The wage – local unemployment relationship in a highly regulated labour market: Greece

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Abstract

Using data obtained from 80,000 employees, this paper examines the relationship between individual wages and regional unemployment in Greece. The findings highlight the dynamics of the local labour markets in a case such as Greece, where the OECD claims that wage flexibility is limited. This study does not find evidence that wages in Greece are rigid, but finds a wage curve elasticity of close to -0.1, which corresponds to evidence from many counties. Interestingly, graduates are found to be the most responsive group of workers to the behaviour of local labour markets.

1. Introduction

> *'There is a scope for Greece to … [enhance] the flexibility of the wage setting system.…Wage flexibility is limited in Greece…Greater flexibility … could bring about lower unemployment'* (OECD, 2005, p. 104).

Until 1974, Greece was one of the fastest growing economies in the world and the reported levels of unemployment were low. After the first oil crisis, the rate of economic growth decreased, and simultaneously, unemployment rose very fast. In the beginning of the 1990s, unemployment increased further, to the European average. The situation remains the same today, and Greece has one of the highest rates of unemployment in Europe. For instance, in 2005, the rate of unemployment in Greece was 9.8% , compared to 8.7% of EU25 (EUROPEAN COMMISSION, 2006).

One of the most distinctive characteristics of the Greek economy is the strong persistence of regional differences, since divergence of regions is much stronger than other peripheral areas of Europe, such as Spain and Portugal. Nevertheless, research on the convergence hypothesis provides mixed results. A body of evidence (SIRIOPOULOS and ASTERIOU, 1998; TSIONAS, 2002) suggests lack of income convergence among Greek regions, and the existence of economic dualism between southern and northern regions. On the other hand, a study by MICHELIS et al., 2004, does not reject the idea of regional convergence. Regarding unemployment, its rates vary greatly across regions within the country. The implications of regional variation of unemployment for the Greek economy are significant as Greece has the highest percentage (73%) of the labour force living in regions with an unemployment rate above the national average amongst OECD countries (OECD, 2005). All the above,

suggest strong regional differences in the Greek economy. These differences, apart from problems of immigration and other sociological and historical explanations, have also been attributed to ineffective planning, which is mainly an outcome of lack of previous experience in comparison to rich countries (SIRIOPOULOS and ASTERIOU, 1998).

Regarding wage flexibility, it is well-argued that it is quite limited, while it is also suggested that these low levels are partly held responsible for the high unemployment rates. For instance, a study by BABETSKII, 2005, found that during the period 2000-2004 wage flexibility in Greece experienced a decrease, and the wage elasticity to unemployment changed from being negative for the period 1995-1999 to being insignificant for 2000-2004. Similarly, a study by MILAS, 1999, using aggregate time-series data, suggests that there is narrow employment and wage inflexibility in the Greek labour market. Finally, CLAR et al., 2007, studying real wage flexibility in a large number of countries, classify wage flexibility in Greece as intermediate.

This study adds to the existing wage curve literature in several ways. First, no attempt has been made before to estimate a wage curve for Greece. Greece is an interesting case because it is a small economy with one of the highest rates of unemployment in Europe, high labour costs and strong regulation in the labour market. Second, since wage flexibility is suggested as being limited, the existence of a wage curve is debatable. Third, contrary to many of the countries that BLANCHFLOWER and OSWALD, 1994, examined, unemployment in Greece varies substantially according to region[i], and it therefore provides a promising case for studying wage flexibility. For instance, since unemployment varies considerably across regions, this paper estimates

a separate wage curve for two types of region; regions with low unemployment, less than 10%, and regions with a high level of unemployment, 10% or more. This enables us to assess which regions are more responsive to an increase in unemployment. Fourth, we question whether a wage curve exists in the longer run, by examining the relationship between time-averaged wages and unemployment rates.

2. Regional unemployment differentials

The phenomenon of regional differences in unemployment has attracted substantial attention in the literature. MYRDAL, 1957, suggested that regional disparities tend to increase as leading regions exploit initial advantage (i.e. economies of scale, innovation, technology), and become self-sustaining and self-reinforcing, so that the initial advantage increases over time. Regional disparities were also explained by MARSTON, 1985, who adopted two different approaches. The first suggests that this may be the result of an equilibrium situation, in which each region moves towards its 'natural' unemployment rate, as determined by a particular composition of amenities and endowments. The second approach refers to the heterogeneous distribution of rates of unemployment across regions, an outcome of a disequilibrium situation that is rigidities in the labour market act as barrier to achieving an equilibrium path. The rigidities that are usually seen as accounting for the uneven distribution of unemployment rates are wage flexibility and the high cost of migrations. Moreover, ELHORST, 2003, concludes than the main determinants of regional unemployment rates are a combination of labour supply, labour demand and wage settings factors.

Nevertheless, over the last two decades the main focus of study has been on wage flexibility. PHILLIPS, 1958, explored the hypothesis that pay is inversely related to

the unemployment rate. This relationship, known as the Philips Curve, has become part of standard macroeconomics. HARRIS and TODARO, 1970, argued that in order for a typical worker to accept a job in an industry that experiences high unemployment, he/she needs to be paid well, otherwise the worker will find it too risky to stay in this area. BLANCHFLOWER and OSWALD, 1990, found that an inverse relationship exists between the real wage, paid to the employees, and the rate of unemployment in a local labour market. They suggested that the unemployment elasticity of pay is -0.1. BLANCHFLOWER and OSWALD, ibid, named this relationship 'the Wage Curve'.

3. Regional unemployment and the elasticity of pay (wage curve)

> "it is clear that the wage curve has prompted a wave of fascinating research on local labour market" (NIJKAMP and POOT, 2005).

Over the last two decades, there has been extensive research on the responsiveness of individuals' wages to the changing conditions within the local labour market. BLANCHFLOWER and OSWALD, 1990, examined micro-level US and British data and found that an inverse relationship exists between real wages paid to employees and the rate of unemployment in a local labour market. They suggested that the unemployment elasticity of pay is -0.1. This implies that a 10% rise in the regional unemployment rate will lead to approximately a 1% wage decline, *ceteris paribus*. BLANCHFLOWER and OSWALD, 1994, replicated this research in 12 countries[ii], and concluded that this relationship is an empirical law of economics.

BLANCHFLOWER and OSWALD, 1994, suggest three possible explanations for the wage curve. These could be supported by; a labour contract model, an efficiency wage model of a bargaining model. The labour contract model (AZARIADIS, 1975, and BAILY, 1974) assumes that regions differ in amenity values, but have the same 'outside option' (i.e. reservation wages or the unemployment benefits). Firms and workers agree on a state-contingent wage level and a state-contingent employment level. Regions with attractive amenities will be close together at outcomes characterized by low long-run wages with high long-run unemployment. A union bargaining model, derived from a contribution by DE MENIL, 1971, generates a wage equation of the form $w = \alpha + s\,\pi/v$, where w is the negotiated wage available to union workers, α is the expected 'alternative' wage in the non-union sector, π/v, is the level of profits per worker and s is a relative bargaining power parameter. An increasing rate of unemployment will cause α to decrease, resulting in the existence of a wage curve. The third wage curve theory builds on the efficiency wage model of SHAPIRO and STIGLITZ, 1984. Employers, who can monitor workers' productivity, will offer a compensation that will discourage workers from evading work. Because the expected penalty for the evasion of work is greater in cases where it is harder to find a job, firms can offer a lower wage premium during times of high unemployment. In contrast to the efficiency wage model, CAMPBELL and ORSZAG, 1998, explain the wage curve by suggesting that companies in regions with low unemployment economize on costs associated with hiring new employees by paying higher wages so as to discourage existing workers from quitting.

The robustness of this relationship, subsequent to the publication of BLANCHFLOWER and OSWALD, 1994, has been confirmed by studies in many

other countries[iii]. An important finding in the wage curve literature is that the unemployment elasticity of pay varies across diverse groups of individuals. In particular, CARD, 1995, finds that elasticity is higher for young rather than old people, for males than for females, for lower educated rather than higher educated, for private sector employees rather than public and for non-union members rather than union members.

Nevertheless, despite the fact that it is generally acknowledged that the wage curve is a "robust empirical phenomenon" (NIJKAMP and POOT, 2005), some doubts persist regarding its subsistence. In particular, there are some cases where a relationship has not been found to exist. For instance, ALBAEK et al., 1999, did not find a stable negative relationship between wages and unemployment in the Nordic labour markets. In addition, LUCIFORA and ORIGO, 1999, did not find a wage curve for Italy. Also, PARDRIDGE and RICKMAN, 1997, found the existence of an upward sloping curve. In addition, a number of academics (see CARD, 1995; CARD and HYSLOP, 1997) argue that the wage curve may be a result of the misspecification of regression analysis, and actually suggest that the wage curve is a misspecified Phillips curve. Indeed, studies by CARD and HYSLOP, 1997, and BLANCHARD and KATZ, 1999, have found support for the variant of the Phillips curve, rather than the wage curve. Moreover, some evidence (HALL, 1979, 1972, REZA, 1978, PAPPS, 2001, BEL et al. 2002, MORRISON et al., 2006) suggests that long-term wages and the long-term unemployment rates are positively related. For instance, a recent paper by MORRISSON et al. provided a theoretical framework suggesting that while the wage curve might exist in the short-term a positive relationship between wages and

unemployment will be seen in the longer-term, along the lines of HARRIS and TODARO, 1970.

4. Regional unemployment in Greece

The large regional unemployment disparities are one of the most striking features of the Greek labour market. In fact, a study by PUGA, 2002, classifies Greece as falling within the group of countries with the largest regional disparities in Europe.

Table 1 presents the average regional unemployment rate for the period 1998-2006. As can be seen, differences in regional unemployment are quite large. To illustrate this point, Western Macedonia has an unemployment rate (15.2%) of around two and half times higher than Crete (6.4%). In general, unemployment is concentrated mainly in northern and central regions. On the other hand, southern regions of Greece seem to be less affected by unemployment. The high rates of unemployment in Northern and Central Greece can be attributed to the contraction of the manufacturing and agriculture sectors. Regarding manufacturing, the pressures of international trade and the attractiveness of the low paid workforce in countries of Eastern Europe have led many industrial units, operating mainly in regions of Northern Greece and Sterea Ellada, either closing down or moving elsewhere. This, together with the shrinkage of the agricultural sector, which has traditionally been a large part of the Greek economy, has resulted in a rise in the rate of unemployment in these particular regions over the last twenty years. Regarding Southern Greece and Ionian Islands, the levels of unemployment have remained at low levels, as these regions rely heavily on tourism, which remains at high levels, while they have experienced high levels of economic growth over the last decades. The large differences in unemployment

between northern and southern regions support the notion of economic dualism, as discussed in the introduction.

[Table 1 HERE]

Figures 1, 2, 3, 4, and 5 present some of the structural characteristics of the 13 regions. Figure 1 illustrates the distribution of population according to status of economic activity. It is interesting to observe that the regions that suffer from high levels of unemployment, such as Western Macedonia, Ipeiros, and Sterea Ellada, have the highest level of economic inactivity. This may be attributed to the nature of these economies and the fact that they are heavily based on agriculture and manufacturing (see Figure 2), which are declining sectors. On the contrary, regions where the level of unemployment is lower, such as Crete and Ionian Islands, have a very strong service sector. Regarding level of education (Figure 3) we observe that high levels of tertiary education are generally related to lower levels of unemployment. On the other hand, regions with high levels of unemployment (e.g. Western Macedonia and Sterea Ellada), have low levels of tertiary education. Figure 4 shows how the regional workforce is distributed across self-employed, family workers, and wage earners. A key observation of Figure 4 is that regions (excluding the urban regions, i.e. Attica and Central Macedonia) where the sum of self-employed and family workers is low (i.e. Western Macedonia, Ipeiros, and Sterea Ellada), the rates of unemployment are particularly high. In other words, regions in which paid employment (wage earners) is higher seem to suffer from the highest levels of unemployment. This is indicative of the structures of trends within the Greek economy, where the role of self-employment and small family businesses is central, and is often seen as safety net against unemployment. Figure 5 illustrates the shares of public and private employment across regions. The share of public sector employment generally seems to be around

20% across regions, and no particular patterns can be observed. Other aspects of the local labour markets that would enable us to investigate regional unemployment further, such as unionisation rates and wage bargaining, are not captured by the LFS questionnaire, or other widely available sources. In addition, an interesting study would be to examine how workers' mobility is related to levels of unemployment. However, this is not possible, since the variable that captures the responses of commuting patterns across the regions of Greece was omitted from the LFS data.

[Figures 1,2,3,4,5 HERE]

Figure 6 illustrates how the incidence of unemployment and long-term unemployment varies across regions in Greece, as estimated by the analysis of LIVANOS, 2007, and LIVANOS, FORTHCOMING. As Figure 6 suggests, whether an individual is employed or unemployed, short or long term-unemployment is affected greatly by the region in which he/she resides. The vertical axis shows the chances of someone being unemployed/long-term unemployed, as compared with residents of Athens (which in the analysis of Livanos is set as reference category). Where the value of the vertical axis is more than 1, this suggests that an individual has a higher chance of being unemployed/long-term unemployed, when compared with residents of Athens and *visa versa*. In general, residents of southern regions of Greece (e.g. Crete, Ionian Island, North and South Aegean) seem to be better off in the Greek labour market than residents of northern and central regions (e.g. Western Macedonia, Central Macedonia, Ipeiros, Thessaly), as they have a better chance of being employed (than unemployed) and short-term (than long-term) unemployed.

[Figure 6 HERE]

A possible explanation for these significant disparities across Greek regions could be the low levels of labour mobility. OSWALD, 1999, argues that the rate of

unemployment of an economy depends on the ease with which its citizens can move around in order to find employment. MORRISON et al, 2006, found, in fact, that groups of workers that experience low geographical mobility (e.g. older workers, those with lower education) are fairly responsive to changes in the local employment rate. The same study suggests that an attempt to reduce the vulnerability of these workers will require increases in the geographical mobility of these workers.

Greece has experienced three big influxes of population into Athens during the 1920s and 1950s, and into Athens and Thessalonica during 1980s. This created a very uneven distribution of both Greek industry (almost 60% of industrial employment and establishments are situated in these two urban cities) and the Greek population (almost 40% of the population reside in these cities). However, labour mobility remains at very low levels nowadays, mainly on account of socio-economic reasons. For example, low mobility can be attributed to issues of cultural, as the existing strong bonds with family and birthplace often prevent workers from moving elsewhere in order to find employment. A further explanation of low mobility in Greece is the high levels of home ownership, which in general is found to affect mobility negatively (BARCELO, 2002). Regarding Greece, a study by MULDER, 2006, reports that home ownership is over 75%, one of the highest figures in Europe. Naturally, other reasons for low mobility exist, such as insufficient; transportation system and road infrastructure, all of which prevent commuting for working purposes.

5. Data and methods

The analysis draws on micro data from the Labour Force Survey (LFS). In particular, annual cross-sections for the period 2000-2004 (spring quarter) are used. The Greek LFS is conducted by the National Statistical Service of Greece (ESYE). Since 1998, the LFS is conducted four times per year, in order to meet the standards set by Eurostat. The questionnaire used comprises approximately 100 questions and both its questions and definitions are based on the European LFS (see EUROPEAN COMMUNITIES, 2003). The sample of the survey is 30,000 households, and includes approximately 80,000 observations. Since the LFS is a sample survey, ESYE follows weighting procedures that are accordance with EU guidelines[iv]. The five individual datasets were pooled together into a unique one. For the purposes of our econometric analysis, only those individuals that are classified as wage earners are utilized. The total number of individual cases (employees) examined is approximately 80,000. The inclusion of a wage variable since 2000 makes the estimation of a wage curve for Greece possible. The data on wages refer to net income from main employment. The wage variable in the LFS questionnaire distinguishes 6 income bands for the years 2000, 2001 and 2002, and 8 income bands for 2003 and 2004. For our purposes, the median wage of each band is calculated, and its logarithm is used as the pay variable of the analysis. Regarding the region variable, LFS adopts the 2 level Nomenclature of Territorial Units for Statistics (NUTS), and defines 13 Peripheries of Greece. NUTS 3 level detail, which would increase the variation in the sample, is not available in the Greek LFS micro-data due to the anonymization process of ESYE. As for the unemployment variable the analysis utilizes rates of unemployment for each of the 13 regions. Finally, the weighted population variable, provided by ESYE, is

applied to our analysis, in order to obtain the total population of the labour market variables presented in this paper.

As with BLANCHFLOWER and OSWALD, 1990, the specification of the wage curve used is:

$$\log w_{irt} = \alpha \log U_{rt} + \beta X_{irt} + \delta_r + \gamma_t + \varepsilon_{irt} \quad \text{.....} \quad (1),$$

where w_{irt} is the nominal monthly wage for the individual i observed in region r in period t, U_{rt} is the unemployment rate in region r in period t, δ_r and γ_t are region and time effects and ε_{irt} is the error term. A set of key personal characteristics of the individual i, is included in the specification and is denoted by $X_{irt.}$ The decision about the dummy variables used in the specification was made by judgments based on the literature on the wage curve and the data available in the Greek LFS. The variables chosen include; sector of economic activity, head of household control (HH henceforth), age-group, marital status, type of employer, occupation, and education dummies. The grouping of these variables is heavily based on the one used in the LFS questionnaire. The sector of economic activity variable classifies the individual in the three main sectors of the economy; primary, secondary and tertiary. The position in the household distinguishes between HH and a set of other positions (partner, children, parents, other relatives, and other), which for the purposes of this paper are grouped as non-HH. The age group variable splits the workforce into ten year age bands, and includes all individuals in employment (students included). The use of a quadratic in age, which is a common practice in the wage curve literature, was not possible, since ESYE omits (due to anonymization reasons) the age variable and

replaces it with the age-bands one. Regarding the type of employer, the relevant variable distinguishes between six types of public organization and one type of private organization. This variable has been grouped into two main types; private and public. The occupation variable uses ESYE's 1 digit occupational classification (STEP-92), which is in turn based on the International Standard Classification of Occupations ISCO 88 (COM). Finally, the education variable is based on the International Standard Classification of Education (ISCED 1997) and offers twenty-six categories of education distinguishing by level of education and subject of undergraduate degree. For the purposes of this paper, this variable was grouped to four main levels of education; post-graduate, graduate, other qualifications (colleges, vocational qualifications), and secondary schooling of below.

6. The Greek wage curve

Table 2 summarizes the main results. Row 1 displays the OLS estimates of the wage curve elasticity (β) in equation (1). The rest of the rows in Table 2 report the coefficients on the personal control variables. The results of the estimated model are robust, as all coefficients are statistically significant at the 5% level. The specifications include regional fixed-effects models. An unemployment elasticity of -.15 is found to exist, when regional fixed-effects are allowed for. This suggests that a 10% rise in regional unemployment in Greece will cause local wages to drop by approximately 1.5%. This finding opposes the popular view that wage flexibility in Greece is limited. This level of unemployment elasticity of pay is fairly similar to other studies across a wide range of countries and time periods (see BLANCHFLOWER and OSWALD, 2000; SANZ-DE- GALDEANO, forthcoming).

Nevertheless, contrary to most studies (see NIJKAMP and POOT, 2005), the inclusion of time fixed-effects influences the elasticity considerably. As can be seen from Table 2, unemployment elasticity tends to be smaller in magnitude for time fixed-effects than for regional fixed-effects. This finding suggests that Greece has a very strong cross-section wage curve, which when time controls are included, drops to vary low. However, this may be because of the fact that this paper uses a nominal, rather than real wage measure. Moreover, when both time and location fixed-effects are calculated, the unemployment elasticity drops to barely -0.02. However, this is due to the small number of years available for research. Also, the measurement error causes attenuation bias and has a downward effect on the fixed-effects estimates.

[Table 2 HERE]

In addition to fixed-effects models, random-effects models have also been estimated. The regression estimating random-effects used the same set of variables as the one estimating fixed-effects. The results of this analysis were very similar to the results using fixed-effects. The estimates of this analysis were robust, and most of the variables were statistically significant. In particular, the GLS estimates suggest that the unemployment elasticity of pay is -0.14. In order to assess whether the two models are statistically different, the HAUSMAN, 1978, was used. This test, based on the random-versus fixed-effects estimators, cannot reject the null hypothesis (individual effects are uncorrelated with the other regressors in the model). Therefore, it cannot be said that a random-effects model is preferred to a fixed-effects model[v]. Hence, for the illustrative purposes of this paper, the results of the fixed-effects model are used. When no fixed-effects are calculated, the unemployment elasticity is found to be -0.14.

Another issue that was be taken into consideration is the fact that the literature (MOULTON, 1990) suggests that state-level variables often exaggerate the levels of statistical significance. In particular, CARD, 1995, found that unadjusted OLS estimation overstate the t-ratio of the wage curve elasticity by approximately a factor of 2. Thus, the present study corrects the standard errors for clustered observations. In particular, the HUBER, 1967/WHITE, 1980, robust estimates of the standard errors were computed. The specification calculated used clustered data by time.

7. Wage structures in Greece

The coefficients on the personal control variables of the original model, presented in Table 2, provide information on wage structures in Greece. The findings are largely in line with other empirical studies on wage structures for Greece. The negative coefficient on the non-HH dummy shows that, controlling for all the other explanatory variables, the mean salary of individuals that are non-HH is lower by 7% than the mean salary of HH workers. This finding comes as little surprise, given that the HH has greater financial responsibilities, and hence puts greater effort into achieving higher levels of income. In addition, males, who traditionally have the role of the "breadwinner" in the Greek society usually receive in general higher wages than females (KANELLOPOULOS and MAVROMARAS, 2002). As with the above, the mean wage for married individuals is higher than for single (or others). Moreover, the coefficients of the age-group dummies imply a positive rate of return to age, which finding is not surprising as the fact that income increases with age is a well documented fact. Regarding the type of employer, the mean wage was found to be higher for employees of the public sector than employees of the private, which is in line with the evidence of KANELLOPOULOS, 1997, and PAPAPETROU, 2006.

Regarding the level of education, evidence implies that pay increases when the level of education increases. In particular, it is found that someone who holds a university degree receives higher pay than someone with no higher education qualification, but less than someone that holds a PhD degree. Finally, most of the coefficients of the sector and occupation dummies are statistically significant, and reflect that the average wage differs according to the sector and occupation that the individual operates in.

8. Wage curves for various groups of workers

Table 3 reports the unemployment elasticities for the different groups of employees The elasticities in Table 3 are estimated by splitting the sample and running separate regressions for each group[vi]. The specification used, whose results are presented in this paper, is the same as in equation (1).

The empirical results of this analysis suggest that wages for females are more responsive to regional unemployment rates than the wages of males (-0.18 and -0.13 respectively). Evidence also suggests that university graduates are more affected by local unemployment rates than individuals with other levels of education. The above two findings are opposite to most of the results of similar empirical studies for other countries (e.g. CARD, 1995). Regarding females, it is not surprising that as they are usually secondary earners in Greek households, they are usually rewarded with lower wages than males in the labour market, and therefore may be more willing to accept wage cuts than males, who are the primary earners. As for the high elasticity of graduates, this might be explained by the fact that graduate unemployment in Greece is relatively high. In particular, various studies (e.g. LIVANOS, 2007) have

highlighted the difficulties that graduates face in the Greek labour market. As for the high level of graduate wage flexibility, a possible explanation could be that graduates, whose employability is clearly affected by the high levels of unemployment amongst them, may have to lower their compensation considerably in order to find employment. Moreover, the wages of single (or other) individuals are more responsive to local unemployment when compared to married individuals. Similarly, the wages of employees that are not HH are more responsive to local wages than HH. Results for the different age-groups are less clear cut than other variables. However, the results suggest that prime-aged workers (25-34) are the most responsive group to local unemployment. On the other hand, older workers (55+) are the least responsive (-0.09).

[Table 3 HERE]

The role of regional conditions in wage bargaining is also considerably different for employees of the private and the public sector. In particular, OLS estimates suggest that employees of the private sector are much more responsive to local unemployment rates than public sector employees (-0.19 and -0.08 respectively). The above is in line with most of the findings in the literature (e.g. CARD, 1995), and does not come as a surprise as the private sector is generally much more flexible than the public sector.

The fact that the level of unemployment varies considerably across different regions in Greece allows to estimate the wage curve for two types of regions; regions with low unemployment, less than 10%, and regions with high level of unemployment, 10% or more. The results, displayed in rows 20 & 21 of Table 3, suggest that the wages of employees in regions with low unemployment are in fact responsive to the regional unemployment rates. On the other hand, the results for regions with high

unemployment suggest that there is no statistically significant relationship between the wage level and the rates of local unemployment. This finding might actually serve to suggest that workers in regions with high levels unemployment decide to immigrate to regions where unemployment is lower, or even exit the workforce, and hence no relationship if found. On the other hand, workers in regions where unemployment is lower than 10% are more responsive to a rise in the level of unemployment, since they will probably not consider emigrating to a region where unemployment is high.

9. Is there a wage curve in the longer-term?

Finally, this study examines whether a positive relationship exists between wages and unemployment in the longer-term. In particular, we examine the relationship between time-averaged regional wages and unemployment over the 5-year-period that we have data for. Indeed, when we do so, we find a statistically significant positive correlation (0.19) between the two variables. Figure 7 consists of a scatter plot illustrating this relationship. This positive relationship serves to suggest that in the longer-term, the wage curve relationship vanishes. This fact could be due to exogenous shocks that originate within the local labour markets, such as permanent change in the level of amenities. Also, it might suggest that in the longer run, workers move between regions and thus, the wage curve relationship vanishes. This finding confirms the notion that the wage curve is a short-term business cycle phenomenon (NIJKAMP and POOT, 2005).

[Figure 7 HERE]

10. Conclusions

Over the last two decades, the study of the wage curve has provided a new platform for researching local labour markets. The existence of a negative relationship between wages and local unemployment has various implications for the behavior of labour markets. For example, if a region has low unemployment rates and high wages, then workers from other regions might move to this more attractive, region (BLANCHFLOWER and OSWALD, 1994). Evidence from various countries suggests that the relationship between the real wage, paid to the employees, and the rate of unemployment in a local labour market is inverse, and the unemployment elasticity of pay is -0.1.

So far, to the best of our knowledge, this relationship has not been researched in Greece, even though Greece seems to be an interesting case due to the large differences in regional unemployment and the low levels of wage flexibility. This study used recently available micro data from the Labour Force Survey over the period 2000-2004. Contrary to the conclusions of OECD, this study finds much evidence of wage flexibility. The overall wage curve elasticity was found to be -0.15. This level of elasticity corresponds to findings from various studies other countries and suggests that local wages in Greece are, indeed, quite responsive to an increase in unemployment. A possible explanation of high wage flexibility could be the limited levels of labour mobility, which make workers very responsive to local labour market conditions. However, despite the fact that a short-run wage curve was found to exist, the relationship seems to be positive in the longer run.

This study could provide a new platform of discussion with regards to policies aiming at tackling unemployment. In particular, even though wage rigidity has been suggested to be a cause of high unemployment in Greece, this study did not find evidence of low wage flexibility. Therefore, the policy recommendation of OECD is somewhat arbitrary. On the other hand, policies that facilitate labour mobility across regions in Greece could be useful for tackling unemployment.

Regarding the wage curve, slopes for the various groups of workers are found to vary considerably. In particular, there are some groups of workers who can protect themselves against external shocks, and isolate their wages from the behaviour of the local labour markets. These groups include males as well as employees of the public sector. On the contrary females and private sector employees seem to be vulnerable in the Greek labour market, and are the main candidates for wage reductions in cases where unemployment increases. Regarding females, the finding of this study (i.e. higher elasticity of pay than males) could be attributed to the fact that females are in most cases secondary earners, and therefore are more likely to accept wage cuts than males. Similarly, non- HH individuals are also found to be more responsive. As for employees of the private sector, these are more likely to experience wage reduction as they are generally less protected in the labour market than those of the public sector.

A surprising fact in this study is that graduates are actually the most responsive groups of workers to the rising levels of unemployment, although one might expect that they are less responsive to external shocks due to the high qualifications they possess. This highlights a wider problem of the Greek labour market, where graduates face high levels of unemployment while the level of one's qualification is not found to

affect his/hers employment probabilities. This evidence regarding graduate employability raises questions about the (employment) value of higher (tertiary) education. This should be taken into consideration by policy makers in Greece, who over the last two decades have focused on increasing the numbers of students who pursue higher education (KANELLOPOULOS 2003). Thus, the rapid growth of education in Greece has had an impact on graduates' employability. However, this phenomenon is not unique to Greece. Neighboring Turkey has experienced similar problems (ERC, 2005). Again, the above could contribute to low geographic mobility and the fact that graduates who reside in regions with high unemployment may not decide to immigrate to other regions in order to find employment.

The large differences in the levels of unemployment across regions in Greece have allowed us to estimate wage curves for regions with high and low unemployment separately. We found evidence of elasticity of pay for the regions with low level of unemployment but not for those with unemployment over 10%. This might serve to suggest that workers in regions where unemployment is already high, may decide to exit the workforce or perhaps emigrate to other regions in the case of a further increase of unemployment. On the other hand, workers of regions where unemployment is low, are less discouraged to exit the workforce while the option of immigrating to other regions would seem less appealing to them, and may thus be more responsive to the shock of unemployment.

An interesting point for further research would be to assess how wage curve elasticities for various groups of workers compare with the levels of geographic mobility of these groups. This would require the LFS questionnaire to include and

make available more questions regarding commuting and immigration. Also LFS data that would provide greater level of regional desegregation (NUTS-3), and the inclusion of additional questions (e.g. unionization rates) would increase the variation in the sample and will make possible to examine the wage curve in greater detail.

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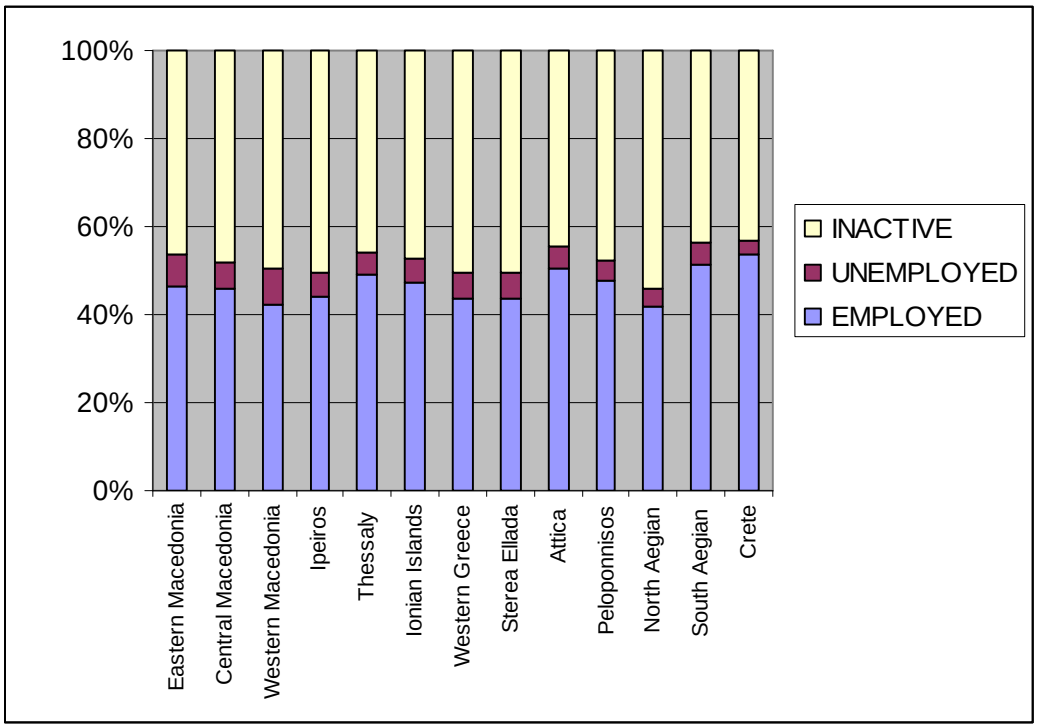

Figure 1: Status of economic activity across regions 2004

Source: Greek LFS micro-data 2004 (2nd quarter)

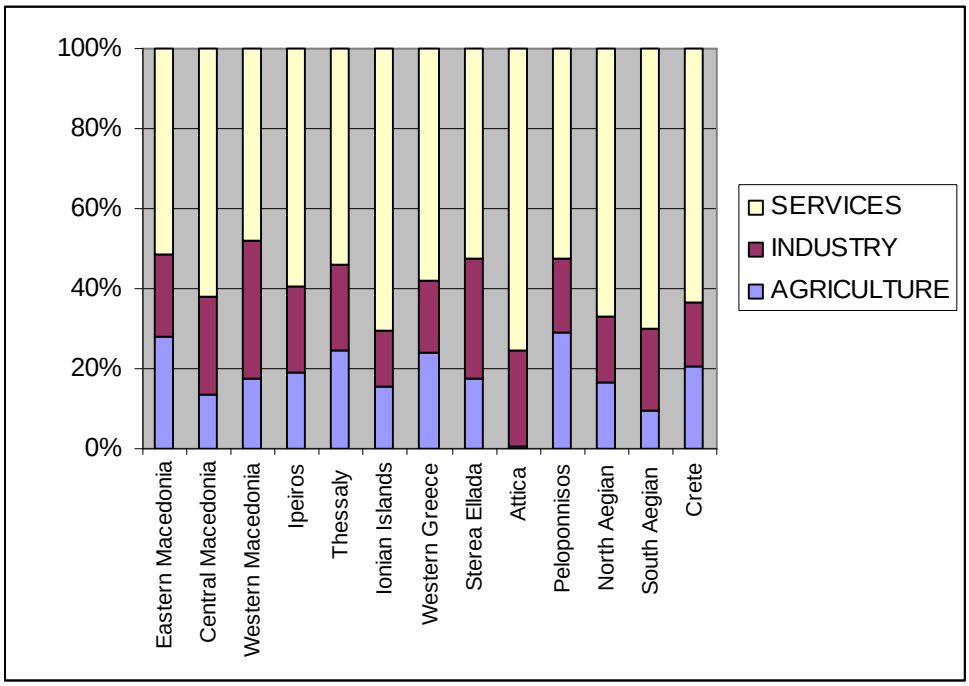

Figure 2: Sectoral employment across regions 2004

Source: Greek LFS micro-data 2004 (2nd quarter)

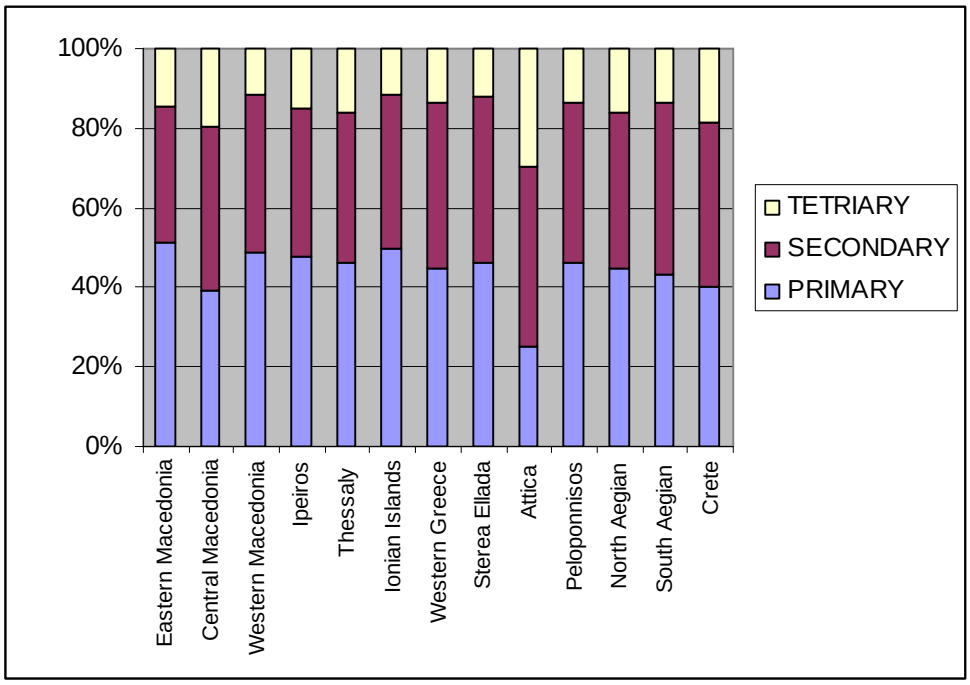

Figure 3: Levels of education across regions 2004

Source: Greek LFS micro-data 2004 (2nd quarter)

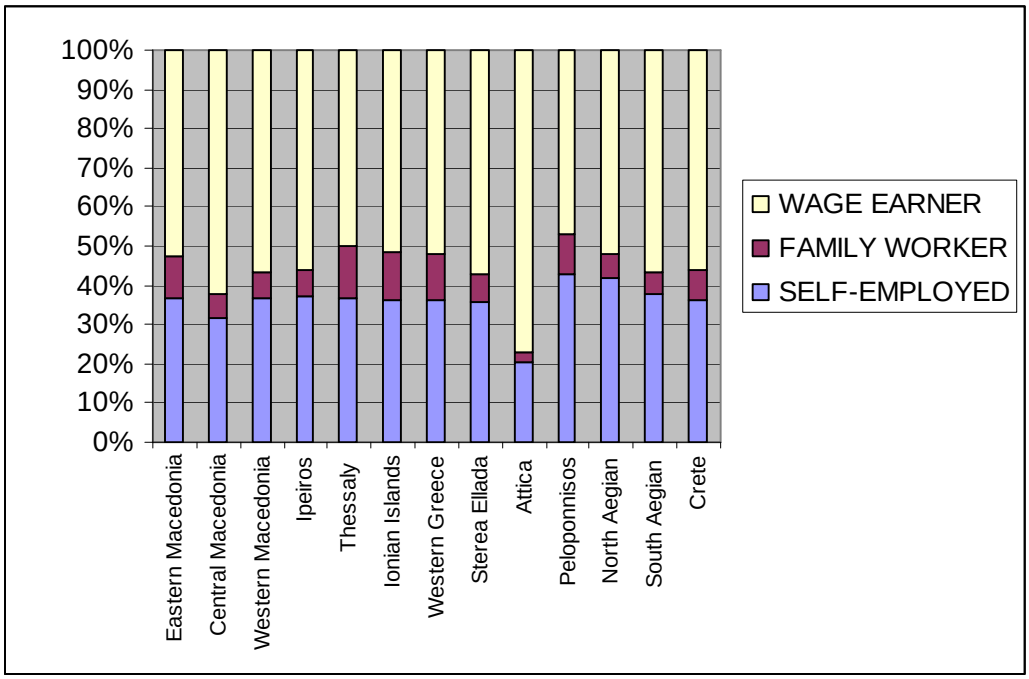

Figure 4: Status of employment across regions 2004

Source: Greek LFS micro-data 2004 (2nd quarter)

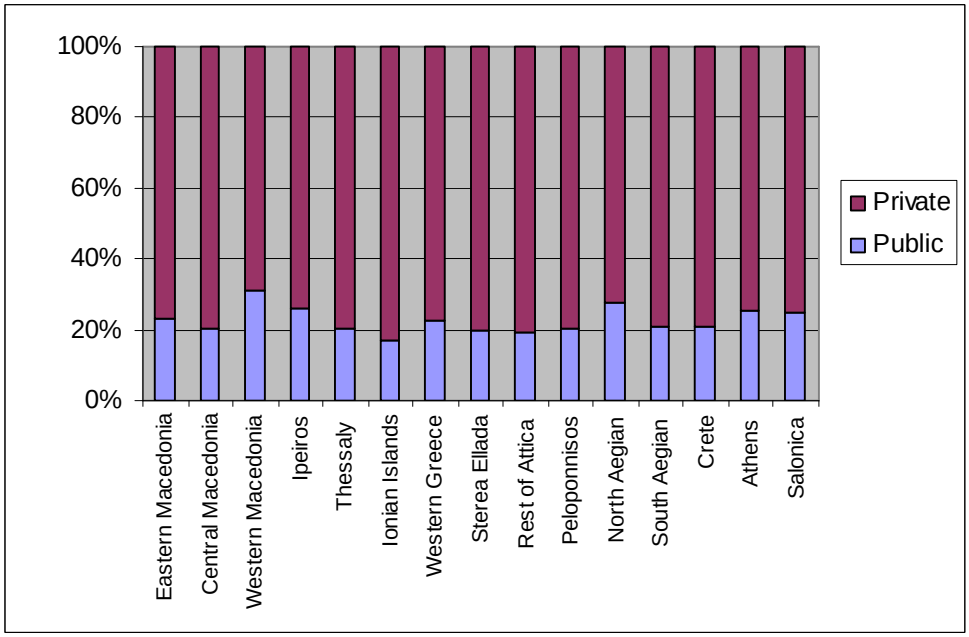

Figure 5: Type of employer across regions 2004

Source: Greek LFS micro-data 2004 (2nd quarter)

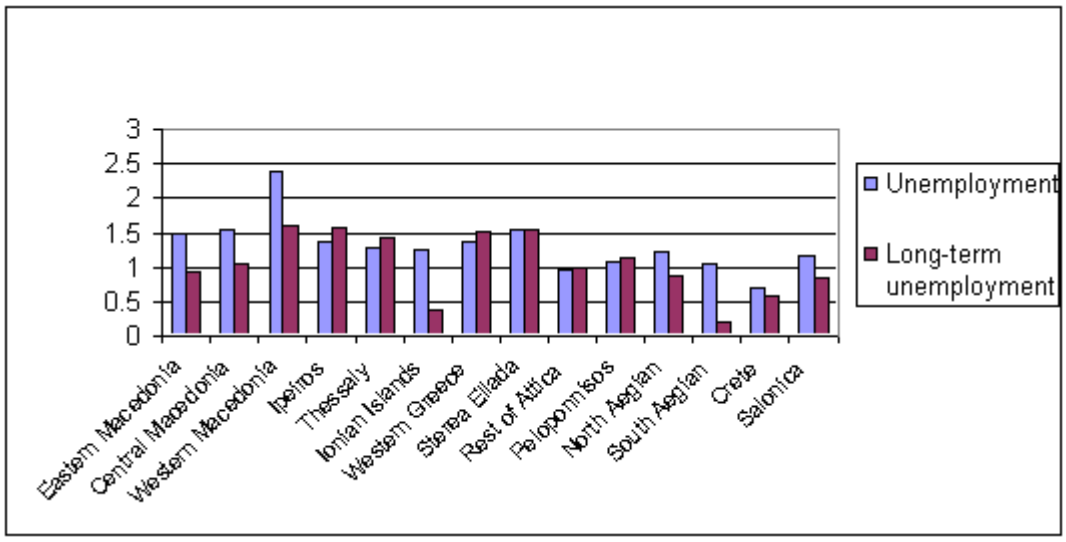

Figure 6 The incident of unemployment and long-term unemployment in regions in Greece*

* Athens is set as the reference category

Source: LIVANOS, 2007, LIVANOS, forthcoming.

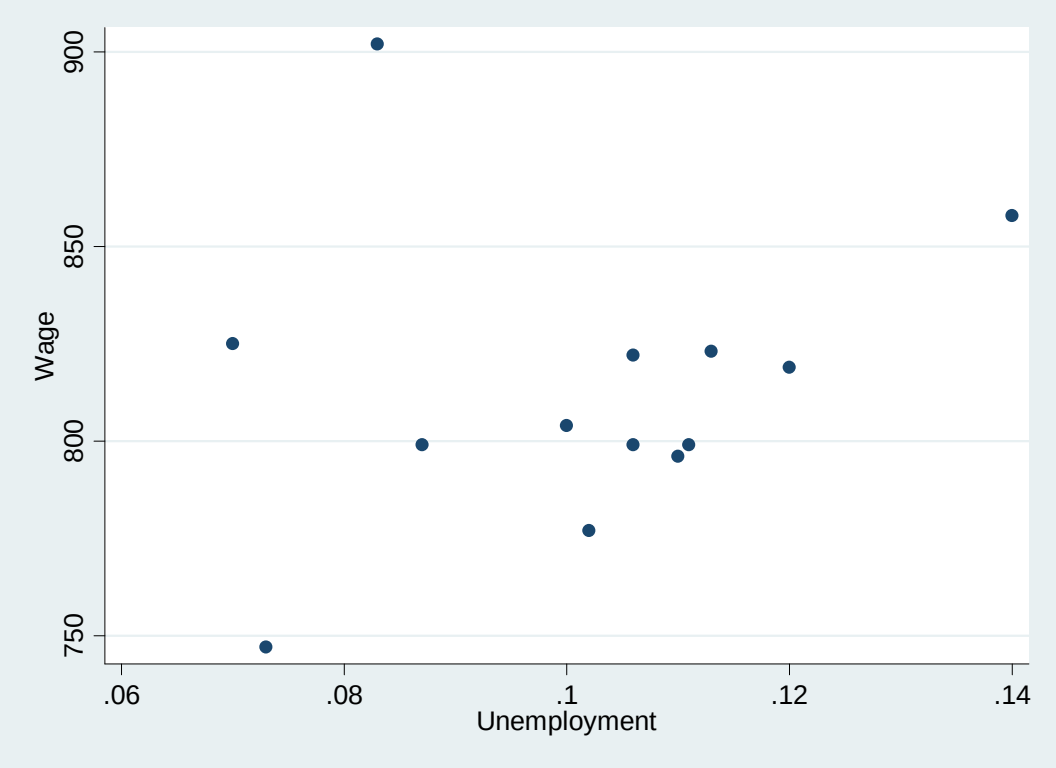

Figure 7 Longer-term relationship between regional wages and unemployment

Source: Greek LFS micro-data 2004 (2nd quarter)

Table 1 Regional Unemployment in Greece 1998-2006 (%)

Northern Greece	**11.9**
Eastern Macedonia	10.7
Central Macedonia	10.8
Western Macedonia	15.2
Thessaly	10.9
Central Greece	**10.1**
Ipeiros	11.9
Ionian Islands	7.4
Peloponnisos	8.3
Western Greece	10.6
Sterea Ellada	12.0
Attica	**10.1**
Aegean Islands & Crete	**8.3**
Nothern Aegean	9.3
Southern Aegean	9.2
Crete	6.4
All Regions	**10.2**

Source: Labour Force Surveys 1998-2006, 2nd term

Table 2 The Wage Curve for Greece 2000-2004 (LFS data, second quarter). Coefficients in the log-wage equations.

	Fixed-effects					
	Regional		*Time*		*Regional & time*	
LnU	**-0.15**	**(0.010)**	**-0.02**	**(0.005)**	**-0.01**	**(0.007)**
Not HH	-0.07	(0.003)	-0.63	(0.002)	-0.06	(0.002)
Single	-0.08	(0.002)	-0.07	(0.002)	-0.08	(0.002)
Private sector Employee	-0.18	(0.002)	-0.18	(0.002)	-0.18	(0.002)
Primary sector	-0.20	(0.011)	-0.21	(0.010)	-0.19	(0.010)
Tetriary sector	-0.03	(0.003)	-0.02	(0.003)	-0.02	(0.003)
Legislator	0.12	(0.011)	0.21	(0.011)	0.21	(0.011)
Professional	-0.04	(0.005)	0.06	(0.005)	0.06	(0.005)
Technician/ associate professional	0.02	(0.005)	0.11	(0.005)	0.11	(0.005)
Service worker	-0.07	(0.004)	0.00	(0.004)	0.00	(0.004)
Skilled agricultural worker	-0.05	(0.018)	0.03	(0.018)	0.03	(0.017)
Craft worker	-0.09	(0.004)	-0.00	(0.004)	-0.00	(0.004)
Plant operator	-0.01	(0.005)	0.07	(0.005)	0.07	(0.005)
Agegroup 15-14	-0.14	(0.005)	0.18	(0.005)	-0.17	(0.005)
Agegroup 25-34	-0.06	(0.003)	-0.07	(0.003)	-0.07	(0.003)
Agegroup 45-54	0.07	(0.003)	0.06	(0.003)	-0.00	(0.003)
Agegroup 55+	0.05	(0.004)	0.05	(0.004)	0.05	(0.004)
Post-graduate	0.11	(0.004)	0.10	(0.004)	0.10	(0.004)
Other qualifications	-0.78	(0.003)	-0.06	(0.003)	-0.06	(0.003)
Schooling or below	-0.19	(0.004)	-0.17	(0.004)	-0.17	(0.004)

Note: The wage measure refers to nominal monthly earnings from the main job, Omitted categories: HH; married; public sector employee; secondary sector employee; clerk; age-group 35-44; graduate. Number of observations: 77,758. Standard errors are reported in parentheses. Robust estimates of standard error were computed. The standard errors are clustered at year level.

Table 3 Unemployment elasticities for different groups in Greece 2000-2004 (LFS data, second quarter)				
All	-0.152	(0.010)	-0.148	(0.009)
Males	-0.131	(0.012)	-0.131	(0.012)
Females	-0.181	(0.016)	-0.116	(0.009)
Primary Sector	-0.033	(0.090)	-0.051	(0.054)
Secondary Sector	-0.187	(0.019)	-0.043	(0.011)
Tetriary Sector	-0.172	(0.012)	-0.105	(0.007)
HH	-0.141	(0.014)	-0.052	(0.008)
Not HH	-0.193	(0.015)	-0.123	(0.009)
Married	-0.132	(0.012)	-0.054	(0.007)
Non-married	-0.219	(0.017)	-0.147	(0.010)
Age-group 15-14	-0.111	(0.044)		
Age-group 25-34	-0.173	(0.018)	-0.147	(0.023)
Age-group 35-44	-0.137	(0.018)	-0.119	(0.011)
Age-group 45-54	-0.127	(0.021)	-0.061	(0.011)
Age-group 55+	-0.09 0	(0.038)	-0.017	(0.022)
Post-graduate	-0.149	(0.024)	-0.047	(0.014)
Graduate	-0.227	(0.028)	-0.168	(0.017)
Other qualifications	-0.157	(0.014)	-0.058	(0.008)
Schooling or below	-0.096	(0.022)	-0.039	(0.013)
Regions with High Unemployment	0.030	(0.016)		
Regions with Low Unemployment	-0.142	(0.039)		
Public Sector Employees	-0.082	(0.015)	-0.041	(0.014)
Private Sector Employees	-0.193	(0.039)	-0.131	(0.008)
Regional fixed effects	**Yes**		**No**	

Note: Standard errors are reported in parentheses. All models include a set of control variables: 8 occupational dummies (clerks is set as the omitted variable), 2 sector variables (secondary sector is the omitted category), HH dummy, married dummy, 4 age-band dummies (age group 35-44 is the omitted category), 3 education dummies (graduate level is the omitted category), and public sector dummy. *Number of observations: 77,758.* Robust estimates of standard error were computed The standard errors are clustered at year level.

[i] A similar case to Greece is Spain (see GARCIA-MAINAR and MONTUENGA-GOMEZ, 2003) where large differences exist in regional unemployment structure.

[ii] These countries were; the US, Canada, the UK, Federal Republic of Germany, Austria, Italy, the Netherlands, Ireland, Switzerland, Norway, South Korea and Australia.

[iii] Wage curves have been reported, so far, for Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Czech Republic, Denmark, East Germany, Estonia, Finland, France, Great Britain, Holland, Hungary, India, Ireland, Italy, Japan, Latvia, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, South Africa, South Korea, Spain,

Sweden, Switzerland, Taiwan, Turkey, USA, and West Germany (for a summary of the research literature see BLANCHFLOWER and OSWALD, 2005).

[iv] For a description of ESYE' s weighting procedures see EUROSTAT,2006.
[v] The random-effects are not reported in this paper in order to save space. The results on the control variables are available upon request from the author.
[vi] The coefficients on the personal control variables of each regression are not presented in the paper in order to save space. However, the tables can be made available by the author upon request.