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Abstract: Greece, traditionally characterised by high regional inequalities, has been the hardest hit country by the recent economic crisis. During these times, new forms of flexible employment have been becoming very common, and the question is whether these forms actually mask unemployment as they entail a «lack of choice» element. This paper uses data from the Labour Force Survey, covering periods before and during the crisis to investigate the existence, determinants, and extent of Involuntary Non-standard Employment (INE), across Greek regions. The outcomes are calling for policy actions to safeguard employment of the vulnerable groups and regions.

Keywords: precarious employment, involuntary employment, regional inequalities.

JEL classification: J21, R12, R23.

1. Introduction

During the last decade, since the onset of the economic crisis, the Greek labour market has undergone dramatic changes. The crisis, as well as the consequential reforms that were applied during the three bailout programmes, have created a climate of uncertainty in all aspects of the Greek economy (Fountas *et al.*, 2018). During the prolonged economic recession, apart from the severe increase in unemployment rates, another notable trend in the Greek labour market has been a move away from the traditional, standard type of employment (with open-ended full-time contracts) towards non-standard employment (with temporary part-time contracts).

This increase of non-standard employment is a twofold phenomenon. On the one hand, it has been an inevitable implication of the crisis, as it has often been seen as a step by both employers and states to cut costs and preserve flexibility levels. However, on the other hand, the continued increase of non-standard employment in Greece is raising concerns about the country not

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being able to fully exploit its human capital potentials and hence assist the economic recovery and long-term growth. Even before the economic crisis, forms of non-standard work had resulted in an underprivileged working class in Greece, thus fostering a troubling labour market (Theodosiou, Pouliakas, 2005; Gialis *et al.*, 2017). However, some of the reforms implemented as part of the «Memorandum» programmes (e.g. regulations concerning working hours and limitation of barriers to part-time and temporary contacts) are likely to have further deteriorated the condition of the Greek labour market (Theodosiou, Pouliakas, 2005). The economic crisis led to a number of regulations for the restructuring of the Greek economy. These regulations led to the shrinkage of the public sector and the expansion of sectors which are more reliant on non-standard employment forms (e.g. in retail sales, hospitality, catering and food services). At the same time, the growing prevalence of involuntary forms of employment has been elevating the levels of uncertainty in the Greek economy. For instance, high levels of involuntary forms of atypical employment result in higher job insecurity, poorer career prospects, lack of social security and poorer working conditions.

So far, the literature has examined part-time and temporary employment either separate or in aggregate (Hipp *et al.*, 2015). However, involuntary part-time work and involuntary temporary work have been handled as two distinct phenomena. Only recently, these two have been examined in aggregation (Green, Livanos, 2013 for the UK; Green, Livanos, 2015 for the EU; Livanos *et al.*, 2018 for Italy), creating a new concept, defined as involuntary non-standard employment (hereafter INE). The idea underlying this new concept is that even though looking for a temporary or a part-time job may be driven by different motives (for instance flexibility for part-time work and signalling for a temporary contract), ending up involuntarily in the one or the other has common grounds revealing the element of «lack of choice». Therefore, these two (involuntary temporary and part-time) are grouped together and their determinants are examined against any other form of voluntary work (standard or non-standard).

The aim of this paper is to shed some light on involuntary non-standard forms of work and focus on its extent, regional trends and determinants, before and after the onset of the prolonged Greek economic crisis. These are aspects of the labour market that are typically overseen by the official labour market statistics. In this paper regional disparities are investigated together with whether convergence with respect to INE is achieved through time and along with an attempt to identify the groups of people who are more vulnerable to INE and the regions that face the highest INE rates.

The paper addresses two research questions related to regional economic characteristics. The first is whether INE increased during the crisis, displaying thus a counter cyclical behaviour. The second is whether INE is related to the structure of economic activity in the region.

The paper adds to the literature about INE in Greece (Livanos, Pouliakas, 2019), offering an in-depth analysis of the Greek labour market and regional

inequalities. The findings of this study can be useful to inform policy makers on how to better structure suitable employment policies in Greece, towards the elimination of INE in general and of regional INE disparities.

Micro data from the European Labour Force Survey (hereafter EU-LFS) for Greece are used to isolate the «lack of choice» elements for two types of non-standard employment; part-time and temporary employment. A binary variable is constructed by cross-tabulating the Greek EU-LFS data by the type of employment contract (permanent, voluntary temporary and involuntary temporary) and by the hours of work (full-time, voluntary part-time and involuntary part-time). The variable takes the value 1 if an individual is in INE and the value 0 otherwise. The disaggregation of individuals by these cross-tabulation results into nine categories, five of which have an INE equal to 1, as they include an involuntary non-standard employment component. In particular, these categories are: permanent and involuntary part-time, involuntary temporary and full-time, involuntary temporary and involuntary part-time, involuntary temporary and voluntary part-time, and voluntary temporary and involuntary part-time. This measure makes it possible to differentiate between INE employment and any other form of voluntary employment (standard or non-standard). By «involuntary» it is implied that these individuals have compromised with accepting such contracts, but they would rather find a full-time and/or permanent job or accept a non-standard job voluntarily (e.g. they intentionally want to work only a few hours a day or want to use a temporary contract as a stepping stone to gain some experience in one field). Therefore, this new variable, INE, examines a common situation these workers are facing, namely that of precarious employment.

To address the main research questions related to the regional aspect of INE in the Greek labour market, some regional variables are used; the «regional crisis» to indicate whether INE increased during the crisis in all regions, the «regional unemployment» to see whether INE proves to be counter-cyclical, and the «regional accommodation and catering» to examine the effect of the structure of economic activity on INE.

2. The Greek labour market during the economic crisis

At such times of economic crisis, literature on the labour market typically focuses on unemployment. Specifically, before the onset of the crisis and the bailout programmes, unemployment did not seem to be an urgent issue for Greece, and the unemployment rate had been stable at around 10%. However, it picked up dramatically after 2010, reaching unprecedented levels among all European Union countries. For instance, there were 440 thousand unemployed people in 2006 (an unemployment rate of about 9%) rising to almost one million three hundred thousand in 2013 corresponding to a

27% rate of unemployment, temporarily falling slightly to 24.5% in 2015. In other words, the number of people unemployed in 2015 was 2.7 times higher than the respective number in 2006. The unemployment rate picked up again in 2016 and reached 28%, its highest level ever, before showing the first signs of recovery, falling to 18.5% by the end of 2018. It is a fact that youth unemployment was even more severely affected by the crisis, reaching unprecedented high levels in 2013, with an unemployment rate of 58% for those aged 15-24 and 43% for those aged 25-29 years. On top of the high unemployment levels, estimates also unveil that until 2015 between 350 and 427 thousand Greeks had emigrated, since the onset of the crisis, to find work abroad (Labrianidis, Pratsinakis, 2014; Lazaretou, 2016). At the same time, contrary to past trends, it is the highly educated that seek to leave the country in pursuit of a better career while the vast majority of them are young people (aged 18-25). Based on evidence from 2014, 75% of the emigrants hold at least a university degree and 25% also hold a post graduate degree, many of whom were graduates of polytechnic and medical schools. Around 18 thousand doctors were estimated to have left the country at that point. However, this «brain drain» has led to a shrinkage of the total workforce and a 20% decrease of the total number of people employed.

These numbers only picture part of the crisis' consequences in the idle Greek labour market. In particular, «hidden unemployment», like «discouraged» workers, is not incorporated in the official country statistics. For example, those who may have actively been searching for a job for some time, but finally gave up trying as they could not find any suitable employment, even though they wish to have a job. The problem of the under-utilisation of skills is in the same category of «hidden unemployment», which again is not taken into account by the official statistics. It is an issue that adds more to the problem of high levels of unemployment, as it affects the employed population itself. This captures the case of individuals, who in times of buoyant economic activity would actively search for work and would not compromise their wage and working conditions, but under sever circumstances might eventually accept jobs with wages, working hours and conditions they would normally reject. Therefore, apart from the high levels of unemployed or a discouraged workforce, concerns also arise about an increasing trend of other forms of «hidden» unemployment in Greece. These consist of atypical employment forms, such as cases of workers employed with constrained hours (i.e. would prefer to work full-time instead of part-time) or over-qualified for their jobs (Pouliakas, 2014). The share of workers who are involuntarily accepting non-standard employment contracts, namely working part-time or with temporary contracts, has strikingly increased in Europe during the crisis, and this precariousness seems to be affecting specific groups of individuals, like women and young people (Livanos, Papadopoulos, 2019).

3. Past work in the area

Academic research on INE, despite its importance, is still relatively limited. Cam (2012) analyses the relationship of involuntary part-time work with demographic and work-related factors and identifies a positive correlation of the former with low educational and occupational levels in the UK.

Kauhanen (2008) investigates the determinants of both part-time work and involuntary part-time work in the private service sector in Finland, finding that it is most probable for females, middle-aged, and low-educated people to be in involuntary non-standard employment. A few years later, Kauhanen and Nätti (2015) expand the analysis for Finland, examining the implications of involuntary part-time employment on job quality such as training, career prospects and job security.

Additionally, there is research that focuses on the differences between workers who are voluntarily and involuntarily in non-standard work. Amuedo-Dorantes (2000) find that non-standard contract work in Spain is, to a large extent, involuntary, while Nunez and Livanos (2011) investigate the personal, socioeconomic, national and institutional factors that cause different types of temporary employment in the EU and find that women, young people, singles and non-national workers are more vulnerable to involuntary temporary employment. In the last few years, part of the literature has been investigating the concept of precarious employment during the crisis. Valletta *et al.* (2020) examine involuntary part-time work in the USA during the Great Recession, concluding that the crisis has led to higher levels of workers employed involuntarily part-time, and indicate that the cause is mainly structural factors of the labour market. Studies for the EU also show an increase of precarious employment during the crisis (Gutierrez-Barbarrusa, 2016; Matilla-Santander *et al.*, 2019; Broughton *et al.*, 2016) and find that this rise in precarious employment is mostly related to poverty for countries with deregulated labour markets and with insecurity for Southern European countries. Matilla-Santander *et al.* (2016) examine employment precariousness as a more general concept and conclude that two out of three workers have been involved in precarious employment during the crisis, and the levels of precariousness are higher in the Eastern EU countries, while lower in the Nordic ones. The research of Broughton *et al.* (2016) corroborates the results of other studies that men, older and higher educated people are more likely to work full-time and with permanent contracts. The same research reports that the EU countries with the highest levels of involuntary part-time employment are Greece, Spain, Italy, Bulgaria and Cyprus.

As can be observed in this brief review, the scant work has focused more on involuntary part-time employment and less on involuntary temporary employment, and there are only rare cases in the literature where the two have been examined within the same framework. This makes sense, as the two forms of non-standard employment are distinctively different. Nevertheless

there is one common element in both forms, the «lack of choice», which enables to examine them within the same framework, as done by Green and Livanos (2013) on the determinants of INE in the UK, Green and Livanos (2015) on the determinants of INE in the EU, Livanos *et al.* (2018) on INE in Italian regions and Livanos and Pouliakas (2019) on INE in Greece. The findings of these studies suggest that young people, individuals from non-white ethnic groups, women, and those in economically weak regions are at particular risk of INE. The current paper adds to the existing literature by focusing on regional INE disparities in Greece during the time of the economic crisis.

4. Regional disparities in Greece

Greece is a traditionally highly-divided country, as the Greek economy is characterised by the persistence of regional differences (Salvati, 2016). In particular, the regions of Greece are far more divergent in comparison with other EU countries, like Spain or Portugal. Additionally, evidence from the early years of the crisis indicate that, although Greece as a country seems to have converged with the EU averages, the crisis has intensified the GDP inter-regional disparities even more (Christofakis, Papadaskalopoulos, 2011). Regional inequalities exist in many aspects of the Greek economy; however, so far the literature has mainly focused on product inequalities. The phenomenon of regional inequalities is not a consequence of the crisis as the pre-existing literature had already revealed a lack of regional income convergence and highlighted the difference between south and north (Siriopoulos, Asteriou, 1998; Tsionas, 2002). Another part of the literature examines regional inequalities in Greece for a period of 12 years before the crisis, by developing a composite indicator including GDP, employment, housing, private cars, doctors and hospital beds, and finds no significant evidence of convergence among the Greek regions (Goletsis, Chletsos, 2011). The same research indicates that Central Greece ranks high among other regions when the GDP is considered, as the majority of industries are concentrated there, while the results for Attica are totally different from the rest of Greece. It is estimated that around 50% of the Greek GDP is produced in Attica and 14% in Central Macedonia, where the second biggest city of the country, Thessaloniki, is located (Caraveli, Tsionas, 2012; Salvati, 2016). This is clear evidence of the high regional differences that exist in Greece. A body of research, triggered by the recent economic crisis, suggests that the problem of regional GDP inequalities has deteriorated after the onset of the crisis (Petrakos, Psycharis, 2016; Christofakis, Papadaskalopoulos, 2011; Caraveli, Tsionas, 2012; Salvati, 2016). Petrakos and Psycharis (2016) conclude that the regions where the GDP was hit the most during the crisis were the Aegean and the Ionian Islands and Crete, as they depend on tourism, and Central

Macedonia, Thrace and Thessaly which are areas with a large manufacturing sector, a sector that has been declining in Greece during the last few years. On the other hand, regions that rely on agriculture and self-consumption, like Epirus, Western Greece and Peloponnese, were less hurt by the crisis, with regard to the GDP.

Apart from production, the Greek economy is also characterised by regional variation of unemployment. This phenomenon has important consequences, as Greece has the highest percentage (73 %) among the OECD countries, of people in the labour force who live in areas with an unemployment rate above the national average (OECD, 2005). Areas with high unemployment rates are Western Macedonia, Continental Greece, Northern Greece and Epirus, while Crete, the Ionian and Aegean Islands and Peloponnese are the regions that face the least severe unemployment problems. As is indicated in the literature, regions with low tertiary education levels, low self-employment and family workers rates, and high manufacturing and agriculture sectors are the ones hit the most by high unemployment rates (Livanos, 2010). There is clear evidence of INE increase in Europe during the crisis (Livanos, Papadopoulos, 2019); however the literature on INE in Greece is very limited, particularly regarding regional analysis. Atypical employment has increased during the crisis, but differences among regions are observed. Specifically, part-time employment increased in agricultural areas, like Thessaly, and in industrial areas like Attica, Central and Western Macedonia. On the other hand, after the onset of the crisis temporary unemployment picked up in the South Aegean Islands and in Crete, as these areas are very dependent on tourism. Moreover, part-time employment is found to be the fastest growing type of non-standard employment during the crisis, though not the one with the highest rates (Gialis *et al.*, 2017). All the aforementioned evidence corroborates the conclusion of high regional differences in the Greek economy.

5. INE across regions in Greece

The regional analysis of INE in Greece is imperative, due to the apparent regional differences the country shows in terms of both GDP and unemployment. Table 1 presents the part-time employment and the involuntary part time employment shares in different regions and in the total number of residents in Greece for four different years, covering the period before and after the crisis so that a dynamic analysis can be applied. Part-time employment is not very high in Greece, however the crisis has triggered a significant increase of 2 percentage points between 2006 and 2018 (from 6% to 8%), which is in line with previous evidence (Gialis *et al.*, 2017).

Contrary to the total trend in the country, there are regions where part-time employment remained constant or even decreased in the crisis years, like Eastern and Western Macedonia, the Ionian Islands and Crete. The regions

Table 1: Part-time and involuntary part-time employment (percentages)

Regions	Part-time/ Total employment				Involuntary part-time/ Part-time employment			
	2006	2010	2014	2018	2006	2010	2014	2018
Eastern Macedonia and Thrace	6	7	7	5	44	38	61	64
Central Macedonia	6	7	9	9	47	53	75	72
Western Macedonia	9	10	9	9	36	41	38	77
Thessaly	6	7	14	11	56	44	51	50
Epirus	6	9	7	5	47	36	48	72
Ionian Islands	5	5	6	4	30	52	43	67
Western Greece	4	5	7	9	50	58	70	66
Continental Greece	8	7	7	10	40	47	56	78
Peloponnese	7	7	10	7	51	52	65	64
Attica	4	6	11	10	52	63	78	72
Northern Aegean	4	6	4	5	33	32	65	68
Southern Aegean	6	7	6	9	21	48	57	60
Crete	7	7	8	6	24	51	76	61
Total	6	7	9	8	44	51	67	68

Source: Authors' elaborations based on the Greek EU LFS yearly data.

with the highest part-time over total employment share are Thessaly (11%), Attica (10%) and Continental Greece (10%), with the first two, which are regions highly dependent on agriculture and industry respectively, having also the highest increase (6 percentage points) during the crisis. Even before the crisis, almost half of those employed part-time were working involuntarily under these non-standard contracts, while this share rose even more after the crisis, reaching almost 70% in 2018. Thus, even if there are areas where the part-time over total employment remained constant or even slightly decreased, in almost all Greek regions the involuntary part-time employment has increased during the crisis. After the economic crisis, Western Macedonia, which is characterised by low education levels of its workforce and high unemployment, and Continental Greece have the highest share of involuntary part-time work. These regions together with the Ionian and South Aegean Islands, which are very dependent on tourism, have the highest increase in involuntary part-time contracts.

The respective information for temporary employment is included in Table 2. Temporary work has a bigger share in total employment in comparison to part-time work, as also indicated by previous literature (Gialis *et al.*, 2017). The deterioration of the Greek economy during the crisis led to a rise in temporary work from 11% in 2006 to 13% in 2018. The Ionian Islands and South Aegean Islands are the regions with the highest share of

Table 2: Temporary and involuntary temporary employment (percentages)

Regions	Temporary/ Total employment				Involuntary temporary/ Temporary employment			
	2006	2010	2014	2018	2006	2010	2014	2018
Eastern Macedonia and Thrace	11	10	12	10	84	85	87	88
Central Macedonia	12	13	12	14	84	86	85	89
Western Macedonia	18	16	23	15	86	85	92	98
Thessaly	14	13	12	9	82	78	95	89
Epirus	12	15	9	8	88	86	85	93
Ionian Islands	16	22	25	32	82	93	96	95
Western Greece	10	13	14	13	85	93	70	84
Continental Greece	12	10	8	9	85	89	85	93
Peloponnese	14	15	16	12	82	84	90	97
Attica	8	10	6	6	83	82	80	71
Northern Aegean	12	16	17	15	65	80	97	85
Southern Aegean	16	24	32	29	89	90	93	61
Crete	17	20	29	26	83	92	90	81
Total	11	13	13	13	83	86	87	83

Source: Authors' elaborations based on Greece EU LFS yearly data.

temporary employment, which can be easily explained by the fact that they depend heavily on tourism; a sector with high seasonality. About 3 out of 10 employees were under temporary contracts in 2018 and these are also the regions with the highest increase during the Greek economic recession.

On the other hand, there are regions with extremely low shares of temporary work, which decreased even more during the crisis; Thessaly, Epirus, Continental Greece and Attica, mostly areas that depend on industry and agriculture. It is noteworthy that the variance of temporary work among the different regions of Greece is much higher in comparison to part-time work, as the standard deviation of the percentage of temporary work over total employment was about 5 in 2006 and also almost doubled during the crisis to reach a value of about 9 in 2018. Involuntary temporary work is much higher than the involuntary part-time work and even much higher than the respective share in other countries, like the UK and Italy (Green, Livanos, 2013; Livanos *et al.*, 2018). Western Macedonia and the Peloponnese have the highest shares of involuntary employment among the temporary workers, the majority of whom would prefer to have a permanent job after the crisis. Western Macedonia, strongly dependent on industry, together with the Peloponnese also have the highest growth of involuntary temporary workers. On the contrary, regions like Attica and the Southern Aegean Islands show an important decline in involuntary temporary employment. This also

Table 3: INE Share over Total Employment (percentages)

Regions	INE/Total employment				Unemployment			
	2006	2010	2014	2018	2006	2010	2014	2018
Eastern Macedonia and Thrace	10	9	12	13	11	14	23	15
Central Macedonia	10	12	15	19	9	14	28	21
Western Macedonia	14	15	21	19	14	15	27	26
Thessaly	12	12	18	14	8	12	24	17
Epirus	10	13	11	12	10	12	26	19
Ionian Islands	13	21	24	31	11	14	18	14
Western Greece	8	13	14	17	9	11	28	23
Continental Greece	10	11	10	17	9	12	25	18
Peloponnese	12	13	18	15	7	9	23	14
Attica	7	9	11	11	8	13	28	20
Northern Aegean	8	13	15	15	9	9	22	22
Southern Aegean	15	24	31	22	9	14	21	17
Crete	14	19	22	21	7	12	24	13
Total	10	12	15	16	9	13	26	18

Source: Authors' elaborations based on the Greek EU LFS yearly data.

comes in contrast to the increase of involuntary part-time work. A possible explanation is that workers, during times of high unemployment, would voluntarily accept temporary contracts as a step to first signal their skills and potential and later request or look for a permanent contract. The high degree of regional variations is obvious in this type of work as well, as the standard deviation of involuntarily employed temporary workers among the Greek regions is more than 25.

Table 3 shows the total INE over the employment share in comparison with the unemployment rates for the same years as the two previous tables, in an attempt to analyse the total non-standard employment in Greece. It is obvious that both unemployment and INE increased during the crisis, however in the dynamic analysis the highest unemployment rates were in 2014 while INE rates picked up a few years later, in 2018. The deterioration of regional inequalities after the crisis is evident in both INE and unemployment, as the standard deviation almost doubled from 2006 to 2018 for both variables. The region with the far highest total INE in 2018 is the Ionian Islands where 3 out of 10 workers are involuntarily employed under non-standard contracts, followed by the Southern Aegean and Crete, all of which are areas that have seen their GDP being much affected by the Greek debt crisis and are also highly dependent on tourism. The Ionian is also the region with the highest increase of INE over total employment during the crisis (18 percentage points) mainly due to the increase of temporary

Table 4: Sample characteristics

	Full employed sample (%)	INE (%)	Unemployed
<i>Gender</i>			
Male	59	46	45
Female	41	54	55
<i>Nationality</i>			
Greek	93	81	91
non-Greek	7	19	9
<i>Age band</i>			
15-25	5	13	16
26-35	22	33	31
36-45	29	28	25
46-55	28	19	19
56-65	16	7	9
<i>Education level</i>			
Low	36	38	33
Medium	39	41	47
High	26	21	20
<i>Marital status</i>			
Married	67	52	45
Single	28	41	49
Other	5	7	6
<i>Occupation</i>			
Legislators	7	0.3	n/a
Professionals	15	11	n/a
Associate professionals	7	5	n/a
Clerks	10	11	n/a
Service workers	17	25	n/a
Skilled agricultural	15	2	n/a
Craft	13	13	n/a
Plant and machine operators	7	5	n/a
Elementary occupations	7	26	n/a
<i>Sector</i>			
Agriculture	16	5	n/a
Industry	19	19	n/a
Services	65	75	n/a
<i>Past status</i>			
One year ago employed	96	81	15
One year ago unemployed	3	15	73
One year ago inactive	1	4	12

Source: Authors' elaborations based on Greek EU LFS yearly data.

employment. However, it is interesting that the increase in unemployment is relatively small, making the Ionian Islands the only region with a very high increase in INE during the crisis, which does not seem to be a result of high unemployment growth but rather than of a transformation of the employment relationship away from standard permanent contracts. Regarding unemployment, the areas with the highest rates in 2018 are Western Macedonia (26%), Western Greece (23%), Northern Aegean (22%), and Attica (20%), while at the same time they are also those with the highest unemployment increase from 2006 until 2018.

Finally, in addition to the regional differences, discrepancies also seem to appear among different groups of individuals. The sample description is presented in Table 4 distinguishing the employed (full sample), INE, and the unemployed. From this Table it can be concluded that specific groups (i.e. women, young people, non-nationals, medium educated) of workers are more vulnerable to adverse employment statuses. For instance, while female workers comprise 41% of the total sample, their share in INE and unemployment increases to 54% and 55% respectively. Another point to be made is that the employment status also seems to be dependent on the occupational group and the sector of economic activity, with service workers or elementary occupations workers having a higher share in INE and unemployment than in the full sample of the employed. Working conditions one year ago are also important, as it seems that those who were unemployed or inactive one year ago have a higher share in INE than in total employment.

6. Data and methods

EU-LFS micro-data for Greece, and for the 2000-2018 period, are used for the purposes of our analysis. The EU-LFS is a household-level survey which contains information on the labour market for the residents of all EU countries. It collects information on aspects related to employment, such as labour market status, previous working experience, flexible working patterns, occupational group, economic activity sector, but also on socio-demographic aspects, such as age, gender, education level etc. It is run under the supervision of EUROSTAT, but is actually conducted by the national statistical agency of each country. Due to its large size and harmonisation of variables and definitions it is the most reliable and useful micro-data survey for comparative analytical research in the EU. The Hellenic Statistical Authority (ELSTAT) is running the survey for the Greek data in the EU-LFS dataset.

7. Construction of the dependent variable and scope of the econometric analysis

As already reported in the introduction to the paper, attention in this research is concentrated on individuals who are employed in general or specifically in INE. Based on the EU-LFS definition, a person is considered employed if «during the reference week he/she performed work, even for just one hour a week, for pay, profit or family gain or was not at work but had a job or business from which they were temporarily absent because of, e.g. illness, holidays, industrial dispute and education and training».

The objective behind the construction of the dependent variable INE is to combine in one unique measure the elements of involuntary part-time and involuntary temporary employment (which are considered as non-standard forms of work in this study), while excluding voluntarily accepted non-standard employment.

There is no direct question for INE, thus this variable is estimated from a number of other questions and the individuals' spontaneous response to them; questions for the type of employment, preference for part-time as opposed to full-time or for temporary rather than permanent contracts, reasons for working under non-standard contracts. In the EU-LFS the distinction between full-time and part-time refers to the main job and is based on a spontaneous response by the respondent. Regarding the type of contract (temporary or permanent), this is also based on responses to a direct question and employees with temporary contracts are by definition those «whose main job will terminate either after a period fixed in advance, or after a period not known in advance, but nevertheless defined by objective criteria, such as the completion of an assignment or the period of absence of an employee temporarily replaced». Even if there is no direct question on INE, the survey's respondents are asked to declare if «they work part-time because they are unable to find full-time work» and if they «are in limited duration contracts due to inability to find a permanent job».

Thus, after a cross-tabulation of the LFS data on the type of employment and the hours of work, the INE variable is constructed. The result of the disaggregation is categories of employees who have an INE equal to 1, as they include an involuntary non-standard employment component. Specifically these categories are: permanent and involuntary part-time, involuntary temporary and full-time, involuntary temporary and involuntary part-time, involuntary temporary and voluntary part-time, and voluntary temporary and involuntary part-time. In a nutshell, the resulting INE variable equals 1 for those in INE and 0 for all other individuals in employment (i.e. those with standard working contracts or those who voluntarily accept non-standard contracts). This measure makes it possible to group together workers ending up involuntarily in two different forms of non-standard work and examine the determinants of such an outcome (INE) against all other types of voluntary employment.

For the econometric analysis, EU-LFS data for Greece and for the years 2000-2018 are used, this way including periods both before and after the outburst of the Greek debt crisis. Thus, results will provide evidence for the effects of the crisis on the development of INE in Greece. For the regional aspect, data is also being used at the level of the 13 Greek regions according to NUTS-2.

8. Econometric methodology

The aim of the paper is to examine the various socio-economic and regional factors that explain the incidence of INE. As INE is observed only in a selected sample (labour market participants), selection models are used with INE as the outcome (dependent) variable. Using INE as a filter for the outcome variable in the full sample results in the problem of sample selection, which happens when some factors related to the outcome variable intervene in the selection of the sample. In particular, this sample selection issue occurs if the outcome variable ($y_2 = 1$ for INE) is observed only for a specific value of the selection variable (here the participation in the labour force; $y_1 = 1$). In this case, there are two different scenarios with two respective suitable econometric analyses. In the first scenario, the outcome variable (y_2) is independent of the selection one (y_1) and a simple two-step econometric model is proposed, which allows for flexibility and computational simplicity. The case of this paper belongs to the second scenario, in which the outcome variable (y_2) is not randomly selected from the population. In this situation, selection models are preferable, as they control for dependency in the two-step model (Heckman, 1979). In the two-step Heckman model, the first step is a Probit regression (selection equation) where y_2 is the dependent variable and estimates the likelihood of labour market participation. The second step consists of the INE equation, where the coefficients of the selection equation are used to estimate the conditional probability of being in INE (y_2).

Additional explanatory variables, which are related to the selection variable but unrelated with the outcome variable, are used in the first step equation, in order to overcome the identification problems. Such variables proposed by the literature are marital status, number of children, level of education, regional unemployment rate etc. The explanatory variables used in the first step equation of this research are two, the number of young children and the marital status of the individual, following Humphries and Sarasúa's (2012) approach. Overall, the purpose of this first-stage equation is to remove the selection bias from the second-step equation.

The second-step equation of the Heckman-Probit model includes individual-level and variables for the NUTS-2 Greek regions. The individual level variables include the following socio-demographic and work-related variables: 1) gender (with males as the reference category); 2) nationality (with

nationals as the reference group); 3) age group (36-45 being the reference group); 4) marital status: married, singles, and «other», including widowed/divorced (with married as the reference category); 5) level of education: low, medium, and high¹ (with high used as the reference level); 6) occupation (with professionals as the reference category); 7) economic sector (with industry being the reference category); 8) past employment status a year before the survey (employed, unemployed and inactive, with employed being the reference category); and 9) regions, with regional dummies, one for each of the 13 NUTS-2 Greek regions (with Attica, the country's capital city, as the reference one). Additionally, there are some more variables created as products of other variables and included in the model. A «regional crisis» variable is included, which compares the post-crisis period (2008-2018) to the pre-crisis period (2000-2007) and helps to investigate whether the INE has higher probability in a given region in the post-crisis period compared to before. Moreover, the variables «regional unemployment» and «regional accommodation and catering» serve for the examination of the main research questions; whether INE is cyclical or countercyclical during the crisis and if it is related to the structure of the economic activity of a region.

9. Results and discussion

The results of the econometric model that has explicitly been analysed before are presented in Tables 5a and 5b, where the coefficients of the participation equation are shown in 5a and the coefficients of the INE equation, which is the main focus of the paper, are shown in 5b. Apart from the coefficients, the marginal effects of the second step equation for aggregate INE, temporary INE and part-time INE are presented in the last 3 columns, as they offer a more easily interpretable representation of the results. Nevertheless, it should be noted that investigating the reasons behind taking up voluntarily a temporary or a part-time contract (which takes the 0 value in these two binary variables) remains outside the scope of this paper, which explicitly is to investigate the reasons for being precariously in non-standard contracts.

Regarding the participation (first-step) equation (Table 5a) the two variables used, total number of kids and marital status, are statistically significant, meaning that they both affect the decision for participating in the labour market, thus validating the use of these variables in the equation. The coefficient of the total number of young kids is positive, indicating that, as the number of children increases, individuals have more possibilities to participate in the labour force. This can be explained as children impose

¹ «low» (pre-primary, primary, and lower secondary education), «medium» (upper secondary and post-secondary education such as vocational diplomas), and «high» (first and second stage of tertiary education and above).

Table 5a: Econometric results: Participation Equation

Participation Equation Variables		
Total Young Kids		0.144***
Marital status	Married	Reference group
	Single	-0.139***
Constant		-0.057***
athrho ^a		-0.038

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. ^a athrho is the transformed version of rho i.e. the correlation between the error terms.

Source: Author's estimations are based on EU LFS data for individuals aged 15-65 years old, sample of employees, 2006-2018.

pressure on parents to work and more easily accept non-standard employment contracts in order to be able to financially support the family. On the other hand, the coefficient of the «single» dummy is negative, meaning that single individuals are less likely, compared to the married ones, to participate in the labour market.

The results of the second-step equation, which is the most essential part of the econometric analysis, are presented in Table 5b. In most cases they are in line with the results of the descriptive statistics, but they also provide additional insights on the magnitude of the impact of different economic, demographic and regional characteristics on the likelihood of being in INE, *ceteris paribus*. Apart from the aggregate INE, the model is also applied on temporary INE and part-time INE, so that we get a more complete picture.

There is evidence that there are «vulnerable» groups of people who are more likely to be working in INE, such as women, non-nationals, older people aged 56-65, and low educated individuals. Table 5b includes the chances of aggregated INE against any other type of employment, temporary INE against temporary voluntary employment and part-time INE against voluntary part-time employment. Moreover, we have included the variables «regional unemployment» and «regional accommodation and catering», to further identify the characteristics of Greek regions which are affected by INE the most.

Between the two genders, women in Greece are more likely to be in INE, a result in line with similar research for other European countries (Green, Livanos, 2015). Specifically, female workers have 4.5% higher chances of INE than male ones. At the same time, results show that women are more prone to involuntary temporary employment, while men are more likely to be involuntarily working in part-time jobs. However, as has been already mentioned, part-time is relatively lower in Greece, than temporary employment, hence in total women are found to be more susceptible than men with respect to INE. This fact can be viewed as gender discrimination in the labour market or it can be explained by several other factors, mainly

associated with family responsibilities. Due to these responsibilities women may have restricted access to employment information, thus making it more difficult for them to find the ideal job. Moreover, in a family usually the mother is more locally restricted than the father, meaning that a man could more easily find a job which might require some travelling and that however fulfills his requirements and preferences. Women could also accept more easily to work involuntarily under a non-standard contract at the beginning, in order to signal their abilities, skills and commitment to the employer and later be offered a permanent contract, as they are usually supposed to have more family responsibilities and not be as committed to work as men may be.

Nationals are in an advantageous position, as it is less possible for them to be in INE than non-nationals. Greeks have almost 2% lower chances to be in INE, compared to non-nationals.

The most surprising result is the positive relationship between age and INE, as in all previous similar studies a U-shaped relationship was found for the UK (Green, Livanos, 2013), Italy (Livanos *et al.*, 2018), and the EU (Green, Livanos, 2015), with the youngest group being the most vulnerable. However, for the case of Greece it can be observed from Table 5b that the higher the age the higher the possibilities of being in INE. In particular, individuals aged 15-25 have 2% lower chances of working involuntarily under precarious conditions compared to the reference group (aged 36-45). On the other hand, older people (aged 56-65) have 4% higher chances of INE than those aged 36-45 years old. These results regarding the relationship between age and INE in Greece may be explained by the fact that traditionally children may continue to live with their parents even at older ages and Greek parents may keep financially supporting their children for many years until they are financially independent, or even grandparents may financially support their children's family. Based on this fact, young people may voluntarily choose to work in part-time jobs or with temporary contracts, as they do not have many family responsibilities and they are usually financially supported by their parents in case of need. Moreover they see it as an opportunity to screen and signal their skills and abilities in the labour market, gain experience from different jobs, before they decide what they are good at and then seek for a more standard job. On the other hand, older people's need to work may be more imperative, as they are more likely to have family responsibilities. Thus, they accept INE because they cannot find a less precarious job. Moreover, older people may face difficulties in accessing and retaining employment. Due to this unexpected relationship, the paper additionally examines the effect of the crisis on INE for the younger age-groups. It can be concluded that the situation for those aged 15-25 has worsened during the crisis, as they face higher INE chances during the crisis than before, which can be explained by the unprecedented unemployment rate of 58% in 2013 for those aged 15-24. On the other hand, those aged 26-35 face lower chances of being in INE during the crisis than before.

With regard to marital status, single individuals have 1.7% higher possibilities than married ones to be involved in INE. This trend may be explained by the household specialisation model (Becker, 2009) according to which in a marriage usually one person focuses on employment and the other one on the household. Thus, the person who works in the family specialises more in employment and is more likely to find a standard contract job. Another explanation could be the fact that if in a married couple one of the two is working in a standard work that could support the couple, the other person might not need to seek for a full-time permanent job thus willingly choose to work under a non-standard contract. However, the question that arises here is on the direction of the causality, specifically whether INE is the result of being single or the fact that someone is in INE prevents them from getting married, as they do not have job stability and feel unable to support a family.

The results in Table 5*b* also suggest a reverse relationship between the likelihood of INE and the level of education, meaning that the higher the level of education the fewer chances the individual has to be involved in INE. In particular, a person with low educational level has 4.7% more chances of INE and a person with medium level has 2% higher chances, always in comparison to someone with a high educational level. This result is in line with the human capital theory, according to which graduates in the labour market usually have higher salaries (Becker, 1962).

Regarding the sector of economic activity, the findings indicate that workers in the industry sector have the lowest chances of being in INE, while those in the service sector have 2.7% higher chances and those in the agricultural sector have 5.4% higher chances than those who are employed in industry. These results are in line with a similar research conducted for the EU (Green, Livanos, 2015) and can be explained by the fact that the industry sector, having a big share in manufacture, does not have high rates of part-time or temporary employment. Moving on to occupations, legislators and associate professionals are those with the lowest likelihood of INE, while on the other hand those working in elementary occupations or skilled agricultural workers have the highest likelihood, corroborating the results of the sample characteristics presented in Table 4. This is not a surprising conclusion as professional and managerial positions are not so much exposed to precariousness as occupations that require less skilled employees (McGovern *et al.*, 2004).

The econometric analysis also considers individuals' past employment status. It is proven that employees who were employed one year before the survey had less chances of being in INE than someone who was unemployed (9% higher INE chances) or inactive (4% higher INE chances) a year ago. This makes sense, as it suggests that past non-working experience increases the chances of current work instability, as supported by other studies (Alba-Ramirez, 1998). In addition, as can be observed in Table 5, tenure and INE show a negative relationship, indicating that the more years someone is in

the same position, the fewer chances they have to be involuntarily working under non-standard contracts.

However, the vital contribution of this paper is to examine regional inequalities of INE. The findings indicate that individuals located in Western Macedonia, Southern Aegean, Northern Aegean and Thessaly have the highest possibilities of being in INE, while on the other hand the regions with the lowest rates are Attica, Western Greece, Continental Greece, and Eastern Macedonia and Thrace. Specifically, Western Macedonia is the region with the highest marginal effect as seen on Table 5*b*, with 8.7% of employees being employed under INE contracts. The regional non-standard employment trends much depend on regional employment specialisation. In particular, Attica and Western Greece are much dependent on industry, which is the sector with the lowest INE likelihood. On the other hand, high INE likelihood in Thessaly and Western Macedonia can be explained as these regions are very dependent on agriculture, which is the most vulnerable sector (Gialis *et al.*, 2017), as indicated by the results of Table 3. The same happens for the Southern and Northern Aegean where the labour market is much dominated by tourism, meaning there is a big service sector in those areas; a sector also very vulnerable to INE. Additionally, Western Macedonia has low levels of tertiary education which might also affect the INE rates of this region (Gialis *et al.*, 2017) and is also the region with the highest unemployment rates (26%) in 2018. Regarding Eastern Macedonia and Thrace, we observe in Table 3 that they have lower unemployment rates than almost all other regions, thus residents of this region do not experience as much pressure as in other areas to accept non-standard contracts if they do not want to.

If we take a look at the other two columns of Table 5*b*, we may find some more interesting results. We observe that the Peloponnese has a 6.7% chance of INE, which is mainly attributed to involuntary part-time work, as 8% of people who work part-time do it involuntarily; which is the highest rate of involuntary part-time among all Greek regions. On the other hand, the South Aegean Islands have the highest probability of a temporary contract being involuntary (2.8%). At the same time, Southern Aegean has the second highest total INE, as almost 8% of people employed are working under INE.

For the purposes of the current research, the «regional crisis» variable is also examined, which is an indication of the effect of a crisis on INE by region. Specifically, it shows for each region if and for how much it is more likely for someone to be in INE during the crisis, compared to the years when there is no crisis. There is evidence that INE is higher during the crisis compared to the years before in all NUTS-2 Greek regions, as the coefficient of the «regional crisis» variable is positive. However, INE is not equally deteriorated in all regions, as the possibility of working involuntarily under non-standard contracts for residents of Attica, Western

Macedonia and Central Macedonia has increased much more, while in Epirus, the Peloponnese and Northern Aegean the increase of INE was the smallest one compared with the rest of Greece. It is noteworthy that Attica, Western Macedonia and Central Macedonia, where the INE has been affected the most by the crisis, are regions with relatively low chances of INE. At the same time, these are regions, together with Northern Aegean, with the highest impact of crisis on unemployment as well. Thus, it can be concluded that the regions that had the highest unemployment growth between 2000 and 2018 are those where INE was affected the most by the crisis, while regions with lower unemployment increases also faced a lower impact of the crisis on INE. The only case that does not follow this trend is that of the Ionian Islands, which according to Table 3 had the highest INE growth between 2000-2018 (136%), in line with the relatively high crisis impact on INE (3,5% according to Table 5*b*), however, the unemployment rate change is the smallest among all regions.

An interesting point, when comparing the temporary INE and the part-time INE is to examine the «regional crisis» variable. In temporary INE the marginal effects are all positive, while in part-time INE most of them are negative. This means that during the crisis the proportion of involuntary temporary workers against all temporary workers increased. Probably people were forced to accept temporary contracts owing to the lack of more permanent ones or because they were discouraged by having searched for a permanent job with no luck. An important fact is that the region with the highest increase of temporary INE during the crisis was the Ionian Islands, with a 15% increase. This result is in line with findings from the descriptive statistics, earlier on in this paper, where this region was found to have the highest rate of temporary over total employment among the Greek regions (Table 2). It is also one of the regions, according to other literature, with the highest drop of regional GDP during the crisis (Petrakos, Psycharis, 2016), which can be linked with the deterioration of temporary INE during the crisis.

Regional unemployment plays a vital role for INE, as it has a positive 30% marginal effect. This finding reveals that regions with high unemployment rates are more vulnerable to INE. Comparing the last two columns of Table 5*b*, it can be easily concluded that regions with high unemployment face a much higher risk of part-time involuntary work, as the part-time INE is 75% of total part-time employment. On the other hand, involuntary temporary work is not as much affected by regional unemployment.

As in some cases the high INE rates can be explained by the employment specialisation of the regions, and especially by a broad tourism sector, we also add the «regional accommodation and catering» variable in the model, as an indicator of tourism. The positive sign of the marginal effect of this variable indicates that the higher the tourism sector in each region, the higher the INE share in this region.

Table 5b: Econometric results: second step equation

Variable	Value	Coefficients	Marginal effects (%)	Marginal effects temporary INE (%)	Marginal effects part-time INE (%)
Gender	Male	Reference group			
	Female	0.276***	4.	1.3	-3.1
Nationality	Greek	-0.118***	-1.9	-3.1	-4.6
	non-Greek	Reference group			
Age	15-25	-0.119***	-1.9	-9.7	-7.3
	26-35	-0.051***	-0.8	-2.1	-0.5
	36-45	Reference group			
	46-55	0.134***	2.2	-0.9	0.1
	56-65	0.250***	4.1	-2.5	-3.4
Marital status	Married	Reference group			
	Single	0.104***	1.7	-2.3	3.0
Region	Eastern Macedonia	0.188***	3.1	-0.9	2.1
	Central Macedonia	0.249***	4.1	-0.1	1.3
	Western Macedonia	0.602***	9.8	2.7	2.2
	Thessaly	0.418***	6.8	0.0	7.6
	Epirus	0.328***	5.3	1.0	4.3
	Ionian Islands	0.399***	6.5	-2.7	-2.9
	Western Greece	0.138***	2.3	-0.9	5.9
	Continental Greece	0.149***	2.4	-0.6	4.3
	Peloponnese	0.410***	6.7	0.1	8.1
	Attica	Reference group			
	Northern Aegean	0.439***	7.2	-7.1	1.6
	Southern Aegean	0.502***	8.2	2.8	-7.0
	Crete	0.362***	5.9	-2.5	-0.7
Regional crisis	Eastern Macedonia Crisis	0.123***	2.0	0.9	-1.3
	Central Macedonia Crisis	0.226***	3.7	1.7	0.1
	Western Macedonia Crisis	0.069**	1.1	0.7	-3.2
	Thessaly Crisis	0.073***	1.2	2.3	-7.4
	Epirus Crisis	0.038*	0.6	-1.3	-3.5
	Ionian Islands Crisis	0.211***	3.5	15.3	2.6
	Western Greece Crisis	0.252***	4.1	1.1	-2.1

Table 5b: (continued)

Variable	Value	Coefficients	Marginal effects (%)	Marginal effects temporary INE (%)	Marginal effects part-time INE (%)
Education	Continental Greece Crisis	0.171***	2.8	2.8	-1.0
	Peloponnese Crisis	0.038*	0.6	2.8	-2.3
	Attica Crisis	0.251***	4.1	-2.3	0.6
	Northern Aegean Crisis	0.003	0.1	7.6	-1.5
	Southern Aegean Crisis	0.184***	3.0	4.0	3.8
	Crete Crisis	0.196***	3.2	4.4	0.6
	Low level	0.286***	4.7	-0.7	-0.4
	Medium level	0.122***	2.0	-2.5	-1.4
	High level	Reference group			
	Agriculture	0.328***	5.4	1.1	-2.1
Sector	Industry	Reference group			
	Services	0.168***	2.7	-2.8	0.0
	Legislators	-0.497***	-8.1	-3.0	-16.3
	Professionals	Reference group			
	Associate Professionals	-0.166***	-2.7	2.6	-1.7
	Clerks	-0.087***	-1.4	5.5	-2.4
	Service Workers	0.064***	1.1	8.2	-2.9
	Skilled Agricultural	0.332***	5.4	10.3	-14.4
	Craft	0.214***	3.5	7.2	1.9
	Plant	-0.127***	-2.1	9.3	0.1
Occupations	Elementary Occupations	0.490***	8.0	10.8	6.0
	One Year Ago Employed	Reference group			
	One Year Ago Unemployed	0.551***	9.0	1.6	6.6
	One Year Ago Inactive	0.253***	4.1	-12.2	-7.0
	Regional Unemployment	1.991***	32.3	5.0	75.3
	Regional Accommodation and Catering	1.585***	25.7	-76.1	27.0
	Tenure	-0.082***	-1.3	0.1	-0.4
N. of observations			1,758,495	984,715	988,443

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Source: Author's estimations are based on EU LFS data for individuals aged 15-65 years old, sample of employees, 2006-2018.

Overall, there is slight evidence of regional convergence regarding INE, as regions that used to have relatively lower INE share some years ago, they also had high increases of INE during the crisis.

10. Conclusion

Over the past years new forms of employment, traditionally considered as job creators and signs of flexibility (i.e. temporary and part-time contracts), have become popular. At the same time, and over the economic crisis in particular, more jobs of non-standard nature have become available driven by a growing focus of the economy towards the accommodation sector. However, a strand of the literature focuses on the question of whether these actually mask unemployment as they entail a «lack of choice» element for people looking for a job during times of high unemployment. In particular, the extent to which such employment has been occurring voluntarily or not has been examined, creating «hidden unemployment» and developing a new concept, namely that of Involuntary Non-standard Employment (INE). The aim of this paper has been to add to the literature on INE in Greece focusing on its regional dimensions. Data from the EU-LFS for the years 2006, 2010, 2014, 2018 has been used to provide evidence on INE, its determinants and regional extent, focusing on part-time and temporary employment, before and during the crisis. The paper has posed two research questions; the first being whether INE is related to the phase of the economic cycle and the second whether it is being shaped by the structure of economic activity. Both of the research questions have been investigated at the regional level.

The empirical analysis has unveiled an increase in INE after the outbreak of the crisis, accompanying the severe increase of unemployment rates. The deteriorating condition of the Greek economy has inevitably led to higher levels of INE in Greece, as a whole, and in different regions as well. This confirms our hypothesis that INE displays a counter-cyclical behaviour as it is dependent on the economic environment and workers are indeed «forced» to accept such contracts as a shield against unemployment.

To investigate the links between unemployment and INE at a regional level, the interaction of the two is examined. The results, answering to one of the research questions, prove that there is a counter-cyclical behaviour of INE, as it increases in regions with high unemployment. In parallel, the effects of the crisis on INE for each particular region are also examined, and they indicate that the effect of the crisis is significant in all regions, as INE worsens in all regions during the crisis, however some have been more severely harmed than others. These regions are Western Greece, Attica, Central Macedonia and the Ionian Islands. Specifically, in Western Greece the share of INE during the crisis was 4.1% higher than the periods of no crisis. By comparing the marginal effects of the regions to the ones of the

«regional crisis» variable, the findings of this paper suggest that in regions with already high levels of INE, the crisis has not really worsened the situation (like Western Macedonia, and the Aegean). Instead, regions with lower shares face higher increases, in involuntary non-standard employment, during the crisis (Attica and Western Greece).

Therefore, our paper serves to suggest that the economic crisis overall worsened the employment conditions across the country, not really distinguishing how «affluent» a region is, but severely affecting regions that pre-crisis would enjoy better labour market conditions. In particular, the regions which show the highest INE increase during the crisis are Attica as well as the regions of Macedonia, which concentrate the industrial production of the country. Therefore, even though INE is distributed unevenly and the metropolitan area of Attica has the lowest concentration, we cannot ascertain that the crisis has further intensified regional inequalities through escalation of «precarious» work in less privileged/peripheral regions. In fact, it seems that INE goes hand-in-hand with unemployment, driving individuals even in affluent regions to be left with little choice but accepting working conditions that they would normally reject. This conclusion serves as an answer to one of the paper's main research questions, indicating the counter-cyclical nature of INE.

Thus, an important finding of this study is that INE is shaped differently across the Greek regions while the impact of the crisis has affected regions in a different way, and not necessarily driving regional disparities further. In particular, the regional non-standard employment trends largely depend on regional employment specialisation. Decentralised regions like Western Macedonia, Southern Aegean, Northern Aegean and Thessaly have the highest INE rates, possibly due to the high concentration of agriculture, tourism, and the service sector in general which typically offers non-standard forms of work. Indeed, this paper has found that the incidence of INE is much higher for workers in the service sector. In particular, the results prove that INE grows in the same direction as the share of catering and accommodation at the regional level, thus explaining why some regions which rely heavily on tourism face higher chances of INE. Therefore, this finding answers one of our main research questions and confirms our hypothesis that INE is affected by the structure of the economic activity at the regional level.

Given that as an outcome of the economic crisis, sectors that expanded include accommodation and catering (partly because people started looking for such pursuits in the close vicinity of their houses while the cost of setting up such a business is relatively small) and that these particular sectors typically employ a large share of non-standard workers (temporary and part-time), one can infer that worsening of the economic environment and the employment situation go hand-in-hand. In other words, the economic crisis has paved the way for many new non-standard contracts (in such sectors) which many workers have been «forced» to accept for fear of remaining

unemployed. Therefore, our two research questions do not stand alone but it seems that are well connected to each other during the economic crisis.

Nevertheless, the socioeconomic breakdown of the workforce, i.e. supply-side reasons, also plays a role, with vulnerable groups of workers (e.g. female, young people, non-national) being affected more. Nevertheless, as a legacy of the crisis, the employment relationship seems to have been transformed, moving away from its traditional standard forms. Indicative is the fact that in the Ionian islands even though they have not been affected as much by unemployment, the trend towards non-standard forms of work has been intensified, which does not seem to be well-received by job seekers who end up there involuntarily.

Further investigation of other forms of precarious work will shed further light on this new, emerging form of employment that has undoubtedly risen in Greece, and across its regions, as an aftermath of the recent economic crisis which may be intensified even further by the on-going Covid-19 crisis.

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