WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Structural Transformation in Production Sectors and Tourism Influence: The Case of Greece

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ABSTRACT

Purpose: As part of a broader study on identifying structural transformations in the economy because of tourist flows in the Mediterranean geographical area, this study will focus on the existence of a structural transformation of production sectors in the geographical area of Greece.

Methodology: The methodology is based on the application of statistical indicators that identify the transformation of a variable (employment). In this study we will use the Lilien structural transformation indicator, while for the level of concentration of an economic activity at a regional level, the concentration index (Location Quotient) will be used.

Summary: The Lilien structural change index reflects the rate of redistribution of employees between the country's production sectors and thus signals a structural change/ transformation. For the majority of the country's regions (Greece), through the Lilien index, there is an impressive movement of employees from the primary production sector to the tertiary sector, with the rates of movement being higher in the so-called tourist areas. Indeed, with the help of the concentration index (Location Quotient), a correlation is found between the decrease in employment in the primary production sector and increased concentration in tourism activity, while the country seems to be affected.

Key words: Structural Transformation, Structural change, Modified Lilien Index, Location Quotient, Greek regions – Nuts II, Productive Sectors, Employment

INTRODUCTION:

In this study, we will analyze the content of the concept ***of "structural transformation"*** and attempt to identify the existence of productive structural transformations in the case of Greece, while exploring the existence of a correlation between productive structural transformations and tourism activity.

Trough the distribution of employment over a period of thirty-five years for Greece, at regional level, will highlight the presence and dynamics/intensity of the structural transformation of the country's production sectors and their correlation with tourism flows. The geographical distribution of the data, at NUTS II regional level, was chosen to give the best possible correlation between tourism activity and structural transformation of production sectors in geographical areas in limited spatial contexts, without altering the conclusions and extrapolating them at country level[1].

FIRST SECTOR

THEORETICAL FRAMEWORK – METHODOLOGY – APPLICATION

Structure and Structural change[2]

[1] It was considered necessary to identify first any change in production sectors at regional level, because correlation between change and tourism is more effective in small geographical areas than big as countries.

[2] In English, the term "Structural transformation" is given in Greek as "Δομικός Μετασχηματισμός" and the term "Structural change" in Greek is referred to as "Δομική Αλλαγή" The question is whether there is a difference between the two terms. It would not be inappropriate to say that there is no substantial difference between "change" and "transformation," since both concepts, in Greek, state and outline a modification or change, at least at the level of non-specialists. However, to be scientifically correct, only a brief reference will be made, and this is why further analysis goes beyond the purpose of this study. The researchers who studied structural changes initially linked them to the growth component, and Fisher Clark (in Syrquin M, 1988, p 206) referred to changes in the composition of economic structures, as a factor of industrialization, focusing mainly on labor movements, while Kuznets(in Syrquin M,1988, p 206) referred to corresponding changes over time in production and the participation of production sectors in general, and identified corresponding demographic changes and income distribution.

Based on this view, it would not be inappropriate to say that structural transformation is the whole of isolated changes, but if they are intricately linked

In this study[3], as already noted, we will be concerned with the content of the concept of ***'structural change***.' A first approach to this concept, however, requires the necessary clarification of the concept of '***Structure***,' otherwise the content of the structure is the one that is being transformed/changed. Thus, referring to international literature, Machlup defines '*Structure*' as the fundamental condition which presents elements of consistency for analytical and modelling purposes, regardless of the nature of the model, emphasizing that the 'Structure' is synonymous *with a 'formation' with* the characteristic, not easy to change[4]. (Machlup, 1958). In the economy, "structure" or "formation" means macroeconomic parameters, such as domestic product, employment, the participation of production sectors in the GDP, etc. thus, a 'structure' is identical to a particular model or production system of an 'economy.'

Mindful of the content of the concept of 'Structure,' that is to say, that of a formation or a system that is not frequently modified and presents elements of consistency, we will try to define the concept of '*structural change.'* Machlup, having worked thoroughly in the sense of 'structural *change*,' argues that we refer to a situation which, when detected, remains stable and that it is not temporary. A situation which, when it occurs, embodies the characteristic of a lasting change in the basic links of an economy. Based on this view, the *'structural change' is certainly* not temporary, stable, and permanent, taking place not in the short term but in the long term and its main feature is a radical change in the key parameters of the economic formation.

Summarizing the content of the '*structural change*' with one or more definitions, starting from that of Machlup, which defines structural transformation as a 'different classification of productive economic structures' *in (Olga Memedovic, Lelio apadre, 2009, p1).* Therefore, a different classification of the production branches/sectors of an economy between two time points constitute or compose a 'structural change.'

In exploring production sectors[5], Kuznets illustrate more clearly the content of the 'structural *change'* and defines it as a shift in the production process from the primary production sector towards non-agricultural production sectors. *(Kuznets, 1971, p248).* This is a very important end, because it does not only identify a shift in the production process, gives concrete expression to it and defines it as a shift in the production process from the primary sector to non-agricultural sectors, i.e. either to the manufacturing/construction sector or to the service sector. Based on this assumption, the 'structural change*' translates into* a radical change in the productive sectors of an economy, while at the same time creating a similar change in the distribution of labor between productive sectors and a different percentage of their participation in the GDP of countries. Syrquin identifies the link between structural change and economic growth, defining this combination as a structural transformation. (Syrquin M, 1988, p 206)

To summarize the content of the concept of "structural change," it should be noted that it includes the element of change in time and place as its main feature. A change involving a coherent formation, such as the sectors of the production process, which are modified over time, thereby creating a structural change in production, which overall constitutes a structural transformation.

BIBLIOGRAPHIC ANALYSIS

The international arthrography / bibliography captures statistical indicators recording the presence of structural changes. Goschin et al., in a published study on the spatial concentration of economic activity in Romania, used the Lilien index to identify the speed of the change in employment between the productive sectors of the economy. (Goeshin et all, 2009). In Russian arthrography[6], the study of structural change is conducted through the Ryabtsev and Kazinets indices. Both are used to estimate the level of difference between two geographical areas and to estimate the structural change of a geographical area between two-time intervals. More specifically, Yu.V. Preobrazhensky used the Ryabtsev index to determine the level of industry structure in selected geographical areas as well as to capture over a period of ten years the structural differences in industry between different geographical areas. (Yu.V. Preobrazhensky, 2021)

METHODOLOGY

The statistical indicators that will be used to establish the presence of structural change between Greece's production sectors consist of the Lilien and concentration indicators, while the level of employment, spot and per production sector, will be used as a variable over a period of thirty-five years. The statistical data are derived from the Labor Force Survey[7] of the Hellenic Statistical Authority.

to development.

[3] We will try to identify by means of indicators the existence or otherwise of structural change in Greece and there will be no link with whether the change leads to growth or not, and the scope of the investigation will be limited only to the workforce and not to the entire production process.

[4]The terminology "not easy" is used to illustrate the specificity of a coherent formation in the non-variability with the characteristic, when the change occurs, will be the result of a long-term process.

[5] In Greek language "productive sectors, productive branches, productive structure "have the same meaning. In this study, we prefer to use the term "productive sectors" as the sectors of productive activities in economy.

[6] S.A. Berezikov, 2017, I.I. Zaprudskiy, 2018, I.A. Poljakova, G.A. Bondarenko, 2018

[7] This is a survey aligned with Regulation 2019/1700 of the European Parliament, to apply a common framework to the statistical methodology on isolated s and employment in Europe, while according to the Italian Statistical Office, this methodology is the most important mapping of employment data. The Greek Labor Force Survey has been recording employment statistics since 1981, but the Nuts II classification of the regions, as it is now, is in 1988 and, to ensure homogeneity of the statistical data, by region, the period 1988-2023 has been preferred as the analysis interval.

Lilien Index:

In his attempt to see the link between structural changes in the economy and employment, Lilien found that the change in the distribution of employment between economic sectors could be a driver for corresponding changes in the level of unemployment. (Lilien, 1982).[8] Therefore, this indicator identifies changes between production sectors because of labor displacement. Thus, in an indirect way, this indicator records changes in the economic sectors. In this study, we will focus on highlighting the absence / presence of structural change between Greece's production sectors at NUTSII level. In international literature, the Lilien index is ideal to identify the reallocation of labor and indirectly to highlight, if positive, the view that the economy adopts changes in labor demand, outlining structural changes in production sectors, at least at local geographical level.[9]

The mathematical expression of the Lilien index is given:

$$MLilien = \{ \sum (\chi_{is} * \chi_{it}) (\ln \chi_{is} / \chi_{it})^2 \}^{(1/2)}$$ [10]

The Series takes values from s = 1..... S

In this study, s takes a value from 1 to 3.

Xis: Participation in the employment of the 'i' production sector in geographical area A for-time s

Xit: Participation of the employment of the 'i' productive sector in geographical area A for year t

LN xsi: Neperian Logarithm

LN xi: Neperian Logarithm

The above mathematical expression for a fixed period (s-t) uses the participation of the level of employment, in total, of a productive sector for a given geographical area, to calculate the rate of redistribution of labor between the productive sectors of the economy. This format is the improved version of Lilien's initial mathematical expression. According to Stammer, the modified Lilien index covers the failures of the simple Lilien index (in Pastore F, Musicta C, 2014 p 400) and has been identified as the main indicator of the speed of structural changes[11] (Dietrich 2012, Zulkhibri et al. 2015)

M-LILIEN INDICATOR RESULTS

This section analyses the reallocation over time of the country's workforce between the three production sectors of the economy. The data were broken down over a period of thirty-five years for each geographical area at NUTS II regional level. Note that the two outliers of the modified Lilien index belong to the interval [0,1]. The higher the indicator receives, the higher the redistribution of employment, between sectors of the economy and indirectly of structural change, while a value equal to zero is equivalent to the absence of structural change. An average of the value obtained by the modified Lilien index will identify both the geographical areas that collect the maximum/minimum values, while also looking for the possible cause (s) of this change, and spatial maps will be used to capture the results. As the mathematical expression and expected effects of the degree of change in labor reallocation will relate to two points in time, we will initially select the period [1988-2023] to reflect the change/reallocation of labor between the productive sectors of the economy, over thirty-five years, while also reflecting the extent of the change in redeployment for the intermediate periods [1988-1998], [1998-2008] [2008-2018].[12]

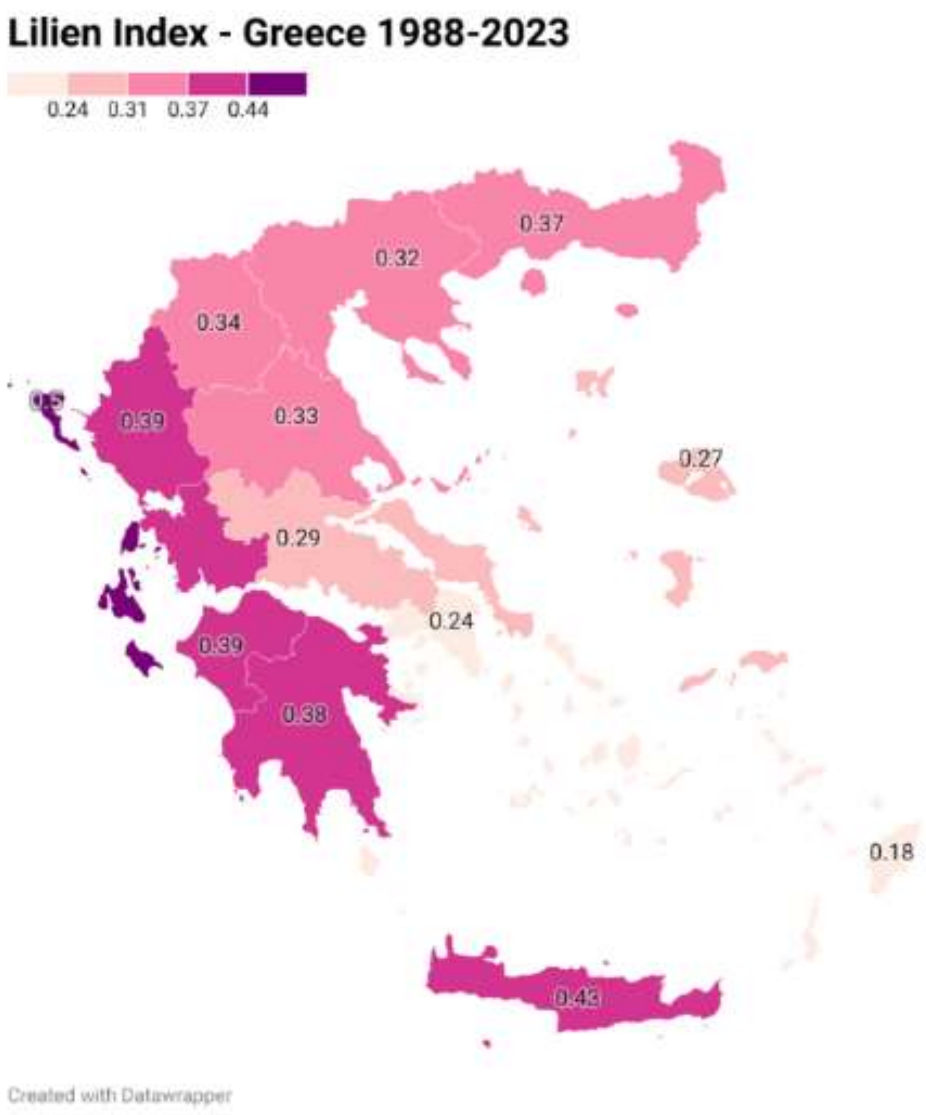
[8] In this study we will not directly investigate the Lilien case, which has been verified by consultants. With a percentage regression approach, a higher degree of redistribution of employment was found to be linked to a higher unemployment rate, subject to conditions. Panagiotidis T, Pellon G, p 68. At the same time, the Basile et al., studying structural changes and the level of unemployment in the Italian labor force, using the Lilien index, concluded that the geographical areas of southern Italy, which have high values, are highly vulnerable to structural changes in Basile et al., p 532, while it is noted in their study that the Lilien index is an indicator of structural change, noting that the higher it receives, the higher the degree of change will be.

[9] This study, as already noted, will analyze the redistribution of labor between production sectors in Greece for thirteen geographical areas classified by NUTSII, i.e., at regional level. A secondary objective is the interconnection of possible structural change, because of and/or tourism activity. Therefore, the smaller the geographical area of study, the fewer the externalities of the effect and thus a scientifically clearer figure of a phenomenon, considering that the isolated effects may be grouped together.

[10] In the present study we will use a mathematical expression improved over Lilien's original one, with the index being called modified Lilien.

[11] In international literature, the Norm of Absolute Value has also been used to investigate the rate of labor redistribution, but according to Trofimov, the modified Lilien index outweighs by covering failures, giving more reliable results. (Ivan D. Trofimov, 2023, p 7)

[12] The isolated intervals are recorded to show the intensity of change between the isolated geographical areas of the country, rather than as an indicator of change, due to the short reference period.



Map 1. Source: Labor Force Survey – Hellenic Statistical Authority, same processing.

The spatial- choropleth map I shows the Lilien index according to the distribution of regions in Greece by NUTS II[13][14]. It is evident that the modified Lilien index takes a value between 0,18 (South Aegean) and 0,51 (Ionian Islands). These values are the minimum and maximum values of the indicator for the period 1988-2023. The rate of redistribution of labor between the three production sectors of the country for the geographical area of the Ionian islands is the highest, while the geographical area of the South Aegean has recorded the lowest reallocation of labor between the three production sectors.

The remaining geographical areas classified by NUTS II are divided into two major groups, with the modified Lilien index values ranging between [0,32-0,41] and including the regions of the first group, Central Macedonia (0,32), Thessaly: (0,33), Western Macedonia (0,34), East Macedonia & Thrace: (0,37), Peloponnese: (0,37) and Epirus (0,39) -West Greece (0,39), while Crete records a value of 0,42, finally, the second group includes the regions, Attica: (0,23), North Aegean: (0,21).

[13] To reference countries' regions for statistical purposes, the EU has developed a classification known as NUTS (Nomenclature of territorial units for statistics).
NUTS divides each EU country into 3 levels:

- NUTS 1: major socio-economic regions
- NUTS 2: basic regions (for regional policies)
- NUTS 3: small regions (for specific diagnoses)

Source: www.ec, Europa.eu/Eurostat/web/nuts

[14] Because of specific translation in English language, we note nomenclature of Greek regions at level II as following : Attiki- Attica , Anatoliki Makedonia & Thraki- East Macedonia & Thrace, Kentriki Macedonia – Central Macedonia, Dytiki Macedonia- West Macedonia, Ipiros- Epirus, Thessalia- Thessaly, Ionia Nisia- Ionian Islands, Kriti -Crete, Voreio Aigaio-North Aegean, Notion Aigaio- South Aegean, Dytiki Ellada – West Greece, kentriki Ellada – Central Greece, Peloponnisos – Peloponnese

Table IA below shows in order the value of MLilien for the period 1988-2023.

Table 1A

M-LILIEN - GREECE 1988-2023	
IONIAN ISLANDS	0,51
CRETE	0,42
EPIRUS	0,39
WEST GREECE	0,39
EAST MACEDONIA & THRACE	0,37
PELOPONNESE	0,37
CENTRAL GREECE	0,36
WEST MACEDONIA	0,34
THESSALY	0,33
CENTRAL MACEDONIA	0,32
ATTICA	0,23
NORT AEGEAN	0,21
SOUTH AEGEAN	0,18

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

While Table IB below shows the evolution over time, every ten years of the modified MLilien index for the regions of Greece. A first observation is that the indicator decreases proportionally over time, approaching the year 2023, at least for most of them. This trend of decreasing the modified MLilien index, between the periods of [1988-1998] – [1998-2008] – [2008-2018], shows that the redistribution of employees between the production sectors of the country, which is either gradually declining or fluctuating marginally. This figure strengthens the view that any change in the reallocation of labor is now consolidated. [15]

Table I B

M-LILIEN - GREECE	1988-1998	1998-2008	2008-2018
EPIRUS	0,24	0,09	0,17
NORTH AEGEAN	0,12	0,11	0,06
WEST GREECE	0,19	0,18	0,09
IONIAN ISLANDS	0,25	0,14	0,15
SOUTH AEGEAN	0,06	0,09	0,10
CENTRAL GREECE	0,23	0,11	0,06
CENTRAL MACEDONIA	0,18	0,13	0,06
EAST MEACEDONIA & THRACE	0,13	0,18	0,10
WEST MACEDONIA	0,15	0,11	0,05
THESSALY	0,15	0,14	0,10
CRETE	0,21	0,20	0,06
WEST GREECE	0,20	0,18	0,10
ATTICA	0,09	0,08	0,01
PELOPONNESE	0,18	0,12	0,10

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

[15] The purpose of the analysis of the isolated time periods, broken *down by ten years, is not to highlight the extent of labor redistribution between the country's production structures, but was carried out for the whole period [1988-2023], to verify that the 'structural change' is not* temporary, stable and permanent, is not carried out in the **short** but in the **long term** and its main feature is a radical change in the basic parameters of the economic formation.

DISCUSSION OF RESULTS

We will start analyzing the results from the two extreme values of the modified Lilien indicator, as recorded in two regions of Greece, for the Ionian Islands and the South Aegean. The geographical area of the Ionian Islands has the highest value of the modified Lilien index = 0, 51, which suggests that the rate of redistribution of labor between production sectors is the highest among the rest of the country. While in 1988 there was a relative balance between the labor force employed in the primary and tertiary production sectors[1617], with a ratio of 45 % 42 % of total employment, it would appear that, for 2023, there was a shift of workers from the primary sector to the tertiary sector, changing the employment rates between primary and tertiary employment to 7 % 81 % respectively[18], with almost unchanged the rate of employment in the secondary sector, with a figure of 12 % of all employees. This is an important finding of redistribution of labor, leading to the abandonment of the production sector, more specifically the primary sector, in favor of the tertiary sector. This finding is reinforced by the fact that the total workforce in the Ionian Islands has fallen by 2 700 persons in the total workforce over a period of 35 years, which points to the belief that there will be a shift between production sectors rather than strengthening one sector by increasing the total workforce, as we will see in the Aegean region. The South Aegean region has seen an increase in employment between [1988-2023], by 57.89 %, from 83.600 (1988) to 132.000 (2023). The percentage of employees, even from the beginning of the period under review, appears to be concentrated in the tertiary production sector, with a figure of 63.77 % (53300, 1988), while the two others share 13.03 % (10900, 1988) for primary and 23.20 % (19400, 1988) for secondary sectors workers. Focusing on the tertiary production sector and recording the rate of change for the thirty-five years period, we will observe that it increased by 95 %[19], taking a value (104200, 2023)[20], while the primary sector was under pressure and decreased by 35 % (7000, 2023), and the secondary sector grew by 8 % (20800, 2023). Therefore, in view of the figure of the South Aegean region, we will conclude that, while initially there is a different distribution of employees among the productive sectors of the economy in favor of the tertiary production sector, however, the growth of its employees (2023) appears to stem either from the overall increase in the number of people employed in the region or from the primary production sector of other Greek regions The essential element in this region is not so much the low rate of redistribution of employees between the isolated productive sectors of the economy, as shown in the modified Lilien index, but rather an uneven distribution in favor of the tertiary sector from the outset. However, over time, the primary production sector also is under downward pressure, while an increase in the secondary production sector is also identified. The regions of Epirus, Western Greece, Peloponnese, and Crete show a modified Lilien index value between [0,39-0,44]. In particular, the Region of Crete, which records the highest value, initially 0,44 (1988), has a primary sector with 47 % employed (93100, 1988), which has a relative equilibrium with the tertiary sector, as it stands at 37 % (74300, 1988)[21]. For 2023, i.e. after thirty-five years, the figure is changing, with a primary sector employing only 17 % (43400, 2023) of total employment in the region, with a reduction of 53.38 %[22], with the tertiary sector increasing its capacity by 88 % (175300, 2023), and an increase of 28 % in 2023 compared to 1988 (253500, 2023/197200, 1988). Therefore, there is also an increase in employment in the tertiary sector and a corresponding decrease in those employed in the primary sector. In all other geographical areas of the group, there is almost the same figure as a primary sector shares the employees with the tertiary production sector for 1988 and a marked change in the reallocation of labor towards the tertiary sector at the expense of the primary sector, strengthening the view that the higher value of the modified Lilien index, the higher the reduction in primary sector employees with a corresponding increase in the tertiary production sector. Attica, Central Greece, and North Aegean are the geographical areas of the second group with the values of the modified Lilien index, belonging to the period [0,24-0,29]. Attica has the lowest employment rate in primary production, with only 2 % (19500, 1988) of all employees in 1988, which is decreasing to 1 % (17900, 2023). The two productive sectors that appear to monopolize the interest of employees are the secondary sector with around 31 % (388500,1988) and the tertiary sector with around 67 % (828000, 1988) for the year 1988, while for 2023 there is an increase of 26 % (1236000, 1988/1563800, 2023) in the region's total employment, with employment in the secondary sector benefiting from a reduction of 16 % (231200, 2023) and a tertiary increase of 17 % (1313700, 2023). The other two regions, namely Sterea Ellada and Voreio Aigaio, have a similar figure with Attica as regards the redistribution between production structures, with a reduction in the number of people employed in the primary production sector and an increase in the tertiary sector.

CONCLUSIONS

At the beginning of the analysis period (1988), apart from Attica[23], most of the regions have a considerable proportion of people employed in the primary production sector, which, with small variations, is close to the proportion of people employed in the tertiary production sector. For 2023, there appears to be a significant shift of employees[24] partially or totally from the primary production sector to the tertiary sector, even for regions with significant employment rates in the primary sector, such as Central Macedonia, Thessaly, and the Peloponnese. The Ionian islands are the region that was subject to the highest pressure to reduce the number of people employed in the primary production sector and, accordingly, the highest growth pressure in the

[16] For 1988, the number of employees in the primary sector was 35400 and tertiary 32700. Source: Hellenic Statistical Authority
[17] The percentages relate to the total percentage distribution of production (primary, secondary and tertiary), within geographical reference limits.
[18] For 2023, the number of people employed in the primary sector is 5300 and in tertiary sector 61600 out of a total of 75700 Source: Hellenic Statistical Authority
[19] D = ((dt-dt-1)/dt), t, t-1, time
[20] Of the total number of people employed in the region
[21] The percentages are based on the total number of persons employed in the region, which is 197200 (1988).
[22] In relation to those employed in the same production sector for the year 1988
[23] Attiki has had the lowest employment rate in the primary production sector over time, thus dividing the employees between secondary and tertiary production sectors, while this is also the case in Sterea Ellada, however, with a more balanced distribution of employees between production sectors [1988-2023]
[24]The decline over time in the primary production sector for most of the geographical areas of Greece and the corresponding increase in the tertiary sector, in similar amounts, e.g. Ionian Islands, show a shift in the production process and even the higher the drop in primary production, the higher the increase in the tertiary production sector.

tertiary production sector, with 81 % of all employees allocated to the tertiary production sector (2023). Thus, the Ionian islands accepted the highest change/redistribution of their labour force, causing a structural transformation of employment and thus of the production process in the region.

Crete received a significant reduction in primary production employees of 30 % of all employees between [1988-2023] but not as high as that of the Ionian Islands. The South Aegean, a geographical area with a fairly high employment rate in the tertiary production sector, even since the beginning of the analysis period (1988), with a share of 63 % of total employment, shows an increase in employment in the same sector, reaching 78 %, one of the highest employment rates, out of the total, accounting for only 5 % of employment in the primary production sector.

The fact of a sharp fall in employment in the primary production sector, especially in regions with high rates of tourist flows, raises questions not only about whether the 2023 conditions compared to 1988 constitute a structural change, but about whether and to what extent tourism activity is involved in the partial or total abandonment of a production structure, which has always been regarded as one of the most important for the economy.

SECOND SECTION

In this section, we will try to identify the cause of this reallocation of labour from the primary production sector to the tertiary sector, over a period of thirty-five years, focusing on the increase in tourist activity over time in Greece. The question to be asked is therefore whether tourism flows, and thus employment in tourism, are responsible for the structural changes we have already identified in the first section. In order to answer positively that tourism activity is responsible to some extent for the reallocation of labour to the tertiary production sector, of which tourism activity is part, we need to interpret the change over time in the concentration of tourism employment in each of the thirteen regions of the country for the period under review [1988 2023]. For this reason, use is made of the concentration indicator, which illustrates the degree of concentration of a specific economic activity, in this case tourism, through employment, at regional level, relative to the country. The mathematical relationship is assigned by the following mathematical expression.

LQ = (Eia/Ea)/(Ein/En) (Location Quotient)

Eia: The employment of region a in sector i

EA: Total employment in region a

Ein: Total country-wide employment for industry i

EN: Total employment at country level

If the indicator value is higher than one, then the degree of employment in each sector and geographical area is higher than that of total employment in the same sector but at the country level, thus showing an excess concentration at regional level.

In the case where the value of the indicator is less than one: at that time, the degree of employment in a particular sector and geographical area concerned is lower than that of total employment in the same sector but at country level, in this case, in concentration, at regional level.

Value intervals:

LQ > 1,25: Hyper-concentration

0, 75 > LQ >1, 25: Small deviation from the country as a whole

LQ >0, 75: Sub-concentration

Table I shows for the thirteen regions of Greece, broken down by Nuts II, the indicator of the concentration of tourism activity through employment for the period [1988-2023]. Table I shows the evolution over time of the employment concentration index in the tourism sector for those regions where its value is below or slightly above the unit. This translates into the fact that these regions fall short of tourism employment compared to the rest of the country, or marginally receive the unit value, noting the increase in tourism employment over time. In particular, East Macedonia Japan Thrace receives the lowest value at LQ = 0,73 (2023), while the other geographical areas in Table I, although showing a significant increase in the concentration of tourism employment between [1988-2023], appear to be at least marginally concentrated in relation to the country's overall level of tourism employment. In conclusion, for the above geographical areas, areas with low employment rates relative to the country (1988) show an increase in the tourism sector, but not so significant as to be classified as excessive concentration.

Table 2

	LOCATION QUOTIENT - TURISM SECTOR- GREECE NUTS II 1988-2023				
NUTSII	EAST MECEDONIA & THRACE	THESSALY	WEST GREECE	CENTRAL GREECE	PELOPONESSE
2023	0,73	0,84	0,87	0,90	0,88
2022	0,81	0,86	0,93	0,85	0,93
2021	0,81	0,84	0,96	0,80	0,90
2020	0,84	0,86	0,83	0,85	0,92
2019	0,83	0,82	0,85	0,87	0,89
2018	0,79	0,85	0,90	0,86	0,85
2017	0,81	0,86	0,90	0,91	0,89
2016	0,80	0,85	0,88	0,87	0,84
2015	0,80	0,82	0,91	0,81	0,81
2014	0,71	0,75	0,93	0,91	0,79
2013	0,67	0,76	0,95	0,91	0,76
2012	0,72	0,80	0,91	0,91	0,80
2011	0,78	0,86	0,91	0,83	0,79
2010	0,80	0,85	0,91	0,77	0,84
2009	0,78	0,81	0,92	0,81	0,83
2008	0,76	0,82	0,93	0,87	0,78
2007	0,74	0,82	0,94	0,87	0,76
2006	0,75	0,77	0,92	0,93	0,74
2005	0,79	0,83	0,92	0,95	0,77
2004	0,78	0,86	0,96	0,92	0,82
2003	0,72	0,79	0,89	0,94	0,78
2002	0,72	0,84	0,90	0,91	0,80
2001	0,75	0,80	0,90	0,86	0,81
2000	0,55	0,64	0,61	0,70	0,60
1999	0,68	0,82	0,81	0,91	0,85
1998	0,67	0,81	0,82	0,84	0,81
1997	0,79	0,82	0,72	0,71	0,67
1996	0,75	0,81	0,77	0,75	0,76
1995	0,70	0,78	0,75	0,79	0,74
1994	0,69	0,77	0,73	0,82	0,71
1993	0,64	0,74	0,77	0,82	0,71
1992	0,74	0,76	0,78	0,78	0,79
1991	0,74	0,71	0,76	0,74	0,72
1990	0,71	0,79	0,73	0,76	0,77
1989	0,67	0,81	0,70	0,76	0,72
1988	0,69	0,80	0,70	0,79	0,72

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table II shows the geographical areas where the concentration of tourism employment is marginal at 1. It is evident that Western Macedonia has seen a significant increase in the concentration of tourism employment (LQ = 0.65, 1988/LQ = 0.91, 2023), as well as Epirus (LQ = 0.81, 1988/LQ = 0.91, 2023), while Attica (LQ = 1.29,1988/LQ = 1.03, 2023) and the North Aegean (LQ = 1.26, 1988/LQ = 0.99,2023) seem to have experienced a significant decrease, thus approaching tourism employment in the country as a whole.

Table 3

	LOCATION QUOTIENT -TURISM SECTOR- GREECE NUTS II- 1988-2023			
NUTS II	CENTRAL MACEDONIA	WEST MACEDONIA	ATTICA	SOUTH AEGEAN
2023	0,97	0,91	1,03	0,99
2022	1,00	0,81	1,04	1,06
2021	1,02	0,82	1,04	0,91
2020	0,99	0,73	1,07	0,99
2019	0,96	0,66	1,06	1,03
2018	0,96	0,66	1,05	0,99
2017	0,97	0,73	1,05	1,01
2016	0,95	0,69	1,07	1,00
2015	0,95	0,74	1,08	0,88
2014	0,99	0,77	1,09	0,97
2013	1,00	0,74	1,11	1,12
2012	0,99	0,76	1,10	1,01
2011	1,02	0,82	1,09	1,02
2010	1,03	0,77	1,08	1,01
2009	1,01	0,74	1,08	1,05
2008	0,97	0,73	1,08	1,03
2007	0,97	0,69	1,09	1,05
2006	1,00	0,65	1,10	0,98
2005	0,99	0,67	1,08	1,00
2004	0,98	0,71	1,07	1,04
2003	0,95	0,68	1,12	1,21
2002	0,96	0,67	1,11	1,14
2001	0,96	0,68	1,12	1,16
2000	0,72	0,55	0,87	0,77
1999	0,96	0,77	1,14	1,10
1998	0,99	0,65	1,16	1,11
1997	0,89	0,83	1,33	0,92
1996	0,98	0,72	1,17	1,06
1995	0,98	0,76	1,17	1,02
1994	0,97	0,70	1,18	1,16
1993	0,95	0,69	1,20	1,12
1992	0,90	0,70	1,22	1,23
1991	0,90	0,76	1,26	1,40
1990	0,93	0,73	1,25	1,45
1989	0,93	0,73	1,27	1,37
1988	0,90	0,65	1,29	1,26

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table III shows the regions in favor of tourism, the first being the region of the Ionian Islands. This region is not only in the first place because of the increased concentration ratio in relation to the rest of the country 2023 (LQ = 1,55) but mainly because of the increase in tourist concentration compared to the year 1988 (LQ = 1,04).The South Aegean region also is over-concentrated in tourism activity, but it is clearly lower for 2023 (LQ = 1,53) than in 1988 (LQ = 1,79). Finally, Crete sees an increase in the concentration of tourism activity, but this is around the unit (LQ = 1,14).

Table 4

	LOCATION QUOTIENT -TURISM SECTOR- GREECE NUTS II 1988-2023		
NUTS II	IONIAN ISLAND	SOUTH AEGEAN	CRETE
2023	1,55	1,53	1,14
2022	1,48	1,43	1,08
2021	1,60	1,45	1,03
2020	1,32	1,43	1,05
2019	1,38	1,60	1,13
2018	1,56	1,56	1,12
2017	1,55	1,49	1,09
2016	1,49	1,40	1,21
2015	1,31	1,48	1,22
2014	1,21	1,45	1,17
2013	1,16	1,33	1,09
2012	1,21	1,30	1,09
2011	1,16	1,28	1,07
2010	1,27	1,31	1,06
2009	1,36	1,43	1,07
2008	1,40	1,49	1,12
2007	1,41	1,56	1,10
2006	1,27	1,51	1,08
2005	1,46	1,46	1,08
2004	1,46	1,45	1,06
2003	1,44	1,39	1,07
2002	1,37	1,50	1,04
2001	1,18	1,55	1,04
2000	0,84	1,14	0,84
1999	1,27	1,56	1,06
1998	1,22	1,59	1,02
1997	0,66	0,82	0,79
1996	1,31	1,63	0,98
1995	1,30	1,68	1,02
1994	1,38	1,69	1,04
1993	1,30	1,68	1,05
1992	1,10	1,69	0,87
1991	1,13	1,74	0,83
1990	1,14	1,82	0,79
1989	1,05	1,75	0,85
1988	1,04	1,79	0,89

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

CONCLUSION

Analyzing the data on the concentration of tourism activity in the thirteen regions of the country, there is an upward trend in this area of employment. In particular for the year 1988, seven regions in the country had a sub-concentration in tourism activity with a range of [0,65-0,81], three moderate sub-

concentration to marginal regions, with values between [0,89-1,04], while three regions, South and North Aegean, as well as Attica, were over-concentrated in tourism activity with a range of [1,26-1,79]. The figure for 2023 seems to be different as, on the one hand, the overall concentration of tourism activity increases, for almost all regions, with the eight regions concentrating between [0,88-1,14], three regions with a range of [0,73-, 87], while two regions are in favor of concentration with a range of [1,54-1,55]. Based on the results, the trend of increasing tourism employment in Greece, through the concentration indicator, is evident[25]. At this point, it is worth noting that the South Aegean region does not record a high structural change indicator, as the change already occurred in this region before the start of the reference period (1988). It appears that for the year 1988 the concentration index is LQ = 1,79, a significant excess concentration, which shows a downward trend to LQ = 1,51 for 2023. A second important finding is the concentration index values for the region of the Ionian Islands, which showed a significant over-concentration of tourism activity from LQ = 1,04 (1988) to LQ = 1,55 (2023), thus justifying the view of the increased indicator of structural change reflected in the previous section.

An important finding is that the indicator of tourist activity varies over two periods. The first is the period of the monetary crisis in our country and the period of the coronavirus pandemic. Thus, for the first period between [2008-2014], there appears to be a decline in the values of the indicator of concentration of tourism employment, particularly pronounced in high-index areas, while the same behavior is found in the pandemic period, thus raising questions about the prevalence of the view that in areas where tourism activity is concentrated under the influence of an exogenous parameter, the response is limited, thus reducing the resilience of these areas, thus creating conditions of **dependence.** [26]

THIRD SECTION

The question we asked in this study relates to whether there are structural changes in the regions of our country and whether these are due to tourism activity[27]. We consider that we have answered the first question both through the Lilien index and through the variation, especially in specific regions of the indicator of concentration of tourism activity.

However, this is sufficient to create a route based on tourism flows and the consequent growth of employment in the tertiary production sector, leading to the removal/abandonment of part of the other two productive sectors of the economy. If the above approach is verified, tourism may lead to a redistribution of employment to the benefit of the tertiary production sector.

To this end, we reflected the concentration indicator across the country's productive sectors and for thirteen regions[28] and for time points 1988, 1998, 2008, 2018, 2023.

Table 5

IONIAN ISLANDS	2023	2008	1998	1988
PRIMARY SECTOR / AGRICOLTURE - FISHING	0,61	1,47	1,42	1,70
SECONDARY SECTOR	0,74	0,70	0,70	0,52
INDUSTRY - ENERGY	0,31	0,41	0,43	0,32
CONSTRUCTION	2,04	1,16	1,27	1,11
TERTIARY SECTOR	1,12	1,02	0,99	0,87
TRADE -TURISM SECTOR -COMMUNICATION - TRASPO	1,55	1,40	1,22	1,04
BUSSINES & FINANCIAL ACTIVITES	0,89	0,64	0,79	0,79
OTHER SERVICES	0,73	0,71	0,75	0,67

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table 4, shows the evolution over time of the concentration index of the production sectors of the Ionian Islands. We note that for the year 1988 there is a concentration of the primary production sector with a value of LQ = 1,70, which shows a continuous decline every ten years until the sub-concentration of the specific production sector at the value of LQ = 0,61 (2023). On the contrary, the tourism sector is over-concentrated, as we have seen in the section above. The tourism sector does not involve only the tertiary production sector but also the construction sector for this geographical area since the concentration ratio of 1, 11 (1988) exceeds 2 points for 2023(LQ =2, 04). Therefore, the main characteristics of the 10-year period for the geographical area in question are that the tourism sector is over-concentrated at the expense of the primary production sector, while at the same time the construction sector is positively associated. This shows a redistribution of employees from the primary production sector to tertiary and partly secondary, through the construction sector.

[25] This study investigates the presence of a redistribution of employees between production structures, using the Lilien index, and attempts to interconnect with tourism activity, through the concentration index, to verify the interconnection.

[26] Botsis Miltiadis, Nikolaos Kotsis Resilience Indicator of The Greek Regions. Impact Of the Tourist Flows in The Covid-19 Pandemic Era, IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 28, Issue 11, Series 2 (November 2023) 46-53

[27] According to the distribution of statistical data based on the Labor Force Survey, tourism, i.e., hotels and restaurants, includes transport, trade as well as communications, related sub-sectors of tourism activity.

[28] This section does not consider it necessary to present the data in all the regions of the country, due to the similarity that some of them have, thus focusing our attention, on all those that identify diversity characteristics.

Table 5

SOUTH AEGEAN	2023	2018	2008	1998	1988
PRIMARY SECTOR - AGRICOLTURE - FISHING	0,46	0,35	0,57	0,46	0,49
SECONDARY SECTOR	0,99	0,88	0,87	1,06	0,91
INDUSTRY - ENERGY	0,56	0,59	0,64	0,66	0,65
CONSTRUCTION	2,30	1,73	1,23	1,93	1,71
TERTIARY SECTOR	1,09	1,13	1,12	1,14	1,33
TRADE -TURISM SECTOR -COMMUNICATION - TRASPORTATION	1,53	1,56	1,49	1,60	1,79
BUSSINES & FINANCIAL ACTIVITES	0,51	0,76	0,64	0,72	0,43
OTHER SERVICES	0,83	0,76	0,85	0,69	0,92

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table 5 shows the concentration index of the South Aegean region. We can observe that the primary production sector showed for all four sub-concentration points in relation to the rest of the country. On the contrary, tourism activity seems to have been in favor of – concentrated as early as 1988. In this region, tourism activity has an impact on both the tertiary production sector and the construction sector. An important feature of this region is the already created low concentration of the primary production sector and the excessive concentration of tourism activity, showing that the geographical area received the first significant tourist flows compared to the rest of the regions, while it appears that although the concentration indicator has been subject to small downward pressures, but always at levels of over-concentration, the construction sector has continued to have an upward trend.

Table 6

CRETE	2023	2018	2008	1998	1988
PRIMARY SECTOR - AGRICOLTURE - FISHING	1,49	1,47	1,43	1,82	1,78
SECONDARY SECTOR	0,86	0,79	0,88	0,62	0,59
INDUSTRY - ENERGY	0,72	0,63	0,69	0,50	0,42
CONSTRUCTION	1,29	1,25	1,18	0,88	1,11
TERTIARY SECTOR	0,95	0,96	0,97	0,90	0,78
TRADE -TURISM SECTOR -COMMUNICATION - TRASPORTATION	1,14	1,12	1,12	1,02	0,89
BUSSINES & FINANCIAL ACTIVITES	0,67	0,72	0,88	0,67	0,60
OTHER SERVICES	0,86	0,87	0,82	0,82	0,68

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table 6, shows the evolution over time of the concentration index of Crete. It is evident that the primary production sector is lower for 2023 (1,50) than in 1988 (1,77), but it is over-concentrated in relation to the country. The tourism sector appears to have been in concentration for the year 1988 (0,89), while it receives a value slightly higher than the unit for the year 2023 (1,14). The region of Crete has similar characteristics to the region of the Ionian Islands in terms of tourism employment, which appears to have developed gradually after 1988, with the difference that this region has also maintained the primary production sector at high levels of concentration, unlike the region of the Ionian Islands, while at the same time not developing tourism activity at a high level of concentration, thus showing more homogeneity in its production structures. Finally, the concentration of construction appears to have not developed significantly, as in the region of the Ionian Islands and the South Aegean.

In conclusion, as regards the above regions, we will consider that the region of the South Aegean has been active in tourism since 1988, a tourist activity which does not coincide in time with any region in Greece. Crete and the Ionian Islands have similar characteristics in the tourism concentration of tourism activity, noting that the first region does not favor – it has concentrated this production sector at the expense of the primary sector, as was the case in the Ionian Islands region. Here, there is also a correlation between the primary production sector, the construction sector, and the tourism sector. For the above geographical areas in particular, the rapid increase in the concentration of tourism activity is accompanied by a corresponding increase in concentration in the construction sector and a sharp decline in the primary production sector, whereas when the increase in concentration in the tourism sector is smooth, a substandard balance between production sector seems to be maintained. This is an important finding which will be reinforced by the analysis of the concentration index of other regions of the country.

Table 7

EAST MACEDONIA & TRHACE	2023	2018	2008	1998	1988
PRIMARY SECTOR - AGRICOLTURE - FISHING	2,00	2,04	2,21	2,12	1,77
SECONDARY SECTOR	0,97	0,87	0,93	0,85	0,80
INDUSTRY - ENERGY	1,05	0,95	0,96	0,89	0,82
CONSTRUCTION	0,73	0,64	0,89	0,74	0,74
TERTIARY SECTOR	0,85	0,85	0,82	0,72	0,68
TRADE -TURISM SECTOR -COMMUNICATION - TRASPORTATION	0,83	0,79	0,76	0,67	0,69
BUSSINES & FINANCIAL ACTIVITES	0,68	0,63	0,63	0,55	0,44
OTHER SERVICES	0,95	1,02	0,98	0,83	0,73

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table 7, shows the concentration indicator of the production sectors of the Eastern Macedonia Region Thrace. It is evident that the long-term figure of this region shows an upward trend in employment in the primary production sector, with a pro-concentration finding of LQ = 2 (2023). The tourism sector is on the rise but remains within the concentration LQ = 0.82 (2023).

A similar figure can be seen in the following two tables (XI -XII), respectively, of Sterea Ellada and Thessaly. For both regions there is an increase in concentration overtime in the primary production sector, with pro-concentration characteristics, with the tourism sector showing an increasing trend over time but at levels of concentration.

Table 8

CENTRAL GREECE	2023	2018	2008	1998
PRIMARY SECTOR - AGRICOLTURE - FISHING	1,60	1,72	1,70	1,43
SECONDARY SECTOR	1,67	1,41	1,30	1,32
INDUSTRY - ENERGY	1,86	1,56	1,38	1,34
CONSTRUCTION	1,07	0,97	1,18	1,28
TERTIARY SECTOR	0,76	0,79	0,78	0,74
TRADE -TURISM SECTOR -COMMUNICATION - TRASPORTATION	0,90	0,86	0,87	0,84
BUSSINES & FINANCIAL ACTIVITES	0,46	0,66	0,54	0,52

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

Table 9

THESSALY	2023	2018	2008	1998	1988
PRIMARY SECTOR - AGRICOLTURE - FISHING	1,88	1,69	1,82	1,73	1,52
SECONDARY SECTOR	0,92	0,95	0,99	0,88	0,90
INDUSTRY - ENERGY	0,92	0,93	0,97	0,88	0,81
CONSTRUCTION	0,93	1,01	1,01	0,89	1,17
TERTIARY SECTOR	0,88	0,89	0,87	0,82	0,76
TRADE -TURISM SECTOR -COMMUNICATION - TRASPORTATION	0,84	0,85	0,82	0,81	0,80
BUSSINES & FINANCIAL ACTIVITES	0,52	0,69	0,58	0,64	0,52
OTHER SERVICES	1,07	1,03	1,04	0,90	0,77

Source: Labor Force Survey – Hellenic Statistical Authority, same processing

RESULTS

The attempt to link structural change and tourism activity required a parallel interpretation of an indicator that would reflect the degree of concentration of tourism employment in the regions of Greece. The concentration indicator shows that employment in tourism activity for 2023 is becoming more homogeneous, which points to an expansion of the tourism workforce in all geographical areas of Greece, thus recording a trend towards tourism activity. In particular, focusing on three geographical areas and in order to strengthen the vision of the positive trend between tourism activity and structural changes, it is necessary to answer the question, why the South Aegean, although it has a high tourist potential and a high concentration in tourism employment, reflects the lowest indicator of structural change.

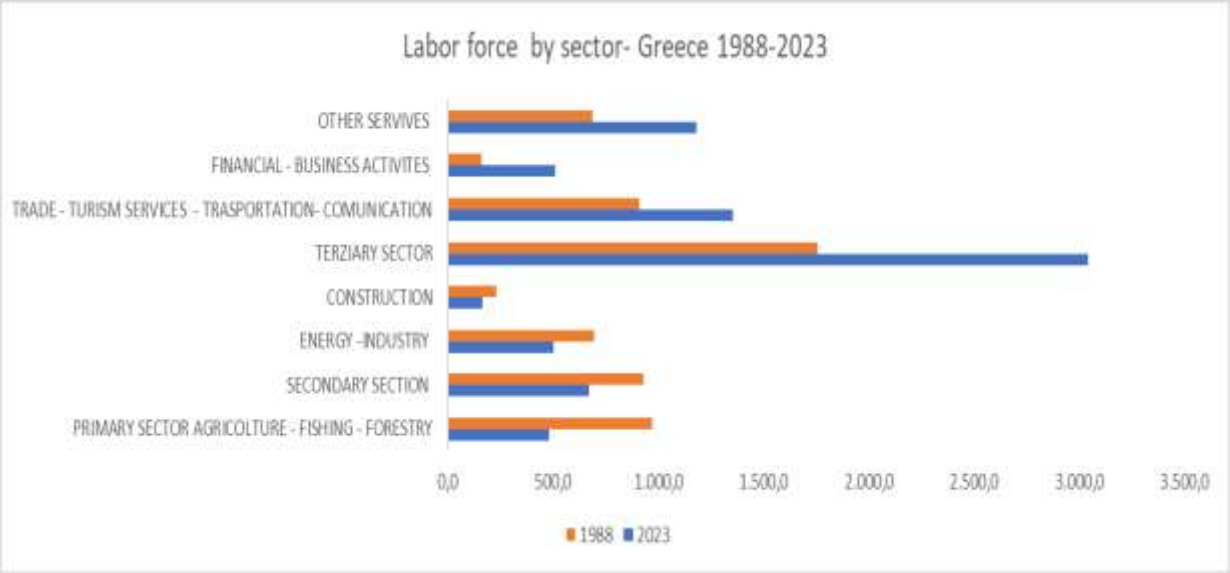
Based on the above result, is the correlation between structural change and increased tourism activity degraded?

The geographical area of the South Aegean is indeed a special case because it has high rates of concentration of employment in tourism activity since 1988, which has remained stable or even declined until 2023. Therefore, there is no strong change/redistribution between production sectors because of tourism employment because there was simply no strong change over time. Therefore, the Lilien index reflects the lowest structural change over time for the South Aegean region, because the distribution of the workforce to tourism activity was already high, while the distribution of employment between the other two production sectors was small over time. This view is reinforced by the interpretation of the results of the Ionian Islands region. In this geographical area, there is a change/reallocation of labor to the benefit of the tertiary production sector and tourism activity in particular, since the concentration indicator for tourism activity receives the highest value of 1,56 (2023), while at the same time the highest structural redistribution of the workforce to the tourism sector is identified, as shown by the employment concentration index, while we also identified the regions which have changed over time in the primary production sector, while in 2023 they continue to concentrate employment in this productive sector, while the tourism sector is still in the process of being concentrated. In conclusion, it would not be inappropriate to say that the areas identified for concentration in tourism activity had left the primary production sector (South Aegean) long before 1988, whereas, in the case of the Ionian Islands, the abandonment of the primary sector was completed by 2023. Therefore, there is a basic but inverse relationship between the primary and tertiary production sectors, at least for geographical areas with high tourism activity.

LONGITUDINAL EVOLUTION OF THE LABOUR FORCE IN GREECE BY PRODUCTION STRUCTURE 1988-2023[29]

First Period

Graph 1



Source: Labor Force Survey – Hellenic Statistical Authority, same processing (figures in thousands)

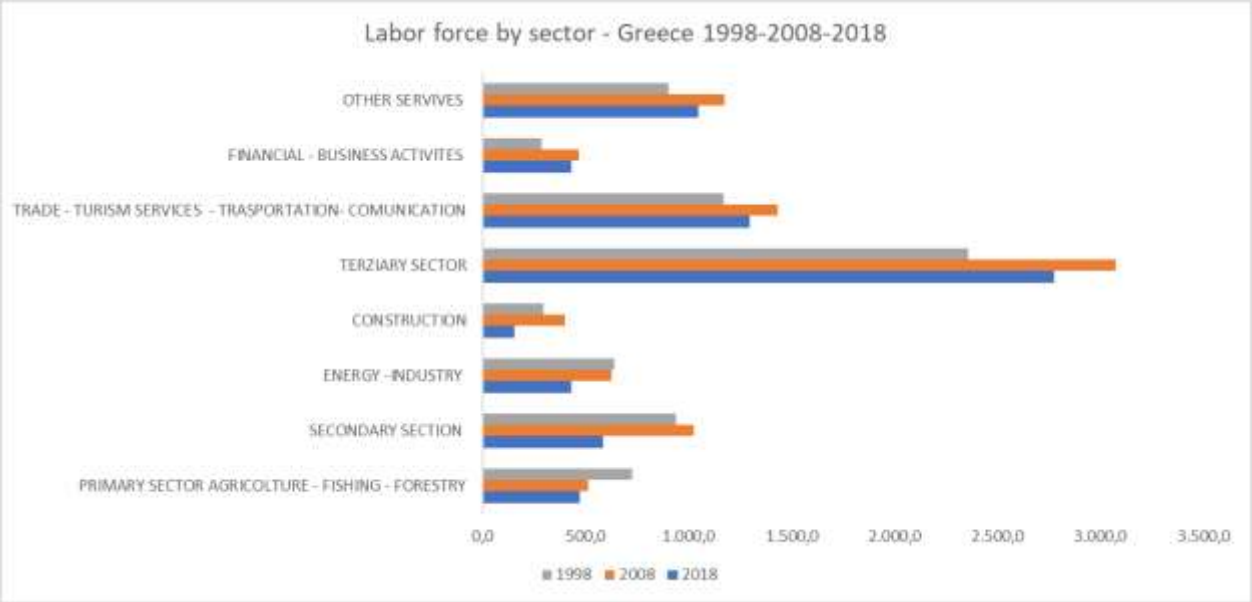
Graph I shows the evolution of Greece's workforce over time between 1988-2023. In this regard, it is evident that the tertiary production sector, that of services, is growing rapidly, amounting to 72.50 %[30] of the total workforce in 2023, turning the country into a production force for the provision of services. Of this, 45 %[31] belong to the trade sector, purely touristic services, hotels and restaurants, transport, and communications. At the same time, it should be noted that employment in the primary production sector was subject to a notable change, which decreased by 50.55 % over a period of 35 years.[32]

Second Period

Graph II shows the evolution of Greece's workforce over time between 1998-2008-2018. This graph also shows the trend over time in increasing employment in the tertiary production sector and declining in the primary production sector, although between the two points in time there is a negative rate of change in the number of people employed in all production sectors.[33] At this point, we will be in 2008-2018, when part of the financial crisis in Greece is detected. It appears that by 2018 the workforce is under pressure compared to the year 2008 in all productive sectors in the country, while again the tertiary production sector appears to employ 72 % (2018) of all employees[34]. It should be noted that the total number of employees in Greece for 2018 decreased by 5 % compared to 2008, with the share of employees in the tertiary sector accounting for 66.6 % (2008) of the total[35]. This shows that during the decade, while the labor force in the country appears to decrease, the proportion of people employed in the tertiary production sector has risen by about 6 percentage points, while the primary labor force rose by only 1 %[36], while the construction sector appears to fall by about 62 %.

[29] The values in the graphic are expressed in thousands.
[30] Of the total number of employees in Greece amounting to 4193,6 (2023), 3041,2 (2023) are concentrated in the tertiary production sector. (the figures in thousands)
[31] 3041,2 (2023) employees in the tertiary production sector of which 1352,1 (2023) are concentrated in trade, tourism services, transport, and communications. (the figures in thousands)
[32] This is a major change that transforms the country into a country where services are provided. The decline in employment in the primary production sector is marked by statistical data, with 971000 (1988) people in employment reaching 480900 (2023). The difference in labor force is over time, considering that, since 1981, the year of the first recording in a total country of workers in the primary production sector, the number of people employed in the primary production sector was 1082500.
"Rate[33] of change" means a change in a quantity within the same production sector and not in relation to the total.
[34] Employees in the tertiary sector, 2774 (2018) out of total 3828 (2018) – (figures in thousands)
[35] Employees in the tertiary sector, 3072,30 (2008) out of a total of 4610,60 (2008), although it is worth noting that the rate of change between the two years of employment in the tertiary sector is declining. (the figures in thousands)
[36] The increase of one percentage point will be fictitious and mainly due to a 5 % fall in the total labor force, in particular 513,50 people employed in the agricultural sector out of a total of 4610,60 (2008), while for 2018 there are 469,60 (2018) out of 3828 (2018) – (thousand figures).

Graph 2



Source: Labor Force Survey – Hellenic Statistical Authority, same processing (figures in thousands)

DISCUSSION

The Lilien structural change index reflects the rate of redistribution of employees between the country's production sectors and thus signals a structural change. For the regions of our country, the maximum and the minimum value are 0,51-0,18, respectively. Given the assumption that this indicator takes a value in the interval [0,1], it is assumed that as the value approaches the unit, the higher the localized change will be. In Greece, the highest structural redistribution of employees was recorded in the region of the Ionian Islands and was strengthened/verified by the indicator of the concentration of employees among production structures, which identified the abandonment over time of the primary production sector to the tertiary sector, in particular tourism activity. In fact, the degree of abandonment of the primary sector seems to be proportional to the level of tourism activity, i.e., the higher the increase in the concentration rate of tourism workers, the lower the concentration rate in the primary sector.

At this point, and in the context of a possible new scientific study, the question arises as to the search for the mechanism which causes a high degree of mobility for certain geographical areas towards tourism employment, particularly those with high tourist flows. It is a mechanism based on personal employment choices and is therefore subject to isolated behaviors[37] or an organized effect[38] that directs employment towards the tourism sector. Of particular importance, not so much in the cause but in the result of this move in the search for dependency conditions. Already in a previous Botsis study. M, Kotsis N, 2023, identified the limited response and reduced resilience of so-called tourist areas, particularly the Ionian Islands, in which the highest structural redistribution of employees between production sectors was identified.

BIBLIOGRAPHY

1. Abraham KG, Katz LF (1986) Cyclical unemployment: sectoral shifts or aggregate disturbances? J Polit Econ 94 (3): 507 – 522
2. Adam Szirmai, Bart Verspagen, Ludovico Alcorta, Neil Foster-McGregor, (2020) New Perspectives on Structural Change Causes and Consequences of Structural Change in the Global Economy, Oxford University Press
3. Athanasiou E, (2020) Regional specialisation and geographical concentration of economic activity considering the pandemic, JMRC, Economic Developments, Issue 42, pp. 66-75
4. Basile, R., A. Girardi, M. Mantuano, and F. Pastore, "Sectoral shifts, Diversification and Regional Unemployment: Evidence from Local Labour Systems in Italy, "Empirica, 2012, 39.
5. Botsis Miltiadis, Nikolaos Kotsis Resilience Indicator of The Greek Regions. Impact Of the Tourist Flows in The Covid-19 Pandemic Era, IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 28, Issue 11, Series 2 (November 2023) 46-53
6. Caroleo FE, Pastore F (2010) Structural change and labour reallocation across regions. ECONS Paper

[37] We refer to personal choices – preferences away from a productive sector from the point of view that these are due to free will and not from the influence of any external influence.

[38] The term "Organized Impact" means a continuous, directed effort to create the right conditions for incentives or disincentives to enter or remove employees in a productive sector, to achieve their own benefit, even indirectly, of creating conditions of dependence.

7. Ciaran Driver IV -Chit-Wei Saw (1995), Performance of structural change indices: analysis using real and simulated data, Routledge.
8. Dietrich, A. (2009). Does growth cause structural change or is it the other way round: a dynamic panel data analysis for seven OECD countries (No. 2009, 034). Jena Economic Research Papers
9. Driver, C. (1992) Measuring the rate of structural change in Structural Change in the UK Economy eds C. Driver and P. Dunne, Cambridge University Press, Cambridge
10. Druzhinin, P.V. and Prokopiev E. A. (2015). Modeling of sectoral structural shifts in the Russian economy. Economic analysis: Theory and practice, 16 (415): 26-36
11. Enrico Marelli, 2000, The various sectors of the European regions, 40th congress of the European Regional Science Association
12. Floro Ernesto Caroleo JoinFrancesco Pastore, 2010. "Structural Change and Labour reallocation Across Regions: A Review of the Literature, "AIEL Series in Labour Economics, in: Floro Ernesto Caroleo situated Francesco Pastore (ed.), The Labour Market Impact of the EU Enlargement, pages 17-47, Springer.
13. Gianluigi Pelloni, Theodore Panagiotidis (2014) Asymmetry and Lilien's Sectoral shifts hypothesis: A quantile regression Approach Review of Economic Analysis 6 68-86 1973-3909/2014068
14. Goschin, Z., Constantin, D.L., Roman, M., Ileanu, B. (2009), 'Regional Specialisation and Geographic Concentrantion of Industries in Romania', South-Eastern Europe Journal of Economics, No.1 (2009), pp. 61-76
15. Gregory M. Dempster, Justin P. Isaacs, Structural change in the U.S. economy: 1850 – 1900, Structural Change and Economic Dynamics 31 (2014) 112 – 123
16. I.A. Poljakova, G.A. Bondarenko, Statistical analysis of structural and dynamic differences in regional systems of the subjects of the Southern Federal District, Accounting, and statistics 1 (49) (2018) 39-46 (In Russ.).
17. I.I. Zaprudskiy Territorial and sectoral shifts in the industry of the Republic of Belarus in the post-Soviet period, regional studies 2 (60) (2018) 101-110 (In Russ.).
18. Ivan D. Trofimov, Kolej Yayasan Saad (2023) The Effects of Structural Change on Economic Growth: A Panel Data Analysis
19. Johnston, Bruce, and John Mellor. 1961. The Role of Agriculture in Economic Development. American Economic Review, 51: 566-593
20. Jorgenson, Dale, and Marcel Timmer. 2011. Structural Change in Advanced
21. Krugman, P. (1998), What is new about the new economic geography?', Oxford Review of Economic Policy, 14, pp. 7-17
22. Kuznets S (1971), Economic Growth of Nations: Total Output and Production Structure, Cambridge, Mass
23. Kuznets, S. (1973) Modern Economic Growth: Findings and Reflections. Nobel Memorial Lecture. American Economic Review, 63, 247-258
24. Lilien, D. (1982) Sectoral shifts and cyclical unemployment, Journal of Political Economy
25. Machlup F (1958), Structure and Structural Change: Weaselwords and jargon, Journal of Economics, Springer
26. Marelli E. (2006), Specialisation and Convergence of European Regions, The European Journal of Comparative Economics, No. 2, pp. 149-178
27. Martins, P.M.G. (2019), 'Structural change: RATE, patterns and determinants", Review of Development Economics, Vol. 23, No. 1, pp. 1-32.
28. Manolis Christofakis, Andreas Gkoyzos, Eleni Gaki (2024), Demographic change and regional Specialisation: The case of Greece NUTS II regions, MDPI
29. Olga Memedovic, Lelio apadre, Structural Change in the World Economy: Main Features and Trends, 2004
30. Panagiotides T, Pelloni G, (2014) Asymmetry and Lilien's Sectoral shifts hypothesis: A quantile regression Approach, Review of Economic Analysis, Digital Initiatives at the University of Waterloo Library, vol. 6 (1), pages 68-86, June.
31. Pastore F, Musida C, Note on Lilien and Modified Lilien Index November 2014 the Stata Journal Promoting Communications on statistics and Stata 14 (2): 398-406 DOI: 10.1177/1536867X1401400211
32. Pasinetti L (1981) Structural change and economic growth-a theoretical essay on the dynamics of the wealth of nations. Cambridge University Press, Cambridge
33. Pelloni G. and Polasek W. (2003) Macroeconomic effects of sectoral shocks in Germany, the U.K., U.S.: aVAR-GARCH-M approach, Computational Economics, 21 (1-2), 65-85

34. Roberto Basile, Alessandro Girardi, Marianna Mantuano, Francesco Pastore (2012), Sectoral shifts, diversification and regionalunemployment: vidence from local labour systems in Italy, Empirica, 39, 525-544

35. ROBSON M (2009) Structural change, Specialization, and regional labor market performance: evidence for the UK. APPL Econ 41 (3): 275 – 293

36. S.A. Berezikov, Structural changes in the industry of the regions of the North and the Arctic of Russia, North and market: the formation of the economic order 3 (54) (2017) 165-178 (In Russ.).

37. Samson L (1985) A study of impact of sectoral shifts on aggregate unemployment in Canada. Can J Econ 18 (3): 518 – 530

38. Syrquin M (1988) Patterns of structural change

39. Stamer, M., "Interrelation between Subsidies, Structural Change and Economic Growth in Germany, A Vector Autoregressive Analysis," 1998. Konjunkturpolitik

40. Wolfe M (1955) The concept of economic sectors. Q J Econ 69: 402 – 420

41. Witt. W. Lawrence Role of Agriculture in Economic Development: A Review Journal of Farm Economics, Feb. 1965, Vol. 47, No. 1 (Feb. 1965), pp. 120-131

42. Yu.V. Preobrazhenskiy, Structural Differences in the Industry of the Volga Region, News of Saratov University, Ser. Earth Sciences 20 (2) (2020) 98-103 (In Russ.). DOI: https://doi.org/10.18500/1819-7663-2020-20-2-98-103