Evaluating Greek economic sectors' regional dynamics during the pre and in-crisis period

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Abstract
As economic recession is still present in Greece, economic sectors are strongly influenced by the negative growth rates of Greek economy. The process of recovery should be primarily based on the strengthening of the most competitive sectors. The present paper aims at the identification of the sectors that should constitute the growth engines of the Greek economy. Analysis does not only target on the national level, but it also takes into account the dynamics of sectors in Greek prefectures. The present paper focuses both on the pre-crisis and in-crisis period as the estimations concern the years 2005 and 2010. For the identification of sectors' dynamics, an input – output analysis is adopted and the size of regional multipliers for the Greek prefectures (NUTS III) is estimated. Then, the observed differences and the changes amongst the multipliers for the prefectures and sectors are analyzed and evaluated. Additionally, the values of regional multipliers of the most dynamic sectors are implemented as the dependent variable in a regression analysis in which a set of socio-economic and spatial factors of Greek prefectures are used as the independent variables. By doing so, we are able to capture the relationship among the characteristics of each prefecture and the dynamics of its economic sectors.

Keywords: Input-Output Analysis, Regional multipliers, Regional Development, Tobit regression, Greece

JEL classification: R15, O33, O52, C240

Introduction

Input-output I-O analysis as an economic modeling technique aims at understanding the interactions between productive sectors, producers and consumers within an economy. It is a powerful tool for the estimation of magnitude of transactions occurred between different sectors of an economy, providing useful overview of the structure of it (Polyzos and Sofios, 2008). An input-output table includes the flows of products from each sector considered as a producer to each of the sectors considered as consumers (Miller and Blair, 2009). Several I-O techniques have been developed and are widely used worldwide for measuring diverse elements and entities such as gross regional product, household consumption and employment generation.

Other analytical techniques such as shift-share and location quotient analyses, econometric and statistical models have also been developed for measuring relevant regional economic aspects. These tools provide useful insights into the structure of regional economies and their trajectories of change over time. The various analytical techniques rely heavily upon quantitative methods and their use for analyzing regional economies has certain limitations (Polyzos and Sofios, 2008).

By using Input-Output (I-O) Analysis we can study the structural changes within a national or regional economy, since it provides the tools that are necessary in order to evaluate industries, including their relationships to the rest of the economy and the effects of international or interregional trade on those relationships. Moreover, it provides the scientific base for the product and employment multipliers estimation and thereby the evaluation of each applied economic policy. Although input-output models were firstly applied at a nation-wide level, the models were modified in order to cover different spatial units, such as regions. The extension of the national-level models led to the creation of a set of regional input-output models.

In this paper, we regionalize the national Input Output tables and estimate the regional multipliers of Greek Prefectures. Thus, we analyze the structural changes in the regional economy for the period 2005 to 2010 using national input-output tables provided by National Statistical Services of Greece. Additionally, a regression model is formulated in order to estimate the relationship among the values of the regional multipliers and several features of regional economy.

The structure of the remainder paper is as follows. In the next section the methods of I-O tables' regionalization are described and evaluated. Then, the Input – Output technical coefficients are estimated by using the LQ's technique for the 51 Greek prefectures. Moreover, an analysis of multipliers' changes is performed and the values of multipliers are regressed with a set of socio-economic and spatial factors of each prefecture. The paper concludes by drawing some general remarks derived from the preceding analysis.

Input - Output technical coefficients' regionalization

The general equation of the I-O analysis for n productive sectors of an economy is the following (Miller and Blair, 2009):

$$X=(I-A)^{-1}f \qquad (1)$$

where, X is the total output of economy, A denotes the technical coefficients matrix, and f is the final demand of economy.

The common methods that are used to develop a regional I-O table can be distinguished in three basic categories: (a) The survey methods, (b) The non-survey methods and (c) The partial survey or hybrid methods. The central task of these methods, mainly of the two last ones, is the adaptation of the technical coefficients of a national I-O table in order to highlight features of the analyzed regional economy. With the survey method, primary data concerning the regional intra-sectoral transactions are used for the construction of the regional I-O table. This procedure is rarely used at the regional level since it is costly and time-consuming.

The non-survey methods, based on the application of various techniques for the modification of the national technical coefficients of I-O table in regional ones, are used more frequently. A number of non-survey techniques for regionalization of national coefficients through adjustments are based entirely on published regional statistical data about employment, output, added value and income.

The third category includes the hybrid techniques which combine the survey and non-survey methods through superior statistical data and information obtained from small scale surveys. The methods of this category have expanded beyond the limitations of non-survey approaches and the prohibitive costs of survey methods assuring a compromise between accuracy and required recourses.

In this paper a non-survey method will be implemented, in order to estimate the regional technical coefficients of I-O analysis for Greek Prefectures (NUTS III). Before applying the method to the Greek case, a brief description of the main techniques that belong to the second category will be preceded.

The assumptions made by non-survey methods concern existing differences between a regional and a national economy, despite the commonly assumed similarity of the production technology. The techniques that have been developed focus on the estimation of input and trade coefficients and less on technical coefficients because the assumption of identical technology. According to many empirical findings the regional purchase coefficients used to scale down the inputs are more important in determining the accuracy of the model than is the assumption of similarity of the production technology (Kuhar et al., 2009). The basic data or regional indices used by these methods concern location quotient, regional supply percentages, supply-demand pool approach, regional purchase coefficients, etc. The majority of these methods are based on the location quotient index. A brief description of the most important approaches belonging in this category takes place below.

(a) A way to modify the national coefficients in regional ones is by using Simple Location Quotients (SLQ). The SLQ for sector i in region r is defined as:

$$SLQ_i^r = \frac{Q_i^r / Q^r}{Q_i^N / Q^N} \qquad (2)$$

where Q_i^r and Q^r denote output (or alternatively employment) of sector i in region r and total output of all sectors in region r, respectively, and let Q_i^N and Q^N denote these totals at the national level. When $SLQ_i^r > 1$, the sector i is more localized or concentrated in region r than in the nation as a whole, and it is able to satisfy the regional demand requirements for its products. In this case, the regional coefficient is assumed $\alpha_{ij}^r = \alpha_{ij}^N$ and the same assumption holds if $SLQ_i^r = 1$. Conversely, if $SLQ_i^r < 1$, then the sector i is less localized or less concentrated in region r than in the nation as a whole. Consequently, the region needs to import products from other regions in this sector in order to satisfy the whole regional demand requirements and $\alpha_{ij}^r = \alpha_{ij}^N SLQ_i^r$ (Miller and Blair, 2009).

(b) The above modification has been improved by using the Cross-Industry Location Quotient (CILQ). The CILQ compares the share of the selling industry's output of the region to the national with that of the purchasing industry in the region to the national and it is formulated as:

$$CILQ_{ij} = \frac{SLQ_i}{SLQ_j} \quad (3)$$

When $CILQ_{ij} > 1$, the regional selling sector i can supply all the requirements of the regional purchasing sector j and the sector i has a greater share in sectoral national output than the sector j. In this case, no adjustment is needed and the regional technical coefficient and the regional imports coefficient are identical with the national ones. Similarly, no adjustment is needed when $CILQ_{ij}=1$. If $CILQ_{ij}<1$, the regional technical coefficient is adjusted downward with the product of the national coefficient and the computed $CILQ_{ij}$.

(c) Round (1978) proposed a new formula using the semilogarithmic quotient (RLQ). In this new location quotient the selling and purchasing sectors are considered as in the case of CILQ, but also the relative sizes of region and nation are added. The RLQ is formulated as:

$$RLQ_{ij} = \frac{SLQ_i}{\log_2(1 + SLQ_j)} \quad (4)$$

Thus, $\alpha^r_{ij} = \alpha^N_{ij} RLQ^r_i$.

(d) Another formula has been developed by Flegg et al. (1995) and Flegg and Webber (1997), in order to overcome some weaknesses of the previous ones. They had as starting point the fact that the SLQ and CILQ provide an alternative way of estimating the relevant trading coefficients. Trading coefficients measuring the proportion of a commodity supplied from within the region depend on the next variables: (a) the relative size of the supplying sector, (b) the relative size of the purchasing sector, (c) the relative size of the region (Kuhar et al., 2009).

In the formula proposed by Flegg et al. (1995), the three variables are captured and the formula is defined as follows:

$$FLQ_{ij} = CILQ_{ij}\lambda \quad (5)$$

In equation (5), λ is the weighting measure of the regions' relative size and it is estimated as follows:

$$\lambda = [\log_2(1 + \frac{\sum Q^r_i}{\sum Q^N_i}]^\delta \text{ with } 0 \le \delta \le 1 \text{ and } 0 \le \lambda \le 1 \quad (6)$$

where, δ is the weighting parameter based on the size of region. Then,

$$\alpha^r_{ij} = FLQ^r_{ij}\alpha^n_{ij} \text{ for } FLQ^r_{ij} < 1$$
$$\alpha^r_{ij} = \alpha^n_{ij} \text{ for } FLQ^r_{ij} \ge 1 \quad (7)$$

Flegg and Weber (2000) developed another augmented formula, which allows for $\alpha_{ij}^{r} > \alpha_{ij}^{N}$ and it is defined as:

$$AFLQ_{ij} = FLQ_{ij}[\log_2(1 + SLQ_j)] \text{ for } SLQ_j > 1$$
$$AFLQ_{ij} = FLQ_{ij} \text{ for } SLQ_j \leq 1 \quad (8)$$

Regional multipliers in Greek prefectures for the years 2005 and 2010

This section focuses on the measurement of the technical coefficients for the Greek prefectures at years 2005 and 2010 using the FLQ method described by the equations (5), (6) and (7).

According to the references (Flegg and Webber, 2000; Miller and Blair, 2009), the coefficient δ is usually defined arbitrarily and its value is specified close to 0.3. In this article, the technical coefficients were calculated by using δ = 0.1, 0.2 and 0.3. The results show that δ=0.1 is the most suitable value in order to calculate technical coefficients and multipliers at prefecture level.

By using the matrices of technical coefficients, we estimate the product multipliers for the industries of the Greek prefectures according to the equation, $OM_j = \sum_{i=1}^{n} b_{ij}$, where OM_j is the product multiplier of the industry j and b_{ij} are the elements of Leontief inverse matrix. The changes of the multipliers will show which industries have been affected most by the economic crisis and which industries should constitute the growth engines for the economic recovery of the Greek economy.

The results indicate that the industries that present the highest product multipliers at Greece in 2005 are the following: constructions, professional, scientific and technical activities, and accommodation and food service activities. In 2010, industries of Greek economy such as constructions, professional, scientific and technical activities, administrative and support service activities, and human health and social work activities have the highest product multipliers.

By examining the dominant industries at prefecture level, it is evident that in 2005 the product multipliers in the constructions industry show high values in prefectures such as Attiki, Thessaloniki, Kavala, Evoia and Imathia. In 2010, the most important product multipliers in the constructions industry are observed in prefectures of Drama, Serres, Fthiotida, Attiki and Thessaloniki.

The professional, scientific and technical activities constitute a growing industry of the Greek economy that presents high values of product multipliers in prefectures such as Attiki, Thessaloniki, Achaia, Ioannina, Kavala, Voiotia, Fthiotida.

As far as the accommodation and food service activities, it is realized that prefectures of Attiki, Larisa, Voiotia, Thessaloniki and Imathia get major multiplier effects both in 2005 and 2010. It is worth noting that there is important reduction at the product multipliers values in 2010. Moreover, the island prefectures appear low product multipliers values in this industry.

Prefectures including major urban centers (Attiki, Thessaloniki, Larissa, Achaia, Serres, Fthiotida, Korinthia, Evoia etc.) show high product multipliers values in industries of the tertiary sector such as administrative and support service activities and human health and social work activities both in 2005 and 2010.

Finally, prefectures of Magnisia, Thessaloniki, Korinthia, Attiki and Kavala get the highest product multipliers values in the primary sector (agriculture, forestry and fishing).

By analysing the changes of the product multipliers per industry in the Greek prefectures between 2005 and 2010, it is concluded that the most positive changes are observed in the industries of administrative and support service activities (Preveza, Evritania, Attiki), constructions (Drama, Serres) and human health and social work activities (Argolida, Kavala). In contrast, accommodation and food service activities get the most negative changes among the industries of Greek economy in the prefectures of Pella, Kilkis, Larisa, Voiotia, Attiki, Xanthi and Imathia (see in Appendix).

The industries that show a positive change in almost all the Greek prefectures between 2005 and 2010 are the following: Agriculture, forestry and fishing (except Kyklades), transportation and storage (except Evros, Imathia, Pella, Halkidiki and Kastoria, financial and insurance services (except Pella), education (except Pella), human health and social work activities (except Imathia, Pella, Achaia and Kyklades).

On the other hand, almost all the Greek prefectures develop a negative change in industries such as mining and quarrying (except Kastoria and Arta), water supply, sewerage, waste management and remediation activities (except Evros, Drama, Pieria, Fthiotida and Attiki), and accommodation and food service activities.

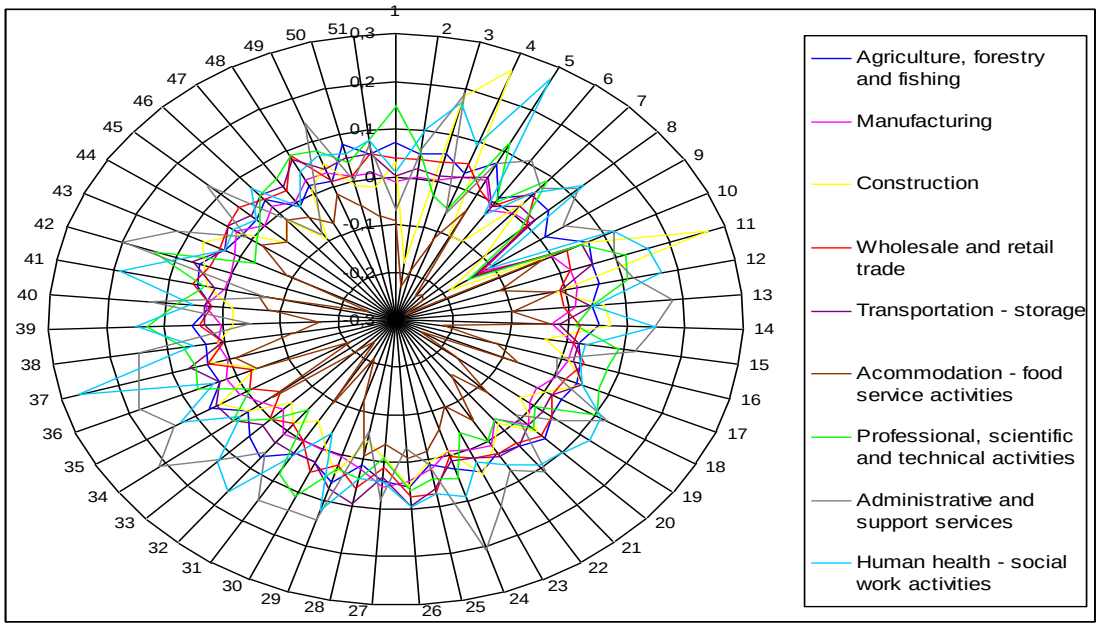

Figure 1: Changes of multipliers in basic productive industries of Greek prefectures during the period 2005-2010[1]
Source: EL. STAT., 2013 (own elaboration)

[1] The numbers of the figure correspond to the 51 Greek prefectures (see Table 4 - Appendix).

Further analysis and interpretation of multipliers

In this section, the relation between several indicators and the multipliers of the key-industries of Greek economy is examined. Analysis focuses on the NUTS III level in order to capture the effect of spatial and socio-economic factors of each prefecture on its industries' dynamics. Thus, the estimated multipliers values (OM) of each industry for the 51 prefectures will be used as the dependent variable in a regression analysis. These values constitute a reliable indicator of each industry dynamics (Polyzos, 2009; Polyzos, 2011).

Moreover, as mentioned above, the independent variables are selected in a manner of adequately representing the socio-economic and spatial characteristics of Greek Prefectures. These variables are:

(a) GDP per capita (*GDP*) which constitutes an indicator used to measure wealth and development, despite the weaknesses at the process of calculation in the case of Greek economy.
(b) The Education Index (*EI*) which shows the education and training level of each prefecture. Prefectures presenting high values of this indicator, appear high quality of human resources and favourable growth prospects.
(c) The Centrality Index (*CI*) which depicts the relative position of each prefecture compared to the others. High index values indicate favourable accessibility of the prefectures in relation to the transport networks, whereas low index values indicate limited accessibility. The prefectures are divided into two groups based on the values of their Centrality Index thus, creating a dummy variable. The variable takes the price 0 for observations with values of centrality index lower than 100 and 1 for the observations of centrality index higher than 100.
(d) The Population of Capital Cities (*CP*) which reflects the growth dynamics of the prefectures. Urban areas with high population are associated with great growth potentials in activities of secondary or tertiary sector as well as with high incomes (Polyzos and Sofios, 2008; Polyzos et al., 2011).

Since multipliers values are constrained from the left to the value (1), Ordinary Least Squares (OLS) regression may lead to a censorship bias. To avoid this bias, the present paper implements Tobit regression technique which leads to more accurate estimations when the depended variable of a regression is censored (Niavis and Tsekeris, 2012).

The Tobit model represents the potential (expected) value of the dependent variable OM as a latent variable, $\hat{O}M$, which can only be partially observed within the feasible range of multiplier values (>1), as follows (Tobin, 1958):

$$\hat{O}M_j = \begin{cases} 0, & \text{if} \quad \hat{O}M_j \leq 1 \\ \hat{O}M_j, & \text{if} \quad \hat{O}M_j > 1 \end{cases} \tag{9}$$

The specification of the Tobit model for Greek industrial sectors can be expressed as following:

$$OM_i = \beta_1 + \beta_2 GDP_i + \beta_3 EI_i + \beta_4 CI_i + \beta_5 CP_i + \varepsilon_i \tag{10}$$

Where,

OM_i = Sector's multiplier value of i prefecture ($i = 1, 2, ..., 51$)

β_i = The regression coefficients ($i = 1, 2, ..., 5$)

GDP_i = GDP per capita in 2010 constant prices of i prefecture (000€)

EI_i = Education Index of i prefecture (0-100)

CI_i = Dummy variable of Centrality Index. 0 for low centrality index values (<100) and 1 for high centrality index values (>100).

CP_i = Capital's Population of i prefecture (0.000 habitats)

ε_i = the error term

The model (10) will be applied to several sectors of Greek economy. The selection of sectors is based on the criterion of their overall growth potential, as it was reflected on their relative multiplier values. The sectors examined in the model are the following: (a) agriculture, forestry and fishing (AFF), (b) constructions (CON), (c) transportation and storage (TaS), (d) wholesale and retail trade (WaRT), (e) human health and social work activities (HaSW), (f) accommodation and food service activities (AaFD), and (g) administrative and support service activities (AaSS). The descriptive statistics of the variables are presented in Table 1.

Table 1: Descriptive Statistics of Tobit Model Variables

	Mean	Min.	Max.	St. Dv.	CV
Dependent Variables					
OM_{AFF}	1,249	1,170	1,398	0,061	4,90%
OM_{CON}	1,320	1,094	1,809	0,161	12,20%
OM_{TaS}	1,306	1,139	1,564	0,061	4,67%
OM_{WaRT}	1,267	1,076	1,567	0,068	5,38%
OM_{HaSW}	1,312	1,109	1,540	0,130	9,92%
OM_{AaFD}	1,174	1,018	1,339	0,098	8,36%
OM_{AaSS}	1,439	1,189	1,605	0,107	7,42%
Independent Variables					
GDP	16,162	10,213	30,860	4,145	25,65%
EI	18,667	0	100	17,208	92,18%
CP	5,667	0,612	66,405	10,108	178,36%

Source: EL. STAT., 2013 (own elaboration)

As it can be seen in Table 1, the dependent variables present significantly greater homogeneity than the independent. The CV values of the observations do not exceed the critical value of 10% for almost all of the dependent variables, with the exception of *CON* sector variable, for which the CV price estimation is 12,20%. The highest average value of multipliers is found for sector AaSS (1,439) followed by sectors CON, HaSW and TaS which present similar mean values, ranging from 1,320 to 1,306. Additionally, WaRT and AFF sectors have lower mean values from the aforementioned, ranging from 1,267 to 1,249. Finally, the lowest average multiplier mean value is estimated for the AaFD sector (1,174).

The results of the Tobit model for the seven selected sectors of Greek economy are presented in Table 2. The results show that the fitting of the seven different Tobit models to the Greek data is quite satisfactory. More specifically, the values of Likelihood Ratio Tests for all the models exceed the critical values of the X^2 distribution. Thus, the null hypothesis that the constant-only models perform better than the models with the four selected variables is rejected for all models at the 0,01 significance level.

Table 2: Tobit Model Estimations

	OM_{AFF}	OM_{CON}	OM_{TaS}	OM_{WaRT}	OM_{HaSW}	OM_{AaFD}	OM_{AaSS}
β_1	1,1858*** (0,0286)	1,3029*** (0,0664)	1,2525*** (0,0219)	1,17*** (0,0223)	1,154*** (0,068)	1,1969*** (0,0422)	1,5603*** (0,054)
$\beta_2(GDP)$	0,0009 (0,0018)	-0,0041 (0,0041)	0,0008 (0,0014)	0,0031** (0,0014)	0,0086** (0,0042)	-0,0027 (0,0026)	-0,0092*** (0,0033)
$\beta_3(EI)$	0,0017** (0,0008)	-0,0008 (0,0019)	0,0007 (0,0006)	0,0017** (0,0006)	-0,003 (0,0019)	-0,0031** (0,0012)	-0,0012 (0,0015)
$\beta_4(CI)$	0,0403*** (0,0144)	0,0876** (0,0333)	0,0258** (0,011)	0,0039 (0,0112)	0,0966*** (0,0341)	0,0818*** (0,0212)	0,0503* (0,0271)
$\beta_5(CP)$	0,0003 (0,0014)	0,011*** (0,0032)	0,0032*** (0,001)	0,0024** (0,0011)	0,0062* (0,0032)	0,0079*** (0,002)	0,0049* (0,0026)
σ	0,0461 (0,0046)	0,1071 (0,0106)	0,0354 (0,0035)	0,0359 (0,0036)	0,1097 (0,0109)	0,068 (0,0067)	0,0871 (0,0086)
Log Likelihood	84,55	41,55	98,09	97,25	40,35	64,73	52,08
LR Test Chi2(4)	27,98***	40,65***	53,78***	64,26***	16,84***	36,44***	19,53***

Std. Error Estimates are shown in parenthesis.
Statistical Significance Levels: ***0,01; **0,05; *0,1

The statistical significance and the signs of the estimated coefficients across the different sectors' models present significant variations. The sign of the relationship among independent and dependent variables is depicted in the rows of Table 3. The green bullet indicates a positive estimated relationship, the red bullet denotes a negative estimated relationship and the black dash indicates estimation without statistical significance.

Table 3: The Relationship among Regional Multipliers and Local Factors

	OM_{AFF}	OM_{CON}	OM_{TaS}	OM_{WaRT}	OM_{HaSW}	OM_{AaFD}	OM_{AaSS}
$\beta_2(GDP)$	–	–	–	●	●	–	●
$\beta_3(EI)$	●	–	–	●	–	●	–
$\beta_4(CI)$	●	●	●	–	●	●	●
$\beta_5(CP)$	–	●	●	●	●	●	●

●	Positive Sign
●	Negative Sign
–	Lack of Statistical Significance

The results show a positive correlation among multipliers and GPD per capita in industries such as wholesale - retail trade and human health

- social work activities. The estimation for both sectors is statistically significant at the 0,05 confidence level. In the other sectors, the estimation of the repressors coefficients of GPD per capita is statistically non-significant.

Moreover, it is evident that prefectures with high levels of education have high multipliers in industries such as wholesale and retail trade and agriculture, forestry and fishing. In contrast, there is negative correlation between multipliers and education level in accommodation and food service activities. This may be explained by the fact that the tourist sector attracts a significant number of low-skilled employees who cover the high demand for employment of one of the most active economic sectors in Greece.

The centrality and the capital population of each prefecture are two variables that are positively correlated with the multipliers of almost all the sectors. Prefectures appearing high accessibility in relation to the transport networks get high multipliers values in almost all the sectors. Moreover, prefectures including cities with large population show positive correlation with industries' multipliers that belong to the secondary and the tertiary sector. This fact means that these regions have favourable growth prospects.

Conclusions

The aim of this article was the evaluation of multipliers changes in productive industries of Greek economy at prefecture level during the period 2005-2010.

It is observed that constructions industry as well as industries of the tertiary sector (professional, scientific and technical activities, administrative and support service activities, human health and social work activities) appear the highest multipliers. At prefecture level, in most cases, higher multipliers are presented in prefectures including dynamic urban centers, such as Attica, Thessaloniki, Achaia, Fthiotida, Larissa, Evia, etc.

By examining the changes of the product multipliers per industry in the Greek prefectures between 2005 and 2010, it is concluded that the most positive changes are observed in the industries of administrative and support service activities and human health and social work activities. In contrast, accommodation and food service activities get the most negative changes among the industries of Greek economy.

Additionally, the results of the regression analysis of multipliers to four factors showed that the growth dynamics of different sectors seems to be influenced in a complex way by various socio-economic and spatial characteristics of Greek prefectures. The multipliers of almost all the sectors are highly related with factors such as centrality and capital population of Greek prefectures. On the other hand, factors such as the GDP per capita and the education level of the prefectures seem to affect the multipliers of each sector in different ways.

Concluding, the multipliers constitute an important tool that should be taken into account during the formulation of regional policy, because they can contribute to the achievement of the policy goals. The present paper constitutes an introductive analysis to the dynamics of Greek sectors at regional level and the specific local factors that may influence it. As Greece moves towards to the exit of the crisis, even with small steps, the dynamics of each sector should be an issue

of consideration, as the strengthening of the most dynamic sectors may be crucial for the attainment of economic recovery. Additionally, the local authorities should be able to recognize the competitive advantages of their area, which are shaped by the dynamics of the local economic sectors. Also, authorities have to form an adequate strategic plan for the strengthening of their economic growth. To achieve that, the factors and the way in which they influence the dynamics of each sector should be clear, both at local authorities and central government, as these administrative bodies are responsible for the structuring and implementation of regional policy.

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Appendix

Table 4: Changes of multipliers in basic productive industries during the period 2005-2010

	Agriculture, forestry and fishing	Manu Facturing	Construction	Wholesale and retail trade	Transportation and storage	Accommodation and food services	**Professional, scientific, technical activities**	**Administrative and support service activities**	**Human health and social work**
1.Evros	0,07	-0,01	0,03	0,04	0,00	-0,09	0,15	-0,07	0,01
2.Xanthi	0,05	0,00	-0,18	0,04	0,02	-0,23	0,05	0,06	0,10
3.Rodopi	0,06	0,00	0,18	0,04	0,01	-0,20	-0,03	0,19	0,17
4.Drama	0,03	0,02	0,26	0,05	0,02	-0,12	-0,05	-0,06	0,09
5.Kavala	0,07	0,03	-0,10	0,01	0,04	-0,04	0,12	0,07	0,27
6.Imathia	0,01	-0,02	-0,10	-0,01	-0,01	-0,24	0,00	0,11	-0,03
7.Thessaloniki	0,05	0,00	0,03	0,06	0,02	-0,23	0,09	0,07	0,06
8.Kilkis	0,05	0,01	-0,09	0,00	0,02	-0,24	-0,01	0,12	0,13
9.Pella	0,01	-0,12	-0,19	-0,13	-0,14	-0,28	-0,15	0,05	-0,11
10.Pieria	0,07	0,00	0,07	0,03	0,06	-0,02	0,06	0,12	0,12
11.Serres	0,06	0,02	0,27	0,02	0,06	-0,11	0,12	0,10	0,16
12.Chalkidiki	0,06	0,02	-0,02	-0,01	-0,01	-0,02	0,11	0,12	0,17
13.Grevena	0,04	0,01	0,06	-0,01	0,04	-0,10	0,04	0,18	0,04
14.Kastoria	0,05	-0,03	0,07	0,02	-0,02	-0,03	0,01	0,15	0,15
15.Kozani	0,02	0,01	-0,04	0,01	0,02	-0,22	0,09	0,12	0,03
16.Florina	0,03	0,01	0,01	0,04	0,02	-0,12	0,08	-0,01	0,03
17.Karditsa	0,04	0,00	0,05	0,02	0,05	-0,07	0,08	0,00	0,05
18.Larisa	0,03	-0,02	0,00	0,01	0,01	-0,25	0,10	0,12	0,11
19.Magnisia	0,04	-0,01	-0,03	0,04	0,02	-0,17	0,00	0,05	0,12
20.Trikala	0,06	0,02	0,04	0,05	0,02	-0,08	0,03	-0,01	0,10
21.Arta	0,04	-0,03	-0,02	0,03	0,04	-0,15	-0,03	0,11	0,09
22.Thesprotia	0,03	0,01	0,02	0,03	0,04	-0,05	0,00	0,07	0,06
23.Ioannina	0,05	0,00	0,06	0,02	0,02	-0,10	-0,04	0,13	0,03
24.Preveza	0,03	-0,01	-0,01	0,00	0,01	-0,06	0,05	0,21	0,09
25.Zakynthos	0,01	0,02	0,00	0,07	0,06	-0,02	0,04	0,01	0,07
26.Kerkyra	0,05	0,04	0,05	0,07	0,09	-0,01	0,06	-0,03	0,09
27.Kefallonia	0,04	0,05	-0,01	0,01	0,03	-0,04	-0,01	0,08	0,04
28.Lefkada	0,01	0,02	-0,04	0,06	0,09	-0,01	0,04	-0,06	0,04
29.Aitoloakarnania	0,06	0,00	0,04	0,02	0,07	-0,12	0,03	0,14	0,12
30.Achaia	0,03	0,00	-0,01	0,05	0,03	-0,21	0,11	0,14	-0,04
31.Ileia	0,03	0,00	-0,05	0,00	0,03	-0,09	0,08	0,15	0,04
32.Voiotia	0,07	0,01	-0,02	-0,02	0,03	-0,24	-0,06	0,06	0,16
33.Evoia	0,05	-0,03	-0,05	0,00	0,02	-0,20	0,00	0,12	0,13
34.Evritania	0,02	-0,01	0,02	-0,05	0,05	-0,03	0,05	0,21	0,04
35.Fthiotida	0,07	0,01	0,05	-0,01	0,06	-0,21	-0,01	0,14	0,13
36.Fokida	0,03	0,02	-0,04	-0,03	0,03	-0,04	0,07	0,18	0,04
37.Argolida	0,04	0,00	0,03	0,04	0,07	-0,01	0,06	0,16	0,27
38.Arkadia	0,03	0,01	0,01	0,00	0,00	-0,12	0,07	0,15	0,05
39.Korinthia	0,05	0,00	-0,02	0,04	0,03	-0,17	0,13	-0,05	0,15
40.Lakonia	0,02	0,03	-0,02	0,02	0,03	-0,08	0,08	0,13	0,05
41.Messinia	0,05	0,00	0,03	0,06	0,02	-0,06	0,04	-0,07	0,19
42.Attica	0,06	0,00	0,05	0,04	0,07	-0,25	0,14	0,20	0,09
43.Lesvos	0,03	0,01	0,07	0,04	0,03	-0,09	-0,03	0,12	0,03
44.Samos	0,02	0,03	0,02	0,05	0,05	-0,02	-0,01	0,01	0,04
45.Chios	0,02	0,00	-0,05	0,06	0,03	-0,05	0,01	0,13	0,02
46.Dodekanisos	0,04	0,02	-0,02	0,04	0,05	-0,02	0,05	-0,01	0,07
47.Kyklades	-0,01	0,00	-0,09	0,03	0,04	-0,04	0,06	-0,08	-0,01
48.Irakleio	0,02	0,03	0,01	0,09	0,08	-0,07	0,09	-0,01	0,05
49.Lasithi	0,01	0,03	0,05	0,01	0,04	-0,02	0,08	0,14	0,07
50.Rethimno	0,08	0,01	-0,01	0,01	0,05	-0,05	0,04	0,00	0,06
51.Chania	0,05	0,01	-0,02	0,05	0,05	-0,08	0,08	0,07	0,08

Source: EL. STAT., 2013 (own elaboration)