Social Cohesion and Development

Relations between national-regional unemployment and employment policies for a sustainable development in Greece

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Η Σχέση εθνικής- περιφερειακής ανεργίας και πολιτικές απασχόλησης για μια βιώσιμη ανάπτυξη στην Ελλάδα

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ABSTRACT

The extent of unemployment constitutes one of the most basic indicators of sustainable development and particularly in the field of socio-economic development, given that the extended unemployment, especially of the youth, cannot be considered to be compromising with the concept of sustainable development, as it restricts the possibilities of an important part of society to satisfy its needs, in the present and in the future too. Labor, when using the linear regression analysis, defines the relations between regional and national employment and unemployment in Greece, in order to reveal the reactions of each of the 13 regions of the country to the national trends for a period of 16 years, between 1998 and 2013. The differentiations that are revealed are considered crucial in the implementation of a regional strategy against unemployment, in order to achieve better prospects of economic development, to reduce the unemployment rate of each particular area and to implement an integrated strategy of sustainable development of the country.

KEY WORDS: Sustainable Development, Endogenous Development, Unemployment, Regional Differentiations, Regression Analysis

ΠΕΡΙΛΗΨΗ

Η έκταση της ανεργίας αποτελεί έναν από τους βασικούς δείκτες της βιώσιμης ανάπτυξης και ειδικότερα του τομέα της κοινωνικοοικονομικής ανάπτυξης, δεδομένου ότι η εκτεταμένη ανεργία, ιδιαίτερα των νέων, δεν μπορεί να θεωρηθεί ότι συμβιβάζεται με την έννοια της βιώσιμης ανάπτυξης, αφού περιορίζει τις δυνατότητες σημαντικού τμήματος της κοινωνίας να ικανοποιεί τις ανάγκες του και στο παρόν αλλά και μελλοντικά. Η εργασία, χρησιμοποιώντας την ανάλυση γραμμικής παλινδρόμησης, προσδιορίζει τις σχέσεις μεταξύ περιφερειακής και εθνικής απασχόλησης και ανεργίας στην Ελλάδα, προκειμένου να αναδειχθούν οι αντιδράσεις της κάθε μιας από τις 13 περιφέρειες της χώρας στις εθνικές τάσεις σε μια περίοδο 16 ετών, μεταξύ 1998 και 2013. Οι διαφοροποιήσεις που αναδεικνύονται θεωρούνται κρίσιμης σημασίας στην εφαρμογή μιας περιφερειακής στρατηγικής κατά της ανεργίας, προκειμένου να επιτευχθούν οι καλύτερες προοπτικές οικονομικής ανάπτυξης και η μείωση του ποσοστού ανεργίας κάθε συγκεκριμένης περιοχής και να εφαρμοστεί μια ολοκληρωμένη στρατηγική βιώσιμης ανάπτυξης της χώρας.

ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ: Βιώσιμη Ανάπτυξη, Ενδογενής Ανάπτυξη, Ανεργία, Περιφερειακές Διαφοροποιήσεις, Ανάλυση Παλινδρόμησης

1. Introduction
1.1 Sustainable Development and Employment

Already since 2002, the World Summit on Sustainable Development or the Johannesburg Summit officially recognized that sustainable development is supported by three fundamental components or dimensions: the economic, the environmental and the social one (in which the cultural is also included)[1]. The economic component mainly refers to the preservation of a sustained economic growth, which is considered as a necessary condition for the constant improvement of social wellbeing, the avoidance of extreme imbalances between the economic sectors, the promotion of ecologically effective production and consumption standards and the satisfaction of basic human needs. The environmental one mainly refers to respecting the limits of the ecosystem (the natural and organic environment) aiming at preserving its stable productive base, guaranteeing the protection and the quality of the natural resources (atmosphere, earth, oceans, seas, coasts) so that no overexploitation or deterioration of their quality occurs and the protection of biodiversity. The social one mainly refers to guaranteeing equality within and among generations (combating any form of discrimination), to social integration and cohesion (dealing with any kind of exclusion), to the political participation, to social mobility and to the respect of cultural diversity. It is obvious that unemployment is a threat to the core of the social dimension of sustainability, given that it does not ensure the equality within and among the generations and at the same time it affects social integration and cohesion.

Those three basic components are inextricably linked to one another, meaning that all three of them are necessary preconditions of sustainability but none of them is able to achieve it by itself. That is each one is a necessary but not a sufficient condition of sustainability. This derives from analyzing the concept of viable or sustainable development itself, as a development that covers the needs of the current generation without restricting or putting the strain on the possibilities of future generations to cover their own needs[2]. Each generation that does not secure at least the same economic, environmental and social conditions it inherited from the previous one for the next one, clearly violates the basic preconditions of viability or sustainability. It is also noted that viability is a dynamic concept, given that even if an economy satisfies the criterion of viability in the present, it is possible that it may not satisfy it in the future, especially if its economic activity increases significantly in relation to the basis of its natural capital (Dasgupta, 2007, p. 5).

At this point it should be noted that the acceptance of the three aforementioned components of sustainability rose important questions of restrictions or "morale" of development that the traditional theory of economic growth, but also the economic policy followed by the governments, generally ignored in the past[3]. The governments of the various countries, either developing but also developed ones, pursued economic growth without restrictions or limits. Gradually it started to be recognized that the unrestricted increase of the GDP can overturn the balance of relations between humans and environment and thus the patterns of economic policy followed should be altered, mainly with the integration of environmental dimensions in all aspects of this policy, but especially in the fields of agriculture, energy and transports, which are connected with very important environmental consequences.

Thus, it is recognized, that the viability or sustainability is not guaranteed in the long-run if the three dimensions are not appeased at the same time and in a balanced way, given that economic, environmental but also social factors may restrict the possibilities of future generations to satisfy their own needs. Even though the multidimensional character of viability of development has long

ago been noted and has been recognized in the above three fundamental components in general, particular emphasis has been given up to today by the relevant research and academic literature to the investigation of the economic and environmental dimensions of sustainability. The recent global economic crisis in Greece and the debt crisis that followed, in the case of Greece, the unprecedented unemployment with which both of these crises were combined as a result of the policies to address them both but the latter in particular, however, come to underline the importance of social development as a necessary condition of long-run sustainability of economic growth.

Regarding the relations between sustainability and employment, it is useful to mention that, in the framework of the European Strategy for Sustainable Development, 10 sectors or themes of sustainability have been specified, defining the general directions of policy for the sustainable growth, with the corresponding 11 headline indicators. These sectors are: socioeconomic development, sustainable consumption and production, social integration, demographic change, natural resources, global partnership and good governance. In parallel with that, the operational objectives and targets for each sector, as well as actions or explanatory variables, which are connected to the respective indicators[4], have been specified. In the sector or theme of socioeconomic development, three operational objectives and targets have been identified, one of which is employment, with the respective employment rate indicator (Vavouras, 2013, pp. 522-523). Thus, the connection between sustainable development and employment is institutionally recognized on a European Union (E.U.) level.

This analysis is drafted in the framework of these relations between sustainability and employment, the basic proposition of which is that a high level of economic wellbeing is unsustainable in the long-run if it does not go hand in hand with a high level of employment, which constitutes a precondition of guaranteeing social development and social cohesion in particular. This is the key condition of sustainability of economic growth, which constitutes the most reliable mechanism of coping with economic and social crises in the long term. The improvement of economic growth that is not in harmony with a high level of employment, does not guarantee its long-run sustainability, as it will be connected with a high level of inequality within and among the generations and insufficient social integration and cohesion.

1.2 Discussing unemployment and its regional dimensions-A review

In the last years and in particular after the 2008-2009 global recession the issue of unemployment has taken huge dimensions worldwide and it is already apparent that it will be one of the largest social scourges of the 21st century. Of course, it is highlighted from the start that both recession and unemployment do not affect all the economies in the same way. There are economies where these problems have a larger intensity and time extent in comparison to the other ones.

The forecasts about the dimension of unemployment were pessimistic by a large number of researchers since the end of the 20th century. Since 1995, J. Rifkin foresaw that in the future nothing will remind of today's conditions in the labor market (Rifkin, 1995). Traditional policies, such as the existing professional training programs, did not seem to be effective in guaranteeing employment; neither did economic growth seem to contribute significantly in the decrease of unemployment (Meadows, 1996). An important issue during that period was examining the factors that lead modern economies to the expansion of the problem of unemployment. Structural factors that modern societies face, such as the transition to the information society, the internationalization of economy and the use of new technologies are considered to contribute immensely to the increase of unemployment.

The rapid growth of the tertiary sector (tertiarization) of the international economy was considered a key parameter of international developments (Buigues and Sapir, 1993). Indeed, in the framework of this transition to the sovereignty of services, their internationalization and their development as driving forces of growth, large structural changes in the economy of the countries took place and employment shrunk.

Furthermore, those who considered the worldwide trend of internationalization of the economy an important factor for determining the regional employment seem to have been verified, given that the development of internal markets, the liberalization of international trade, the continuous expansion of transnational organizations etc. gave new roles to the regions of the world with uncontrollable consequences to employment. This development was in favor of the already developed areas, which have the possibility to adapt to new conditions in a faster pace.

Technological transitions contribute to drastic changes of the productive sectors that led to the development up to now. The businesses that wanted to escape the crisis applied new technologies in the production process and searched for new products and markets. This procedure steadily led to the abandonment of productive factors that were used in the past and even areas where they were established. This policy steadily led to re-establishment procedures, thus to abandoning areas and transfer to other ones. So, we were led to long-run unemployment in a structural way, from which mainly the youth, women and whoever is educationally disadvantaged are affected the most, as had been foreseen by researchers towards the end of the 20th century (Lyon, 1994, pp. 65-85).

On a regional level, as it is natural, the areas which lose their comparative advantages in the new conditions that are being shaped are affected the most. In general, the introduction of technology rather decreases employment, despite the new professions that are created. In order to maintain the development in those areas, the labor force should adapt to the new requirements of the labor market, which are mainly of a higher level. The impacts of the new technology to employment are mainly defined by the following procedures:
1. Robotic production line.
2. New industrial relations.
3. Working at home (telematics).

The introduction of the "chip" to the production creates machines that have tremendous possibilities of substituting human labor. Furthermore, the construction of expert systems on the constructions in other productive sectors as well, restricts the need of using specialized and scientific labor force to half. Finally, the possibility of working from home, through the development of networks, when its mass implementation will be completely possible, creates huge changes to employment and devalues a series of professions (such as transports etc.). The impact of telematics to employment depends to a great extent on the size and the composition of the labor force that in the end will be placed between this system of work and its expansion varies between the European countries (Rontos, et al., 2014).

The answer, referring to the grade in which technology affects regional employment internationally is a tough one and depends on various factors, some of which are mentioned hereunder:
1. Growth rates. If the growth rates are high, the negative impacts will be smaller.
2. The rates of new population groups entering the labor market (women, secondary education graduates etc.)

3.   The degree and rate of entering of the new technology. It is considered certain that old technology industries will be affected first by automatism and the consequences will be more severe (Lyon, 1994).

The European crisis of 2008 accelerated the impact of the aforementioned factors and became even more negative in countries and regions where the economy had not adapted to the oncoming structural changes, verifying the interpretations and predictions above.

1.3 Establishing the target of the paper

The relation of national to regional unemployment has been a topic that has been widely discussed in international literature (Black and Slatter, 1975, Clark, 1978). Under the new structural changes that were mentioned above, the research of the disparities between regional and national unemployment obtains new interest. It is attempted to investigate this relation with the help of quantitative methods, such as the Box – Jenkins techniques, OLS regression, etc. (Johnson, 1979). From the quantitative analysis it is derives that it is strongly questioned if a national policy of full employment would seriously affect regions that already have high unemployment rates in a positive way, and, after all, many disadvantaged regions cannot achieve the national standards of full employment (Clark, 1979).

The differentiations between national and regional unemployment trends also lead to differentiations in policy that should be implemented in dealing with the special problems of regions and towns with local development strategies but also with viable and sustainable development.

These issues are being researched regarding Greece, in such a way so that useful conclusions can be provided for the regional policy and the policy of sustainable development in the direction of reducing unemployment and minimizing the effect of structural changes that take place internationally today and which shape the 21st century's society and economy, too.

In particular, in this paper the development of unemployment in Greece will be investigated on a national and regional level, as well as the relation between regional and national unemployment and, finally, the modern means for a more effective regional – local employment policy will be mentioned, which should be implemented in Greece. We regard that this analysis cannot be but the core of the sustainable development strategy of the Greek country.

2. Methodology and data

In order to investigate the relation between regional and national unemployment, the simple linear regression was used and the national unemployment rate served as explanatory variable and the respective rate of each region of the country as a dependent variable. In total 13 linear functions were drawn up with primary data covering the 1998-2013 period.

The general form of the models for each region i is a follows:

$Y_i = a_i + b_i X + e$,

where:

Y_i = unemployment in region i (unemployment rate)

X = national unemployment (unemployment rate)

a_i, b_i = regression coefficients

e = residuals

The results of the above implementation are analyzed in the following way. The coefficients b_i show the sensitivity of the regional-local unemployment in the respective changes on a national level. If $b_i = 1$, then a change by one point in the national unemployment leads to an equal change in the area i. If $b_i < 1$, this shows that a change in national unemployment causes a smaller change in the area i. If $b_i > 1$, then the area i reacts more intensely to national changes. Thus, the coefficient bi shows the relevant sensitivity / fragility of the regional – local unemployment to the respective national one. Regarding the constant term a_i the interpretation of the values it receives is as follows. If $a_i = 0$, then there is no accumulation of unemployment in area i, in relation to the national situation. If $a_i \neq 0$, then in $a_i > 0$, there is an accumulation of unemployment in the area and even above the average, whereas if ai < 0, then local unemployment is accumulated below the average level.

It should be noted that the ascertainment that national unemployment series are actually not independent from the respective regional – local numbers constitutes a basic critique of the aforementioned methodology, so that the particular regression equations should be used. This is particularly true when the latter have a large participation in the national series, thus, when it is about a large town/region in comparison to the national number. It is actually considered that national economic cycles are affected by the respective regional ones (Chisholm, Frey and Hagget, 1971).

However, the aforementioned restrictions have not been taken into account in later relevant works. The national trend is still taken as an independent coefficient separately for each region, because this method provides useful information about the trends in the regional deviations of unemployment. In any event though, the usefulness of this model in detecting the relations between national and local/regional economies is important, as will be proven hereinafter.

The primary data on labor force and unemployment, with which the unemployment rate was drafted [(unemployed / labor force) x 100] up to the other employment data that are mentioned in this paper, are derived from the Labor Force Survey, of the D' quarter of the years 1998-2013 that is conducted by the Hellenic Statistical Authority (ELSTAT) (former ESYE).

3. The development and the determining factors of unemployment in Greece in the last decades

In absolute measures the number of the unemployed in Greece during the 1998-2013 period increased from 519.000 people in 1998 to 1.363.100 in 2013. The unemployment rate in Greece in the year 2013 approached 27.50% of the total labor force and was the highest in the EU[5]. This rate even presented a continuous and a rapid rise during the 2009-2013 period during which it almost tripled in size (from 9.6% of the labor force of 2009 to 27.5% in 2013). Since 2014 a small drop in the country's unemployment rate is observed. The unemployment rate for the youth is particularly high, whereas for the younger aged 15-19 and 20-24 it reached 71.2% in 2013 and 54.8% of the respective labor force. Apart from its high level, the indicator of those ages is increasing in the particular period that is being examined. In figure 1 the development of unemployment in Greece is portrayed on an average annual basis for the 1998-2014 period. The data regarding 2014 refer to the month of April.

Figure 1: The development of unemployment in Greece in an average annual basis during the 1998-2014 period
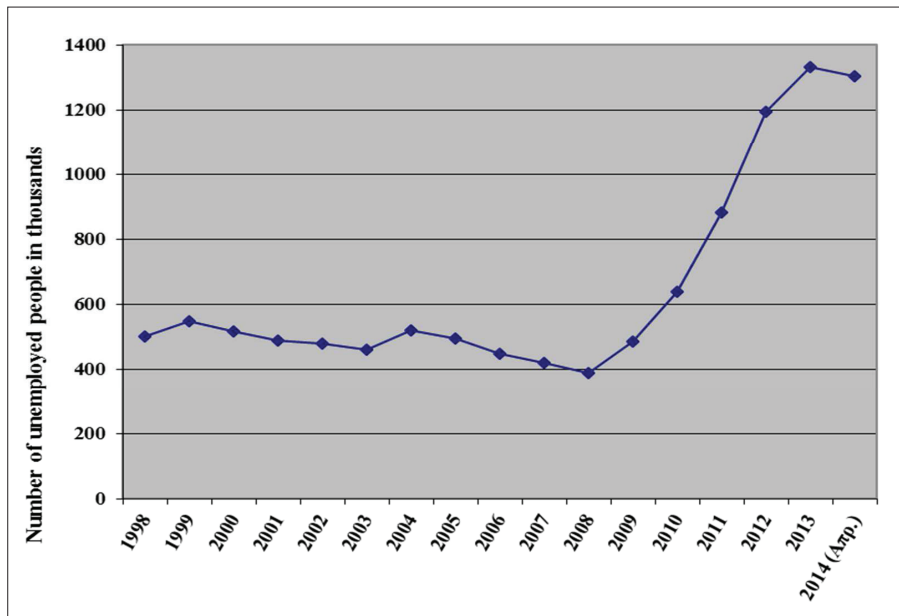
Source: Eurostat.

To the 27.5% unemployment rate that was estimated for the year 2013 by the Labor Force Survey carried out by ELSTAT, the hidden unemployment, discouraged unemployment[6], as well as underemployment that is hidden in categories of employees, such as unpaid assistants who help the family business and self-employed people without staff should be added too. The aforementioned categories include to a large extent underemployed people, usually women, and in many cases people who are practically unemployed, even though they are counted among the employed, in statistical terms. These categories constitute 30.32% of the working population, whereas the salaried employees are only 63.12% of them, a structure that shows a more general problem of the Greek economic reality, from which many difficulties arise regarding the carrying out of a more effective economic policy.

At this point it should be commented on that the effect of the structural factors, that according to what was mentioned in the introduction of the paper, are mainly the transition towards the post-industrial society, the internationalization of the economy and the technology, on the unemployment in Greece.

The effect of the first factor that is the transition from the dominance of industry to a society of services on the unemployment in Greece during the last decades seems to be important, as the concentration of the main volume of unemployed people in manufacturing, is obvious (Rontos, 1996 and 1997). The structural changes, foreseen by other researchers too, will hit countries such as Greece that have not been properly prepared for this transition towards a society of services (Buigues and Sapir, 1993).

The effect of the second factor on the unemployment in Greece, that is the tendency towards the internationalization of the global economy and the reallocation of the distribution of the worldwide or global economic activity, which is combined with the first factor too (tertiarization of the economy), has not been sufficiently investigated and it is also not possible to make exact forecasts. However, it is apparent that according to a previous analysis, Greece has comparative advantages in the wider European area, in the field of tourism due to its culture, its spiritual and historical legacy, its natural beauty and its recreation potential, facts that it should utilize (Rontos, 1995).

Then there is the third factor, namely technology. Its impact on unemployment even in Greece seems to devalue the traditional professions or at best drastically reduces the working jobs. By a special qualitative analysis for Greece, the results of which have been announced, (Rontos, 1997), it derives that according to a linear multivariable model with an important total interpretative ability (ADJ $R^2 = 0,81$), only the intensity rate of the new population group entering the labor market has an effect on the development of unemployment. On the contrary, the level of economic development and the rate of technology input do not seem to effect at a statistically significant level. This conclusion, of course, should be considered as an initial indicator of the interpretative ability of the factors that define the effect of technology on unemployment. Further and recent quantitative research of the issue is required so that some other factors can be taken into consideration too, to take into account the time lag in the variables etc.

4. Investigating the relation between national and regional unemployment in Greece

The country's regions present, exactly like the national measure, increasing trends in unemployment over time but differentiate considerably regarding the size of their rate compared to each other and in relation to national unemployment as well.

The regression analysis of the national on the regional unemployment shows interesting relations and confirms the regional differentiations in Greece regarding the issue being examined. The analytical results of the application of the linear regression functions for each region are presented in Table 1 and the evaluation of the models derived from this analysis in Table 2.

Table 1: Results of regression analysis for investigating the effect of national unemployment on regional unemployment 1998 - 2013

REGIONS	Coefficient Estimation				
	a	b	R2	Adj R2	DW
EASTERN MACEDONIA – THRACE	2,772 (t= 3,300) (p= 0,005)	0,807 (t= 13,834) (p= 0,000)	0,932	0,927	1,340
CENTRAL MACEDONIA	-0,808 (t= -1,629) (p= 0,126)	1,119 (t= 32,475) (p= 0,000)	0,987	0,986	1,148
WESTERN MACEDONIA	5,212 (t= 4,813) (p= 0,000)	0,920 (t= 12,233) (p= 0,000)	0,914	0,908	1,104
EPIRUS	2,639 (t= 4,525) (p= 0,000)	0,884 (t= 21,827) (p= 0,000)	0,971	0,969	1,839
THESSALY	2,144 (t= 2,922) (p= 0,011)	0,849 (t= 16,656) (p= 0,000)	0,952	0,949	0,831
IONIAN ISLANDS	6,802 (t= 4,509) (p= 0,000)	0,458 (t= 4,371) (p= 0,001)	0,577	0,547	1,506
WESTERN GREECE	0,263 (t= 0,358) (p= 0,726)	1,008 (t= 19,745) (p= 0,000)	0,965	0,963	1,759
CENTRAL GREECE & EUBOEA	0,739 (t= 1,215) (p= 0,244)	1,058 (t= 25,038) (p= 0,000)	0,978	0,977	1,876
ATTICA	-1,805 (t= -4,537) (p= 0,000)	1,120 (t= 40,545) (p= 0,000)	0,992	0,991	1,189
PELOPONNESE	0,353 (t= 0,597) (p= 0,560)	0,798 (t= 19,430) (p= 0,000)	0,964	0,962	1,212
NORTH AEGEAN	0,404 (t= 0,406) (p= 0,691)	0,765 (t= 11,060) (p= 0,000)	0,897	0,890	1,426
SOUTH AEGEAN	5,495 (t= 3,163) (p= 0,007)	0,542 (t= 4,489) (p= 0,001)	0,590	0,561	1,667
CRETE	-1,276 (t= -1,869) (p= 0,083)	0,939 (t= 19,794) (p= 0,000)	0,966	0,963	1,408

Table 2: Evaluation of linear relation between regional-national unemployment

REGIONS	TOTAL EXPLANATORY ABILITY OF NATIONAL ON REGIONAL UNEMPLOYMENT	STATISTICAL SIGNIFICANCE OF THE REGRESSION COEFFICIENTS		AUTOCORRELATION IN THE RESIDUALS
		a	b	
EASTERN MACEDONIA THRACE	Extremely large	**	***	There is no negative autocorrelation. No conclusions are drawn about positive autocorrelation
CENTRAL MACEDONIA	Extremely large	***		There is no negative autocorrelation. No conclusions are drawn about positive autocorrelation
WESTERN MACEDONIA	Extremely large	***	***	There is no negative autocorrelation. No conclusions are drawn about positive autocorrelation
EPIRUS	Extremely large	***	***	There is no autocorrelation
THESSALY	Extremely large	**	***	There is positive autocorrelation
IONIAN ISLANDS	Moderate	***	***	There is no autocorrelation
WESTERN GREECE	Extremely large		***	There is no autocorrelation
CENTRAL GREECE & EUBOEA	Extremely large		***	There is no autocorrelation
ATTICA	Extremely large	***	***	There is no negative autocorrelation. No conclusions are drawn about positive autocorrelation
PELOPONNESE	Extremely large		***	There is no negative autocorrelation. No conclusions are drawn about positive autocorrelation
NORTH AEGEAN	Large		***	There is no autocorrelation
SOUTH AEGEAN	Moderate	**	***	There is no autocorrelation
CRETE	Extremely large	Uncertainty	***	There is no autocorrelation

SCALE OF TOTAL INTERPRETATIVE ABILITY: Moderate: 0,5 <AdjR2 < 0,7, Large: 0,7 <AdjR2 < 0,9, Extremely large: AdjR2 > 0,9
*** Level of statistical significance a = 0.001,
** level of statistical importance a = 0.01 and
* level of statistical importance a = 0.05

First of all, for almost all of the regions, the total explanatory ability of the national on the regional unemployment is very large for all the regions apart from the Ionian Islands and the

South Aegean that show moderate levels (0.5<ADJ R^2 < 0.6). The R^2 coefficient in this application shows the grade in which national unemployment explains the variation of each region's unemployment. A basic finding which also constitutes a success for the model of investigating the relation between national and regional unemployment is that all regions present statistically significant b coefficients'. The constant a term does not present statistical significance in equations of 5 regions (Table 1) which means that we have to keep some reservations to our conclusions that have been extracted from them. Statistical significance is still meaningful even in our case where we do not take a mere sample but all the country's regions. Finally, in only one region (Thessaly) there is a clear indication of autocorrelation, a fact that shows a successful application in that aspect, as the existence of an autocorrelation constitutes the basic critique in the implementation of the models for identifying the effects of national unemployment on the regional one (Clark, 1979).

Based on the angular coefficient b of each function conclusions are derived regarding the vulnerability/sensitivity of the regional-local unemployment to the national changes.

The regions that react more intensely to the national trends regarding unemployment (b > 1) are the following, based on the analysis (Table 3):

- Central Macedonia (b = 1.119)
- Attica (b = 1.128)

On the contrary, the regional changes in unemployment are smaller than the national ones for the regions (b < 1):

- Eastern Macedonia (b = 0.807)
- Western Macedonia (b = 0.920)
- Epirus (b = 0.884)
- Thessaly (b = 0.849)
- Ionian Islands (b = 0.458)
- Peloponnese (b = 0.798)
- North Aegean (b = 0.765)
- South Aegean (b = 0.542)
- Crete (b = 0.939)

Finally, according to the analysis in the regions of Western Greece and Central Greece and Euboea unemployment follows the national trends (= 1, b = 1.008 και b = 1.058).

Table 3: Sensitivity grade (reaction) of regional unemployment to the national changes

Large (1<|b|<2)	Moderate |b| = 1 *	Small |b| <1
Central Macedonia, Attica	Western Greece, Central Greece and Euboea	Eastern Macedonia, Western Macedonia, Epirus, Ionian Islands, Peloponnese, North Aegean, South Aegean, Crete Thessaly

*A change in the regional unemployment by 1 point causes an equal change to national unemployment.

According to the value of the constant coefficient a, the regions are grouped in the following categories. Western Greece (a = 0.263), Peloponnese (a = 0.353) and North Aegean (a = 0.404) which do not present a large concentration of unemployed people in relation to the national levels (a ≈ 0). The regions of Eastern Macedonia (a = 2.774), Western Macedonia (a = 5.212), Epirus (a = 2.639), Thessaly (a = 2.144), the Ionian Islands (a = 6.802), South Aegean (a = 5.495) and Central Greece (a = 0.739) present a higher accumulation of unemployed people than the national average (a > 0), whereas the other regions also present such an accumulation but in levels lower than the average (Central Macedonia a = -0.808, Attica a = -1.805, Crete a = -1.276) (Table 4).

Table 4: Accumulation grade of unemployment in the Regions in relation to the national levels

There is no accumulation (a≈ 0)	Small accumulation (a < 0)	Large accumulation (a > 0)
Western Greece, Peloponnese, North Aegean	Central Macedonia, Attica, Crete	Eastern Macedonia, Western Macedonia, Epirus Ionian Islands, South Aegean, Central Greece Thessaly

5. The characteristics of the regions and the implementation of a modern regional employment policy

The regions of Central Macedonia and Attica constitute the ones that react intensely to the national changes of unemployment. These regions, being metropolitan that accumulate a large part of the country's population and economic activity in secondary and tertiary sector, are affected immensely by the de-industrialization and the other structural changes that take place in Greece and internationally resulting in high numbers of unemployment. For each national policy measure, mainly with structural character, that affects employment, the immense consequences that will be presented in the aforementioned regions and shall increase unemployment even faster should be taken into account. However, in national policies that boost employment the regions in question have the privilege to be benefited more. The resent financial crisis in Greece but particularly the debt crisis that followed and the measures taken, particularly in order to confront the latter, also caused intense differentiations to the regional labor markets.

The mainland central regions of Western Greece and Central Greece follow the national changes regarding unemployment that is they react less intense that the previous metropolitan regions, a fact that should also be taken into account during carrying out employment policy or taking new measures that affect unemployment.

In the other regions of the country, unemployment reacts less to the national changes. Firstly, the island regions, due to their isolation, their prevalent orientation towards agriculture (Ionian Islands) or tourism (South Aegean), the restricted high technology sector, the lack of a satisfactory telecommunications network and the lack of dynamic urban centers. The Peloponnese, even though it is not an island, presents the same characteristics and intense intra-regional differentiations to the detriment of the prefectures that are situated in the southern part

of the region. Eastern Macedonia and Thrace also have the characteristics of regions being at the border and various socio-economic problems, whereas Epirus presents structural problems so that it cannot follow the national developmental trends. In this period, however, of huge increase of unemployment in Greece, the relative inaction of those regions to the national trends, constitute a protective element for the further increase of unemployment.

However, any policy to exit the crisis should take the relative inaction of these regions in question into account, a fact that entails the possible ineffectiveness of carrying out a unified central employment policy in them. The development of infrastructures in a regional and intra-regional level, the implementation of special local and sectoral programs and the emphasis on vocational training – basic education, will contribute to the approach of the basic developmental parameters of these regions, at least in a national framework.

It is typical that all the above regions, apart from those of the South Aegean and Crete, are characterized by a relatively low growth rate. After all, most of them present, according to the results of the regression, a large accumulation of unemployed people in relation to the national numbers. However it should be noted that Western Macedonia and Crete present a coefficient b, slightly smaller than 1, thus they practically almost follow the national trends. The first one because it does not present a large grade of isolation and is geographically and organically near Thessaloniki and the second one because it's economic activity is mainly exports, it has local developmental advantages (important urban centers, technology, dynamic farming etc.) and in general present characteristics of a successful endogenous development.

As a general ascertainment however, from the empirical results of this application the different reaction of the regions to the national changes should be mentioned, with relative inaction being the main characteristic mainly of the isolated and developmentally disadvantaged regions of Greece. The study confirms the fragmentation of the labor markets between the various areas of the country and urges the establishment of a specialized regional employment policy instead of carrying it out centrally and unified, which rather adds to instead of reducing regional inequalities.

Indeed, the ascertainment of indications that concern the mild up to intense differentiation of regional unemployment in relation to the respective national one, also defines the direction the policy should take that might possibly provide solutions to the mass unemployment that the Greek and the global society experiences on a daily basis. Traditional policies that adopt the strategy of "top-bottom development" do not seem to face the problem of unemployment, that continues to grow and leads to important and dynamic parts of society to social exclusion (from work). It is also noted, that the solutions merely "to put out the fire" without them being rational in order for employment to increase, such as recruitment in the public sector etc. are no longer possible due to the need for a restrictive policy and simultaneously due to the introduction of technology in the public sector.

Furthermore, the policy for combating unemployment through training programs and other social policy measures does not seem to give solutions if those measures are designed on a national level. For these reasons and given that carrying out employment policy is nowadays identified with the creation of new job positions, the trend for a decentralized system is created, which will deal with the disturbance of the balance at its source, meaning the place each local balance is created, of course always taking into account the national and international factors.

The effect of the institutional and economic changes on the regional unemployment can also be seen when comparing the results of this application to a respective one conducted a decade

ago for the 1988-99 period (Rontos, 2004), that is before Greece entered the EMU and the budgetary discipline of the 2009-14 period with large consequences to the economic recession and the huge explosion of unemployment.

The following can be mentioned as the most meaningful conclusions from the comparison of the two applications:

- The regions of Western Macedonia, Eastern Macedonia & Thrace, Epirus and Central Greece are inactivated regarding their reaction to national unemployment in the resent application.
- Attica is now one of the two regions that react intensely to the national trends as opposed to the previous periods.
- Central Macedonia remains in both periods among the regions with an intense reaction to the national trends.
- During the first application the inaction of the three regions (Attica, Western Greece, and Crete) to national trends from the older application, lately expands to as many as 9 regions, as has already been presented in this analysis.
- A large accumulation of unemployed people, in relation to the national number is presented by an important number of regions, as we saw in the latest period, whereas in the application in the 90's, such an accumulation was only presented by the regions of Attica and Western Greece.

Those differentiations (and others) between the two periods should be analyzed in depth, but at this point we estimate that we can draw the following clear conclusions: The differentiation of policies during the recent period (entering the EMU, implementing measures of violent monetary adaptation during the crisis, guardianship by the EU and the IMF when carrying out policy) not only deepened the problems of unemployment by this boom but also enhanced the regional disparities, fragmented and isolated the labor market on a regional level even more and generalized the accumulation of unemployed people in a large number of regions, so that the regional image of unemployment turns out to be more problematic but also more complicated than ever.

6. Conclusions and policy recommendations

The problem of unemployment constitutes one of the most important problems of modern societies that hit the core of sustainable development strategy. Entering information society, the internationalization of economy and the continuous technological input magnify the problem of unemployment. On a regional level, the effects of the aforementioned factors differ from area to area and hit the areas that cannot easily adapt to the new conditions more. The different grade in which the regions are hit also leads to the need to differentiate the employment policy that should be implemented by regions, that is, a regional employment policy should be carried out.

Thus, investigating the relation between national and regional employment, by applying linear regression models, also contributes to carrying out a rational regional employment policy, as it detects the degree of response of regional unemployment to the changes in national unemployment, as well as to the effective application of an integrated strategy for sustainable development.

In particular, regarding unemployment, from the results of the application in the country's regions, three basic groups are detected. Those that follow the changes in national

unemployment, those who are more sensitive to national changes and those that respond less intensely to the national trends. These groups of regions present common economic and geographical characteristics that interpret those different reactions to the national changes but are also interpreted by them to a great extent.

The particularities of the regions and the independence or the differentiation of the development of their unemployment in relation to the national trends, renders it necessary to draw up a regional – local development strategy with "bottom-up development" as a main choice and the "local employment initiatives" as basic means. This regional-local development strategy should constitute a main pillar of national sustainable development strategy.

Notes

1. See par. 8 of the Declaration of Sustainable Development Policy, Johannesburg 2002, in Gr. Tsaltas (edit.), 2003. See also United Nations, Department of Economic and Social Affairs, 2002. Regarding the analysis of the three basic components of sustainable development, see in Vavouras, 2013, pp. 513-514.
2. "Development that meets the needs of the present generation without compromising the ability of the future generations to meet their own needs". World Commission on Environment (Brundtland Commission) Report, 1987, p. 3.
3. For the analysis of the relations between growth and development, see among others in Vavouras, 2011, pp. 27-28.
4. See Eurostat, *Sustainable Development Indicators*, http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi
5. Spain followed with 26.1%, whereas the average unemployment rate for EU was 10.8%.
6. Hidden unemployment is when it is possible to reduce the number of employees without reducing production levels that is to the point where the marginal productivity of labor equals zero. Discouraged unemployment is constituted of dispirited work which means people at a working age that would like to enter the labor force if they considered the opportunities offered in the labor market were favorable. See Vavouras, 2013, pp. 382-383.

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