



'Going under-employed': Industrial and regional effects, specialization and part-time work across recession-hit Southern European Union regions

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Abstract

The paper explores the regional dimensions of under-employment by analysing the uneven dispersion of part-time jobs in Greece. It understands under-employment as an integral dimension of contemporary flexible labour trends, triggered by devaluation and expanding amid crisis, although in diverse geographical and sectoral terms. It follows a methodology that comparatively analyses 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 analysed through location quotients, and a new embellishment of shift-share analysis is implemented for 2005–2008 and 2009–2012 across nine sectors. The findings reveal four distinct, although porous, patterns of under-employment that 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 the most keen on expanding part-time work, are scrutinized. Concluding, three deeper causal mechanisms, namely *productive-technological*, *organizational* and *institutional*, that determine the under-employment patterns revealed, are discussed and contrasted to relevant literature findings.

Keywords

Part-time work, shift-share analysis, regional patterns, under-employment casual mechanisms, Greek regions.

Introduction

During the past two decades, part-time employment has expanded faster than full-time employment across most of the European Union (EU; Horemans 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 *under-employment* (Jenkins and

Charleswell, 2016), a phenomenon that not least has hit Greece in a particularly severe manner since the

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eruption of the Greek crisis. Under-employment, 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 labour flexibilization (Green and Livanos, 2015; Jenkins and Charleswell, 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 under-employment. By doing so, the paper offers new critical insights regarding economic restructuring and regional labour market change and the issues of under-employment, labour surplus and precarious forms of employment. More specifically, the paper investigates under-employment 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 under-employment is an integral dimension of flexible labour trends that are triggered by devaluation and crisis. The second dimension of this hypothesis is that under-employment has diverse geographical and sectoral expressions.

Three research questions guide the paper: firstly, what is the extent of under-employment, and of part-time work in particular, after the onset of the Greek crisis in 2008? Secondly, what are the regional and sectoral differences of the rise of under-employment in the country? Finally, what are the mechanisms driving the trends in under-employment, 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 produce four divergent regional responses (e.g. between the metropolitan and the tourism-oriented spatial entities); these divergences make the ‘Greek peculiarities’ an interesting case of wider significance.

In contrast to unemployment, under-employment lacks a strict definition. Most studies point out that an under-employed individual usually works on a part-time basis while needing and desiring full-time employment or is employed in a low-paying job that requires less skill or training than he/she possesses (thus the terms ‘part-time work’ and ‘under-employment’ are below used interchangeably; Eurostat, 2016). Under such a definition, the under-employed persons do not have access to a salary that is necessary to sustain themselves and their families and, thus, face very similar problems to those that are unemployed. An under-employed individual is, then, an ‘underutilized labourer’ who is usually low-paid or over-qualified for the work that he/she carries out or is engaged in work for a few (e.g. four or less than four) hours per day (Livingstone, 2016; Veliziotis et al., 2015). Many studies tend to neglect the underpaid or over-qualified aspects of contemporary part-time work, voluntary or not, although it is increasingly seen as a norm in labour markets in Southern Europe. In Greece, for example, all part-time workers receive an official gross salary of less than 480 Euros per month, an amount that is far below the official poverty line in the country (Copus et al., 2015; INE, 2016: 110).

The remainder of the paper is structured in the following manner: After a conceptual and analytical framework offered in the second section and a methodological framework offered in the third section, we enter a region-specific account of under-employment patterns across different sectors in the fourth section. To serve the research objectives, the paper focuses on all 13 Greek regions by comparing thoroughly taxonomized employment data between 2005 and 2008 and 2009 and 2012. We also implement a new embellishment of the shift-share analysis (SSA) method in order to examine the impact of industrial mix (IM) on total employment and under-employment patterns, and assess how regional competitive advantages in relation to such forms of employment seem to have changed due to the crisis. In the fifth section we provide an extended discussion of the interface between local production specialization and restructuring on the one hand, and the issue of an increasing local labour surplus on the other. The final part (the sixth section) offers some concluding remarks.

Crisis and under-employment across multiple geographical scales

Post-1990s, the EU South has experienced a debt-driven growth model with a real estate bubble, resulting in large current account deficits (Hadjimichalis and Hudson, 2014; Mavroudeas, 2014). This process has accelerated since the introduction of the Eurozone and was a major driver behind the outburst of the 2008/2009 crisis and growing socio-economic turbulence ever since, with Greece as the perhaps most prevalent example. During the post-recession period, political-economic intra-EU rivalries are under rising tension, whereas labour market indexes, such as unemployment, in-work poverty and absenteeism, have been increasing (Adam and Papatheodorou, 2016; Gialis and Leontidou, 2014).

Many scholars of various theoretical and socio-political backgrounds have tried to interpret the whys and hows of new trends in the labour market. Two standpoints are typical for political economy approaches. Firstly, the unemployed and under-employed (forming the local labour surplus) constitute territorially embedded human assets of knowledge and expertise, and should be seen as indispensable for the recovery and sustainable growth of the local economy. Secondly, shrinking work opportunities and obstructed access to employment cannot be solved on an individual basis. Rather, joblessness is a problem that affects the community as a whole; it therefore requires the coordination of the local labour surplus with institutional and business organizations in order to claim back the right to work, and upgrade local development structures (Mavroudeas, 2014; Reinhart and Trebesch, 2015; Warren, 2015).

The spatially uneven impact of recession is usually scrutinized through analysing changing unemployment rates either on a national or sub-national level. The diversified role that different segments within 'total employment' play is usually underestimated. Yet, the vast array of everyday working norms, practices and regulations that different groups of the 'employed' (especially the less-privileged ones) face, does matter. The recent work

of Green and Livanos (2015) that focused on *involuntary non-standard employment*, here including involuntary part-time and temporary work, found that some individuals become part of the 'hidden unemployed' instead of maintaining economically active memberships in society. They assert that this applies even for stronger labour markets, such as the regional labour markets of the UK, which present clear variations in terms of involuntary part-time employment trends. As found, stronger regional economies had lower involuntary shares, while the weaker ones were worse off.

Under such circumstances, part-time low-paid contracts can become traps rather than 'stepping stones' to more desirable permanent jobs (see De Jong et al., 2009). For example, several studies have provided some interesting remarks on the connection between such work and limited chances for advancement in the Spanish or Italian labour markets (Amuedo-Dorantes, 2000; Barbieri and Scherer, 2009). The so-called 'rigidity' within local labour markets that produces a dualism between those low-paid, under-employed workers and the more protected 'core employees' is present and generates increasing segregation. The Organisation for Economic Co-operation and Development (OECD) studies the phenomenon through its 'Indicators of Employment Protection' (OECD, 2016) series. Regionally sensitive studies that account for recessionary flexibilization trends found that many Southern EU labour markets, especially the Greek ones, are in the top places of the 'flexibilization ranking', irrespective of the impact of the 'rigidity' index values (Gialis and Taylor, 2015). That being said, some fresh and updated accounts of the inter-connection between (higher than officially estimated) flexibility, under-employment 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 and Livanos (2016) found that part-time work mainly affects younger people, workers of lower education/occupational status and women (Kretsos and

Livanos, 2016); 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 work are highly dependent upon variations in full-time work (Borowczyk-Martins and Lalé, 2016).

Recent studies that have an explicit focus on part-time employment and unemployment are few, 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 employee (dis)-approval for such types of jobs. These trends, combined with the poor wages in almost all part-time jobs, highlight the need to expand the scope of analysis to voluntary part-timers 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 labour market for the non-active segments of the labour force. Easier entry to the labour market and better coupling of work and familial duties, especially for women, are some benefits of part-time employment highlighted in the literature (see Lymperaki and 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, there is a threat to both contemporary living standards and future welfare and pension systems (Jenkins and Charleswell, 2016; Warren, 2015).

Methodological choices and background

In the paper, we analyse two forms of under-employment and contrast them to overall employment numbers. As an operationalization of under-employment, 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). In addition, we choose this extended definition of under-employment 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. Although not directly comparable, the latter source reveals that part-time work is probably more widespread than HELSTAT’s estimates (Ergani, 2016).

We operationalize the research questions through the following methodological framework: firstly, 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 specializations¹ 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 under-employment. Then, we employ a new embellishment of SSA,² presenting a clear decomposition of the distinguishable factors affecting employment change across the identified productive/regional entities.

We focus on two time periods. The first, 2005–2008, covers the pre-crisis expansionary years after the Athens 2004 Olympics, a period also noted for enhanced financial speculation. The second period, 2009–2012, marks the first years of severe economic depression, during which the first memoranda were implemented (Gialis and Tsampra, 2015). The scale of analysis is the 13 NUTS-II regions for which relevant labour data are analysed across nine sectors.³

We follow these steps in the analysis; firstly, we calculate the location quotient (LQ) for all employment forms and across all sectors in order to identify regional specializations and important concentrations of under-employment. This is calculated from the start year and end year of each period, and we use 1.20–1.25 and 0.70–0.75 as approximate cut-off values of over-concentration and under-concentration, respectively. The following changing analogies between two clearly defined ‘dipoles’ are conducted:

- total part-time versus total full-time within total employment;
- non-voluntary versus voluntary as parts of total part-time employment.

We then turn to SSA in order to offer a more dynamic decomposition of the actual employment change of each region in three parts. This includes the national share (NS), the IM, also known as the ‘structural effect’ and, finally, the regional or ‘competitive’ share (RS), which potentially reveals the different factors affecting employment change.

In the SSA we identified four different, yet overlapping, regional groups based on both quantitative and qualitative criteria, namely the high total employment LQs⁴ across the respective sector in 2005, urban or rural, seasonality, geographical centrality and, finally, insularity. Accordingly, we have grouped the regions as *metropolitan* (two regions), *manufacturing* (two), *agricultural* (five) and *tourism-based* (four) (see Table 1). Although relatively homogeneous, the regions also have notable internal differences. For

example, the metropolitan group consists of the two most densely populated regions around Athens and Thessaloniki. Attica hosts the capital city of Athens and is significantly larger and more intensely urbanized (Panori et al., 2016). Central Macedonia, on the other hand, includes several middle-sized cities and agricultural areas in addition to the significant urban agglomeration of Thessaloniki. Thessaloniki has gradually lost its specialization in manufacturing, becoming one of Greece’s rust-belts following industrial relocation and recession (Kallioras et al., 2016; Petrakos and Psycharis, 2016). The agricultural group also demonstrates variation. For instance, Epirus and Eastern Macedonia are deprived areas lacking sufficient infrastructure and human capital, while others, such as Thessaly, are relatively well-off and include important urban–industrial agglomerations (Giannakis and Bruggeman, 2015; Papadopoulos, 2016).

Finally, the tourism-based group consists of all the Greek island regions. These regions typically have high concentrations of employees in the hospitality sector. However, there are distinct variations (Armstrong et al., 2014). The South Aegean and the Ionian Islands are typical cases of areas highly based on ‘sun and sand’ tourism, while the North Aegean region has a higher dependency on the public sector and agricultural activities in addition to tourism. Crete is also a distinct case of a tourism-based region as it holds an important agro-industrial production and a far more diverse economic base (Ergani, 2016; Karoulia et al., 2016).

Analysing under-employment patterns across Greek regions

No country in the crisis-hit Eurozone and the EU has suffered as much employment destruction and productive capacity losses as Greece. The level of losses is only comparable to respective falls in countries under 20th century’s military conflicts or during the post-Soviet collapse (Mavroudeas, 2014; Reinhart and Trebesch, 2015). Indicatively, the pre-recession period of moderate increments in total employment and mild falls in the (already high) unemployment figures was interrupted by a sudden loss of more than 15% of all jobs coupled with skyrocketing rates

Table 1. Employment, unemployment, total and involuntary part-time employment per group of regions, (%), 2005, 2008, 2009 and 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 for total employment
	2005–2008 (%)	2009–2012 (%)	2005 (%)	2005–2008 (%)	2005–2012 (%)	2009–2012 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	2005 (%)	2008 (%)	2009 (%)	2012 (%)	
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 ^a
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 ^a
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 ^a
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 ^a
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 ^a
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 ^b
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 ^b
CENTRAL MACEDONIA	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	^c
ATTICA	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	^c
IONIAN ISLANDS	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 ^d
SOUTH AEGEAN	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 ^d
NORTH AEGEAN	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 ^d
CRETE	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 ^d
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	

LQ: location quotient.

^aLQ values in the agricultural sector.^bLQ values in the manufacturing sector.^cIn metropolitan regions, LQ values are very close to 1 for the majority of sectors.^dLQ values in the hotels, food and catering sector.

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

(more than 100% increase) in unemployment figures. However, although astonishing in its character and intensity, the recession is not homogenous. Some of the regions perform somewhat better, including half of the tourism-based regions and some of the agricultural regions, to a lesser extent (i.e. they are more resistant to employment degradation). The rest of the regions, and the two metropolitan regions in particular, show far worse figures (see Table 1).

The data shows that (total) employment losses are followed by increments in under-employment. Part-time employment shares are higher in 2012 compared to 2005 or 2008, with no regional opt-outs. Involuntary shares also have a sharp increase, with Thessaly (agricultural) being the only exception.

When looking closer at the data, we see that some regions have a higher de facto unemployment coupled with an expansion of under-employment therein. The Ionian Islands region is an example. Other regions do not seem to counteract unemployment through peaking involuntary shares; some are even suffering from both high unemployment and increasing part-time work (either total or involuntary, as in the manufacturing regions, see Table 1). It is thus difficult to find universal trends if we do not consider the regional industrial structures and endowments that determine the particularities of under-employment. As such, we need a comparative view of changing relative shares between different forms of employment that is regional and sectoral-sensitive at the same time. In the next section we unpack some of this complexity.

Internal and (un)balanced under-employment dichotomies

Considering sectoral differences, we find that leisure, arts and related services have the highest part-time shares. Agriculture is second, but its share in part-time work is decreasing. The construction and hospitality sectors are the two most salient sectors where part-time work expands the most. For hospitality, this trend is related to the seasonal nature of employment (see Figure 1). Seen in absolute terms, most part-time labour in Greece is employed in agriculture, commerce and the public sector, although the latter sector has seen declining trends due to massive contract terminations after 2008. Part-time employment has also sharply expanded in construction, whereas full-time

employment has sharply decreased (also see Petrakos and Psycharis, 2016).

When we look at the regional geographies of part-time employment, we see that it is concentrated in metropolitan and tourism-based regions. Almost all tourism-based regions witness a notable 'leap' at some point throughout the two periods we have studied. An example is the Ionian Islands during 2009–2012 (see Figure 2). Metropolitan regions, which hold more than 50% of national part-time employment, also show expanding trends for part-time employment, a finding in line with other contributions (Borowczyk-Martins and Lalé, 2016; Green and Livanos, 2015; Veliziotis et al., 2015). Volume-wise, part-time work can also be found in some agricultural regions, such as Thessaly. The only regions that witness stagnant or shrinking shares are the manufacturing and some of the more deprived agricultural regions (e.g. Epirus).

Distinguishing between involuntary and voluntary forms part-time employment, we see a common trend in almost all sectors and regions (see Figure 1): the relative share of non-voluntary part-time employment retreats during pre-crisis and highly increases during the recession. In 2012, involuntary part-time employment constitutes more than half of total part-time employment, whereas its 2005 relative share was far lower. This is true for all sectors apart from agriculture, and true for all regions apart from Epirus, the Ionian Islands and the South Aegean. Important concentrations of involuntary part-timers have been located in construction, leisure and hoteling, where respective LQ values are far higher than 1.5 (as in Table 2). Also, construction, manufacturing and especially commerce are going through a fast 'low-road to flexibilization' process that boosts not only total part-time work, but its involuntary part alike. A notable case is Central Macedonia, where involuntary part-time work is expanding despite total part-time employment declining.

Overall, part-time employment LQ values show that there is an important increment in most metropolitan and tourism-based regions, as well as in secondary or tertiary activities that are common within these regional productive groups. This increment, coupled with a dynamic expansion in sectors that had almost zero levels of under-employment pre-recession (i.e. construction),

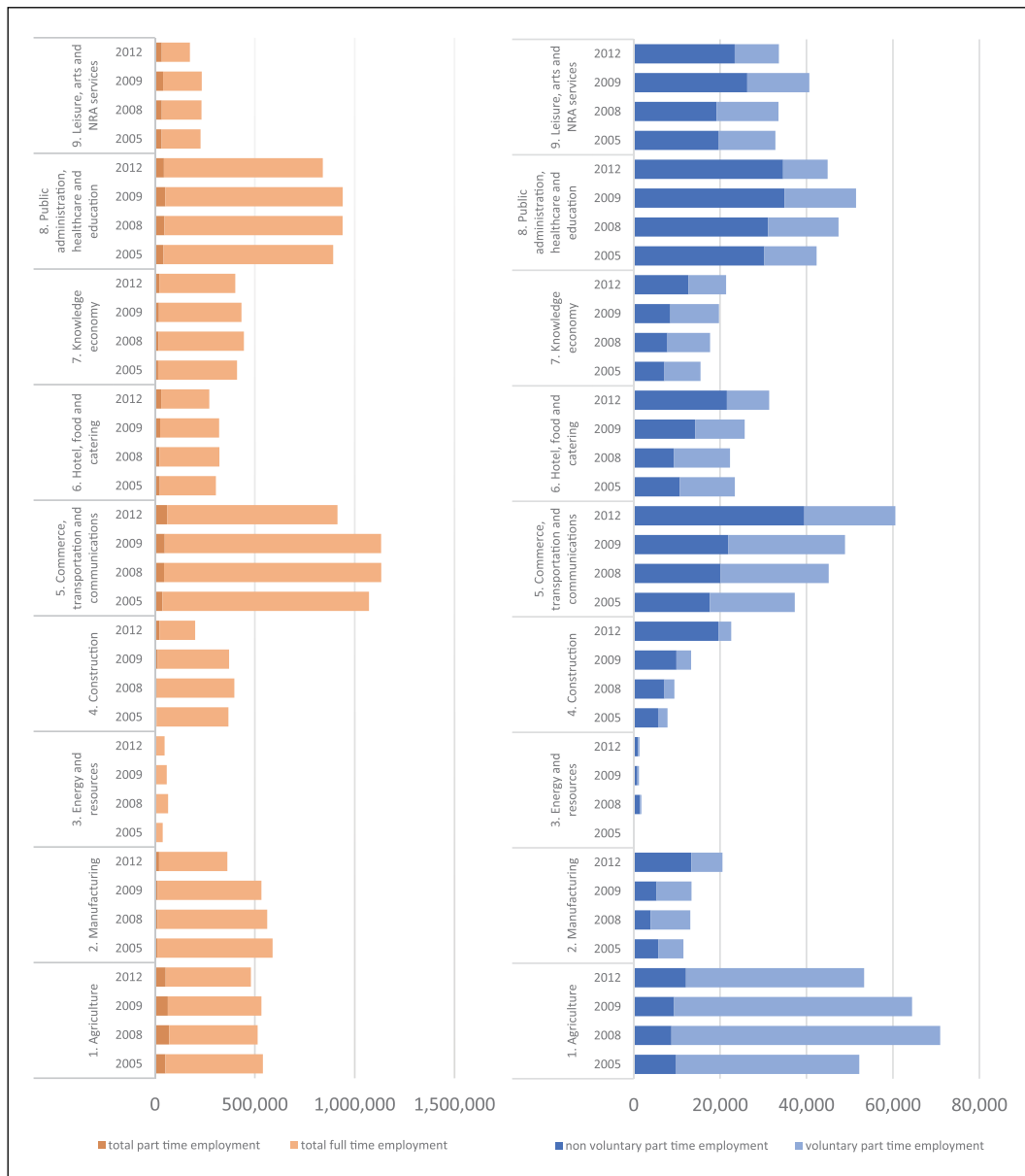


Figure 1. Balance between (i) part-time and full-time and (ii) non-voluntary and voluntary part-time employment (% of total part-time) per sector, 2005, 2008, 2009 and 2012.

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

outweighs shrinkage in more traditional sectors and less-privileged regions (e.g. agriculture). As such, the development highlights the significant setback in full-time jobs in certain productive niches and sectors across the regions.

...and the differentiated impact of structural and regional factors upon groups of regions

When we conduct the SSA for both total and part-time employment (as in Table 3), we find profound,

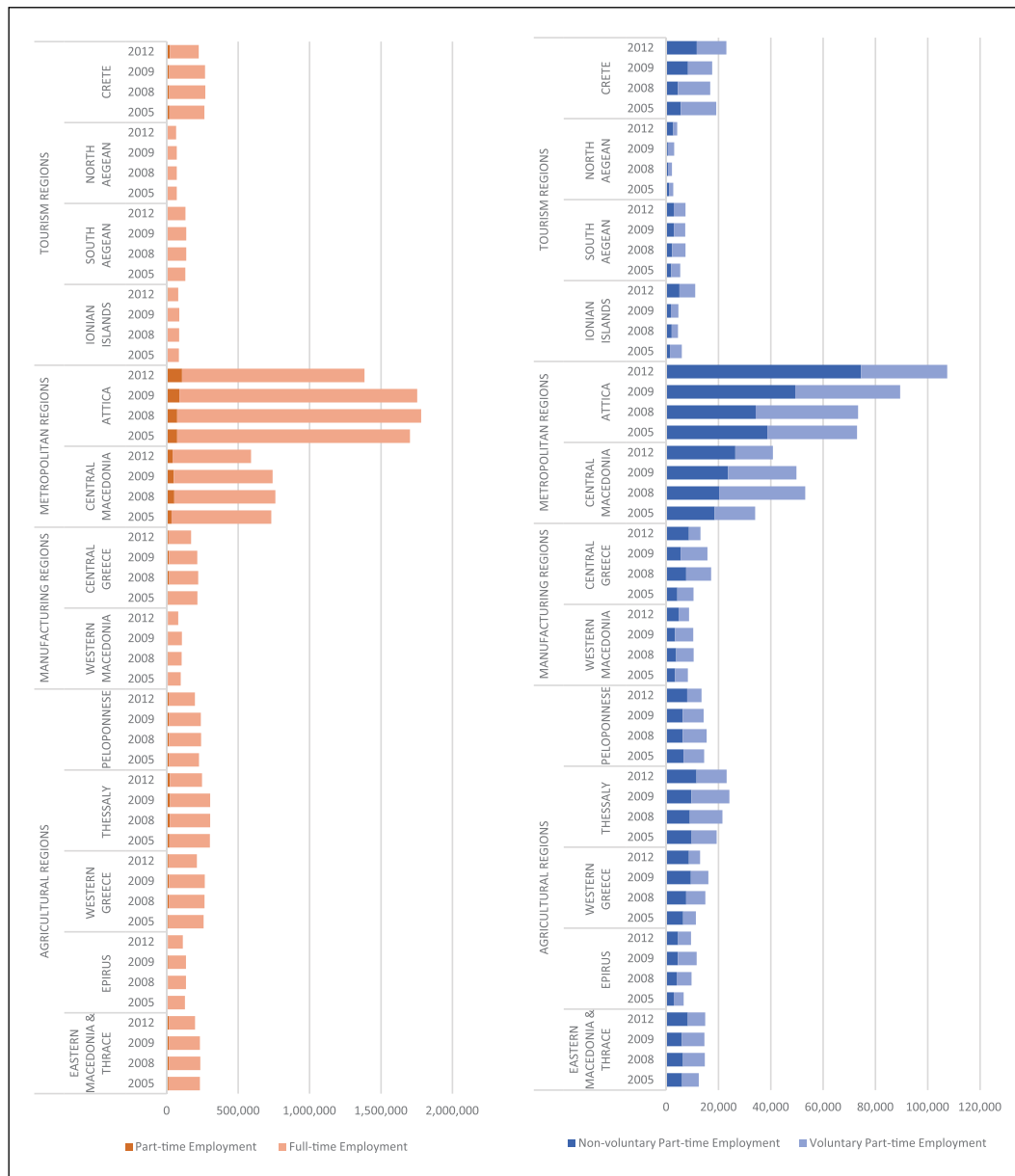


Figure 2. Balance between (i) part-time and full-time and (ii) non-voluntary and voluntary part-time employment (% of total part-time) per group of regions, 2005, 2008, 2009 and 2012.

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

although divergent, changes. The two *metropolitan regions* are different in terms of under-employment; during the pre-crisis period both increased their total employment above the national trend, with Attica as the most important centre for job creation. During

the crisis, however, metropolitan regions lost almost a fifth of their total employment. Besides the impact of national pressures on all sectors, the impacts of regional/ competitive factors are especially harder in Attica. Moreover, sectoral configurations in Central

Table 2. Location quotients of total part-time employment per sector^a and group of regions^b, 2005 and 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 ^c		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	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	1.2	1.5	1.1	0.8	0.9	0.9
ATTICA	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	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	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	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	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
	Value range	Low	Mid	High																

^aRegional to national sectoral share.^bRegional to national total part-time share.^cNRA: Other activities that have not been recorded above/ in other sectors.
Source: Authors' calculation based on HELSTAT's Labour Force Survey data.

Macedonia counterbalanced the significantly negative influence of the territory-deriving forces. These remarks are in line with the findings of previous works (cf. Petrakos and Psycharis, 2016).

In the *manufacturing regions* we find that both under-employment and total employment increase before the Eurozone and Greek crisis. This is especially so for energy-intensive Western Macedonia, which had the highest country-wide increase (for similar findings in the US context, see Beyers, 2013) emanated mainly from regional factors, such as its resource-rich territory. Central Greece can also be regarded as a region with a specialization in manufacturing, as it hosts the largest industrial plants, including those that are capital-intensive. However, employment changes here seem to be more sensitive to national economic trends, suggesting that regional factors are less important. In the recession period (2009–2012), manufacturing regions were in significant distress. The boost of the pre-crisis period was replaced by a sharp decline in employment, as almost one fifth of total employment was lost. Manufacturing regions' structurally weak sectoral mix is also manifested through highly negative IM values in all employment types. For local part-time employment, sectoral configurations outweigh regional factors again, but they offset national influence as well, resulting in a sharp absolute decrease in both regions, while nationally this type of employment expands. This is possibly because, compared to jobs in construction or tourism, the typical factory job is associated with full-time employment in Greece (Martin et al., 2016).

Agricultural regions also saw a rise in employment figures for both total and part-time employment during the pre-crisis period (2005–2008). It seems that sectoral configurations played a smaller role in total employment in almost all other Greek regions, and a mixed one in part-time work, as the mostly negative values of IMs reveal. RS, on the other hand, was mostly positive for total and part-time employment alike. The positive influence of regional competitive characteristics in all but Western Greece appears as quite clear in our analysis. In terms of part-time employment, we find that RS values suggest a significant expansion of under-employment for agricultural regions in the pre-recession period. During the recession (2009–2012), all agricultural regions lost a part of their total employment at a rate

close to the national average (NS of –18.9%). This means that these regions do not seem to be hit as hard as the manufacturing and metropolitan ones. Industry-specific factors seem to have played a positive role for many among the agricultural regions, yet these factors were not able to outweigh the negative impact of national pressures (Table 3). Overall, agricultural activities clearly 'produced' under-employment, which in turn made total employment losses milder than the ones in other regional groups.

Finally, two of the *tourism-based regions*, the Ionian Islands and South Aegean, are the only ones presenting notable total employment increments during the pre-crisis period. In the South Aegean there was a rise in part-time jobs in the pre-crisis period based on the influence of regional characteristics, such as the local endowments that positively affect jobs in tourism. During the recession period, all tourism-oriented regions show a remarkable 'resilience' in total workforce numbers. With the exception of Crete (a 'deviant' example of a much more economically diversified economy than in the other islands), the other three have smaller declines in employment numbers compared to the other Greek regions. Here, the four tourism-based regions have regional characteristics that mitigate some of the negative national employment trends, even despite that the sectoral composition of these regions in itself should work negatively when compared to national numbers. For part-time employment, we see the same trend, and it is remarkable that, apart from the South Aegean, this pattern applies to all tourism-based regions (see Figure 3 for a visual comparison). A possible part of the explanation could be that insularity, favourable climatic conditions and a more stable tourism base compared to mainland Greece restrained the employment decline (see Armstrong et al., 2014). Thus, recessive pressures did not hit tourism-oriented regions as hard as the other Greek regions. The same applies for the agricultural regions, as seen above, but to a lesser extent.

Discussion

By attributing on-the-rise part-time trends to carefully decomposed structural and regional effects, we came across some rather interesting findings. These findings contrast much of the existing literature that

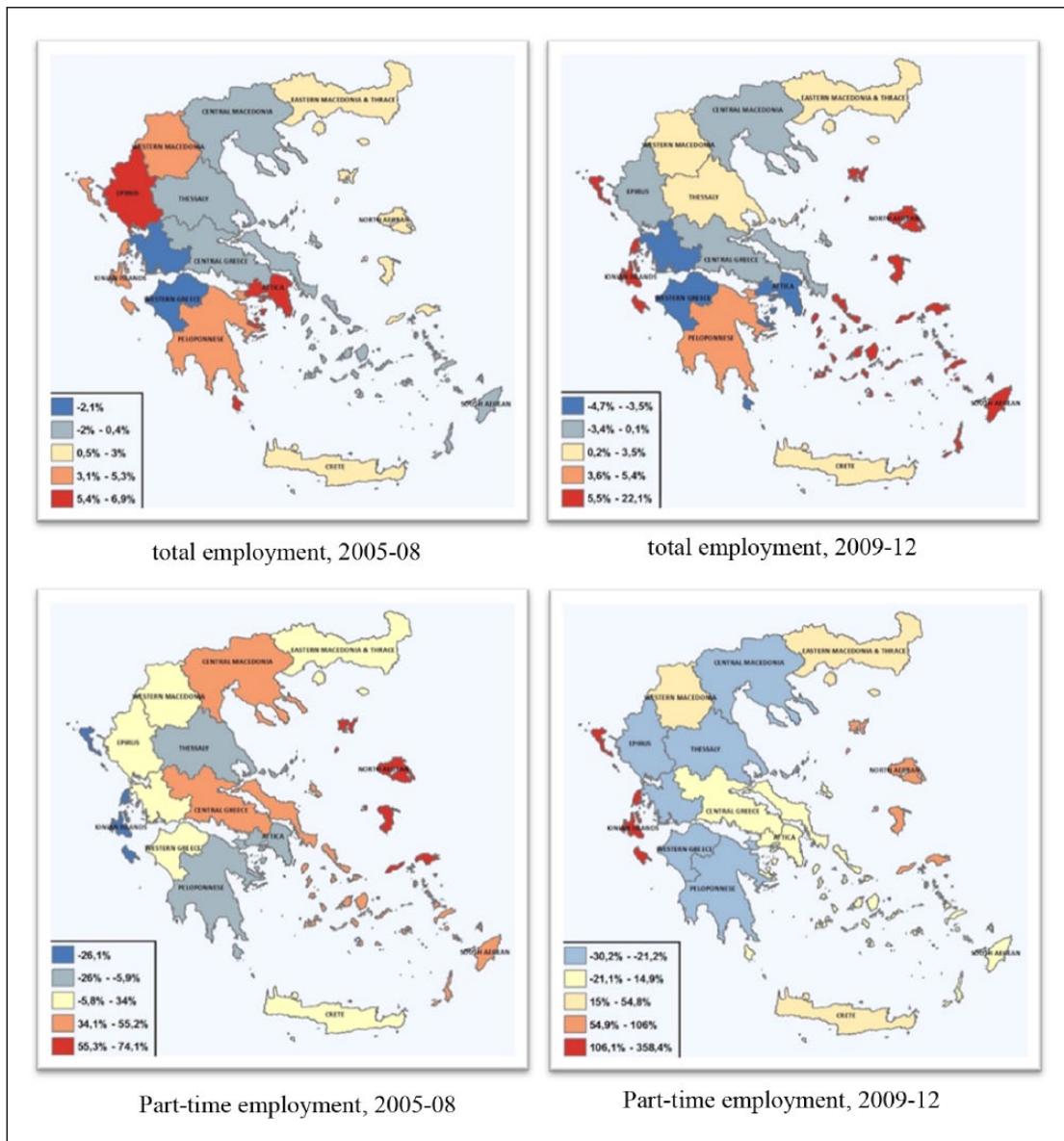


Figure 3. Mapping regional share (RS) for total and part-time employment across Greek regions, 2005–2008 and 2009–2012.

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

focuses on regions of the EU North (Green and Livanos, 2015; Kauhanen and Nätti, 2015).

A first remark, that answers the first question posed in the introductory section regarding the extent of part-time work, is that there is a high, although geographically uneven, expansion of such

jobs in contemporary Greece. As we define under-employment through looking at (involuntary) part-time work, we thus point to the rise in this form of employment in the Greek labour market. Our second remark, which returns to the second question, is that there are important differences between

regions regarding their sectoral composition. This is true for both total employment numbers and the expansion of what we coin under-employment. For instance, some of the Greek regions seem more resistant to job loss in general, some regions see a sharp rise in part-time employment after the crisis and others do not experience higher part-time employment as a replacement to other forms of employment. Explaining these divergences, we identify four distinct, although not rigidly defined, patterns of under-employment.

- i) *Metropolitan regions: precariousness in the urban fabric, flexibilization and expansion in under-employment.* Regional productive systems with a high share of tertiary service activities, in particular, can be associated with the rise of part-time work. This increment, coupled with a dynamic expansion in sectors with almost zero levels of under-employment in the pre-recession period (e.g. construction), outweighs some of the loss of full-time jobs in urbanized areas. However, there are important differences between the two *metropolitan regions* for both periods under study, reflecting the diverse employment outcomes and flexibilization trends in Greece as well as Southern Europe in general (cf. Cuadrado-Roura and Maroto, 2016). It seems that there are heavily urbanized regions that, due to their more backward productive structures, came into a 'low-road' type of flexibilization during the pre-crisis, as here seen in Central Macedonia, while the others, which hold a more diverse industrial composition as well as a nodal role in supra-regional hierarchies and productive chains, such as Athens, witnessed such flexibilization trends after 2008. Similar differences have been confirmed elsewhere, for example between the Italian regions that host Naples and Rome, respectively (Gialis and Leontidou, 2014).

In any case, even though most of the relevant literature findings suggest that stronger regional economies present lower involuntary part-time shares (as in the context of London, see Green & Livanos,

2015; Martin et al., 2016), Attica/Athens, which has a high share of national gross domestic product (GDP; more than 40%), has a higher than national unemployment rate and under-employed labour. This can be attributed to a series of factors, such as the collapse in constructions, as Cuadrado-Roura and Maroto (2016) pinpoint for the Spanish case as well, and the proliferation of part-timers in a range of activities, from typical commercial to knowledge-intensive or even creative economy ones (Avdikos and Kalogeresis, 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 under-employment.* Almost all Greek regions specialize in industrial sectors that, at the national level, are declining and experience a drop in productivity (INE, 2016). The manufacturing regions, following the country's contemporary orientation in low-cost tertiary services and labour-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' at fast rates, at least faster than other types of jobs during recession; this is in great part a result of the regions' IM, which outweighs both regional advantages and national influence and produces unemployment. The backwardness of Greece's 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 that 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, maintained certain competitive advantages (Petrakos and Psycharis, 2016; Voulgaris et al., 2015), but 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 contraction of part-time jobs during downturns.

- iii) *Agricultural regions: continuity of traditional practices and the reproduction of under-employment.* Under-employment 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-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 under-employed 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, 2015; 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 under-employment.

- iv) *Tourism-oriented regions: the resistance of services and commerce to recession and the dispersion of under-employment.* Island tourism-oriented regions seem to respond to the rapid changes of the economic environment better than the other groups of regions. However, the redundancies that came in these regions during the pre-crisis period and the subsequent higher relative preservation of remaining jobs after 2009 partly explains these less negative trends. 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 the EU South. Their local endowment comprises 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 under-employment patterns in various ways. For example, thousands of new hirings can be documented across the five-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 officially declared, doing all kinds of jobs (Adam and Papatheodorou, 2016; INE, 2016). Thus, resilience to recession does not necessarily mean good and sound employment standards, but rather various combinations of under-employment and precarious employment practices.

To answer our third question, we will now highlight some certain mechanisms that drive the trends of under-employment and might be useful for cross-national comparisons. For this, we interpret the four patterns of under-employment change documented above, by using relevant theoretical inputs and secondary sources. Overall, we argue that these patterns are shaped by three *interrelated causal mechanisms* that 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. Cuadrado-Roura and Maroto, 2016; Warren, 2015). 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 labour-intensive semi-dependent secondary structures, lack of strong institutions and long-term planning, as occurred in other countries (Gialis and 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. In addition to 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 2009–2012 (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 under-employment produced by the (mostly negative) regional structural compositions, plus the sharply negative NS effect. As seen above and documented elsewhere, many firms and sectors do make a 'marginal living' by occasionally underutilizing precarious labourers or family helpers (Ergani, 2016; Labour Inspectorates, 2012). Under such terms, the 'relative endurance' of the agricultural regions and the robustness of tourism regions look more important than they really are. Hence, the impact of outdated technology and specializations and the lack of production adaptability upon expanding under-employment is evident across Greek regions, and in particular those regions that specialize in manufacturing (cf. Hadjimichalis and Hudson, 2014; Kallioras et al., 2016; Polyzos et al., 2013).

The second underlying mechanism has to do with *market-driven organizational dynamics* and changing priorities. This mechanism determines the changing analogies between the appropriation full- and part-time jobs by firms amid crisis. New organizational practices and market responses to the recession have not only produced a transition to under-employment for some workers, but also an expansion of working hours for others, as seen for the metropolitan and tourism regions. New organizational practices and market responses have also seemed to produce negative prospects for those that enter the labour market seeking a full-time job. In many cases, overtime and very-few-hours work co-exist in a close symbiotic relationship and are being utilized upon the same groups of employees. Such trends have been verified in other national and regional frameworks as well (cf. Warren, 2015, for the UK; Barbieri and Scherer, 2009, for Italy; Horemans et al., 2016, for various settings). Typically, full-time jobs are temporarily replaced by part-time jobs until peak 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 buffer of flexibly available low-paid employees, either part-timers or overtime workers. Furthermore, the proliferation of under-employment is not merely an organizational choice of the big employers. It can also be the result of an extensive 'gig-economy' and related subcontracting patterns that are expanding in metropolitan areas of the Southern EU. Thousands of smaller firms and micro-entrepreneurs take advantage of these employment schemes (Avdikos and Kalogerisis, 2016).

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 under-employment; 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, have been converted from full-time to part-time after 'mutual employer-employee agreement', serving as examples of new organizational practices (Ergani, 2016; INE, 2016). These precarious patterns are even more prevalent in the tourism-based regions, which face high seasonal variability in demand and need a cheap and abundant labour force, and they are also diffused in the metropolitan areas (Gialis and Tsampra, 2015; Veliziotis et al., 2015).

Finally, the third mechanism that cuts across all groups of regions, despite the divergent responses shown in this paper, 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 Greece⁵ as well as in other Southern EU members. Among other reasons, involuntary part-time work is expanding due to the severely reduced wage levels offered through this employment form,⁶ as the average wage of a part-timer in Greece is in most cases below 300 Euros per month (Copus et al., 2015; INE, 2016). In addition, the successive reforms, cutbacks in welfare provisions and removal of dismissal restrictions have made the already weak part-timers even more cheap and vulnerable with no power to negotiate.

Conclusions

This paper suggests that a strong geographically differentiated connection between regional restructuring, specialization and precarity is turning under-employment into an integral dimension of the contemporary flexibilization of work. As seen in the Greek regions, this connection is differently manifested across different specializations, yet it is based on the same underlying powerful mechanisms that transform contemporary socio-spatial entities according to new accumulation priorities (Hadjimichalis and Hudson, 2014). Asynchronous under-employment expansion trends seem to be more an outcome of regional competitive advantages than a result of the local mix of industries. This subsequently produces regional settings that encourage the use of low-waged part-time work. This is mostly prevalent in the tourism-oriented regions where abundant pools of fluctuating labour surplus were stagnant pre-crisis, but heavily exploited amid recession.

Under-employment as a phenomenon calls for urgent attention, as it holds various unexplored ramifications with other new phenomena, such as the so-called NEET (i.e. those that are 'not in employment, education or training'). Many among the under-employed in Greece and Southern EU face a vicious cycle of disadvantage as they frequently alternate between unemployment and under-employment, unable to find a more stable and prosperous job. Wide segments of the population are pauperized and consequently become socially alienated, with a large number of households having just one or no employed members. This insecure state of periodic employment also impedes the advancement of workforce skills, reducing the quality of the Greek domestic labour market. An inactive labour force with slim chances of a fast re-entry to their profession, or even to a job in general, in conjunction with the mostly low-quality lifelong learning programmes offered, make the conditions for a rapid expansion of long-term labour underutilization. Particularly for middle-aged workers, that means an early and involuntary retirement, which hacks their pension levels when the time for their actual retirement comes. The deterioration of domestic labour markets has also caused a serious brain drain (Adam and Papatheodorou, 2016). Not

surprisingly, talented young people are fleeing Greece, leaving an ageing workforce behind. This implies an inevitable obsolescence of the labour force, but also increased pension expenditures in the future, not least in the context of a social security framework that has already been struggling for years.

Under-employment constitutes a reality for the labour force in many states across the world. The exacerbation of domestic and international inequalities has led to an environment of stark socio-economic segregation and polarization, paving the way for an era of political instability in the EU and beyond. Labour reforms, imposed by a neoliberal agenda and an austerity-directed mentality, are central political issues internationally as eloquently depicted in the recent US elections and the Brexit decision. Only time will tell how and when under-employed workers of these or other countries will react. In any case, their agency against precariousness will be region-specific and path-dependent, in contrast to the ambiguous applicability of reforms and political decisions that ignore region-specific structures.

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Notes

1. 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) classify in relation to innovation diffusion. For Greece-relevant analyses that studied specialization using data for earlier periods than the ones studied here, see Psycharis et al. (2014), Giannakis and Bruggeman (2015) and Gialis and Tsampra (2015).
2. This new SSA has been recently presented by Artige and Van Neuss (2014) in an attempt to better isolate between the regional and the structural effects.
3. In brief, sector 1 is *agricultural production* (two-digit NACE codes: 01–03); sectors 2–4 represent *manufacturing* (05–33), *construction* (41–43) and *Energy production* (35–39), respectively; sectors 5–7 represent *commerce, transportation and communication* (45–53, 58–63), *hotel, food and catering* and *financial* (55–56), *professional and 'knowledge economy'* (64–82) activities, respectively; and finally sectors 8 and 9 include *public services, health and education* (84–88) and *leisure, arts and all activities not recorded above* (94–99, 00).
4. The LQ of a sector in a region is calculated by dividing this sector's (under-)employment share in that region by its share on a national level. Regions are classified across different groups based on their pre-crisis specialization (i.e. total employment LQ > 1.20 in Sector 1 for the agricultural regions, in Sector 2 for manufacturing and in Sector 6 for tourism-based, values for 2005), with the exception of the metropolitan ones, which are defined based on the major cities they incorporate while they hold a LQ close to 1 in almost all their tertiary sectors (as in Table 1).
5. 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.
6. All wages in Greece have been reduced by 35%, on average, compared to pre-2008 levels. For example, the gross minimum wage has been set to 540 Euros

for young workers, an amount far below both the low-pay and the poverty threshold (set to 66.6% and 50% of the median full-time hourly wage of 8.5 Euros per hour, respectively) (Kretsos and Livanos, 2016).

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