29)
Services of Financier Mediation	Region of Attiki (83334.54)	Prefecture of Lefkada (936.23)	Prefecture of Lefkada (-131,27)	Prefecture of Thessaloniki (-20834,97)	Region of Attiki (85756,23)	Prefecture of Lefkada (817,68)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (208078.98)	Prefecture of Lefkada (1150.65)	Prefecture of Lefkada (-148,93)	Prefecture of Thessaloniki (-35395,58)	Region of Attiki (243276,38)	Prefecture of Lefkada (1121,74)
Education	Region of Attiki (159792.71)	Prefecture of Lefkada (1026.77)	Prefecture of Chania (133,90)	Prefecture of Thessaloniki (-31692,00)	Region of Attiki (157480,92)	Prefecture of Evritania (765,47)
Other services	Region of Attiki (198957.37)	Prefecture of Kefallonia (1012.60)	Region of Attiki (1801,66)	Prefecture of Thessaloniki (-60871,49)	Region of Attiki (229869,59)	Prefecture of Evritania (878,09)

Table 6: Higher and lower values for the year 1981

Sector	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization
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	Higher value	Higher value	Higher value	Higher value	Lower value	Lower value	Lower value	Lower value
Products of Agriculture, Hunting and Forestry	Prefecture of Aitolokarnania (5.496)	Prefecture of Karditsa (2.61)	Region of Attiki (0.14360)	Prefecture of Karditsa (0.21284)	Prefecture of Kefallonia (0.383)	Region of Attiki (0.06)	Prefecture of Kastoria (0.00005)	Prefecture of Magnesia (0.00221)
Fishery	Region of Attiki (11.508)	Prefecture of Lesbos (8.36)	Region of Attiki (0.09559)	Prefecture of Lesbos (0.01343)	Prefectures of Grevena, Evritania, Pella and Trikala (0.000)	Prefectures of Grevena, Evritania, Pella and Trikala (0.00)	Prefecture of Florina (0.00025)	Prefecture of Fthiotida (0.00009)
Mines and Pits	Prefecture of Evia (19.413)	Prefecture of Kozani (12.31)	Region of Attiki (0.09276)	Prefecture of Kozani (0.03663)	Prefecture of Evritania (0.000)	Prefecture of Evritania (0.00)	Prefecture of Samos (0.00029)	Prefecture of Argolida (0.00028)
Manufacturing Industries	Region of Attiki (41.701)	Prefecture of Kastoria (2.37)	Region of Attiki (0.05537)	Prefecture of Kastoria (0.14232)	Prefecture of Lefkada (0.049)	Prefecture of Lefkada (0.20)	Prefectures of Evia and Kilkis (0.00041)	Prefecture of Evoia (0.00490)
Electrical Energy, Water and Natural Gas	Region of Attiki (41.334)	Prefecture of Kozani (7.93)	Region of Attiki (0.0535)	Prefecture of Kozani (0.02555)	Prefecture of Lefkada (0.037)	Prefecture of Thesprotia (0.10)	Prefecture of Fokida (0.00007)	Prefecture of Fokida (0.00011)
Constructions	Region of Attiki (33.835)	Prefecture of Ioannina (1.59)	Region of Attiki (0.016046)	Prefecture of Kastoria (0.03080)	Prefecture of Lefkada (0.126)	Prefecture of Kastoria (0.37)	Prefecture of Florina (0.000002)	Prefecture of Viotia (0.00002)
Wholesale and Retail Trade	Region of Attiki (41.690)	Prefecture of Thessaloniki (1.39)	Region of Attiki (0.05532)	Prefecture of Evritania (0.02945)	Prefecture of Evritania (0.120)	Prefecture of Evritania (0.41)	Prefecture of Chios (0.00009)	Prefecture of Kavala (0.00147)
Hotels and Restaurants	Region of Attiki (30.885)	Prefecture of Dodekanissa (5.08)	Prefecture of Dodekanissa (0.02534)	Prefecture of Dodekanissa (0.06671)	Prefecture of Grevena (0.148)	Prefecture of Kastoria (0.41)	Prefecture of Evritania (0.00011)	Region of Attiki (0.00014)
Transport, Storage and Communications	Region of Attiki (43.371)	Prefecture of Chios (1.82)	Region of Attiki (0.06373)	Prefecture of Chios (0.03274)	Prefecture of Kastoria (0.140)	Prefecture of Kastoria (0.24)	Prefecture of Fokida (0.00009)	Prefecture of Evia (0.00078)
Services of Financier Mediation	Region of Attiki (55.522)	Region of Attiki (1.81)	Region of Attiki (0.12448)	Region of Attiki (0.01568)	Prefecture of Lefkada (0.061)	Prefecture of Rodopi (0.22)	Prefecture of Thesprotia (0.00059)	Prefecture of Korinthia (0.00271)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (62.461)	Prefecture of Drama (2.93)	Region of Attiki (0.15909)	Prefecture of Drama (0.00097)	Prefectures of Xanthi, Rodopi, Pieria, Florina, Kozani, Kastoria, Thesprotia, Karditsa, Lefkada, Viotia, Evia, Arcadia, Lakonia, Chios, Samos (0.00)	Prefectures of Xanthi, Rodopi, Pieria, Florina, Kozani, Kastoria, Thesprotia, Karditsa, Lefkada, Viotia, Evia, Arcadia, Lakonia, Chios, Samos (0.00)	Prefecture of Kefallonia (0.00009)	Prefecture of Thessaloniki (0.00002)
Education	Region of Attiki (31.792)	Prefecture of Thessaloniki (1.51)	Prefecture of Thessaloniki (0.03859)	Prefecture of Thessaloniki (0.00943)	Prefecture of Kefallonia (0.177)	Prefecture of Fokida (0.61)	Prefecture of Xalkidiki (0.00002)	Prefecture of Xalkidiki (0.00013)
Other services	Region of Attiki (45.881)	Region of Attiki (1.50)	Region of Attiki (0.07627)	Prefecture of Karditsa (0.03586)	Prefecture of Zakynthos (0.177)	Prefecture of Karditsa (0.42)	Prefecture of Samos (0.00016)	Prefecture of Kavala (0.00310)

Table 7: Higher and lower values for the year 1991

Sector	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization
	Higher value	Higher value	Higher value	Higher value	Lower value	Lower value	Lower value	Lower value
Products of Agriculture, Hunting and Forestry	Prefecture of Aitolokarnania (5.738)	Prefecture of Rodopi (3.37)	Region of Attiki (0.15400)	Prefecture of Rodopi (0.20768)	Prefecture of Chios (0.309)	Region of Attiki (0.08)	Prefecture of Kastoria (0.00003)	Prefecture of Evia (0.00032)
Fishery	Prefecture of Thessaloniki (12.299)	Prefecture of Kyklades (7.13)	Region of Attiki (0.11361)	Prefecture of Kyklades (0.01264)	Prefecture of Grevena (0.014)	Prefecture of Kastoria (0.02)	Prefecture of Florina (0.00018)	Prefecture of Florina (0.00016)
Mines and Pits	Prefecture of Kozani (28.742)	Prefecture of Kozani (23.34)	Prefecture of Kozani (0.14016)	Prefecture of Kozani (0.06210)	Prefecture of Lefkada (0.037)	Prefecture of Ilia (0.07)	Prefecture of Grevena (0.00012)	Prefecture of Ioannina (0.00007)
Manufacturing Industries	Region of Attiki (37.448)	Prefecture of Kastoria (2.74)	Prefecture of Thessaloniki (0.05096)	Prefecture of Kastoria (0.14265)	Prefecture of Lefkada (0.077)	Prefecture of Lefkada (0.25)	Prefecture of Xanthi (0.00013)	Prefecture of Xanthi (0.00244)
Electrical Energy, Water and Natural Gas	Region of Attiki (37.737)	Prefecture of Kozani (10.52)	Prefecture of Kozani (0.05972)	Prefecture of Kozani (0.04271)	Prefecture of Lefkada (0.085)	Prefecture of Rodopi (0.29)	Prefecture of Dodekanissa (0.00002)	Prefecture of Dodekanissa (0.00001)
Constructions	Region of Attiki (29.709)	Prefecture of Kyklades (2.04)	Region of Attiki (0.01605)	Prefecture of Kyklades (0.04338)	Prefecture of Lefkada (0.221)	Prefecture of Rodopi (0.44)	Prefecture of Aitolokarnania (0.00001)	Prefecture of Aitolokarnania (0.00003)
Wholesale and Retail Trade	Region of Attiki (39.907)	Prefecture of Thessaloniki (1.30)	Region of Attiki (0.03777)	Prefecture of Kastoria (0.05003)	Prefecture of Lefkada (0.128)	Prefecture of Kozani (0.34)	Prefecture of Chios (0.00003)	Prefecture of Magnesia (0.00038)
Hotels and Restaurants	Region of Attiki (28.702)	Prefecture of Dodekanissa (4.63)	Prefecture of Dodekanissa (0.02698)	Prefecture of Dodekanissa (0.08161)	Prefecture of Lefkada (0.182)	Prefecture of Rodopi (0.48)	Prefecture of Lefkada (0.00002)	Prefecture of Ioannina (0.00046)
Transport, Storage and Communications	Region of Attiki (44.582)	Prefecture of Chios (1.88)	Region of Attiki (0.06242)	Prefecture of Chios (0.03204)	Prefecture of Grevena (0.171)	Prefecture of Kastoria (0.39)	Prefecture of Evritania (0.000002)	Prefecture of Evritania (0.00005)
Services of Financier Mediation	Region of Attiki (52.441)	Region of Attiki (1.62)	Region of Attiki (0.10447)	Prefecture of Rodopi (0.00708)	Prefecture of Lefkada (0.073)	Prefecture of Rodopi (0.35)	Prefecture of Fokida (0.00016)	Prefecture of Thessaloniki (0.00051)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (50.114)	Region of Attiki (1.55)	Region of Attiki (0.09208)	Prefecture of Florina (0.01384)	Prefecture of Lefkada (0.105)	Prefectures of Rodopi and Florina (0.32)	Prefecture of Evritania (0.00039)	Prefecture of Kerkyra (0.00312)
Education	Region of Attiki (35.149)	Prefecture of Ioannina (1.40)	Prefecture of Thessaloniki (0.02031)	Prefecture of Kilikis (0.01287)	Prefecture of Lefkada (0.181)	Prefecture of Kilikis (0.55)	Prefecture of Evritania (0.000005)	Prefecture of Kozani (0.00008)
Other services	Region of Attiki (43.751)	Region of Attiki (1.34)	Region of Attiki (0.05796)	Prefecture of Pella (0.03836)	Prefecture of Lefkada (0.156)	Prefecture of Pella (0.54)	Prefecture of Fokida (0.00001)	Prefecture of Thessaloniki (0.00035)

Table 8: Higher and lower values for the year 2001

Sector	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization	Gini – Hirschman Coefficient	Location Quotient coefficient	Coefficient of Location	Coefficient of Specialization
	Higher value	Higher value	Higher value	Higher value	Lower value	Lower value	Lower value	Lower value
Products of Agriculture, Hunting and Forestry	Prefecture of Larissa (5.191)	Prefecture of Rodopi (3.81)	Region of Attiki (0.13229)	Prefecture of Rodopi (0.20764)	Prefecture of Lefkada (0.219)	Region of Attiki (0.11)	Prefecture of Chios (0.00029)	Prefecture of Kozani (0.00507)
Fishery	Region	Prefecture	Region	Prefecture	Prefecture	Prefectures	Prefectures	Prefecture of

	of Attiki (13,225)	of Lefkada (7.74)	of Attiki (0.08287)	of Lefkada (0.01557)	of Karditsa (0,038)	of Karditsa and Trikala (0.04)	of Arcadia and Grevena (0.00004)	Arcadia (0.00003)
Mines and Pits	Prefecture of Kozani (23,602)	Prefecture of Kozani (23.38)	Prefecture of Kozani (0.11296)	Prefecture of Kozani (0.03268)	Prefecture of Lefkada (0,017)	Prefecture of Ilia (0.06)	Prefecture of Argolida (0.00008)	Prefecture of Argolida (0.00003)
Manufacturing Industries	Region of Attiki (45,763)	Prefecture of Kastoria (2.19)	Region of Attiki (0.07983)	Prefecture of Kastoria (0.07561)	Prefecture of Evritania (0,058)	Prefecture of Lefkada (0.37)	Prefecture of Pella (0.00001)	Prefecture of Pella (0.00012)
Electrical Energy, Water and Natural Gas	Region of Attiki (34,483)	Prefecture of Kozani (12.77)	Prefecture of Kozani (0.05941)	Prefecture of Kozani (0.05640)	Prefecture of Lefkada (0,078)	Prefecture of Chalkidiki (0.52)	Prefecture of Lassithi (0.00006)	Prefecture of Lassithi (0.00009)
Constructions	Region of Attiki (37,997)	Prefecture of Kyklades (2.50)	Region of Attiki (0.04100)	Prefecture of Kyklades (0.06759)	Prefecture of Evritania (0,211)	Prefecture of Pella (0.62)	Prefecture of Pieria (0.00016)	Prefecture of Pieria (0.00147)
Wholesale and Retail Trade	Region of Attiki (46,010)	Region of Attiki (1.54)	Region of Attiki (0.08106)	Region of Attiki (0.04239)	Prefecture of Evritania (0,093)	Prefecture of Rodopi (0.58)	Prefecture of Kastoria (0.00001)	Prefecture of Pieria (0.00033)
Hotels and Restaurants	Region of Attiki (32,561)	Prefecture of Dodekanissa (3.84)	Prefecture of Dodekanissa (0.02164)	Prefecture of Dodekanissa (0.09789)	Prefecture of Grevena (0,212)	Region of Attiki (0.99)	Prefecture of Grevena (0.00001)	Prefecture of Kozani (0.00014)
Transport, Storage and Communications	Region of Attiki (52,530)	Prefecture of Chios (2.20)	Region of Attiki (0.11366)	Prefecture of Chios (0.04149)	Prefecture of Evritania (0,110)	Prefecture of Rodopi (0.46)	Prefecture of Thesprotia (0.000003)	Prefecture of Thesprotia (0.00008)
Services of Financier Mediation	Region of Attiki (62,331)	Region of Attiki (2.09)	Region of Attiki (0.16266)	Region of Attiki (0.01488)	Prefecture of Evritania (0,081)	Prefecture of Rodopi (0.35)	Prefectures of Chios and Fokida (0.00002)	Prefectures of Chios (0.00017)
Real Estate Services, Services of Renting and Enterprising Services	Region of Attiki (56,222)	Region of Attiki (1.89)	Region of Attiki (0.13212)	Region of Attiki (0.02720)	Prefecture of Evritania (0,067)	Prefecture of Rodopi (0.45)	Prefecture of Kefallonia (0.00012)	Prefecture of Iraklio (0.00058)
Education	Region of Attiki (38,514)	Prefecture of Ioannina (2.07)	Region of Attiki (0.04358)	Prefecture of Ioannina (0.03427)	Prefecture of Evritania (0,131)	Prefecture of Chalkidiki (0.69)	Prefecture of Evritania (0.00001)	Prefecture of Evritania (0.00035)
Other services	Region of Attiki (48,620)	Prefecture of Evros (1.68)	Region of Attiki (0.09411)	Prefecture of Evros (0.06144)	Prefecture of Evritania (0,152)	Prefecture of Pella (0.60)	Prefecture of Kastoria (0.00001)	Prefecture of Kilikis (0.00091)

Conclusions – proposals

In this paper an effort was made to study the specialisation of Greek prefectures as well as for the territorial behavior for 13 sectors of economic activity, using data of employment and methods of regional analysis (Gini – Hirschman coefficient, Location Quotient coefficient, Coefficient of Location, Coefficient of Specialization and analysis of deviation – participation).

According to the results of the survey, the areas that present the higher economic activity are; Region of Attiki, Prefecture of Thessaloniki, Prefecture of Larissa, Prefecture of Kozani, Prefecture of Ioannina, Prefecture of Kastoria,

Prefecture of Kyklades, Prefecture of Dodekanissa, Prefecture of Lesvos. These regions are located on the developmental axis of Greece, or present specialization in specific activities such as, Hotels and Restaurants, Fishery, Manufacturing Industries and others.

The mountainous Prefectures of Grevena, Evritania and others present the lower economic activity. Indeed, these regions are characterized by a significant reduction in the population and high unemployment rates.

Based on the facts mentioned above, the objectives regarding regional development, concern the institutional changes, as well as the infrastructures that should exist. Thus, the following actions are proposed:

- a) Application of Law 3299/2004.
- b) Equal distribution of the funds of the fourth Community Support Framework.
- c) Works of infrastructure in less developed regions.

Greece has made considerable efforts in the last decades, in order to become a developed country. In the following years, the strategy and the directions for the regional development should be in the frames of the Law 3299/2004 and should accord with the sustainable development.

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