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ΓΕΝΙΚΗ ΓΡΑΜΜΑΤΕΙΑ ΕΡΕΥΝΑΣ  
ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ

ΔΙΑΧΕΙΡΙΣΤΗΣ ΠΡΟΓΡΑΜΜΑΤΟΣ



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(EEA GR07/3694)’**

**WP1: ‘Regional industrial mix, specialization and un-/ under-  
employment in Greece’**

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**‘ΕΡΕΥΝΑ ΣΥΜΜΕΤΟΧΙΚΗΣ ΔΡΑΣΗΣ ΓΙΑ ΤΗΝ  
ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΗΣ ΑΝΕΡΓΙΑΣ ΚΑΙ ΥΠΟΑΠΑΣΧΟΛΗΣΗΣ  
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**Υπεύθυνος φορέας: Πανεπιστήμιο Αιγαίου**

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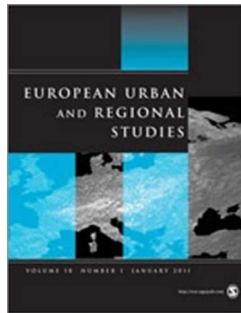
**Χρηματοδοτικός Μηχανισμός ΕΟΧ 2009-2014**

Συγχρηματοδότηση: Χρηματοδοτικός Μηχανισμός Ευρωπαϊκού Οικονομικού Χώρου (ΧΜ ΕΟΧ 2009 – 2014, [www.eeagrants.org](http://www.eeagrants.org)) και Εθνικό Πρόγραμμα Δημοσίων Επενδύσεων, της Γενικής Γραμματείας Έρευνας και Τεχνολογίας του Υπουργείου Παιδείας και Θρησκευμάτων (Διαχειριστής Προγράμματος, [www.gsrt.gr](http://www.gsrt.gr))

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Through the EEA Grants and Norway Grants, Iceland, Liechtenstein and Norway contribute to reducing social and economic disparities and to strengthening bilateral relations with the beneficiary countries in Europe. The three countries cooperate closely with the EU through the Agreement on the European Economic Area (EEA). For the period 2009-14, the EEA Grants and Norway Grants amount to €1.79 billion. Norway contributes around 97% of the total funding. Grants are available for NGOs, research and academic institutions, and the public and private sectors in the 12 newest EU member states, Greece, Portugal and Spain. There is broad cooperation with donor state entities, and activities may be implemented until 2016. Key areas of support are environmental protection and climate change, research and scholarships, civil society, health and children, gender equality, justice and cultural heritage.



**'Going under-employed'; Industrial and regional effects, specialization and part-time work across recession-hit Greek regions**

Journal:	<i>European Urban and Regional Studies</i>
Manuscript ID	EURS-16-0098.R1
Manuscript Type:	Standard Articles
Keywords:	underemployment, Greek regions, shift share analysis, part-time work, Southern EU, recession, Location Quotient
Abstract:	<p>The paper explores the regional dimensions of underemployment by analyzing part-time jobs uneven dispersion in Greece. It understands underemployment as an integral dimension of contemporary flexible labour trends, triggered by devaluation and expanding amid crisis, though in diverse geographical and sectoral terms. It follows a methodology that comparatively analyzes statistical data, relevant secondary sources and previous case-studies, before moving to a theoretical contextualization of the findings. Based on this framework, NUTS-II level total employment and part-time work data are analyzed through Location Quotients, and a new embellishment of shift share analysis is implemented for 2005-2008 and 2009-2012 and across nine sectors for all Greek regions. The findings reveal four distinct, though porous, patterns of underemployment utilization which are distinguished according to different regional productive specializations and the impact of structural or regional effects. The reasons why some regional economies, such as the tourist ones, were more resistant to employment losses, and at the same time most keen on expanding part-time work, are scrutinized. Concluding, three deeper causal mechanisms, namely productive-technological, organizational and institutional, that determine the underemployment patterns revealed are discussed and contrasted to relevant literature findings.</p>

# ‘Going under-employed’; Industrial and regional effects, specialization and part-time work across recession-hit Greek regions

## 1. Introduction

During the past two decades, part-time employment is expanding faster than full-time employment across most of the EU (Horemans et al, 2016; Jenkins et al, 2016). The Euro crisis is also associated with increasing shares of *involuntary* part-time work. As such, part-time employment reflects an underutilization of the labour force, or *underemployment* (Jenkins et al, 2016), a phenomenon which not least has hit Greece in a particularly severe manner since the eruption of the Greek crisis (Ioannides, 2015). Underemployment, often known as ‘hidden unemployment’, is a relatively under-researched aspect of contemporary economic restructuring and only a handful of scholars have discussed its relation to labor flexibilization (Green and Livanos, 2015; Jenkins et al, 2016). Scrutinizing its interconnection to both unemployment and flexible, or even atypical, work is important for developing insights about the dynamics of EU regions. In particular, there is a need to describe and understand the profound changes taking place in the socio-economic structures of Southern Europe.

The paper in hand intends to fulfil part of this gap by offering a theoretically-informed empirical study on how the intersection of production structures and regional labour markets affects underemployment. By doing so, the paper offers new critical insights regarding economic restructuring and regional labour markets change and the issues of underemployment, labour surplus and precarious forms of employment. More specifically, the paper investigates underemployment by focusing on the uneven dispersion of part-time jobs in Greece and its regions during the ongoing crisis and recession. The fundamental research hypothesis tested in the empirical part is that the phenomenon of underemployment is an integral dimension of flexible labour trends that are triggered by devaluation and crisis. The second dimension of this hypothesis is that underemployment has diverse geographical and sectoral expressions.

Three research questions guide the paper: First, what is the extent of underemployment, and of part-time work in particular, after the onset of the Greek crisis in 2008? Second, what are the regional and sectoral differences of the rise of underemployment in the country? Finally, what are the mechanisms driving the trend of underemployment, which, overwhelmingly, hit the less-privileged strata of the labour force? Using a *theoretically-informed empirical analysis* methodological framework the paper highlights certain productive, organizational and institutional mechanisms that

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3 produce four (4) divergent regional responses (e.g. between the metropolitan and the  
4 tourism-oriented spatial entities); these divergences make the 'Greek peculiarities' an  
5 interesting case of wider significance.  
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8 In contrast to unemployment, underemployment lacks a strict definition. Most studies  
9 point out that an underemployed individual usually works on a part-time basis while  
10 needs and desires full-time employment or is employed at a low-paying job that requires  
11 less skill or training than he/she possesses (thus the terms 'part-time work' and  
12 'underemployment' are below used interchangeably; Eurostat, 2016). Under such a  
13 definition, the underemployed persons do not have access to a salary that is necessary to  
14 sustain themselves and their families, and, thus, face very similar problems with those  
15 that are unemployed. An underemployed individual is, then, an 'underutilised labourer'  
16 who is usually low-paid or over-qualified for the work that he/ she possesses or engaged  
17 in work for a few (e.g. four or less than four) hours per day (Veliziotis et al, 2015;  
18 Livingstone, 2016). Many studies tend to neglect the underpaid or over-qualified aspects  
19 of contemporary part-time work, voluntary or not, though increasingly seen as a norm in  
20 labour markets in Southern Europe. In Greece, for example, all part-time workers receive  
21 an official gross salary of less than 480 Euros per month, an amount that is far below the  
22 official poverty line in the country (Copus et al, 2015; INE, 2016:110).  
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29 The remainder of the paper is structured in the following manner: After a conceptual  
30 and analytical framework offered in *Section 2* and a methodological framework offered in  
31 *Section 3* we enter a region-specific account of underemployment patterns across  
32 different sectors in *Section 4*. To serve the research objectives, the paper focuses on all  
33 thirteen (13) Greek regions by comparing thoroughly taxonomized employment data  
34 between 2005-2008 and 2009-2012. We also implement a new embellishment of the  
35 shift-share analysis method in order to examine the impact of industrial mix on total  
36 employment and underemployment patterns, and assess how regional competitive  
37 advantages in relation to such forms of employment seem to have changed due to the  
38 crisis. In *Section 5* we provide an extended discussion of the interface between local  
39 production specialization and restructuring on the one hand, and the issue of an  
40 increasing local labour surplus on the other. The final part (*Section 6*) offers some  
41 concluding remarks.  
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## 50 **2. Crisis and underemployment across multiple geographical scales**

51 Post-1990s, the EU South has experienced a debt-driven growth model with a real estate  
52 bubble, resulting in large current account deficits (Hadjimichalis and Hudson, 2014;  
53 Mavroudeas, 2014). This process has accelerated since the introduction of the Eurozone  
54 and was a major driver behind the outburst of the 2008/2009 crisis and growing socio-  
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3 economic turbulence ever since, with Greece as the perhaps most prevalent example.  
4 During the post-recession period political-economic intra-EU rivalries are under rising  
5 tension, whereas labour market indexes such as unemployment, in-work-poverty or  
6 absenteeism have been increasing (Gialis and Leontidou, 2014; Adam and  
7 Papatheodorou, 2016).  
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11 Many scholars of various theoretical and socio-political backgrounds have tried to  
12 interpret the whys and hows of new trends in the labour market. Two standpoints are  
13 typical for political economy approaches. First, the unemployed and underemployed  
14 (forming the local labour surplus) constitute territorially-embedded human assets of  
15 knowledge and expertise, and should be seen as indispensable for the recovery and  
16 sustainable growth of the local economy. Second, shrinking work opportunities and  
17 obstructed access to employment cannot be solved on an individual basis. Rather,  
18 joblessness is a problem that affects the community as a whole, at it therefore requires the  
19 coordination of the local labour surplus with institutional and business organizations in  
20 order to claim back the right to work, and upgrade local development structures  
21 (Mavroudeas, 2014; Reinhart & Trebesch, 2015; Warren, 2015).  
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27 The spatially uneven impact of recession is usually scrutinized through analysing  
28 the changing unemployment rates either on a national or sub-national level. The  
29 diversified role that different segments within 'total employment' play is usually  
30 underestimated. Yet, the vast array of everyday working norms, practices and regulations  
31 that different groups of the 'employed', especially the less privileged ones face, does  
32 matter. A recent work of Green & Livanos (2016) which focused on *involuntary non-*  
33 *standard employment*, here including involuntary part-time and temporary work, found  
34 that some individuals become part of 'hidden unemployed' instead of maintaining  
35 economically active memberships in society. They assert that this applies even for  
36 stronger labour markets, such as the regional labour markets of the UK, which present  
37 clear variations in terms of involuntary part-time employment trends. As found, stronger  
38 regional economies had lower involuntary shares while the weaker ones were worse off.  
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44 Under such circumstances part-time low-paid contracts can become traps rather  
45 'stepping stones' to more desirable permanent jobs (see De Jong et al, 2009). For  
46 example, several studies have provided some interesting remarks on the connection  
47 between such work and limited chances for advancement in the Spanish or Italian labour  
48 markets (Amuedo-Dorantes, 2000; Barbieri & Scherer, 2009). The so-called 'rigidity'  
49 within local labour markets that produces dualism between those low-paid,  
50 underemployed workers and the more protected 'core employees' is present and  
51 generates increasing segregation. OECD studies the phenomenon through its 'Indicators  
52 of Employment Protection' (OECD, 2016) series. Regionally-sensitive studies that  
53 account for recessionary flexibilization trends found that many Southern EU labour  
54 markets, especially the Greek ones, are at the top-places of the 'flexibilization ranking',  
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irrespective of the impact of the ‘rigidity’ index values (Gialis and Taylor, 2015). That being said, some fresh and updated accounts of the interconnection between (higher than officially estimated) flexibility, underemployment and dualism in Southern EU is needed.

Relevant literature has focused on involuntary part-time and temporary work and its relation to inferior job-quality (Kauhanen and Nätti, 2015). Other studies have explored the ‘strong positive correlation’ between involuntary part-time employment and unemployment. For instance, Kretsos & Livannos (2016) found that part-time work mainly affects younger people, workers of lower education/ occupational status and women (Kretsos & Livanos, 2016); while other researchers have scrutinized the contribution of such employment forms to widening class divisions in advanced societies (Warren, 2015). Here, involuntary part-time workers face a higher poverty risk (Horemans et al, 2016); and, since the ‘Great Recession’, full-time workers face equally high risks of working part-time along with the high probability of being unemployed. Also, variations in involuntary part-time are highly depended upon variations in full-time work (Borowczyk-Martins & Lalé, 2016).

Recent studies that have an explicit focus on part-time employment and unemployment are few, even despite the pressing issue of the Greek crisis for the past six years. Veliziotis et al (2015) find that non-standard low-paid jobs are on the rise and argue that the existent gaps in wage-level and job quality between voluntary and involuntary part-time workers are not as important in Greece as they are in the UK (meaning that part-timers of both types are very close in terms of their work statuses in the former country). Moreover, they point out that part-time jobs were widely viewed by workers as sub-optimal. This, in turn, implies that institutional path-dependence and the quality of part-time contracts are determining employees (dis)-approval for such kind of jobs. These trends combined with the poor wages in almost all part-time jobs highlights the need to expand the scope of analysis to voluntary part-timers when in the Southern EU framework.

Overall, steadily increasing (involuntary) part-time employment is seemingly becoming the norm rather than the exception in certain segments of contemporary labour markets. It is an employment form that has contributed to increasing employment rates and to more numerical and working-hour flexibility, affecting both employers and employees, and increasing the options for re-entering the labor market for the non-active segments of the labor force. Easier entry to the labour market and better coupling of work and familial duties, especially for the women, is praised enough by part of the literature (Lymperaki & Dendrinou, 2004). However, recessive pressures and the need for cheap labour often offset the positive and exacerbate the negative traits. In many cases part-time work is strongly interrelated with ‘low-road’ flexibility practices and bad/ poorly-paid jobs. Under such terms, is a threat to both contemporary living standards and future welfare and pension systems (Warren, 2015; Jenkins and Charleswell, 2016).



### 3. Methodological choices and background

In the paper, we analyze two forms of underemployment and contrast them to overall employment numbers. As an operationalization of underemployment, we turn to *total part-time* and *non-voluntary* part-time employment. The data is collected from the Labour Force Surveys of HELSTAT (National Statistics Authority) which follows the norms of Eurostat (Eurostat, 2016) and identifies non-voluntary part-time work through questioning the employee whether ‘he/ she prefers full-time engagement’.

Along with an explicit focus on non-voluntary part time work, we expand the scope of our analysis to total part-time work in light of our argument about the highly blurred boundaries between part time work categories in Greece. This has to do with the very low wage level and poor job quality in Greece’s overall part-time employment (cf Veliziotis et al, 2015). Additionally, we choose this extended definition of underemployment because of the high discrepancy regarding part-time work shares between HELSTAT and other official sources, such as the employment contracts database of the Ministry of Employment. Though not directly comparable, the latter source reveals that part-time work is probably more widespread than what HELSTAT’s estimates (Ergani, 2016).

We operationalize the research questions through the following methodological framework: First, we divide Greek regions into different groups of distinct productive specializations based on a thorough analysis of major employment/sectoral concentrations. The rationale for this grouping is to offer a fresh account of changing regional specializations<sup>1</sup> as well as a non-exhaustive regional taxonomy that supports our analysis. The analysis commences by scrutinizing (under-)employment, its changing relative shares and notable over- and under concentrations relative to the different groups. Common trends are traced through a series of relative shares’ comparisons in order to understand the regional patterns of underemployment. Then, we employ a new embellishment of Shift Share Analysis (SSA)<sup>2</sup>, presenting a clear decomposition of the distinguishable factors affecting employment change across the identified productive/ regional entities.

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<sup>1</sup> Many relevant works are attempting such ‘loose typologies’ of regions across the EU. For example, OECD (2014) classifies regions along the Urban- Rural divide, while Navarro et al (2009) in relation to innovation diffusion. For Greece relevant analyses that studied specialization using data for earlier periods, than the ones studied here, are the ones of Psycharis et al (2014), Giannakis and Bruggeman, (2015) and Gialis & Tsampra (2015).

<sup>2</sup> This new SSA has been recently presented by Artige & van Neuss (2014) as an attempt to better isolate between the regional and the structural effect.

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3 We focus on two time periods. The first, 2005-2008, covers the pre-crisis  
4 expansionary years after the 2004 Olympics, a period also noted for enhanced financial  
5 speculation. The second period, 2009-2012, marks the first years of severe economic  
6 depression during which the first memoranda were implemented (Gialis and Tsampra,  
7 2015). The scale of analysis is the 13 NUTS-II regions for which relevant labour data are  
8 analyzed across nine (9) sectors<sup>3</sup>.  
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12 We follow these steps in the analysis; First, we calculate the location quotient (LQ)  
13 for all employment forms and across all sectors in order to identify regional  
14 specialization and important concentrations of underemployment. This is calculated from  
15 the start year and end year of each period, and we use 1.20- 1.25 and 0.70- 0.75 as  
16 approximate cut-off values of over-concentration and under-concentration, respectively.  
17 The following changing analogies between two clearly defined ‘dipoles’ are conducted:  
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- 20 • total part-time vs total full-time within total employment
- 21 • non-voluntary vs voluntary as parts of total part-time employment
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27 We then turn to Shift Share Analysis (SSA) in order to offer a more dynamic  
28 decomposition of the actual employment change of each region in three parts. This  
29 includes the national share (NS), the industrial mix (IM), also known as ‘structural  
30 effect’, and finally, the regional or ‘competitive’ share (RS), which potentially reveals the  
31 different factors affecting employment change.  
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35 In the SSA we identified four different, yet overlapping regional groups based on  
36 both quantitative and qualitative criteria, namely the high total employment LQs<sup>4</sup> across  
37 the respective sector in 2005, urban or rural, seasonality, geographical centrality, and  
38 finally, insularity. Accordingly, we have grouped the regions as *Metropolitan* (2 regions),  
39 *Manufacturing* (2), *Agricultural* (5), and *Tourism-based* (4) (see Table 1). Though  
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44 <sup>3</sup> In brief, sector 1 is *Agricultural production* (two-digit NACE codes: 01-03);  
45 sectors 2, 3 and 4 represent *Manufacturing* (05-33), *Construction* (41-43) and *Energy production* (35-39),  
46 respectively;  
47 sectors 5, 6 and 7 is for *Commerce, transportation and communication*(45-53, 58-63), *Hotel, food and*  
48 *catering and Financial*(55-56), *Professional and ‘knowledge economy’* (64-82) activities respectively;  
49 and finally sectors 8 and 9 include *Public services, health and education*(84-88), and *Leisure, arts and all*  
50 *activities not recorded above* (94-99, 00).  
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52 <sup>4</sup>The LQ of a sector in a region is calculated by dividing this sector’s (under) employment share in that  
53 region by its share on a national level. Regions are classified across different groups based on their pre-  
54 crisis specialization (i.e. total employment LQ > 1.20 in Sector 1 for the agricultural regions, in Sector 2 for  
55 the Manufacturing, and in Sector 6 for Tourism-based, values for 2005), with the exception of the  
56 Metropolitan ones which are defined based on the major cities they incorporate while they hold an LQ  
57 close to one (1) in almost all their tertiary sectors (*as in Table 1*).  
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3 relatively homogeneous, the regions also have notable internal differences. For example,  
4 the metropolitan group consists of the two most densely populated regions around Athens  
5 and Thessaloniki. Attica hosts the capital city of Athens and is significantly larger and  
6 more intensely urbanized (Panori et al, 2016). Central Macedonia, on the other hand,  
7 includes several middle-sized cities and agricultural areas in addition to the significant  
8 urban agglomeration of Thessaloniki. Thessaloniki has gradually lost its specialization in  
9 manufacturing, becoming one of Greece's rust-belts following industrial relocalization  
10 and recession (Kallioras et al, 2016; Petrakos & Psycharis, 2016). The agricultural group  
11 also demonstrates variation. For instance, Epirus and Eastern Macedonia, are deprived  
12 areas lacking sufficient infrastructure and human capital, while others, such as Thessaly,  
13 are relatively well-off and include important urban-industrial agglomerations (Giannakis  
14 & Bruggeman, 2015; Papadopoulos, 2016).  
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21 Finally, the tourism-based group consists of all the Greek island regions. These  
22 regions typically have high concentrations of employees in the hospitality sector.  
23 However, there are distinct variations (Armstrong et al 2014). South Aegean and the  
24 Ionian Islands are typical cases of areas highly based on "sun and sand" tourism, while  
25 the North Aegean region has a higher dependency on the public sector and agricultural  
26 activities in addition to tourism. Crete is also a distinct case of a tourism based region as  
27 it holds an important agro-industrial production and a far more diverse economic base  
28 (Ergani, 2016; Karoulia et al, 2016).  
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#### 34 **4. Analyzing underemployment patterns across Greek regions**

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36 No country in crisis-hit Eurozone and the EU has suffered as much employment  
37 destruction and productive capacity losses as Greece. The level of losses is only  
38 comparable to respective falls in countries under 20<sup>th</sup> century's military conflicts or  
39 during the post-Soviet collapse (Mavroudeas, 2014; Reinhart and Trebesch, 2015).  
40 Indicatively, the pre-recession period of moderate increments in total employment and  
41 mild falls in the (already high) unemployment figures was interrupted by a sudden loss of  
42 more than 15% of all jobs coupled with skyrocketing rates (more than 100% increase) in  
43 unemployment figures. However, though astonishing in its character and intensity, the  
44 recession is not homogenous. Some of the regions perform somewhat better, including  
45 half of the tourism-based regions and some of the agricultural regions, to a lesser extent  
46 (i.e. they are more resistant to employment degradation). The rest of the regions with the  
47 two metropolitan regions in particular, show far worse figures (*see Table 1*).  
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54 The data shows that (total) employment losses are followed by increments in  
55 underemployment. Part-time employment shares are higher in 2012 compared to 2005 or  
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3 2008, with no regional opt-outs. Involuntary shares also have a sharp increase, with  
4 Thessaly (agricultural) being the only stands exception to this trend.  
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7 When looking closer at the data, we see that some regions have a higher de facto  
8 unemployment coupled with an expansion of underemployment therein. The Ionian  
9 Islands is an example. Other regions do not seem to counteract unemployment through  
10 peaking involuntary shares, and even others that suffer from both high unemployment  
11 and increasing part-time work (either total or involuntary, as in the manufacturing  
12 regions, *see Table 1*). It is thus difficult to find universal trend if we do not consider the  
13 regional industrial structures and endowments that determine the particularities of  
14 underemployment. As such, we need a comparative view of changing relative shares  
15 between different forms of employment that is regional and sectoral-sensitive at the same  
16 time. In the next section we unpack some of this complexity.  
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24 **[Table 1: Total employment and unemployment changes, and total and involuntary part-**  
25 **time shares per group of regions, 2005, 2008, 2009 & 2012 about here]**  
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#### 28 29 4.1 Internal and (un) balanced underemployment dichotomies 30

31 Considering sectoral differences, we find that leisure, arts and related services have the  
32 highest part-time shares. Agriculture is second, but its share in part-time work is  
33 decreasing. The construction and hospitality sectors are the two most salient sectors  
34 where part-time work expands the most. For hospitality, this trend is related to the  
35 seasonal nature of employment (*see Figure 1*). Seen in absolute terms, most part-time  
36 labor in Greece is employed in agriculture, commerce and the public sector, though the  
37 latter sector has seen declining trends due to massive contract terminations after 2008.  
38 Part time employment also sharply expands in construction whereas full-time  
39 employment sharply decreases (also see Petrakos and Psycharis, 2016).  
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45 When we look at the regional geographies of part time employment, we see that it  
46 concentrates in metropolitan and tourism-based regions. Almost all tourism-based regions  
47 witness a notable 'leap' at some point throughout the two periods we have studied. An  
48 example is the Ionian Islands during 2009-12 (see Figure 2). Metropolitan regions, which  
49 hold more than 50% of national part-time employment also show expanding trends for  
50 part-time employment, a finding in line with other contributions (Green & Livanos, 2015;  
51 Veliziotis et al, 2015; Borowczyk-Martins & Lalé, 2016). Volume-wise, part-time work  
52 can also be traced in some agricultural regions, such as Thessaly. The only regions which  
53 witness stagnant or shrinking shares are the manufacturing and some of the more  
54 deprived agricultural regions (e.g. Epirus).  
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6 [Figure 1: Balance between i) part-time and full-time ii) non-voluntary and voluntary  
7 part-time employment (% of total part-time) per sector, 2005, 2008, 2009 & 2012 about  
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12 Distinguishing between involuntary and voluntary forms part-time employment,  
13 we see a common trend in almost all sectors and regions (*see Figure 1*): The relative  
14 share of non-voluntary part-time employment retreats during pre-crisis and highly  
15 increases during the recession. In 2012, involuntary part-time employment constitutes  
16 more than half of total part-time employment whereas its 2005 relative share was by far  
17 lower. This is true for all sectors apart from agriculture, and true for all regions apart  
18 from Epirus, Ionian Islands and South Aegean. Important concentrations of involuntary  
19 part-timers have been located in construction, leisure and hoteling, where respective LQ  
20 values are by far higher than 1,5 (*as in Table 2*). Also, construction, manufacturing and  
21 especially commerce are going through a fast 'low-road to flexibilization' process that  
22 boosts not only total part-time, but its involuntary part alike. A notable case is Central  
23 Macedonia, where involuntary part-time is expanding despite total part-time employment  
24 declines.  
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31 Overall, part-time employment LQ values show that there is an important increment  
32 in most metropolitan and tourism-based regions, as well as in secondary or tertiary  
33 activities that are common within these regional productive groups. This increment  
34 coupled with a dynamic expansion in sectors that had almost zero levels of  
35 underemployment pre-recession (i.e. construction), outweighs shrinkage in more  
36 traditional sectors and less-privileged regions (e.g. agriculture). As such, the development  
37 highlights the significant setback in full-time jobs in certain productive niches and sectors  
38 across the regions.  
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45 [Figure 2: Balance between i) part-time and full-time ii) non-voluntary and voluntary  
46 part-time employment (% of total part-time) per group of regions, 2005, 2008, 2009 &  
47 2012 about here]  
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#### 51 4.2...and the differentiated impact of structural and regional factors upon groups of 52 regions 53

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56 When we conduct the shift-share analysis for both total and part-time employment (*as in*  
57 *Table 3*) we find profound, though divergent, changes. The two *metropolitan regions* are  
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3 different in terms of underemployment; during the pre-crisis period both increased their  
4 total employment above the national trend, with Attica as the most important centre of  
5 gravity for job creation. During the crisis however, metropolitan regions lost almost a  
6 fifth of their total employment. Besides the impact of national pressures on all sectors, the  
7 impact of regional/ competitive factors are especially harder in Attica. Moreover, sectoral  
8 configurations in Central Macedonia counterbalanced the significantly negative influence  
9 of the territory-deriving forces. These remarks are in line with findings of previous works  
10 (cf Petrakos & Psycharis, 2016).  
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15 In the *Manufacturing regions* we find that both underemployment and total  
16 employment increases before the Eurozone and Greek crisis. This is especially so for the  
17 energy-intensive Western Macedonia which had the highest country-wide increase (for  
18 similar findings in the US context, see Beyers, 2013) emanated mainly by regional  
19 factors, such its resource-rich territory. Central Greece can also be regarded as a region  
20 with a specialization in manufacturing as it hosts the largest industrial plants, including  
21 those that are capital-intensive. However, employment changes here seem to be more  
22 sensitive to national economic trends, suggesting that regional factors are less important.  
23 In the recession period (2009-12) manufacturing regions are in significant distress. The  
24 boost of the pre-crisis period was replaced by a sharp decline in employment, as almost  
25 one fifth of total employment is lost. Manufacturing regions' structurally weak sectoral  
26 mix is also manifested through highly negative IM values in all employment types. For  
27 local part-time employment, sectoral configurations outweigh regional factors again, but  
28 they offset national influence as well, resulting in sharp absolute decrease in both regions,  
29 while nationally this type of employment expands. This possibly because, compared to  
30 jobs in construction or tourism, the typical factory job is associated with full-time  
31 employment, also in Greece (Martin et al, 2016).  
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40 [Table 2: LQs of total part-time employment per sector\* and group of regions\*\*, 2005 &  
41 2012 about here]  
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45 *Agricultural regions* also saw a rise in employment figures for both total and part-time  
46 employment during the pre-crisis period (2005-08). It seems that sectoral configurations  
47 played a smaller role in total employment, as in almost all other Greek regions, and a  
48 mixed one in part-time, as IMs mostly negative values reveal. RS, on the other hand, was  
49 mostly positive for total and part-time employment alike. The positive influence of  
50 regional competitive characteristics in all but Western Greece appears as quite clear in  
51 our analysis. In terms of part-time employment, we find that RS values suggest a  
52 significant expansion of underemployment for Agricultural regions in the pre-recession  
53 period. During the recession (2009-12) all agricultural regions lost a part of their total  
54 employment at a rate close to the national average (NS of -18,9%). This means that these  
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3 regions do not seem to be hit as hard as the manufacturing and metropolitan ones.  
4 Industry-specific factors seems to have played a positive role for many among the  
5 agricultural regions, yet these factors were not able to outweigh the negative impact of  
6 national pressures (Table 3). Overall, agricultural activities clearly ‘produced’  
7 underemployment, which in turn made total employment losses milder than the ones in  
8 other regional groups.  
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14 [Table 3: Results of shift-share analysis for total and part-time employment per group of  
15 regions, 2005-08 & 2009-12 about here]  
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20 [Figure 3: Mapping Regional Share (RS) for total and part-time employment across  
21 Greek regions, 2005-08 and 2009-12 about here]  
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25 Finally, two of the *tourism-based regions*, the Ionian Islands and South Aegean, are the  
26 only ones presenting notable total employment increments during the pre-crisis period. In  
27 the South Aegean there was a rise in part-time jobs in the pre-crisis period based on the  
28 influence of regional characteristics, such as the local endowments that positively affect  
29 jobs in tourism. During the recession period all tourism-oriented regions show a  
30 remarkable ‘resilience’ in total workforce numbers. With the exception of Crete (a  
31 ‘deviant’ example of a much more economically diversified economy than in the other  
32 islands) the other three have smaller declines in employment numbers compared to the  
33 other Greek regions. Here, the four tourism-based regions have regional characteristics  
34 that mitigate some of the negative national employment trends, even despite that the  
35 sectoral composition of these regions in itself should work negatively when compared to  
36 national numbers. For part-time employment we see the same trend, and it is remarkable  
37 that, apart from the South Aegean, this pattern applies to all tourism-based regions. A  
38 possible part of the explanation can be that insularity, favorable climatic conditions, and a  
39 more stable tourism base compared to mainland Greece restrained employment decline  
40 (see Armstrong et al, 2014). Thus, recessive pressures did not affect tourism-oriented  
41 regions as hard as the other Greek regions. The same applies for the agricultural regions,  
42 as seen above, but to a lesser extent.  
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## 53 5. Discussion

54 By attributing on-the-rise part-time trends to carefully decomposed structural or regional  
55 effects we came across some rather interesting findings. These findings contrast much of  
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3 the existing literature that focuses on regions of the EU North (Kauhanen and Nätti,  
4 2015; Green and Livanos, 2016).  
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7 A first remark, that answers the first question posed in the introductory section  
8 regarding the extent of part-time work, is that there is a high, though geographically  
9 uneven, expansion of such jobs in contemporary Greece. As we define underemployment  
10 through looking at (involuntary) part-time work, we thus point to the rise in this form of  
11 employment in the Greek labour market. Our second remark, that returns to the second  
12 question on hand, is that there are important differences between regions that differ in  
13 their sectoral composition. This is true for both total employment numbers and the  
14 expansion of what we coin underemployment. For instance, some of the Greek regions  
15 seem more resistant to job loss in general, some regions see a sharp rise in part-time  
16 employment after the crisis, while others do not experience higher part-time employment  
17 as a replacement to other forms of employment. Explaining these divergences, we  
18 identify four distinct, though not rigidly defined, patterns of underemployment.  
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24 i) *Metropolitan regions: Precariousness in the urban fabric, flexibilization and expansion*  
25 *in underemployment.* Regional productive systems with a high share of tertiary service  
26 activities in particular can be associated with the rise of part-time work. This increment,  
27 coupled with a dynamic expansion in sectors with almost zero levels of  
28 underemployment in the pre-recession period (e.g. construction), outweighs some of the  
29 loss of full-time jobs in urbanized areas. However, there are important differences  
30 between the two *metropolitan regions* for both periods under study, reflecting the diverse  
31 employment outcomes and flexibilization trends in Greece as well as Southern Europe in  
32 general (cf Cuadrado-Roura, & Maroto, 2016). It seems that there are heavily urbanized  
33 regions which due to their more backward productive structures came into a 'low-road'  
34 type of flexibilization during pre-crisis, as here seen for Central Macedonia; while other,  
35 which hold a more diverse industrial composition as well as a nodal role in supra-regional  
36 hierarchies and productive chains, such as Athens, witnessed such flexibilization trends  
37 after 2008. Similar differences have been confirmed elsewhere, between the Italian  
38 regions that host Naples and Rome, respectively (Gialis and Leontidou, 2014).  
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45 In any case, the norm that wants stronger regional economies of more produced  
46 wealth and lower unemployment to have lower involuntary part-time shares, as in the  
47 context of London (Martin et al , 2016; Green and Livanos, 2016), does not apply in  
48 Attica/ Athens which concentrates a high share of national GDP (more than 40%), but at  
49 the same time has a higher than national unemployment rate and underemployed labor.  
50 This can be attributed to a series of factors such as the collapse in construction, as  
51 Cudrado-Roura & Maroto (2016) pinpoint for the Spanish case as well, and the  
52 proliferation of part-timers in a range of activities, from typical commercial to  
53 knowledge-intensive or even creative-economy ones (Avdikos and Kalogerisis,  
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2016). That being said, metropolitan regions are not necessarily more robust and less crisis-prone, again when seen from a Southern perspective.

ii) *Manufacturing regions: Secondary sector's retreat and reduction in underemployment.* Almost all Greek regions specialize in industrial sectors which, on a national level, are declining and experience a drop in productivity (INE, 2016). The manufacturing regions, following country's contemporary orientation in low-cost tertiary services and labor-intensive low-scale production, lack important information technology capacities and advanced financial and insurance services. Enhanced innovative production schemes and practices are also marginal (Kallioras et al, 2016). In the two manufacturing regions analysed above, lots of jobs have been created during expansion but then 'destroyed' in fast rates, at least faster than for other types of jobs, during recession; and this is in great part a result of the regions' industrial mix which outweigh both regional advantages and national influence and produces unemployment. The backwardness of Greek secondary activities, along with the fact that industrial regions usually face harder economic cycles than the service-oriented ones (see i.e. Martin et al, 2016), implies that manufacturing regions are particularly vulnerable. This pattern is evident in the case of Western Macedonia, Greece's energy producer and a region which lacks diversity and strong cross-sectoral linkages, where hundreds of part-timers covering seasonal demand lost their jobs post-2008 (Psycharis et al, 2014).

The 'Great Recession' along with the pressures of economic globalization, falling internal demand and austerity-led state fiscal practices have been detrimental to the manufacturing regions. For example, escalating competition added an extremely high burden upon the more dynamic industrial area of Central Greece and its industrial plants. Many of these plants halted their production. Only a handful of industries, such as food production and processing, maintain certain competitive advantages (Petraikos and Psycharis, 2016; Voulgaris et al, 2015) but the production is less export-oriented and thus more vulnerable to a highly volatile domestic market. Due to such reasons, part-time jobs cannot flourish and unemployment is extremely high in such regions. Therefore, employment increments may lead to part-time labour's consolidation in regions dominated by industrial activities, amid expansionary periods, while employment losses may lead to even more significant part-time jobs contraction during downturns.

iii) *Agricultural regions: Continuity of traditional practices and the re-production of underemployment.* Underemployment changes in agricultural regions, either positive or negative, derived from region-specific and territorial factors, despite the sway of national trends on total employment. In particular, the steady presence of part-time workers in agricultural areas is not a new phenomenon, but a deeply-rooted economic and socio-cultural practice. This practice is strongly related to factors such as seasonality, familial surviving practices, micro-entrepreneurship and the influx of migrants in the rural localities since the late 1980s (Papadopoulos, 2016). Such patterns seem to be re-

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enforced in new ways amid the crisis. One interpretation is that it can represent an optimistic ‘return to the countryside’ movement, considered by some scholars as a solution to Greece’s productivity problems and a way to address rural population decline (Hadjimichalis and Hudson, 2014). However, this return is in most cases not a true revival of an agrarian way of life but rather a reproduction of urban employment and consumption patterns. For example, informally-hired migrants, typically underemployed but working overtime during cultivation periods, carry out almost all manual tasks. The farmers and those who have returned from the cities, usually members of the farmers’ extended families, also engage in seasonal tasks, typically by performing lighter or managerial tasks (Giannakis and Bruggeman, 2016; Papadopoulos, 2016). Through such ways regional competitive advantages related to favourable environmental conditions, local food varieties and the local human capital sustain enduring patterns of social reproduction and underemployment.

iv) *Tourism-oriented regions: Services and commerce resistance to recession and the dispersion of underemployment*: Island tourism-oriented regions seem to respond to the rapid changes of the economic environment better than the rest groups of regions. As depicted, redundancies that have been formatted during pre-crisis have allowed for regional factors positive influence, after 2009, and the ‘preservation’ of as many jobs as no other regional group could save. All tourism regions, with the slight exception of the deprived North Aegean, are exceptional cases that should be further scrutinized and contrasted to other island regions across EU South. Their local endowment is comprised of picturesque islands and beaches, advanced hoteling infrastructures and an “entrepreneurial climate”, cultivated since the 1960s or so, that prioritizes tourism services above all other activities. The latter draws upon an embedded compromise between employers and employees that keeps the nodal touristic value chains uninterrupted during summertime (Gialis and Leontidou, 2014).

Interestingly, the big hotel owners are among the very few fractions of the Greek political elites that managed to increase their profits post-2008, as the sector witnessed a boom in its productivity due to the combined impact of lower labour costs, increasing arrivals of foreign visitors to the regions, and new tax-reducing legislation (INE, 2016; Petrakos and Psycharis, 2016). Such a regional growth engine has strongly influenced underemployment patterns in various ways. For example, thousands of new hirings can be documented across the 5-star rated hotels of Rhodes, Mykonos, Chania and other famous tourist destinations of the South Aegean. Many of these workers are officially under an internship scheme, but they work for more hours than what is officially declared doing all kinds of jobs (Adam and Papatheodorou, 2016; INE, 2016). Thus, resilience to recession do not necessarily means good and sound employment standards but rather that various combinations of underemployment and precarious employment practices are proliferating.

## 6. Conclusions

Concluding, we return to our third question and highlight certain mechanisms that drive the trend of underemployment and might be useful for cross-national comparisons. For this, we interpret the four (4) patterns of underemployment change, documented above, by using relevant theoretical inputs and secondary sources. Overall, we argue that these patterns are shaped by three (3) *interrelated causal mechanisms* which act discretely and unfold across various geographical scales, producing divergent regional responses. These mechanisms, that have wider implications for all countries of the EU South, are the following:

The first mechanism is the one of *capital restructuring and technological change*. In the case of Greece's regions, such change is mostly evident through a series of *productive-technological inadequacies* highlighted for both manufacturing and the construction industry (cf. Warren, 2015; Cuadrado-Roura & Maroto, 2016). These inadequacies have a rich background and are not a new phenomenon; Greece, along with Portugal and many other regions in the Spanish and Italian South, never went through an innovative transformation able to reverse its labor-intensive semi-dependent secondary structures, lack of strong institutions and long-term planning, as occurred in other countries (Gialis & Leontidou, 2014; Hadjimichalis and Hudson, 2014). The escalating global competition and the structural imbalances of the Eurozone that surfaced in the post-2000 period proved that Greece's productive sectors and regions were very weak. Above of this, they also had to confront the post-2008 turbulence.

Intense fixed capital devaluation and falling industrial capacity seemed inevitable, and has been accompanied by an intense fall in domestic consumption, for 2009-12 (INE, 2016). The combined impact of negative trends in manufacturing and construction has several negative effects upon the overall economy and employment. One of these effects is the fluctuating underemployment produced by the (mostly negative) regional structural compositions, plus the sharply negative national share effect. As seen above and documented elsewhere, many firms and sectors do make a 'marginal living' by occasionally underutilizing precarious labourers or family helpers (Labour Inspectorates, 2016; Ergani, 2016). Under such terms, the 'relative endurance' of the agricultural and the robustness of tourism regions looks more important than it really is. Hence, the impact of outdated technology and specializations and the lack of production adaptability upon expanding underemployment is evident across Greek regions, especially the manufacturing ones (cf Polyzos et al, 2013; Hadjimichalis & Hudson, 2014; Kallioras et al, 2016).

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The second underlying mechanism has to do with *market-driven organizational* dynamics and changing priorities. This mechanism determines the changing analogies between full and part-time jobs appropriation by firms, amid crisis. New organizational practices and market responses to recession have produced not only a transition to underemployment for some workers, but also an expansion of working time for some others, as seen for the metropolitan and tourism regions. They have also produced negative prospects for those that enter the labour market seeking a full-time job. In certain, not a few cases, overtime and very-few-hours work co-exist within the same productive boundaries (or they become practices embodied by the same individual during a certain time period) in a close symbiotic relationship. Such trends have been verified in other national and regional frameworks as well (cf Warren, 2015 for UK; Barbieri & Sherer, 2009 for Italy; Horemans et al, 2016 for various settings). For example, organizational responses to recession lead previous full-time jobs temporarily being offered as part-time ones until peak in demand is restored (cf. Labour Inspectorates, 2012). This is mostly prevalent in commerce and trade (e.g. supermarkets or coffee-places) or hotels that need a bulk of flexibly available low-paid employees, either part-timers or overtime workers. Furthermore, the proliferation of underemployment is not merely an organizational choice of the big employers. It can be also the result of an extensive ‘gig-economy’ and related subcontracting patterns that are expanding in metropolitan areas of the Southern EU. As found, thousands of small-firm and micro-entrepreneurs, even the more creative ones, make good use of such employment patterns (Avdikos and Kalogeresis, 2016).

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Workers that try to preserve their jobs and exhibit commitment in a time of cutback are tolerating frequent interchanges between periods of (often informal) overtime work and underemployment; in other cases, they are accepting a part-time contract with the promise of a full-time job after capacity is restored. Thousands of contracts, registered by the Ministry of Employment, that have been converted from full-time to part-time after “mutual employer-employee agreement” are a good sign these new organizational practices (Ergani, 2016; INE, 2106). These precarious patterns are even more prevalent in the tourism regions, that face high seasonal variability in demand and need cheap and abundant labour force, and they are also diffused in the metropolitan areas (Gialis and Tsampra, 2015; Veliziotis et al, 2015).

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Finally, the third mechanism that cuts across all groups of regions, despite of the divergent responses revealed, has to do with the changing *institutional and welfare provisions*. Recent regulatory reforms, imposed by the common EU-IMF- Greek State memoranda, highly increased employment precariousness in Greece<sup>5</sup> as well as in other

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<sup>5</sup>For example, a new law (3846/2010) gives extra incentives to firms that experience adverse financial and economic conditions to impose ‘alternate work’ schemes by distributing reduced capacity among their existent workers and equally reducing their work-time and payment.

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3 Southern EU members. Among other reasons, involuntary part-time work is expanding  
4 due to the severely reduced wage levels offered through this employment form<sup>6</sup> as the  
5 average wage of a part-timer in Greece is in most cases below 300 Euros (Copus et al,  
6 2015; INE, 2016). Additionally, the successive reforms, cutbacks in welfare provisions  
7 and removal of dismissal restrictions, made the already weak part-timers, even more  
8 cheap and vulnerable with no power to negotiate.  
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12 Concluding, there is a strong geographically-differentiated connection between  
13 regional restructuring, specialization and precarious work, turning underemployment into  
14 an integral dimension of contemporary flexible labour. As seen in the Greek regions, this  
15 connection is differently manifested across different productive specializations, yet it is  
16 based on that same underlying powerful mechanisms that transform contemporary socio-  
17 spatial entities according to new accumulation priorities (Hadjimichalis and Hudson,  
18 2016). Asynchronous underemployment expansion trends, which as seen are more an  
19 outcome of regional competitive advantages than a result of the local mix of industries,  
20 produce regional settings that highly utilize low-waged part-timers. This is mostly  
21 prevalent in the tourism-oriented regions where abundant pools of fluctuating labour  
22 surplus were stagnant pre-crisis, but are heavily exploited amid recession.  
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28 Underemployment calls for urgent attention as it holds various unexplored  
29 ramifications with other new phenomena, such as the so-called NEET (i.e. those that are  
30 'not in employment, education or training'). Many among the underemployed in Greece,  
31 Southern EU and abroad, face a vicious cycle of disadvantage as they frequently alternate  
32 between unemployment and underemployment, being unable to find a more stable and  
33 prosperous job. Time will tell how and when the agency of the underemployed workers  
34 will unfold. In any case, their tolerance or resistance against precariousness will be  
35 region-specific and path-dependent, in contrast to the ambiguous applicability of reforms  
36 and political decisions that ignore region-specific structures.  
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55 <sup>6</sup> All wages in Greece have been reduced by 35%, on average, compared to their pre-2008 levels. For  
56 example, the gross minimum wage has been set to 540 Euros for the youngsters, an amount far below both  
57 the low-pay and the poverty threshold (set to 66.6% and 50% of the median full-time hourly wage of 8,5  
58 Euros per hour, respectively) (Kretsos & Livanos, 2016).  
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**Table 1:** Employment and unemployment, total and involuntary part-time employment per group of regions, (%), 2005, 2008, 2009 & 2012

Region	Total Employment Changes		Unemployment Rates and Changes				Part-time Employment Shares (in Total Employment)				Non-voluntary Part-time Employment Shares (in total Part-time Employment)				LQ VALUES FOR TOTAL EMPLOYMENT				
	2005-08 (%)	2009-12 (%)	2005 (%)	2005-08 (%)	2012 (%)	2009-12 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	2005				
EASTERN MACEDONIA & THRACE	1.2	-14.8	11.9	-27.6	22.8	101.4	5.4	6.3	6.3	7.5	48.8	43.5	41.1	55.3	2.2*				
EPIRUS	5.7	-16.8	11.5	-10.9	22.5	92.4	5.2	7.2	8.6	8.4	43.7	41.3	38.5	48.2	1.5*				
WESTERN GREECE	2.5	-20.5	10.7	-6.5	25.6	152.8	4.4	5.6	6.1	6.1	56.9	51.2	58.4	67.0	1.9*				
THESSALY	0.6	-18.7	9.4	-12.1	22.6	134.0	6.4	7.1	7.9	9.3	50.5	42.1	40.0	50.2	2.0*				
PELOPONNESE	6.1	-17.4	8.6	-15.0	19.2	128.8	6.4	6.4	6.0	6.9	45.6	41.0	44.3	59.3	2.8*				
WESTERN MACEDONIA	6.8	-24.5	18.1	-31.0	29.7	124.5	8.4	10.1	9.7	10.9	41.0	36.5	32.2	54.7	1.3**				
CENTRAL GREECE	2.9	-19.9	11.0	-22.6	27.9	165.2	4.9	7.8	7.4	7.6	41.0	44.5	34.9	66.2	1.3**				
CENTRAL MACEDONIA	LEGEND	3.9	-20.3	11.2	-24.1	26.2	152.0	4.6	7.0	6.7	6.9	54.5	38.1	47.5	64.7	***			
ATTICA	Agricultural	4.6	-21.1	9.1	-25.2	25.8	175.3	4.3	4.1	5.1	7.8	53.0	46.7	55.2	69.3	***			
IONIAN ISLANDS	Manufacturing	2.7	-8.2	8.6	0.0	14.7	51.1	7.0	5.1	5.3	13.8	24.2	46.4	38.1	45.7	3.0****			
SOUTH AEGEAN	Metropolitan	4.5	-4.3	9.5	-10.1	15.4	24.0	4.1	5.4	5.3	5.6	36.8	30.9	40.4	39.4	2.9****			
NORTH AEGEAN	Tourism	0.3	-6.5	10.6	-58.3	21.8	270.0	3.8	3.1	4.3	6.4	40.7	30.9	20.9	64.7	1.4****			
CRETE	Value Range	Low	Mid	High	2.5	-16.7	7.2	-9.7	22.3	140.1	7.3	6.2	6.5	10.3	29.1	26.4	47.4	50.9	1.7****
NATIONAL		3.8	-18.9	10.0	-21.4	24.4	146.6	5.0	5.7	6.1	7.8	47.9	41.6	47.1	61.4				

\*In agricultural regions, LQ values address sector 1, agriculture

\*\*In manufacturing regions, LQ values address sector 2, manufacturing

\*\*\*In metropolitan regions, LQ values fluctuate around 1 for the majority of sectors

\*\*\*\*In touristic regions, LQ values address sector 6, hotels, food and catering

\*In agricultural regions, LQ values address sector 1, agriculture, \*\*In manufacturing regions, LQ values address sector 2, manufacturing, \*\*\*In metropolitan regions, LQ values fluctuate around 1 for the majority of sectors, \*\*\*\*In touristic regions, LQ values address sector 6, hotels, food and catering

**Source:** Authors' calculations and synthesis based on HELSTAT's Regional Labour Force Survey data in respective years

**Table 2:** LQs of total part-time employment per sector\* and group of regions\*\*, 2005 & 2012

Region	1. Agriculture		2. Manufacturing		3. Energy and resources		4. Construction		5. Commerce, transportation and communications		6. Hotel, food and catering		7. Knowledge economy		8. Public administration, healthcare and education		9. Leisure, arts and NRA services		PART-TIME EMPLOYMENT					
	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012				
EASTERN MACEDONIA & THRACE	1.0	1.7	0.9	0.4	0.0	0.0	0.7	0.9	0.9	1.0	1.8	1.0	0.8	1.1	1.3	0.8	0.4	0.6	1.1	1.0				
EPIRUS	1.5	2.4	1.3	0.6	0.0	0.0	1.4	1.0	0.6	1.0	1.1	0.7	0.6	0.3	0.9	0.6	0.6	0.3	1.0	1.1				
WESTERN GREECE	1.0	1.3	0.6	0.6	0.0	0.0	1.7	0.6	0.8	1.1	1.4	0.8	0.5	0.3	1.2	1.5	0.8	0.7	0.9	0.8				
THESSALY	1.4	2.2	0.7	0.4	0.0	1.7	1.1	0.6	1.1	0.7	0.7	1.2	0.7	0.4	0.8	0.5	0.9	1.1	1.3	1.2				
PELOPONNESE	2.2	2.7	1.1	0.6	9.0	1.1	1.1	0.2	0.5	0.9	0.5	0.4	0.4	0.2	0.7	0.6	0.7	0.9	1.3	0.9				
WESTERN MACEDONIA	2.2	1.3	1.0	1.1	0.0	7.6	0.5	0.4	0.3	0.9	1.0	1.3	0.4	0.5	0.8	1.1	0.4	0.7	1.7	1.4				
CENTRAL GREECE	1.7	1.5	1.0	1.0	0.0	4.4	1.0	1.0	0.9	0.7	1.2	1.2	0.7	0.7	0.5	1.0	0.7	0.7	1.0	1.0				
CENTRAL MACEDONIA	LEGEND		0.6	0.9	1.5	1.1	0.0	0.2	0.5	0.5	1.3	0.9	1.1	1.0	0.8	1.2	1.5	1.1	0.8	0.9	0.9			
ATTICA	Agricultural		0.1	0.1	1.1	1.4	0.0	0.7	1.1	1.5	1.2	1.1	1.0	1.0	1.8	1.5	1.2	1.1	1.5	1.3	0.9	1.0		
IONIAN ISLANDS	Manufacturing		2.4	1.9	0.8	1.2	15.6	0.0	1.3	0.7	0.3	0.3	0.7	1.2	0.7	0.4	0.6	0.8	0.3	1.5	1.4	1.8		
SOUTH AEGEAN	Metropolitan		0.5	1.4	0.5	0.3	0.0	0.0	2.8	0.8	1.4	1.6	2.0	1.5	0.3	0.4	0.6	0.5	1.1	0.4	0.8	0.7		
NORTH AEGEAN	Tourism		1.3	1.5	0.2	1.7	0.0	0.0	2.6	0.3	0.8	1.5	0.6	0.9	0.6	0.6	1.1	0.3	0.8	0.6	0.8	0.8		
CRETE	Value Range	Low	Mid	High	2.5	1.2	0.6	0.8	0.0	1.5	0.5	1.5	0.8	1.0	0.4	1.0	0.3	0.9	0.4	0.7	0.6	0.9	1.4	1.3

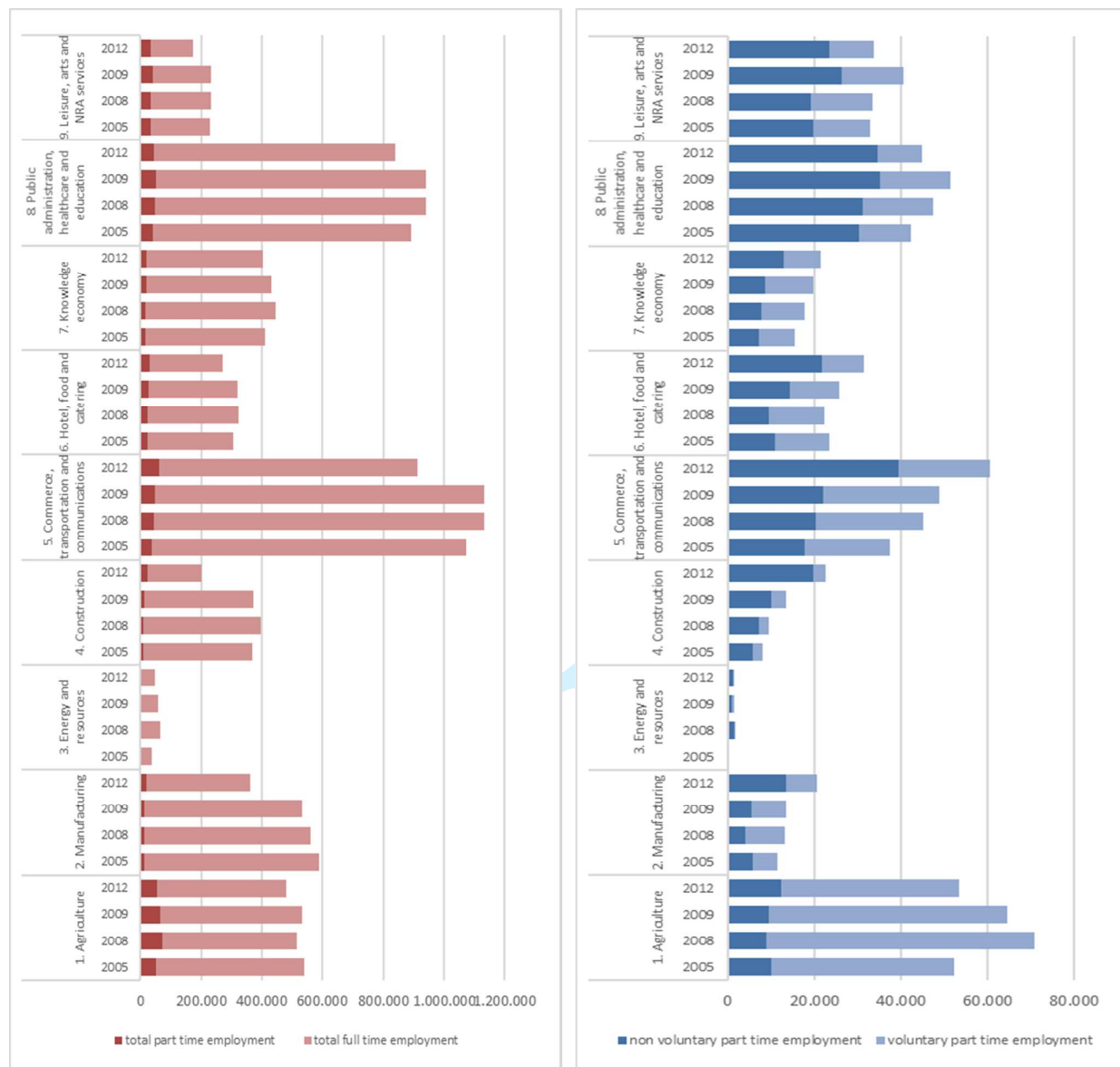
Source: Authors' calculations and synthesis based on HELSTAT's Regional Labour Force Survey data in respective years

**Table 3:** Results of shift-share analysis for total and part-time employment per group of regions, 2005-08 & 2009-12

Region	Total Employment								Part-time Employment							
	2005-2008				2009-2012				2005-2008				2009-2012			
	NS	IM	RS	Actual 2005-08%	NS	IM	RS	Actual 2009-12%	NS	IM	RS	Actual 2005-08%	NS	IM	RS	Actual 2009-12%
EASTERN MACEDONIA & THRACE		-5.6	3.0	1.2		1.5	2.6	-14.8		-9.1	10.2	18.3		-56.4	54.8	2.3
EPIRUS		-4.3	6.2	5.7		3.8	-1.7	-16.8		9.2	18.8	45.2		6.2	-28.9	-18.8
WESTERN GREECE		0.8	-2.1	2.5		3.1	-4.7	-20.5		-9.5	23.8	31.5		6.7	-30.2	-19.6
THESSALY		-2.9	-0.2	0.6		-2.6	2.8	-18.7		0.3	-6.2	11.3		12.9	-21.2	-4.4
PELOPONNESE		-2.0	4.4	6.1		-3.8	5.4	-17.4		-2.2	-8.4	6.6		17.3	-26.6	-5.4
WESTERN MACEDONIA		-2.3	5.3	6.8		-9.1	3.5	-24.5		-18.8	28.8	27.1		-48.8	29.1	-15.8
CENTRAL GREECE	3.8	-0.9	0.0	2.9	-18.9	-1.1	0.1	-19.9	17.2	-1.0	48.4	64.6	3.9	-20.5	-0.3	-16.9
CENTRAL MACEDONIA	LEGEND	-0.3	0.4	3.9		-0.3	-1.1	-20.3		-16.0	55.2	56.3		8.3	-30.2	-18.1
ATTICA	Agricultural	-6.0	6.9	4.6		1.4	-3.5	-21.1		-10.7	-5.9	0.5		1.4	14.8	20.1
IONIAN ISLANDS	Manufacturing	-5.2	4.1	2.7		-11.4	22.1	-8.2		-15.5	-26.1	24.4		-225.0	358.3	137.2
SOUTH AEGEAN	Metropolitan	1.1	-0.4	4.5		-4.8	19.4	-4.3		-32.6	53.0	37.6		-2.0	-0.8	1.1
NORTH AEGEAN	Tourism	-5.6	2.2	0.3		-7.3	19.6	-6.5		-110.5	74.1	19.3		-74.5	105.9	35.2
CRETE	Value Range	-3.8	2.5	2.5		-1.2	3.4	-16.7		-63.2	34.0	12.1		-7.4	34.2	30.7

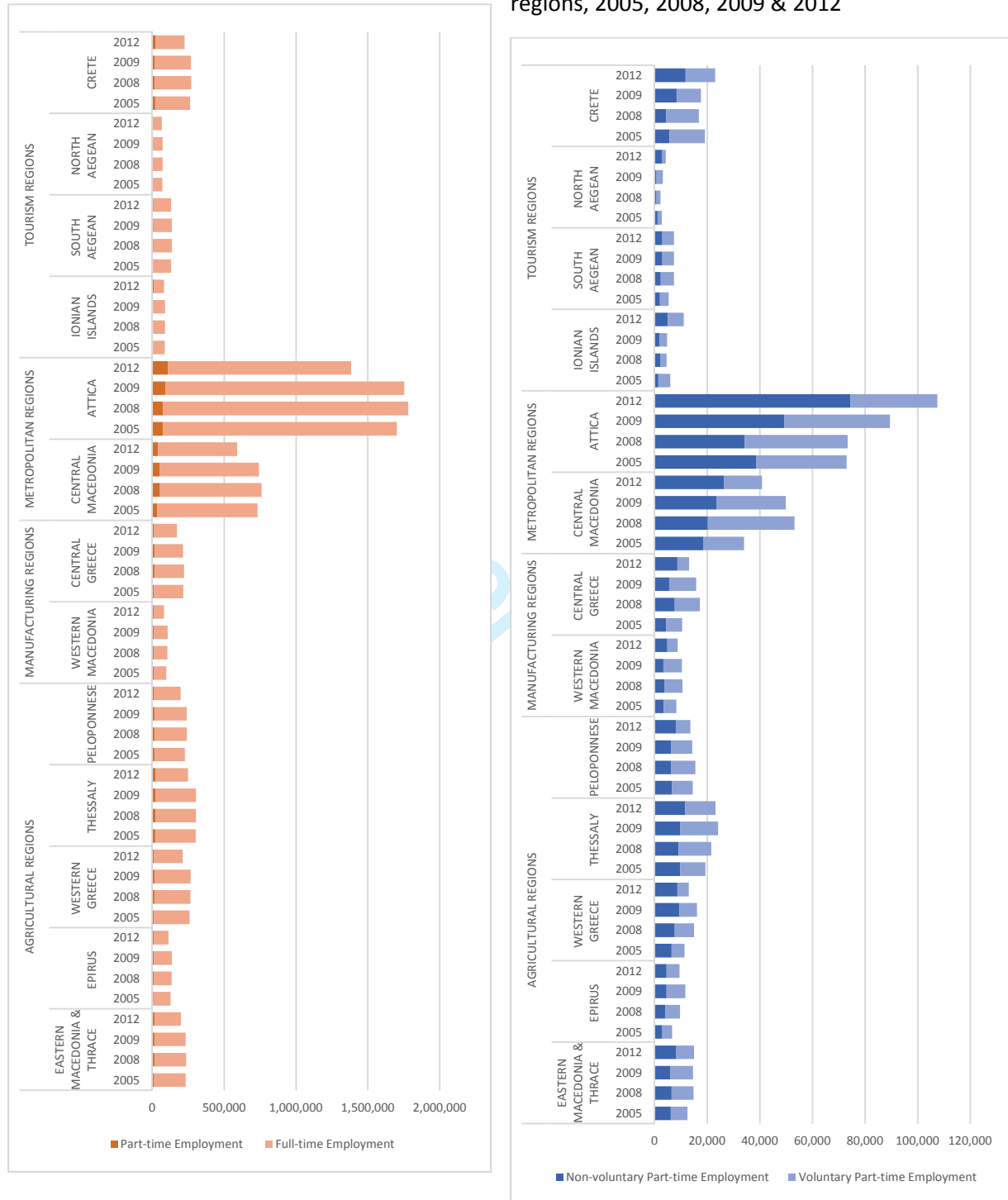
Source: Authors' calculations and synthesis based on HELSTAT's Regional Labour Force Survey data in respective years

**Figure 1:** Balance between i) part-time and full-time ii) non-voluntary and voluntary part-time employment (% of total part-time) per sector, 2005, 2008, 2009 & 2012



**Source:** Authors' calculations and synthesis based on HELSTAT's Regional Labour Force Survey data in respective years

**Figure 2:** Balance between i) part-time and full-time ii) non-voluntary and voluntary part-time employment (% of total part-time) per group of regions, 2005, 2008, 2009 & 2012



Source: Authors' calculations and synthesis based on HELSTAT's Regional Labour Force Survey data in respective years

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For Peer Review

Region	Total Employment Changes		Unemployment Rates and Changes				Part-time Employment Shares (in Total Employment)				Non-voluntary Part-time Employment Shares (in total Part-time Employment)				LQ VALUES FOR TOTAL EMPLOYMENT	
	2005-08 (%)	2009-12 (%)	2005 (%)	2005-08 (%)	2012 (%)	2009-12 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	2005	
EASTERN MACEDONIA & THRACE	1.2	-14.8	11.9	-27.6	22.8	101.4	5.4	6.3	6.3	7.5	48.8	43.5	41.1	55.3	2.2*	
EPIRUS	5.7	-16.8	11.5	-10.9	22.5	92.4	5.2	7.2	8.6	8.4	43.7	41.3	38.5	48.2	1.5*	
WESTERN GREECE	2.5	-20.5	10.7	-6.5	25.6	152.8	4.4	5.6	6.1	6.1	56.9	51.2	58.4	67.0	1.9*	
THESSALY	0.6	-18.7	9.4	-12.1	22.6	134.0	6.4	7.1	7.9	9.3	50.5	42.1	40.0	50.2	2.0*	
PELOPONNESE	6.1	-17.4	8.6	-15.0	19.2	128.8	6.4	6.4	6.0	6.9	45.6	41.0	44.3	59.3	2.8*	
WESTERN MACEDONIA	6.8	-24.5	18.1	-31.0	29.7	124.5	8.4	10.1	9.7	10.9	41.0	36.5	32.2	54.7	1.3**	
CENTRAL GREECE	2.9	-19.9	11.0	-22.6	27.9	165.2	4.9	7.8	7.4	7.6	41.0	44.5	34.9	66.2	1.3**	
CENTRAL MACEDONIA	LEGEND	3.9	-20.3	11.2	-24.1	26.2	152.0	4.6	7.0	6.7	6.9	54.5	38.1	47.5	64.7	***
ATTICA	Agricultural	4.6	-21.1	9.1	-25.2	25.8	175.3	4.3	4.1	5.1	7.8	53.0	46.7	55.2	69.3	***
IONIAN ISLANDS	Manufacturing	2.7	-8.2	8.6	0.0	14.7	51.1	7.0	5.1	5.3	13.8	24.2	46.4	38.1	45.7	3.0****
SOUTH AEGEAN	Metropolitan	4.5	-4.3	9.5	-10.1	15.4	24.0	4.1	5.4	5.3	5.6	36.8	30.9	40.4	39.4	2.9****
NORTH AEGEAN	Tourism	0.3	-6.5	10.6	-58.3	21.8	270.0	3.8	3.1	4.3	6.4	40.7	30.9	20.9	64.7	1.4****
CRETE	Value Range	2.5	-16.7	7.2	-9.7	22.3	140.1	7.3	6.2	6.5	10.3	29.1	26.4	47.4	50.9	1.7****
NATIONAL		3.8	-18.9	10.0	-21.4	24.4	146.6	5.0	5.7	6.1	7.8	47.9	41.6	47.1	61.4	

\*In agricultural regions, LQ values address sector 1, agriculture

\*\*In manufacturing regions, LQ values address sector 2, manufacturing

\*\*\*In metropolitan regions, LQ values fluctuate around 1 for the majority of sectors

\*\*\*\*In touristic regions, LQ values address sector 6, hotels, food and catering

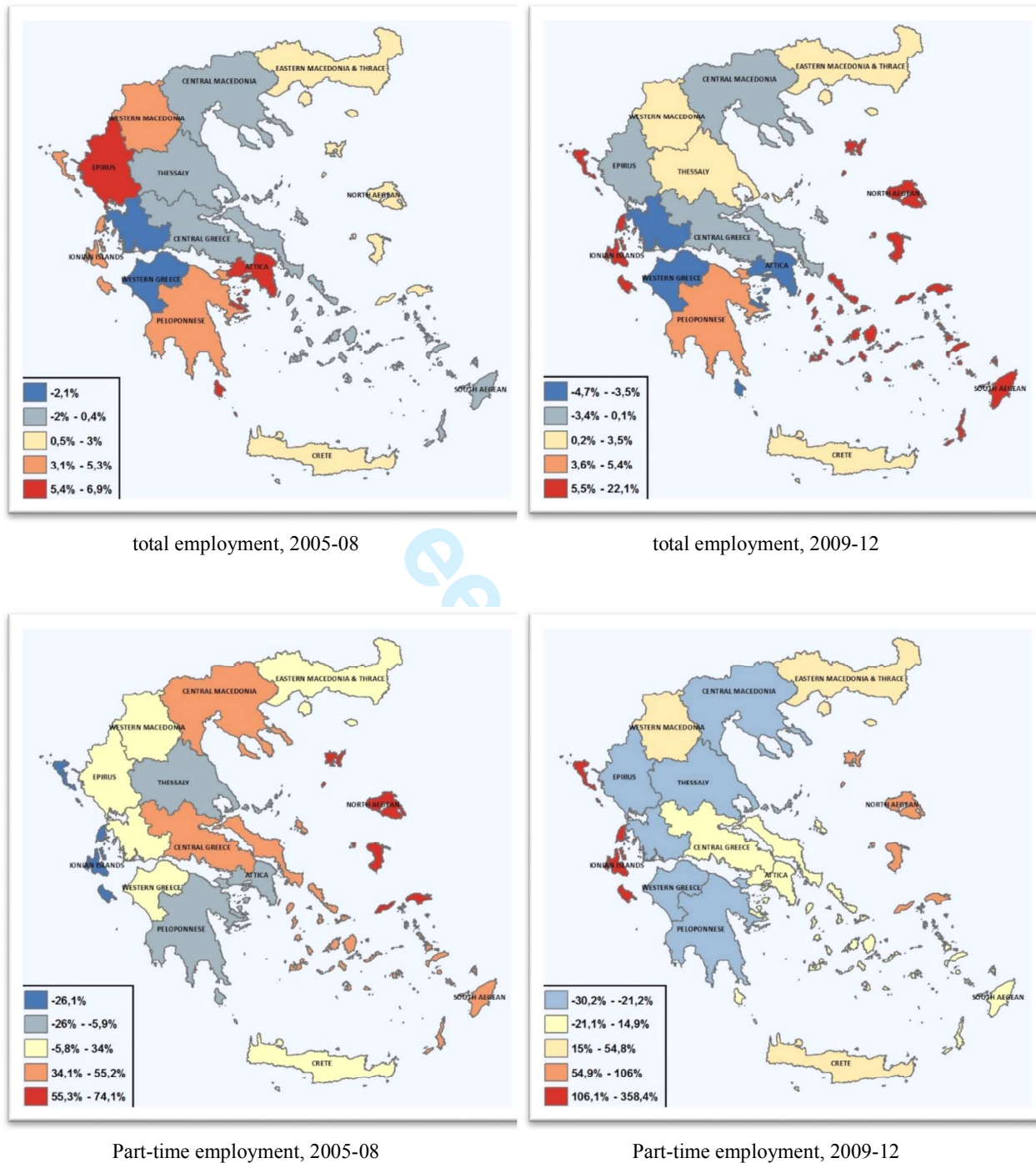
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Region	1. Agriculture		2. Manufacturing		3. Energy and resources		4. Construction		5. Commerce, transportation and communications		6. Hotel, food and catering		7. Knowledge economy		8. Public administration, healthcare and education		9. Leisure, arts and NRA services		PART-TIME EMPLOYMENT					
	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012	2005	2012				
EASTERN MACEDONIA & THRACE	1.0	1.7	0.9	0.4	0.0	0.0	0.7	0.9	0.9	1.0	1.8	1.0	0.8	1.1	1.3	0.8	0.4	0.6	1.1	1.0				
EPIRUS	1.5	2.4	1.3	0.6	0.0	0.0	1.4	1.0	0.6	1.0	1.1	0.7	0.6	0.3	0.9	0.6	0.6	0.3	1.0	1.1				
WESTERN GREECE	1.0	1.3	0.6	0.6	0.0	0.0	1.7	0.6	0.8	1.1	1.4	0.8	0.5	0.3	1.2	1.5	0.8	0.7	0.9	0.8				
THESSALY	1.4	2.2	0.7	0.4	0.0	1.7	1.1	0.6	1.1	0.7	0.7	1.2	0.7	0.4	0.8	0.5	0.9	1.1	1.3	1.2				
PELOPONNESE	2.2	2.7	1.1	0.6	9.0	1.1	1.1	0.2	0.5	0.9	0.5	0.4	0.4	0.2	0.7	0.6	0.7	0.9	1.3	0.9				
WESTERN MACEDONIA	2.2	1.3	1.0	1.1	0.0	7.6	0.5	0.4	0.3	0.9	1.0	1.3	0.4	0.5	0.8	1.1	0.4	0.7	1.7	1.4				
CENTRAL GREECE	1.7	1.5	1.0	1.0	0.0	4.4	1.0	1.0	0.9	0.7	1.2	1.2	0.7	0.7	0.5	1.0	0.7	0.7	1.0	1.0				
CENTRAL MACEDONIA	LEGEND		0.6	0.9	1.5	1.1	0.0	0.2	0.5	0.5	1.3	0.9	1.1	1.0	0.8	1.2	1.5	1.1	0.8	0.9	0.9			
ATTICA	Agricultural		0.1	0.1	1.1	1.4	0.0	0.7	1.1	1.5	1.2	1.1	1.0	1.0	1.8	1.5	1.2	1.1	1.5	1.3	0.9	1.0		
IONIAN ISLANDS	Manufacturing		2.4	1.9	0.8	1.2	15.6	0.0	1.3	0.7	0.3	0.3	0.7	1.2	0.7	0.4	0.6	0.8	0.3	1.5	1.4	1.8		
SOUTH AEGEAN	Metropolitan		0.5	1.4	0.5	0.3	0.0	0.0	2.8	0.8	1.4	1.6	2.0	1.5	0.3	0.4	0.6	0.5	1.1	0.4	0.8	0.7		
NORTH AEGEAN	Tourism		1.3	1.5	0.2	1.7	0.0	0.0	2.6	0.3	0.8	1.5	0.6	0.9	0.6	0.6	1.1	0.3	0.8	0.6	0.8	0.8		
CRETE	Value Range	Low	Mid	High	2.5	1.2	0.6	0.8	0.0	1.5	0.5	1.5	0.8	1.0	0.4	1.0	0.3	0.9	0.4	0.7	0.6	0.9	1.4	1.3

Region	Total Employment								Part-time Employment							
	2005-2008				2009-2012				2005-2008				2009-2012			
	NS	IM	RS	Actual 2005-08%	NS	IM	RS	Actual 2009-12%	NS	IM	RS	Actual 2005-08%	NS	IM	RS	Actual 2009-12%
EASTERN MACEDONIA & THRACE		-5.6	3.0	1.2		1.5	2.6	-14.8		-9.1	10.2	18.3		-56.4	54.8	2.3
EPIRUS		-4.3	6.2	5.7		3.8	-1.7	-16.8		9.2	18.8	45.2		6.2	-28.9	-18.8
WESTERN GREECE		0.8	-2.1	2.5		3.1	-4.7	-20.5		-9.5	23.8	31.5		6.7	-30.2	-19.6
THESSALY		-2.9	-0.2	0.6		-2.6	2.8	-18.7		0.3	-6.2	11.3		12.9	-21.2	-4.4
PELOPONNESE		-2.0	4.4	6.1		-3.8	5.4	-17.4		-2.2	-8.4	6.6		17.3	-26.6	-5.4
WESTERN MACEDONIA		-2.3	5.3	6.8		-9.1	3.5	-24.5		-18.8	28.8	27.1		-48.8	29.1	-15.8
CENTRAL GREECE	3.8	-0.9	0.0	2.9	-18.9	-1.1	0.1	-19.9	17.2	-1.0	48.4	64.6	3.9	-20.5	-0.3	-16.9
CENTRAL MACEDONIA		-0.3	0.4	3.9		-0.3	-1.1	-20.3		-16.0	55.2	56.3		8.3	-30.2	-18.1
ATTICA		-6.0	6.9	4.6		1.4	-3.5	-21.1		-10.7	-5.9	0.5		1.4	14.8	20.1
IONIAN ISLANDS		-5.2	4.1	2.7		-11.4	22.1	-8.2		-15.5	-26.1	24.4		-225.0	358.3	137.2
SOUTH AEGEAN		1.1	-0.4	4.5		-4.8	19.4	-4.3		-32.6	53.0	37.6		-2.0	-0.8	1.1
NORTH AEGEAN		-5.6	2.2	0.3		-7.3	19.6	-6.5		-110.5	74.1	19.3		-74.5	105.9	35.2
CRETE		-3.8	2.5	2.5		-1.2	3.4	-16.7		-63.2	34.0	12.1		-7.4	34.2	30.7
	LEGEND															
	Agricultural															
	Manufacturing															
	Metropolitan															
	Tourism															
	Value Range	Low	Mid	High												

**Figure 3:** Mapping Regional Share (RS) for total and part-time employment across Greek regions, 2005-08 and 2009-12



Source: Authors' synthesis based on the results of shift-share analysis in respective periods