The Incidence of Long-Term Unemployment in Greece: Evidence Before and During the Recession

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Abstract

In an attempt to improve our understanding of recent developments in the Greek labour market, we examine the incidence of long-term unemployment defined as unemployed with continuous periods of unemployment extending for 12 months or longer. Using micro data from the Greek Labour Force Survey for the period 1999 to 2013, we investigate both, the trends and the structure of long-term unemployment. We also contribute to the existing literature by exploring the determinants of long-term unemployment. We apply typical econometric methods of logit regressions to estimate the probability of becoming long-term unemployed (versus short-term unemployed) with emphasis on the changes occurred during the crisis period. Empirical evidence suggests that females, the elderly, the less educated people, singles and those who live in urban areas are the most vulnerable groups to long-term unemployment. Local labor market conditions, as proxied by the regional separation and job-finding rates determine the incidence of long-term unemployment as well.

1. Introduction

A permanent feature of the Greek economy is both the high level and the persistence of unemployment. During the period 1999-2008 the average quarterly unemployment rate oscillated around the 10.5% mark. Both the 2007-2008 global financial crisis that hit Greece at the end of 2008 and the outburst of the Greek sovereign debt crisis in 2010 deteriorated dramatically the conditions in the Greek labour market. Greece experienced the lowest level of unemployment at the third quarter of 2008 which stood at 7.2%. Since then, the unemployment rate was rapidly increasing that rose to a peak of 27.3% at the second quarter of 2013, an unprecedented level that Greece had not attained ever.

Long-term unemployment (defined as people out of work for 12 months or over) has garnered much attention as well. The problem of the long-term unemployment was persistent throughout the survey period. In the pre-crisis period, the average proportion of long-term unemployment (the proportion of unemployed people who are long-term unemployed) was at the neighborhood of the 54.5% mark. Thus, even though the unemployment rates were relatively low, large shares of unemployed workers experienced long spells of unemployment. A starkly different pattern of the long-term unemployment emerged with the onset of the recession. From the end of 2008, the proportion of long-term unemployment -following the unemployment rate- rose precipitously and reached for the first time the 66.8% mark at the second quarter of 2013 (Figure 1). The incidence of high long-term unemployment indicates that unemployment in Greece is characterized by stability: low inflows and outflows of unemployment and long duration (Kanellopoulos, 2011).

Moreover, comparative data shows that the incidence of long-term unemployment is higher than those in the EU-28 or OECD countries. The

corresponding rates for the second quarter of 2013 were 46.5% and 35.3% respectively (Figure 2).

The case of Greece is of particular interest because the economic crisis has strongly affected the Greek labour market. We aim to shed light on the incidence of long-term unemployment using data from the Greek Labour Force Survey for the time period 1999-2013. There are no many studies that examine the incidence of long-term unemployment in Greece and they are limited to the pre-crisis period (Dedousopoulos *et al.* 1991; Kostaki and Ioakimoglou 1998; Livanos 2007; Mitrakos and Nicolitsas 2006). The present study covers a longer period (1999-2013) during which long-term unemployment increased drastically and rapidly especially after 2009. The purpose of our paper is to investigate the trends and the structure of long-term unemployment with emphasis on the significant changes that occurred in the pre-crisis and during-the-crisis periods. Moreover, we contribute to the existing literature by exploring the determinants of long-term unemployment. We apply typical econometric methods of logit regressions to estimate the probability of becoming long-term unemployed (versus short-term unemployed). The literature pertaining to the incidence of long-term unemployment highlights the role of gender, age, education, marital status (Kostaki and Ioakimoglou 1998; Livanos 2007) nationality (Obben *et al*. 2002), region of residence, degree of urbanization, previous employment experience and local labor market conditions (Mitrakos and Nicolitsas 2006; Tasci and Ozdemir 2005). The obtained empirical results suggest that all of the aforementioned factors exert a significant influence on the probability of being long-term unemployed.

It is noted that Greek labour market suffers from serious structural problems so there is a great need for urgent and effective public policy responses (Blanchard, 2006). Our analysis could lead to significant policy implications since particular

worker groups (e.g., females, older people, primary-educated) face a higher probability of being long-term unemployed. In the absence of employment opportunities, certain groups of workers may be trapped in the unemployment pool for longer spells.

The paper is organized as follows. In section 2 we present the data sources and we discuss the distribution of the long-term and short-term unemployment shares by demographic groups between the pre-crisis and during-the-crisis periods. In section 3 we model the relationship between the incidence of long-term unemployment and several individual, job and regional characteristics. Section 4 presents the empirical results. The final section concludes.

2. Data and Preliminary Analysis

2.1 Data sources

The data utilized in this study originate from the Greek Labour Force Survey which is conducted by the Hellenic Statistical Authority (EL.STAT) on a quarterly basis since 1998 and provides useful information on the labour force. The sample of the survey is around 30000 households in each quarter (approximately 80000 persons). We focus on the survey years 1999Q1-2013Q2 and the data provide representative aggregates for the entire economy since they are adjusted by the LFS sampling weights. The LFS database provides information on several individual-specific characteristics such as gender, age, education level, marital status, nationality, region, degree of urbanization, labour market status, economic activity, duration of job search, reasons for becoming unemployed and other elements. The definitions of the variables used in the Greek Labour Force Survey are fully in line with Eurostat Regulations. Our sample consists of the unemployed people. Briefly, persons

classified as unemployed include all those aged 15-74 who were without work during the reference week, were currently available for work and were either actively seeking work in the past four weeks. Following the conventional definitions of ILO and OECD, long-term unemployment refers to the number of people with continuous periods of unemployment extending for a year or longer, expressed as a percentage of the total unemployed. We split our sample into two distinct periods (1999Q1-2008Q3 and 2008Q4-2013Q2) given that a break in the unemployment series is observed at the third quarter of 2008 (Venetis and Salamaliki, 2015), which coincides with the beginning of the recessionary period (Tsouma, 2014).

2.2 Distribution of the long-term and short-term unemployment shares by demographic groups

Table 1 reports the distribution of the long-term and short-term unemployment shares by demographic groups. The shares are calculated using LFS data and cover two important periods: the pre-crisis period 1999Q1-2008Q3 and the crisis period 2008Q4-2013Q2. Each demographic group's share of the short and long-term unemployed is included for two reasons: firstly, to assess whether each group is relatively underrepresented or overrepresented in the long-term unemployed or short-term unemployed and secondly to show how each demographic group's shares shift over time. A share analysis of long-term unemployment by gender consists of determining what proportion of the long-term unemployed was males and what was females. The results show that in the crisis period, among the long-term unemployed, 66.22% were females. This means that females are overrepresented among the long-term unemployed. However, during the crisis-period this share fell to 54.34%. This indicates that females' position seems to have improved in the Greek labor market because males' position deteriorated dramatically. Structural shifts in the employment

(such as the decline in manufacturing and construction industry, sectors that were traditionally dominated by males) made it more difficult for males to find a job.

Regarding age, in the pre-crisis period, individuals aged 15-34 have a high representation in the ranks of the long-term unemployed. In particular, the proportion of the long-term unemployed that were young people was 62% while this share fell to 48% during-the-crisis period. It is apparent that individuals aged 35 and over are disproportionally represented in the ranks of the long-term unemployed during the recession. Concerning marital status, singles make up 55% of the long-term unemployed in the pre-crisis period but it slightly reduced to 50% in the recession period.

With regards to the education level, individuals with secondary education make up 50% of the long-term unemployed for both periods. On the contrary, the share of those with tertiary education among the long-term unemployed increased from 16% to 21% during the crisis period. Regarding nationality, Greek people are highly represented in the long-term unemployment pool for both periods, however, the share of the foreign individuals increased by 5 percentage points over time. Concerning the degree of urbanization, individuals who live in urban areas make up 73% of the long-term unemployed but this share remains constant over time. Finally, the share of people with previous employment experience increased remarkably from 50.29% in the pre-crisis period to 71.13% in the recession period.

3. Econometric Methodology

In this section, we are interested in modelling the incidence of the long-term unemployment. The data allows us to construct a dummy variable which takes the value one if an individual is long-term unemployed and zero if an individual is short-

term unemployed. We apply the typical econometric method of logit regressions to estimate the probability of becoming long-term unemployed versus the probability of being short-term unemployed. The model computed is similar to the one estimated by Obben *et al*. (2002) and Livanos (2007). For interpretation purposes we focus on the notion of the odds ratio. An odds ratio (OR) is defined as the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. If OR coefficient is above (under) unity indicates that the odds of being long-term unemployed for a given category is greater (lesser) than for the reference category. If OR coefficient equals unity, the dependent variable is independent of the explanatory variable.

The analysis is carried out for the pre-crisis period (1999Q1-2008Q3) and during the crisis period (2008Q4-2013Q2). In this procedure, we examine the impact and the evolution of the explanatory variables on the incidence of long-term unemployment. The variables that we use in our analysis include: (a) demographic characteristics such as gender, age, marital status, nationality and education level; (b) regional characteristics such as the region of residence, degree of urbanization and region-specific rates; (c) job characteristics such as previous employment experience and the industry of previous employment; and (d) year and quarter dummies to capture the effect of the business cycle. All regressions are estimated by applying the Maximum Likelihood Estimation (MLE) method and the observations are weighted by a personal-based weight variable.

4. Empirical Results

In this section we present and analyse the factors that determine the incidence of long-term unemployment. The effects of the independent variables are represented

by the odds ratio (exponential value of the estimated coefficient) for both periods (1999Q1-2008Q3) and (2008Q4-2013Q2) and are reported at Table 2. The econometric analysis reveals that all variables are statistically significant at 1% significance level.

According to the obtained results for the pre-crisis period, the odds ratio for females -relative to males- is 1.558. This finding indicates that the odds of a female being long-term unemployed is 1.558 times greater than the odds of a male being long-term unemployed. In other words, females are 1.558 times more likely to become long-term unemployed compared to males. It is impressing to note that the impact of gender in the odds of being long-term unemployed continuous to be valid but reduces overtime. The reduction in the odds ratio from 1.558 to 1.328 implies that during the crisis period, the odds of being long-term unemployed have increased for males relative to females. This is due to the fact that the relative position of males has worsened during the crisis period. Nevertheless, long-term unemployment affects mostly females.

Regarding the effects of age, we observe that young people (15-24 and 25-34) have lower odds of being long-term unemployed compared to prime-aged for both periods. On the contrary, individuals aged 45 and over have higher odds of being long-term unemployed compared to prime-aged. Although there are no significant changes between the two periods, it is apparent that the odds of an individual being long-term unemployed increases with age.

Concerning the marital status, we observe that in the pre-crisis period single individuals are more likely to become long-term unemployed but widowed or separated individuals are less likely compared to married ones. However, during the crisis period, the odds ratios have increased significantly for both groups. The odds of

long-term unemployment are 31.3% higher for singles and 20.8% higher for widowed or separated in relation to married individuals.

With regard to education level, we note that primary educated individuals have greater odds of being long-term unemployed compared to people with higher education. It is obvious that the higher the education level of an individual, the lower the odds of that individual being long-term unemployed. In addition, foreign individuals are found to experience lower odds of being long-term unemployed compared to Greek individuals for both periods despite the fact that their position has deteriorated in the crisis years.

Regarding region, our results indicate that it is a highly significant determinant of the long-term unemployment. Although there are substantial regional variations, it appears that the residents of islands (Ionion Islands, South and North Aegean, Crete) face lower odds of long-term unemployment relative to those living in Attiki (capital) for both periods. The degree of urbanization affects the time that an individual remains in unemployment as well. In particular, individuals who live in rural or semi-urban areas are less likely to become long-term unemployed compared to those who reside in urban areas for both periods.

Moreover, there is also a negative correlation between the odds of long-term unemployment and the previous employment experience of an individual. The results show that an unemployed individual who had worked in the past had 72% lower odds of becoming long-term unemployed in the pre-crisis period but this impact has reduced during the crisis period.

To investigate further the demand side and the differences in the local labor market conditions across regions we have included two novel variables: the regional separation rate and the regional job-finding rate. We find that the regional separation

rate is a significant determinant of the time that an individual stays in unemployment. If the regional separation rate increases by 1 percentage point, an unemployed has 17% lower odds of becoming long-term unemployed in the pre-crisis period. In other words, people who lose their jobs have greater probability of finding a job since they stay in unemployment for a short time. This negative correlation is hold during the crisis period as well. Nevertheless, with 1 percentage point increase in the regional separation rate, an unemployed individual has only 7% lower odds of becoming long-term unemployed. Thus, the negative correlation between the regional separation rate and the odds of long-term unemployment became weaker. It is expected that if the recession becomes deeper, increases in the regional separation rate will increase the odds of long-term unemployment. On the other hand, the regional job-finding rate reveals that that there are not significant developments in the labor demand side to change the structure of the unemployment.

Finally, we restrict our sample only to the unemployed individuals who have previous work experience and re-estimate the model. The results are reported at table 3. All variables are statistically significant at 1% significance level and the findings are similar to those obtained for the total sample. Moreover, we extend the second model with the inclusion of two categories of dummies: the industry of previous employment and the reason for being unemployed. The results are reported at table 4. Evidence suggests that industry has a remarkable effect on the odds of long-term unemployment. During the crisis period only those who had last worked in "Agriculture-Forestry-Fishing" industry had greater odds of being long-term unemployed compared to those who worked in "Manufacturing and Construction" industry. In contrast, those who last worked in "Education-Human health-Social work

activities" or in "Trade-Accommodation-Food" industry are less likely to become long-term unemployed in the crisis years.

Lastly, concerning the reason for unemployment, evidence suggests that in the pre-crisis period, people who lost their jobs (were laid-off or their contract ended) or resigned had lower odds of being long-term unemployed compared to those who stopped their job for other reasons. In contrast, during the crisis period, the odds of an individual being long-term unemployed are 32% higher for people who resigned. Thus, voluntary separation during the crisis period leads to longer unemployment periods.

5. Conclusions

The present study examines the incidence of the long-term unemployment in Greece. We employ quarterly individual-level data, drawn from the Greek Labour Force Survey for a period of 15 years (1999-2013) and investigate both the trends in long-term unemployment and the structure of the long-term unemployed. Evidence indicates that the upward trend in the unemployment rate has been accompanied by a prolongation of unemployment spells which led the proportion of the long-term unemployment to peak at the extraordinary level of 66.8% in 2013. We have also attempted to identify the determinants of long-term unemployment performing logit regressions to estimate the probability of becoming long-term unemployed with emphasis on the changes occurred during the crisis period. Empirical evidence suggests that females, the elderly, the less educated people, residents in urban areas, individuals without previous experience and individuals who are unemployed because they resigned have a higher probability of being long-term unemployed.

The results of the econometric estimations highlight the necessity of policy interventions in the Greek labour market. Hence, policy-makers should focus on creating conditions for generating employment opportunities for unemployed people Furthermore, government should adopt appropriate policy plans that focus on the most disadvantaged groups such as females, old and less educated.

References

1. Blanchard, O. (2006). 'European unemployment: the evolution of facts and ideas', *Economic Policy*, 21:45, January, 5–59.

2. Dedousopoulos, A., Labrinides M., and Serafetinidis G. (1991). 'Long-term unemployment in Greece', OAED-European Documentation Centre. [In Greek].

3. Kanellopoulos, C. (2011). 'Size and cyclicality of worker flows in Greece', in S. Balfoussias, P. Hatzipanayotou, and C. Kanellopoulos (eds) *Essays in Economics: Applied Studies on the Greek Economy*. Athens: Centre of Planning and Economic Research, 259-283.

4. Kostaki, A., and Ioakimoglou E. (1998). 'Demographic factors affecting long-term unemployment in Greece', *Proceedings of the International Labour Market Conference*, University of Aberdeen, Aberdeen.

5. Livanos, I. (2007). 'The incidence of long term unemployment: Evidence from Greece', *Applied Economics Letters*, 14, 405–408.

6. Mitrakos, T., and Nicolitsas D. (2006). 'Long-term unemployment in Greece: Developments, Incidence and Composition', *Economic bulletin*, 27, July, Athens: Bank of Greece.

7. Obben, J., Engelbrecht, H. J., and Thompson V. W. (2002). 'A logit model of the incidence of long-term unemployment', *Applied Economics Letters*, 9:1, pages 43-46.

8. OECD database (http://stats.oecd.org/), Dataset: LFS - Unemployment by Duration (Dataset Level Metadata DUR_I).

9. Taşçı, H. M. and Özdemir A.R. (2005). 'Trends in Long-Term Unemployment and Determinants of Incidence of Long-Term Unemployment in Turkey', *Journal of Economic and Social Research,* 7:2, 1-33.

10. Tsouma, E. (2014). 'Dating business cycle turning points: the Greek economy during 1970-2012 and the recent recession', *OECD Journal: Journal of Business Cycle Measurement and Analysis*, 1-24.

11. Venetis, I., and Salamaliki P. (2015). 'Unit roots and trend breaks in the Greek labor market', *Journal of Economic Studies*, forthcoming.

Figures

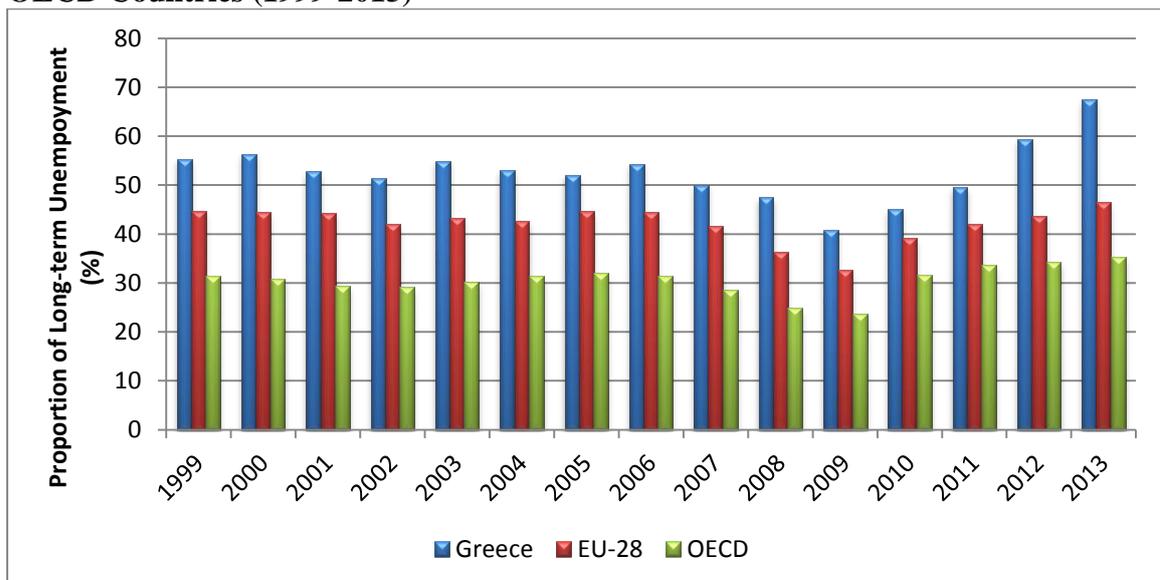**Figure 1. Unemployment and Long-term Unemployment in Greece (1999-2013)**
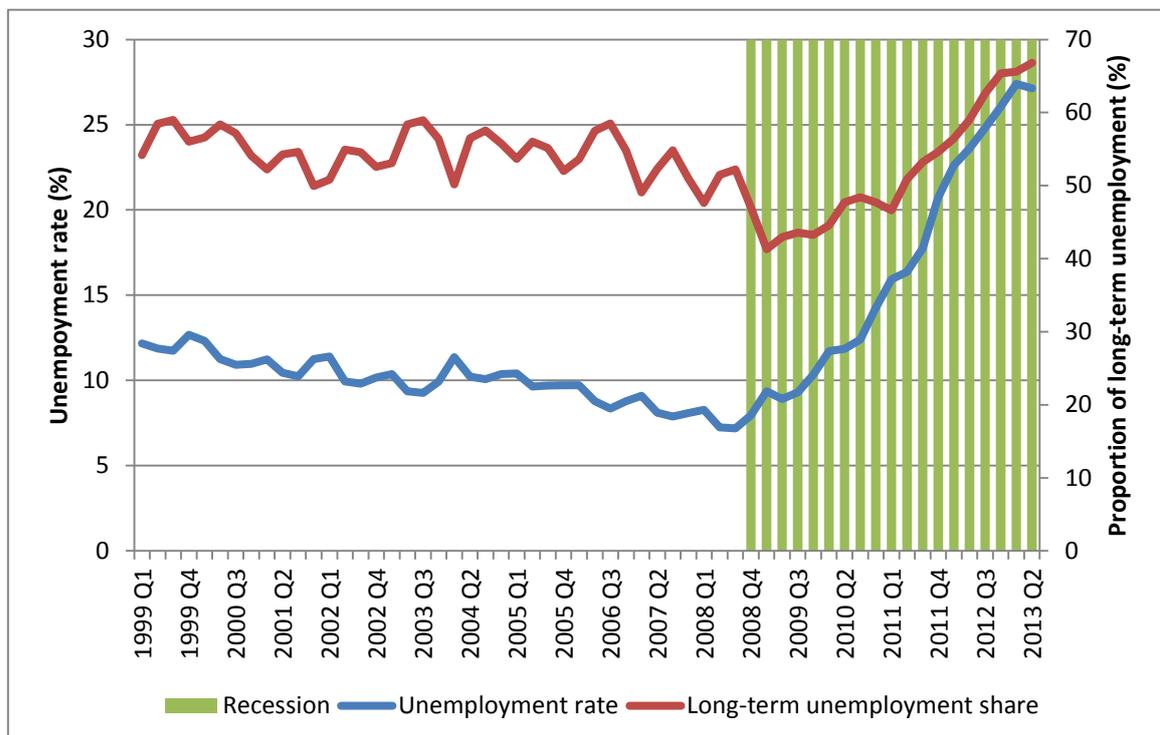
Source: Labour Force Survey (1999Q1-2013Q2). Hellenic Statistical Authority
(EL.STAT).

**Figure 2. Annual Proportion of Long-term unemployment in Greece, EU-28 and
OECD Countries (1999-2013)**

Source: OECD (http://stats.oecd.org/), Dataset: LFS - Unemployment by Duration (Dataset
Level Metadata DUR_I)

Tables

Table 1. Characteristics of the Short-term and the Long-term Unemployed				
	Long-term Unemployed		**Short-term Unemployed**	
	Pre-crisis period (1999Q1-2008Q3)	**During-crisis period (2008Q4-2013Q2)**	**Pre-crisis period (1999Q1-2008Q3)**	**During-crisis period (2008Q4-2013Q2)**
Gender				
Females	66.22	54.34	55.46	48.32
Males	33.78	45.66	44.54	51.68
Age				
15_24	23.14	12.44	30.53	19.89
25_34	38.88	35.54	36.11	34.88
35_44	21.33	26.18	18.83	24.03
45_54	12.08	18.48	10.57	16.02
Above55	4.58	7.36	3.95	5.18
Marital status				
Single	54.62	50.54	56.47	51.37
Married	39.85	42.81	38.74	43.67
Widowed/Separated	5.53	6.65	4.79	4.96
Education				
Tertiary	15.92	21.15	17.54	21.85
Post-secondary	12.53	12.85	13.06	12.28
Secondary	51.85	49	49.55	50.33
Primary	19.71	17	19.85	15.54
Nationality				
Greek	96.11	90.95	93.26	85.83
Foreign	3.89	9.05	6.74	14.17
Regions				
East Macedonia & Thraki	5.94	5.91	5.8	4.83
Central Macedonia	18.09	19.44	18.18	16.42
West Macedonia	4.64	3.23	2.94	2.92
Ipeiros	4.03	3.26	2.63	2.94
Thessaly	7.72	5.88	6.14	6.47
Ionion islands	0.97	0.98	3.31	2.67
West Greece	7.55	7.05	5.56	5.71
East & Sterea Greece	6.49	5.56	4.92	4.73
Attiki	34.35	37.48	33.86	38.18
Peloponnesus	4.99	4.9	4.42	3.51
South & North aegean	2.4	2.41	6.45	5.17
Crete	2.83	3.91	5.81	6.44
Urbanization				
Urban	73.05	72.19	69.83	70.73
Rural	15.32	15.47	17.28	16.43
Semiurban	11.62	12.34	12.89	12.84
Previous Employment Experience	50.29	71.13	69.2	80.94
Observations	69,698	47,238	57,478	39,931
Source: Labour Force Survey (1999Q1-2013Q2). Hellenic Statistical Authority (EL.STAT) Notes: Individuals aged 15-74. Figures are weighted averages multiplied by 100 to represent percentages.				

Table 2: Results of Logistic Regression , Long-term Unemployment (total sample)		
	Pre-crisis period (1999Q1-2008Q3)	**During-crisis period (2008Q4-2013Q2)**
Independent variables	**Odds Ratio**	**Odds Ratio**
Gender		
Female	1.558 (0.002)[a]	1.328 (0.002)[a]
Age		
15_24	0.276 (0.001)[a]	0.272 (0.001)[a]
25_34	0.723 (0.001)[a]	0.743 (0.001)[a]
45_54	1.191 (0.002)[a]	1.104 (0.002)[a]
Above55	1.434 (0.004)[a]	1.440 (0.004)[a]
Marital status		
Single	1.180 (0.002)[a]	1.313 (0.002)[a]
Widowed/Separated	0.942 (0.002)[a]	1.208 (0.003)[a]
Education		
Tertiary	0.667 (0.001)[a]	0.669 (0.001)[a]
Post-secondary	0.952 (0.002)[a]	0.937 (0.002)[a]
Secondary	1.115 (0.002)[a]	0.905 (0.001)[a]
Nationality		
Foreign	0.536 (0.001)[a]	0.647 (0.001)[a]
Regions		
East Macedonia & Thraki	1.051 (0.002)[a]	1.230 (0.003)[a]
Central Macedonia	1.012 (0.002)[a]	1.125 (0.002)[a]
West Macedonia	1.743 (0.005)[a]	1.042 (0.004)[a]
Ipeiros	1.151 (0.004)[a]	0.955 (0.003)[a]
Thessaly	1.114 (0.002)[a]	0.807 (0.002)[a]
Ionion islands	0.300 (0.001)[a]	0.322 (0.002)[a]
West Greece	1.047 (0.003)[a]	1.107 (0.003)[a]
East & Sterea Greece	1.196 (0.003)[a]	1.115 (0.003)[a]
Peloponnesus	0.897 (0.003)[a]	1.203 (0.004)[a]
South & North aegean	0.349 (0.001)[a]	0.421 (0.001)[a]
Crete	0.401 (0.001)[a]	0.585 (0.002)[a]
Urbanization		
Rural	0.814 (0.001)[a]	0.926 (0.002)[a]
Semiurban	0.853 (0.001)[a]	0.930 (0.002)[a]
Previous employment experience	0.284 (0.000)[a]	0.349 (0.001)[a]
Local labor market conditions		
Regional Separation Rate	0.826 (0.001)[a]	0.931 (0.001)[a]
Regional Job-finding Rate	1.005 (0.000)[a]	1.011 (0.000)[a]
Number of obs	127,176	87,169
Pseudo R2	0.0887	0.0748
Log likelihood	-11592794	-10069482

Source: Labour Force Survey. Hellenic Statistical Authority (EL.STAT).
Notes: The reference categories for the independent variables are the following: male, age 35-44, married, Greek, primary education, urban area, Attica. All models include year and quarter dummies. The estimate of the constant term is not reported. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% levels, respectively.

Table 3: Results of Logistic Regression, Long-term Unemployment (for the Unemployed with Previous Employment Experience)

Independent variables	Pre-crisis period (1999Q1-2008Q3) Odds Ratio	During-crisis period (2008Q4-2013Q2) Odds Ratio
Gender		
Female	1.405 (0.002)[a]	1.187 (0.002)[a]
Age		
15_24	0.435 (0.001)[a]	0.436 (0.001)[a]
25_34	0.780 (0.001)[a]	0.800 (0.001)[a]
45_54	1.172 (0.003)[a]	1.101 (0.002)[a]
Above55	1.395 (0.004)[a]	1.383 (0.004)[a]
Marital status		
Single	1.099 (0.002)[a]	1.302 (0.002)[a]
Widowed/Separated	0.996 (0.003)[a]	1.241 (0.003)[a]
Education		
Tertiary	0.876 (0.002)[a]	0.809 (0.002)[a]
Post-secondary	1.060 (0.003)[a]	0.964 (0.002)[a]
Secondary	1.173 (0.002)[a]	0.954 (0.002)[a]
Nationality		
Foreign	0.509 (0.002)[a]	0.594 (0.001)[a]
Regions		
East Macedonia & Thraki	0.890 (0.003)[a]	1.150 (0.004)[a]
Central Macedonia	0.957 (0.002)[a]	1.064 (0.002)[a]
West Macedonia	1.707 (0.007)[a]	0.784 (0.003)[a]
Ipeiros	0.877 (0.004)[a]	0.743 (0.003)[a]
Thessaly	0.942 (0.003)[a]	0.701 (0.002)[a]
Ionion islands	0.158 (0.001)[a]	0.269 (0.002)[a]
West Greece	0.888 (0.003)[a]	1.005 (0.003)
East & Sterea Greece	0.941 (0.003)[a]	1.075 (0.004)[a]
Peloponnesus	0.728 (0.003)[a]	1.081 (0.004)[a]
South & North aegean	0.214 (0.001)[a]	0.324 (0.001)[a]
Crete	0.276 (0.001)[a]	0.491 (0.002)[a]
Urbanization		
Rural	0.670 (0.002)[a]	0.866 (0.002)[a]
Semiurban	0.824 (0.002)[a]	0.898 (0.002)[a]
Local labor market conditions		
Regional Separation Rate	0.773 (0.001)[a]	0.925 (0.001)[a]
Regional Job-finding Rate	1.006 (0.000)[a]	1.018 (0.000)[a]
Number of obs	66,599	60,136
LR chi2	797613,54	973888,73
Prob>chi2	0	0
Pseudo R2	0,0595	0,063
Log likelihood	-6305322,3	-7241646,4

Source: Labour Force Survey. Hellenic Statistical Authority (EL.STAT).
Notes: The reference categories for the independent variables are the following: male, age 35-44, married, Greek, primary education, urban area, Attiki. All models include year and quarter dummies. The estimate of the constant term is not reported. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% levels, respectively.

Table 4: Results of Logistic Regression, Long-term Unemployment (for the Unemployed who denote Industry of Previous Employment)

Independent variables	Pre-crisis period (1999Q1-2008Q3) Odds Ratio	During-crisis period (2008Q4-2013Q2) Odds Ratio
Gender		
Female	1.408 (0.002) [a]	1.230 (0.002) [a]
Age		
15_24	0.436 (0.001) [a]	0.438 (0.001) [a]
25_34	0.779 (0.001) [a]	0.791 (0.001) [a]
45_54	1.162 (0.003) [a]	1.094 (0.002) [a]
Above55	1.392 (0.004) [a]	1.344 (0.004) [a]
Marital status		
Single	1.154 (0.002) [a]	1.361 (0.002) [a]
Widowed/Separated	1.006 (0.003) [b]	1.242 (0.003) [a]
Education		
Tertiary	0.843 (0.002) [a]	0.831 (0.002) [a]
Post-secondary	1.045 (0.003) [a]	0.947 (0.002) [a]
Secondary	1.138 (0.002) [a]	0.948 (0.002) [a]
Nationality		
Foreign	0.499 (0.002) [a]	0.584 (0.001) [a]
Regions		
East Macedonia & Thraki	0.906 (0.003) [a]	1.166 (0.004) [a]
Central Macedonia	0.957 (0.002) [a]	1.072 (0.002) [a]
West Macedonia	1.779 (0.008) [a]	0.859 (0.004) [a]
Ipeiros	0.907 (0.004) [a]	0.767 (0.003) [a]
Thessaly	0.960 (0.003) [a]	0.723 (0.002) [a]
Ionion islands	0.196 (0.001) [a]	0.330 (0.002) [a]
West Greece	0.891 (0.003) [a]	1.056 (0.003) [a]
East & Sterea Greece	0.985 (0.003) [a]	1.073 (0.004) [a]
Peloponnesus	0.779 (0.003) [a]	1.159 (0.005) [a]
South & North aegean	0.271 (0.001) [a]	0.385 (0.002) [a]
Crete	0.336 (0.001) [a]	0.549 (0.002) [a]
Urbanization		
Rural	0.711 (0.002) [a]	0.894 (0.002) [a]
Semiurban	0.861 (0.002) [a]	0.925 (0.002) [a]
Local labor market conditions		
Regional Separation rate	0.780 (0.001) [a]	0.924 (0.001) [a]
Regional Job-finding rate	1.003 (0.000) [a]	1.014 (0.000) [a]
Industry of previous employment		
Agriculture; Forestry; Fishing	0.883 (0.004) [a]	1.121 (0.005) [a]
Electricity, Water supply, Public Administration, Social Security	1.096 (0.003) [a]	1.006 (0.003) [b]
Transportation; Communication; Entertainment	0.843 (0.002) [a]	0.819 (0.001) [a]
Financial-Insurance, Real Estate, Administrative & Other Services	0.891 (0.002) [a]	0.998 (0.002) [a]
Professional, Scientific, Technical Activities	1.010 (0.003) [a]	1.036 (0.003)
Education; Human health; Social work Activities	1.105 (0.004) [a]	0.855 (0.003) [a]
Craft & related trade workers; Accommodation-Food	1.083 (0.003) [a]	0.939 (0.003) [a]

Reason for Unemployment		
Lay-off	0.662 (0.001) [a]	0.822 (0.002) [a]
Contract termination	0.430 (0.001) [a]	0.560 (0.001) [a]
Resignation	0.879 (0.002) [a]	1.321 (0.005) [a]
Number of obs	66,599	60,136
LR chi2	1020201,11	1112430,59
Prob>chi2	0	0
Pseudo R2	0.0761	0.0720
Log likelihood	-6194028,5	-7172375,5

Source: Labour Force Survey. Hellenic Statistical Authority (EL.STAT).

Notes: The reference categories for the independent variables are the following: male, age 35-44, married, Greek, primary education, Attica, urban area, Manufacturing, Mining and Quarrying, Construction. All models include year and quarter dummies. The estimate of the constant term is not reported. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% levels, respectively.