The incidence of long-term unemployment: evidence from Greece

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Abstract

In this paper we use the 2000-2004 data from the Greek Labour Force Survey in order to estimate a logit model for the incidence of long-term unemployment. The model computed is similar to the one estimated by Obben et al. (2002). It is found that attributes of the individual such as gender, age category, marital status and region of residence affect the odds of being long-term unemployed. On the other hand, the level of someone's qualification does not affect the odds of whether he/she will be short or long-term unemployed.

Introduction

Until 1974 Greece was one of the fastest growing economies in the world and the reported levels of unemployment were considerably low. After the first oil crisis the rate of growth decreased and simultaneously unemployment elevated very fast. In the beginning of 1990, unemployment increased further to the European average and the situation remains the same today. In 2003 long-term unemployment in Greece was the highest (5.1%) in Europe of the 15 member states (3.3%) and among the highest in the enlarged Europe (4.0%) (EuropeanCommission 2004).

So far, to the best of our knowledge, no previous studies have examined the incidence of long-term employment in Greece. Data from the Greek Labour Force Survey (LFS) enable us to seek explanation of the long-term unemployment in some detail.

Data used

The analysis draws micro data from the Labour Force Survey, for the second (spring) term of the years 2000-2004. The Greek LFS is conducted by the National Statistical Service of Greece (ESYE). Since 1998, the LFS is being conducted four times per year in order to meet the standards set by Eurostat. The questionnaire used is comprised of approximately 100 questions and both the questions and the definitions used are based on the European LFS (see European Communities 2003). Long- unemployed are considered those individuals that are unemployed for 12 or more months while long-term unemployment is calculated as a share of active persons in the labour market.

The sample of the survey is 30.000 households and includes 80.000 observations approximately. For the purposes of the analysis only the observations that classify the individual as unemployed are used. The total number of observations for the five years of the analysis is 16,151. The question that asks the individual for how long has he/she been looking for a job was transformed to a binomial variable that classifies an individual as long-term unemployed (positive outcome), when the period 12 or more months, or short-term unemployed (negative outcome) when the time in unemployment is less that a year. Six individual level attributes are set as independent variables. These are: sex, marital status, age group, region of residence, level of highest qualification, subject studied and year of graduation.

Econometric Specification

In order to carry out the analysis, it will be assumed that the available data informs us of only whether individual observations are in one category (long-term unemployed) or in a second category (short-term unemployed). Therefore, the dependent variable is a dummy variable which takes the value 1 if an individual is long-term unemployed, and the value 0 if an individual is short-term unemployed.

The logit model assumes that Z_i is a logistic random variable. Therefore, the probability that an individual will be long-term unemployed given her/his attributes can be computed from the logistic cumulative distribution function (cdf) evaluated at Z_i:

$$P_i = F(Z_i) = 1 / (1+ e^{-z_i}) \quad (1)$$

where P_i is the probability that individual i is long-term unemployed, F(.) is the logistic cdf evaluated at a specific value. Z_i ranges from -4 to +4 as P_i goes from 0 to 1, and when $Z_i=0$, $P_i=0.5$.

From equation (1), we get

$$P_i (1+ e^{-z_i}) = 1$$

$$1+ e^{-z_i} = 1/ P_i$$

$$e^{-z_i} = (1 - P_i) / P_i$$

$$e^{z_i} = P_i / (1 - P_i) \quad (2)$$

$$Z_i = \text{Ln} [P_i / (1 - P_i)] =.$$

$$\text{Ln} [P_i / (1 - P_i)] = \alpha + X_{i1} \beta_1 + X_{i2} \beta_2 + X_{i3} \beta_3 + X_{i4} \beta_4 + X_{i5} \beta_5 + X_{i6} \beta_6 + \varepsilon_i \quad (3)$$

where X_{i1} denotes gender, X_{i2} denotes marital status, X_{i3} age group, X_{i4} denotes region and X_{i5} level of qualification.

The dependent variable in the logit model is the log of the odds that an individual will be long-term unemployed. The regression coefficients are

estimated using the maximum likelihood method. A given slope coefficient shows how the log of the odds changes as the corresponding explanatory variable changes by one unit, or as an attribute different from that of the base category changes for nominal variables.

When the regression coefficients are exponentiated, the derived values (or antilogs) indicate the effect of each explanatory variable directly on the odds of being unemployed rather than on the log of odds. In order to calculate the percentage changes in the odds that corresponds to one unit change in explanatory variables, 1 must be subtracted from the antilogs and the results must be multiplied by 100 (Gujarati 1999).

The probability that an individual i will be long-term unemployed can be estimated from the antilogs of both sides of equation (3):

$$P_i /(1-P_i) = e^{L_i}$$

$$P_i = (1-P_i)\, e^{L_i}$$

$$P_i = e^{L_i} / (1 + e^{L_i})$$

Where L_i is the estimated value of the response variable from the regression for individual ***i***.

Empirical results

The results of the econometric analysis are reported in Table 1. The coefficients are computed using the maximum likelihood estimation (MLE). The goodness-of-fit test (model chi-square) suggests that the model is appropriate (chi2=0.000) and the results of the model are quite robust as many of the coefficients are significant at the 1% level.

The odds ratio is presented in column 1 of Table 1. The odds ratio is a measure of association for two variables. The odds ratio is one odds of an event happening divided by the odds of another for the second variable. For example, the odds of being long-term unemployed is calculated as follows for the gender variable: The odds being long-term unemployed for a female individual is A, and the odds of being short term unemployed for a male individual is B (1-A). The odds ratio is calculated by dividing the odds of being long-term unemployed for a female by the odds of being long-term unemployed for a male. In particular, the odds ratio 1.67742 of for Female (from Table 1) means that the odds of a female individual being long-term unemployed is 1.67742 times grater than the odds of a male individual being long-term unemployed. An odds ratio above 1.0 means that the odds of being long-term unemployed for a given category are grater than for the reference category and similarly an odds ratio below 1.0 means that the odds of being long-term unemployed for a given category are less than the reference category. The closer the odds ratio is to 1.0, the more independent is the dependent variable of the explanatory variables.

The marital status of the individual is found to affect the incidence of long-term unemployment. In particular, the odds for being long-term unemployed for single individual are 1.40 times grater when comparing with married ones. On the other hand whether someone is divorced of widow does not effect the type of unemployment.

The age group is another factor that determines the odds of being short or long-term unemployed in Greece. As it seen from column 1 in Table 1 individuals in the age group 15-24 have lover odds (.58) of being long-term unemployed when comparing with age group 25-34. On the other hand, the odds of being long-term unemployed increase as an individual moves up to age-group. It seems that the older someone is the grater are the odds of being long-term unemployed.

The region of residence of the individual is found to effect the time that an individual remains in unemployment. In particular, in most cases, residents of regions outside Athens are found to have greater odds of being long-term unemployed than residents of Athens. On the other hand, for some regions such as South Aegean, Crete and Salonica the odds of being long-term unemployed are lower when comparing with Athens (.19, .58 and .84 respectively).

Moreover, it is found that the level of someone's qualification does not affect the odds of being short or long-term unemployed. As it can be seen from Table 1, only individuals with secondary education have higher odds of being long term unemployed than individuals with University degrees. On the other hand, whether someone has a degree such as PhD, Masters, Technical University, IEK

etc. does not influence the incidence of short or long-tem unemployment. Finally, the year of graduation has only limited influence on the type of unemployment as it was found that as time increases by one unit the odds of being long-term unemployed increase by 1.029 times.

Conclusion

In this paper we estimated a logit model for the incidence of long-term unemployment in Greece using the 2000-2004 Labour Force Survey data. It was found that personal attributes of the individual such as age category, gender, marital status and region of residence influence the odds of being short or long-term unemployed. In particular, the odds are higher for females than for males, for single than for married individuals and (in most cases) for residents of regions outside Athens. On the other hand, the incidence of short or long-term unemployment is not affected by the level of qualification that somebody holds. Therefore, whether someone has a University degree does not affect the odds of him/her being short or long-term unemployed.

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Table 1 Logit regression results, 2000-2004
Greek LFS data (second term)

Explanatory variables		**(1) Odds Ratios**	**(2) z-ratios[#]**
Gender	Female	1.67	14.46(***)
	Male	§	
Marital Status	Single	1.40	7.68(***)
	Married	§	
	Widow	.82	-1.34
	Devorced	1.09	0.98
Age Group	15-24	.58	-11.72(***)
	25-34	§	
	35-44	1.21	3.82(***)
	45-54	1.23	3.38(***)
	55+	1.56	4.85(***)
Region	Eastern Macedonia	.91	-1.16
	Central Macedonia	1.05	0.73
	Western Macedonia	1.60	5.69(***)
	Ipeiros	1.56	5.88(***)
	Thessaly	1.43	4.75(***)
	Ionian Islands	.38	-6.76(***)
	Western Greece	1.52	5.72(***)
	Sterea Ellada	1.54	5.72(***)
	Rest of Attica	.98	-0.23
	Peloponnisos	1.13	1.58
	North Aegian	.86	-1.14
	South Aegian	.19	-13.77(***)
	Crete	.58	-6.16(***)
	Athens	§	
	Salonica	.84	-2.83(***)
Level of qualification	PhD	.85	-0.33
	Masters	.82	-0.70
	University degree	§	
	Technical University degree	1.00	0.01
	IEK/Colleges	1.05	0.75
	Other qualificatin	1.11	0.33
	Secondary education	1.20	3.54 (***)
	Primary education	1.06	0.92
Year		1.02	2.51(**)

Percentage changes in the odds of being unemployed

§ Indicates the ommited dummy variable

*** Statistically significant at the 1% level

** Statistically significant at the 2% level

Log likelihood =-10571.897 , Prob > chi2=0,000, Pseudo R2 =0.0438, No. of obs.:16151