

**UC Berkeley**

**Economics Senior Thesis**

**When Unemployment Strikes – Age, Income, and Sector Factors**

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### **Abstract**

High unemployment rates have plagued European countries since the 1970s. Extensive research has been conducted regarding European labor market institutions. This included an examination of unemployment benefits, union culture, etc. While reforms in these areas have been made, unemployment rates remain high, and more factors must be examined. This paper, using regional data from 1970 to 1990 on fourteen European countries, proposes three less conventional variables to be considered. Using region-specific data allows us to observe the heterogeneity present in each country and arrive at original conclusions. First, we examine the relationship between a young population in the early 1970s, and unemployment rates in following years. Next, we consider regions' GDP per capita, a factor highly correlated with the quality of regions' institutions, in the early 1970s and unemployment rates in the years that follow. Finally, we observe the relationship between a proportionally large services sector in the early 1970s and unemployment rates in the following years. Using an OLS regression, we find positive associations between the first and third variables and unemployment rates, and a negative association between the second variable and unemployment rates.

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# 1 - Introduction

The phenomenon often dubbed the “European Unemployment Miracle” which characterized post World War Two Europe came to an end in the 1970s when unemployment rates rose across Europe and the United States. While the US began to recover in the early 1980s, Europe continued to suffer escalating unemployment rates well into the 1990s when they temporarily dropped only to rise again, leaving present-day Europe plagued by persistently disappointing job markets. This topic is particularly current today as unemployment is reaching new heights in Europe. Spain revealed an unemployment rate of 27.2 percent in the first quarter of 2013, the highest it has been since Spain’s unemployment woes began in the 1970s (Patnaude and Horobin, 2013). Hence, at least in some places, the situation is only worsening, with no recovery in sight. Further, rising unemployment rates across the continent are increasing the risk of social unrest and placing the stability of the European Union in danger. With 26.3 million Europeans unemployed and a 10.9 percent EU unemployment rate, Miguel Angel Malo, an economics professor in Spain and economics expert at the International Labour Organization (ILO) warns of the danger of creeping social unrest, calculated to be twelve percentage points higher than before the global crisis struck (ILO, 2013). Thus, beyond the economic implications of high unemployment rates, social order is in jeopardy until the problems faced by the European labor markets are alleviated. Moreover, while the United States did experience periods of prosperity since the 1970s, the U.S. economy is presently at risk with unemployment rates remaining high since the financial crisis of 2008, five years ago. We must exercise measures to stimulate the labor market now in order to avoid the seemingly never ending downwards spiral seen across Europe.

In an effort to understand and eventually solve the problem, many cultural and institutional arguments have been proposed to explain Europe's high unemployment rates and possible hysteresis. Here, hysteresis refers to the possibility that temporary shocks increasing the unemployment rate may shift the equilibrium rate of unemployment above the natural rate. There are a few mechanisms by which these shocks might exert persistent effects. First, as Olivier Blanchard and Lawrence Summers (1986) discuss, the insider-outsider dynamics, favorable exclusively to employed workers, maintain the status quo and hurt the chances of the unemployed as they try to reenter the labor market. This model will be discussed in slightly more detail in Section 2. Further, people unemployed for long periods of time do not acquire new skills and slowly lose their previously obtained skills, causing them more hardship as they seek jobs. Additionally, unemployed workers may grow accustomed to lower living standards and become less determined in their job search even when demand for labor returns to its previous level. Figure 1 demonstrates the slight increase in unemployment rates in the 1970s followed by extraordinarily high rates in the years that follow, across our sample of fourteen European countries.

The research attempting to explain the rise in unemployment rates and its persistence include generous unemployment benefits which lower job seekers' incentive and urgency to find jobs. Europe's strong union culture, which raises minimum wages and hinders employers' ability to fire workers, is also cited as a force working to impede recovery. While these explanations have merit, they do not account for the entire problem. Europe championed an extensive security net before the woes of the 1970s struck, and reforms to decrease benefits were put in place in the mid-1980s but unemployment rates continued to rise (Blanchard, 2004).

In this paper, using data from 1970 to 1990, I propose three additional explanations for Europe's persistent unemployment problem. First, I suggest that the age structure characterizing the European population in the early 1970s is an additional factor to consider. Having many young people enter the job market during times of high unemployment proves detrimental to recovery. These inexperienced hopefuls find difficulties obtaining employment, and, as time progresses, become unemployable, raising the unemployment rate for as long as they are counted in the labor force. Another variable largely affecting the unemployment rate is the income of the region in question prior to the end of the unemployment miracle. Regions characterized by higher incomes seem to offer stronger institutions and more opportunities to their unemployed, and recover faster. Lastly and most surprisingly, while regions championing a large services sector, and a small industry sector, may seem modern and adaptive, they exhibit higher unemployment rates, suggesting that a dramatic shift to services may be unfavorable to recovery.

The rest of the paper is structured as follows: Section 2 discusses literature concerning Europe's prolonged unemployment problem; Section 3 provides an overview of the data and the initial conditions present in Europe in the early 1970s; Section 4 details the econometric methods used and the conclusions that can be drawn from the results these yield; Section 5 offers an extension as it describes an idea for future research; and Section 6 provides a conclusion as well as discusses lessons to be learned for the future.

## **2 – Literature Review**

As high unemployment rates prove extremely detrimental to aspects ranging from morale to survival, it comes as no surprise that many economists have studied Europe's condition, and tackled the issue from diverse angles in their papers. Different strands of literature discuss the

issue, and this paper attempts to add a new approach as it offers a macroeconomic perspective at the regional level. This approach allows us to consider the economy as a whole without compromising the insights arising from the heterogeneity apparent within each of our sample's countries. As noted, generous unemployment insurance benefits are often cited as a factor prolonging the duration of unemployment. Tony Lancaster (1979) and Stephen Nickell (1979a, b) use a microeconomic methodology whereby they follow individuals facing different levels of benefit over time, and attempt to estimate the effect of these differences on the duration of the individuals' unemployment. The authors conclude that higher levels of benefits received while unemployed are associated with lower chances of leaving unemployment, with a weaker association for very long unemployment durations. In a different paper by these authors, however, Lancaster and Nickell (1980) discuss the difficulties of arriving at meaningful conclusions using such an approach. They explain that controlling solely for the individuals' observable characteristics allows the unobserved attributes to bias the results. The present study, on the other hand, benefits from the advantages of a large yet specific dataset. Describing the European condition on a large scale renders the conclusions more applicable for policy purposes; and the use of regional data maintains the heterogeneity evident across smaller regions.

Reaching similar results to those of Lancaster and Nickell, Bertil Holmlund (1997) presents a survey of the research conducted regarding unemployment insurance (UI), and notes that "In almost all natural rate models, there is a positive relationship between the (equilibrium) unemployment rate and the "generosity" of the UI system. In fact, in many simple models, the wage replacement rate provided by UI is often the only explicit exogenous variable that determines unemployment."

Another traditional argument is supported by the findings of Lucio Baccaro and Diego Rei (2005) who follow a macroeconomic methodology, using data on the country level. They conclude that union density is highly correlated with unemployment rates. The reasoning is that unions discourage employers from hiring workers as they bargain for above market-clearing wages, and promote employment protection, restricting employers' rights to fire at will. While the authors attempt to control for country-specific differences, their data is not specific enough to account the variation inherent in a given country's labor market institutions. There are often large differences between the institutions in the north and those in the south of a country, and these distinctions risk going unnoticed when the data used is not region-specific.

The aforementioned explanations are backed by both intuitive principles of incentives and empirical evidence, but the magnitude of their effects remains vague and it is clear they fall short of explaining the entire phenomenon. As traditional explanations are found unsatisfactory, Blanchard and Summers (1986) focus mainly on the insider-outsider theory by which only the insiders, the employed, obtain the opportunity to negotiate with firms, thereby rendering the outsiders silent during the bargaining process. Since the insiders' sole interest is to keep their jobs, and not to lower the unemployment rate, employment remains at its current, low level. While making valid points, these authors focus their study on the U.S., the U.K., France, and Germany only, and imply that the latter three countries are representative of the continent of Europe. The study could have benefited from a more detailed dataset, examining the differences amongst and within more countries. A theory upon which Blanchard and Summers do not dwell, but do mention, is the Human Capital theory whereby unemployed workers are unable to maintain and update their skills as they are not working. Furthermore, they add, the unemployed face difficulties impressing employers as their résumés show little or no proof of holding a job,

being promoted, etc. Similarly, Edmund Phelps (1972) notes that an increase in unemployment may turn out to be partially irreversible as a result of workers' loss of skill and morale; and David Ellwood (1981) concludes that a teenager who spends time out of work in one year will probably spend less time working in the next year than he would have had he worked the entire year. Ellwood faces a problem similar to that of Lancaster and Nickell as he initially follows a group of about 750 young men, loses about half of them to military service, and remains with a sample of 364. His study does control for heterogeneity but faces selection bias (people who remained in the sample were less prone to unemployment than those who left it), as well as the inability to control for unobserved attributes. The sample is likewise very small and evidently cannot represent the population of the United States, which is the country discussed. These studies, nevertheless, inspire this paper's "age structure" theory by which young entrants facing a dismal labor market and early unemployment are "scarred" for the rest of their lives due to the skills, experience, and morale foregone.

Similarly to other studies, this paper examines the implications of personal incomes, closely associated with the quality of institutions, on unemployment rates. Similarly to this paper's use of GDP per capita, David Blanchflower and Andrew Oswald (1994) examine wages. While implying that it is unemployment that is affecting wages, they analyze the wage curve and provide compelling theoretical and empirical evidence that there is a negative association between wages and unemployment rates across regions. While the 1994 paper looks at wages and unemployment rates at specific times, this paper examines the future consequences of incomes exhibited before the dawn of high unemployment rates. Similarly to the present paper, however, their study collects regional data for several countries around the world, attempting to account for variation across regions. The countries in the study are not, however, concentrated in

one area of the world, but include countries from different continents. Moreover, for each country, the authors only provide data on a sample of people, with some countries' samples including less than three thousand people. For these reasons, the data is quite scattered and does not provide a complete and comprehensive view of a block of countries as does the present paper.

Furthermore, the economic reconstruction, which intensified during the oil crisis in the early 1970s and emphasized development of the service sector while shrinking the industrial sector, seemed necessary in order to keep up with the times. Lars Ljungqvist and Thomas Sargent (1998), however, cite this shift as partially responsible for economic turbulence which proved overwhelming for European welfare states. This instability, they argue, caused European unemployment rates to soar for several decades. This idea will be further explored in the paper.

### **3 – Data and Initial Conditions**

The dataset examined in this paper consists of several variables attempting to give a snapshot of the European condition in the early 1970s, when the unemployment plague struck. Regional data on fourteen countries: Austria, Belgium, Switzerland, Germany, Denmark, Greece, Spain, Finland, France, Italy, the Netherlands, Portugal, Sweden, and the United Kingdom constitute an ample sample representing diverse European institutions, cultures, and norms. Most of the data we used is regional, conforming to the second or third level of the NUTS (Nomenclature of Territorial Units for Statistics) classification. The detailed nature of the dataset allows conclusions to be based on many observations and account for the remarkable heterogeneity across and within the different countries. Our observation period begins in 1970; for some countries, however, the earliest data available is from some later year in the early



1970s. Initial conditions data is collected for the following characteristics: population figures, birth and death rates, sectors of employment (industrial and services, each divided into subcategories such as metals and transportation), age structure (divided into five-year cohorts), GDP and GDP per capita, educational attainment, and inter-regional migration. We focus the study on age structure, GDP per capita, and sectors of employment. Data regarding the labor force and unemployment is collected continually throughout our observation period (1970 through 1990) and beyond. As the initial conditions are predetermined and cannot change after the fact, we avoid simultaneous causality and argue that our explanatory variables are not endogenous. It is difficult for conditions present in the early 1970s to be influenced by later years' unemployment rates, so we can safely determine the direction of causality implied by our regressions.

### **3.1 – Age Structure**

All countries in our sample have high shares of their populations concentrated in the younger age groups during the early 1970s. For example, we recorded the number of people in each age group for each of Spain's eighteen regions (NUTS 2 - autonomous communities and cities). Spain is notorious for its unemployment, and, across these regions, had an average of 27.6 percent of its population accounted for by persons aged zero to fourteen. The average unemployment across Spain's regions was a troubling 16.2 percent in 1990. Sweden, on the other hand, saw persons aged zero to fourteen comprising a lower average of 20.8 percent of its population (averaged over eight regions), and a reassuring 1.8 percent average unemployment rate across the same regions in 1990. It is important to note that the dispersion from the average (for age-structure as well as for unemployment rates) varies across countries. Through

examination of the standard deviations from the mean, we see that Spain's data is very spread out while that of Sweden is extremely concentrated around the mean – hence, some of Spain's regions exhibit even more extreme unemployment rates. Using data on the country level in this case would have led us to oversee the diversity present within a country. We would not notice, for example, that persons aged zero to fourteen account for over thirty percent of the population in some of Spain's regions. More observations coupled with more details help us pinpoint the problems in the diverse European economies with greater precision, and, ultimately, allow us to suggest more effective policies. See columns (1) through (6) of Table 1 for summary data on all countries in the sample.

### **3.2 – GDP per Capita**

Data on the GDP of the regions in each of the sample's countries was collected and divided by the regions' respective populations to yield GDP per capita. Recording the incomes in different regions helps us understand the relationship between the quality of a region's institutions and its unemployment rate. Labor, academic, health and other kinds of institutions are associated with higher incomes; and a better quality of institutions can dramatically improve a region's condition and maintain lower unemployment rates. As virtually every country is composed of regions of lower and higher incomes, it is essential to note the distinctions across countries' regions before reaching conclusions. Column (7) of Table 1 shows the standard deviation from the mean of the logarithm of GDP per capita for every country. This demonstrates the variation in incomes present across countries' regions.

As recording of data varies across countries, with some countries recording the GDP values in actual currency units, others in thousands, and still others in millions, the data is not

standardized. Furthermore, as the Euro currency was not yet adopted in the early 1970s, each country kept records using its own national currency (French Francs, German Deutsche Marks, etc.). To account for these country-specific differences in scale, we use the logarithm of GDP per capita, as well as introduce country-fixed effects. These dummy variables resolve not only the scale discrepancies, but also other unobserved differences across countries which are difficult to quantify. These include anything from a country's labor market policies to its culture and values.

### **3.3 – Employment Sectors: Industry and Services**

The dataset includes figures for the number of workers employed in the industrial sector and for those employed in the services sector. The industrial sector is divided into agriculture, energy, mining, construction, metals, manufacturing, and “other”. The services sector is divided into commerce, transportation, credit, administration, and “other”. The paper focuses on the industrial sector and services sector, each as a whole, as it explores the effect of the general shift from industry to services which intensified in the early 1970s, the beginning of our observation period. As seen in Table 2, adaptation to the economic restructuring varies greatly across countries. While Switzerland had a cross-regional average of only 19.5 percent of its workers employed in services sector in the early 1970s, Denmark had a cross-regional average of 68.4 percent of its labor force concentrated in the services sector. In accordance with this paper's argument that large service sectors prolong unemployment, Switzerland boasted a 1.9 percent unemployment rate in 1990 while Denmark suffered an 8.1 percent rate. Large standard deviations demonstrate that each country is composed of regions more deindustrialized than others, and that the development of the services sector varies across regions. Some regions in Denmark, for example, had their services sector account for as much as 77 percent, more than

three quarters, of employment. Of course, these examples do not represent sufficient evidence to prove our claim which will be discussed further in the next section.

## **4 – Motivation, Econometric Methods, and Results**

This paper argues three nonconventional explanations for the persistence of Europe's unemployment plight since the early 1970s. First, careful consideration of the data reveals that in the early 1970s, the European population was very young. This demographic factor proves to be associated with persistently high unemployment rates as many young people enter a dismal job market, and compete for scarce job opportunities. When young people experience early unemployment, their chances of obtaining work later in their lives decrease, raising the unemployment rate for as long as they are counted in the labor force. Another variable critically affecting the unemployment rate is the income of the region in question prior to the end of the unemployment miracle. Higher incomes are positively correlated with stronger institutions, offering their unemployed better chances at acquiring jobs. These regions, therefore, tend to recover more quickly than others. Lastly, we examine the employment composition of regions in the early 1970s, and find that regions with larger and more developed service sectors experience structural unemployment and generally higher unemployment rates.

### **4.1 – Motivation for our Three Explanatory Variables**

The first factor suggested is European countries' age structure which was peculiarly bottom-heavy, with youngsters under the age of 15 comprising about a quarter of the countries' populations in the early 1970s. When it was time for these youths to enter the labor market, they found it in extremely poor condition. It is well established that the young and inexperienced are

disadvantaged as they seek employment. Niall O'Higgins (2001) notes that in OECD countries (all countries in the sample are members of the Organisation for Economic Co-operation and Development), “the unemployment rate of the 15-24 age group in 1998 was 12.9 per cent, more than double the figure for adults, which stood at 5.7 per cent”. Thus, persons who were, for example, eight years old in 1970, were eighteen years old in 1980, a time of high unemployment, and had to compete against many other young people for very scarce job opportunities. This paper goes further than asserting that young people do, in fact, face a difficult job market, but suggests that youth unemployment often leads to unemployment later on in life as it renders the unemployed “unemployable.”

First, a lack of early employment greatly hinders the development of skills. These include job-specific expertise, as well as experience forming proper interpersonal relations, work ethics, etc. In addition, a “hole,” due to inactivity, in one’s résumé makes a bad impression on employers. Failure to demonstrate the ability to maintain a steady job, lack of evidence of promotions, and no employer referrals all work against the job-seeker. Further, many employers do not even consider candidates without a certain number of years of experience. Paul Gregg (2001) uses the National Child Development Survey to demonstrate that “men who experience an extra 3 months unemployed before age 23 go on to experience another extra two months out of work (inactive or unemployed) between ages 28 and 33.” Furthermore, he asserts that characteristics normally associated with unemployment such as poor educational attainment, a depressed local labor market, a disadvantaged family background, etc. can explain less than 50 percent of the inter-temporal correlation in unemployment. Therefore, he concludes, any person who experienced early unemployment is likely to suffer additional unemployment until “at least

age 33.” Gregg notes the effect is stronger for men than for women, but this paper does not examine gender differences.

Unfortunately, it seems that people who were unemployed earlier in life, often suffer the consequences much after reaching the age of 33. It is established that people who have unsuccessfully searched for a job for a long time lose morale and become discouraged. Stephen Machin and Alan Manning (1998) find that people subject to such a predicament become “detached” from the labor market and less aggressive in their job search. This, they continue, renders them less effective in reducing wage pressure, thereby causing a rise in the overall unemployment rate. We see how the vicious cycle of unemployment which brings about more unemployment unfolds.

The unemployment rates remain high as long as these people who began as unemployed youth remain in its calculations. Having a large proportion of children in the early 1970s thus often results in a large share of unemployed adults several years later. Moreover, as the chronically unemployed are likely to have difficulties providing for their children later on, their descendants are likely to suffer poor educational attainment and shrinkage of opportunities as they enter the labor market. While more research on this second generation is necessary, it is easy to extrapolate that the age structure of the early 1970s continues to affect unemployment rates in the long term. Figures 2, 3, 4, and 5 show scatter plots of the 0-14 age group in the early 1970s and unemployment rates in 1990. We always see a positive relation between the two: as the share of young people goes up, so does later years’ unemployment rate.

The second variable we propose as one which affects unemployment rates in European regions is the level of income characterizing the region before high unemployment rates struck. Using the logarithm of GDP per capita, we see that regions exhibiting higher incomes in the

early 1970s reveal lower unemployment rates later on. A study on inequality and policy supports this claim, asserting that unemployment and income levels are negatively correlated. Further, through examination of the increase in unemployment rates in Europe of the 1980s and 1990s, the study concludes that “pre-existing differences in income levels determined the distribution of rising unemployment” (Conceição, Ferreira, and Galbraith, 1999). The authors explain that low-income countries, such as Spain and Italy, were still recovering from fascist governments when high unemployment rates hit, and offered mostly rural jobs, restricting residents’ mobility.

Moreover, low-income regions tend to have institutions of lower quality in place. This may provide further insight as to why these regions suffer more persistent unemployment rates than their high-income neighbors. The present paper suggests that since people living in high-income regions have more access to educational institutions, they are more likely to escape unemployment faster than those who could not afford higher education. Clearly, persons with higher educational attainment are better suited for certain jobs as they have learned the required skills, and refined their thought processes. Perhaps more importantly, however, educational attainment acts as a signal demonstrating to employers that the candidate possesses favorable characteristics such as high intelligence, determination, and diligence. This renders the labor market more efficient as employers can sort through candidates with greater ease. Firms in lower-income areas, where people are less educated, face great difficulties as they attempt to determine which candidates have the potential to become competent workers. Such firms are likely to experience decreasing returns when hiring additional workers (Coase, 1937). According to John Barron, Dan Black, and Mark Loewenstein (1987) who studied large firms, employers then “compensate” for higher sorting costs by hiring less people and increasing the capital to

labor ratio. Employers in areas characterized by lower incomes face increased sorting costs, and, therefore, hire less people, causing unemployment rates to soar in these regions.

Furthermore, regions where the residents earn higher incomes enjoy more tax revenue, and thus possess the necessary funds to assist those struggling with unemployment. To this day, active labor market policies (ALMPs) play a large role in Europe's struggle to escape from its high unemployment rates. These policies include measures such as job search assistance, labor market training, private sector incentive schemes, and direct job creation in the public sector. All of these - from providing classroom-style courses to wage subsidies - are expensive. There is substantial research examining the effectiveness of, and expenditure on, such programs over these past few years, well after our observation period. These (e.g.: European Commission, 2013) show that countries such as Sweden which tend to have the highest levels of expenditure on ALMPs exhibit the lowest persistence rates in unemployment, while countries such as Italy show low expenditure levels on ALMPs and generally high persistence rates of unemployment. Here, "expenditure" refers to percent of GDP, but it is safe to conclude that places with higher GDPs (and GDPs per capita) have an advantage as they can afford to spend more money on these programs. We will likewise assume similar conclusions hold for the 1970-1990 period we are examining, and hence that regions characterized by higher incomes in the early 1970s had more funds to allocate to unemployment-alleviation programs, and therefore less persistent unemployment rates later on.

The third potential cause of persisting unemployment is a pronounced shift from the industrial sector to the services sector. The oil shocks of 1973 prompted massive economic restructuring, and many European countries saw their industrial sectors shrinking while their services sectors grew. Deindustrialization is widely considered a natural product of successfully



evolving economies experiencing increased productivity in their industrial sector (Rowthorn and Ramaswamy, 1997), and this paper does not contradict this view as it discusses the negative implications this process caused in Europe. When productivity increases, less workers are needed to generate the same amount and quality of output. Manufacturing plants close and workers are laid off. These newly-unemployed persons are skilled and trained for specific industrial jobs and face difficulties as they try to find their place in the deindustrialized economy, in which they have little to offer. In addition, countries which began their deindustrialization processes early, and already had relatively developed services sectors in the early 1970s, might have experienced more difficulty absorbing more workers. Switzerland, for example, had a low average of only about 20 percent of its employment accounted for by the services sector. For this reason, it is plausible that when industrial workers were laid off with the closing of factories, the services sector was ready to train and absorb many of them. A more developed services sector like that of Denmark is more likely to have less demand for new workers, increasing the degree of competition among job candidates. It would thus be more difficult for workers skilled for industrial jobs but not for services jobs, to join the services sector. In accordance with David Lilien's (1982) "Sectoral Shifts and Cyclical Unemployment," the dwindling of one sector causes unemployment rates to rise because should reallocation of workers to other employment sectors even occur, the process would be sluggish. Further, this reallocation process becomes still more difficult when the manufacturing sector, specifically, contracts. Andrew Glyn and Robert Rowthorn (1988) reveal a negative relationship between changes in manufacturing employment and changes in general unemployment rates across their sample of West European countries. They argue that this distinct difficulty arises from the nature of the industry sector where plants and factories are usually geographically concentrated, large lay-offs tend to occur

simultaneously, and job experience and training, as discussed earlier, can be highly specialized. Further supporting this paper’s claim, Christopher Kollmeyer and Florian Pichler (2013) use bivariate analysis of deindustrialization and unemployment to show that declining manufacturing employment is associated with higher unemployment rates both across their sample of sixteen OECD countries, and at the individual country level. Figures 6, 7, 8, and 9 demonstrate a conclusion consistent with the aforementioned studies regarding the long term implications of deindustrialization: higher shares of employment concentrated in the services sector in the early 1970s are positively correlated with unemployment rates of consequent years.

#### 4.2 – Regression Results

Using the three variables introduced – the proportion of the 0-14 age group in the population, the logarithm of GDP per capita, and the share of employment allocated to the services sector – and accounting for country-specific differences through the use of dummy variables, we use regression analysis to demonstrate the relationships established throughout the paper. Namely, we show a *positive* relationship between a young population in the early 1970s and unemployment rates in 1975, 1980, 1985 and 1990; a *negative* relationship between a region’s wealth in the early 1970s and unemployment rates in 1975, 1980, 1985 and 1990; and a *positive* relationship between a proportionally large services sector in the early 1970s and unemployment rates in 1975, 1980, 1985 and 1990. Our regression equation is:

$$UR_{ic,t} = \alpha Age0-14_{ic,1970} + \beta \log(Y)_{ic,1970} + \gamma Share\_serv_{ic,1970} + \delta_c + error$$

where “UR” denotes our dependent variable, unemployment rate; “Age0-14” denotes the share of the population between the ages of zero and fourteen; “log(y)” denotes the logarithm of GDP per capita; “Share\_serv” denotes the share of the working population employed in the services

sector; and  $\delta_c$  are country fixed effects. The subscript “i” stands for region, “c” for country, and “t” for time. While we vary the “t” to measure the unemployment rates at different years, we use data from 1970 (or some other year in the early 1970s, according to availability of data) for all the explanatory variables. As the initial conditions are predetermined and cannot change after the fact, simultaneous causality and endogeneity of our explanatory variables do not present viable risks threatening to bias the results. Table 3 presents the regression results for each of the four years. We can see that all results are significant, at least at the 10 percent level (\*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively). Further,  $R^2$  which represents the share of variation in the unemployment rate that can be explained by our independent variables, is quite high for all the years we test and is always above fifty percent. This suggests that the variables we chose are good predictors of unemployment rates during our observation period.

To understand the message these coefficients are conveying, we articulate the results for the 1990 column as an example. First, a 1% increase in the population share of persons between the ages of zero and fourteen is associated with a 0.256% increase in the unemployment rate of 1990. This supports our claim that a young population in the early 1970s, with many young people entering a grim labor market, can contribute to the persistence of unemployment. Secondly, a 1% increase in GDP per capita is associated with a  $0.01 * (-7.244) = -0.07244$  or a 7.244% decrease in the unemployment rate. This supports our claim that more developed economies are more likely to avoid persistently high unemployment rates. Finally, a 1% increase in the share of employment devoted to the services sector is associated with a 0.172% increase in the unemployment rate. We can compare this figure with Kollmeyer and Pichler’s (2013) regression results according to which, depending on the model used, a one-point rise in

manufacturing employment is associated with anywhere from a 0.173 to a 0.228 percentage-point drop in the national unemployment rate. This result is remarkably symmetrical to our result and supports our conclusion which falls in line with the claim that economies demonstrating a more pronounced shift from the industrial sector to the services sector suffer higher and more persistent unemployment rates.

In order to check the robustness of our results, we conduct the same regression with slight changes. First, we replace the variable representing the share of the population between the ages of zero and fourteen with the variable “birth rates.” Birth rates in the early 1970s should serve as a good proxy for the share of young people entering the market in the years that follow. Our equation becomes:

$$UR_{ic,t} = \alpha \text{Birth\_rate}_{ic,1970} + \beta \log(Y)_{ic,1970} + \gamma \text{Share\_serv}_{ic,1970} + \delta_c + \text{error}$$

Regression results are presented in Table 4. We see, for example, that a 1% increase in the birth rate is associated with a 3.022% increase in the unemployment rate of 1990. The result is significant at the five percent level (as is the coefficient on the population share of persons between the ages of zero and fourteen) and the remaining two variables are almost unchanged and remain significant at the ten percent level. The  $R^2$  is likewise roughly the same as when using the share of persons between the ages of zero and fourteen, and suggests that almost three quarters of the variation in unemployment rates is explained by the variables chosen.

Additionally, we seek to test the whether a greater share of employment in a certain branch of the services sector in the early 1970s, rather than the services sector as a whole, is the true predictor of later unemployment rates. We therefore conduct the original regression, while alternating between the different branches within the services sector instead of using the share of employment in the entire services sector as an explanatory variable. The five different branches

within the services sector are: commerce, transportation, credit, administration, and “other.” Our first equation therefore becomes:

$$UR_{ic,t} = \alpha Age0-14_{ic,1970} + \beta \log(Y)_{ic,1970} + \gamma Share\_comm_{ic,1970} + \delta_c + error$$

where “Share\_comm” denotes the share of the working population employed in commerce. Our second equation is:

$$UR_{ic,t} = \alpha Age0-14_{ic,1970} + \beta \log(Y)_{ic,1970} + \gamma Share\_trans_{ic,1970} + \delta_c + error$$

where “Share\_trans” denotes the share of the working population employed in transportation.

We construct the next three equations in the same fashion. Table 5 presents the results for 1990 as an example. We see that when using the share of the working population employed in commerce, the first two variables barely change and remain significant at the five and one percent levels, respectively. We observe that a 1% increase in the share of employment devoted to commerce is associated with a 0.187% increase in the unemployment rate, and that this result is significant at the five percent level. This is not very different from the result we generated using the share of workers employed in the services sector as a whole. Further, when we use the share of the working population employed in transportation, the first two variables remain almost unchanged and maintain significance levels of five and one percent, respectively. We observe that a 1% increase in the share of employment devoted to commerce is associated with a 0.346% increase in the unemployment rate, and that this result is significant at the five percent level. Again, this result is not dramatically different from the result we generated using the share of workers employed in the services sector as a whole. We notice that the positive association is maintained between a proportionally large branch in the services sector in the early 1970s and the unemployment rate in 1990, no matter which branch we use. This leads us to conclude that there is not one branch within the services sector whose development is particularly associated

with high unemployment rates later on, but that having a large services sector in general in the early 1970s is associated with high unemployment rates in 1990.

## **5 – Extension: Future Research on Inter-Regional Migration**

The initial hypothesis for this paper included a relationship linking the static nature of many European regions (i.e.: the tendency not to migrate from one region to another in search for job opportunities, but rather to remain in one's birthplace) and the persistence of high unemployment rates. In the United States, people who wish to move from, say, one state to another, face moving costs and other emotional tolls such as separation from family, etc. Still, there are no language barriers across the different states, and no visas or permits are necessary, making the transition relatively smooth. Mobility across European countries has been facilitated since 1995 when the implementation of the Schengen Agreements allowed crossing of internal borders within the growing Schengen Area (European Commission, 2013). In the early 1970s, however, in addition to the language and culture barriers still in effect today, the procedure was further complicated by legal and logistic obstacles.

For this reason, inter-regional migration within individual countries is probably a more realistic measure of a dynamic job-search culture. We collected data on migration from one region to another, with regions usually conforming to the third (if not second) level of the NUTS classification, in the early 1970s. We examined the same set of countries less Denmark, Greece, and Portugal for which we did not find sufficiently detailed data. While we tried regressing unemployment rates on the percentage of arriving migrants in the population, on the percentage of departing migrants in the population, on the net flow of migrants (arriving migrants less departing migrants) as a percent of the population, and on the total migration (arriving migrants

plus departing migrants) as a percent of the population, no clear relationship was established. We suspect the lack of uniformity across our data acts to obscure existing relationships, and that more research on the topic may yield important insights. Table 6 presents regression results for unemployment rates in 1985 and 1990 using the following equation:

$$UR_{ic,t} = \alpha Age0-14_{ic,1970} + \beta \log(Y)_{ic,1970} + \gamma Share\_serv_{ic,1970} + \delta_c + \epsilon In\_mig\_pct_{ic,1970} + \zeta Out\_mig\_pct_{ic,1970} + error$$

where “In\_mig\_pct” denotes the percentage of arriving migrants in the population, and “Out\_mig\_pct” denotes the percentage of departing migrants in the population. The relationships between the share of the population composed of persons aged zero to fourteen, the logarithm of GDP per capita, and the share of the labor force employed in the services sector in the early 1970s and the unemployment rate in 1985 and 1990 remain consistent with the paper’s established hypothesis. The relationship between the percentage of arriving migrants in the population in the early 1970s and the unemployment rate is positive in 1985 and negative in 1990. The inverse is true for the relationship between the percentage of departing migrants in the population in the early 1970s and the unemployment rates of 1985 and 1990. We therefore cannot establish any plausible relationship between inter-regional migration in the early 1970s and unemployment rates in the years that follow.

There exists a developed literature regarding the effect of inter-regional migration on the disparities in the unemployment rates of the “core” and that of the “periphery”. One example of such research is found in a study by Paolo Epifani and Gino Gancia (2003) which discusses the mechanism by which migration into core regions first raises these regions’ unemployment rates in the short run, and then lowers the unemployment rates in the long run, increasing disparities. The study explains that the inflow of workers into the core regions increases the supply of labor

in these regions while lowering competition for jobs in the periphery, thereby shrinking the gap between the different unemployment rates. Later, however, once migrants are absorbed by the core regions' labor markets, agglomeration forces come into effect, lowering local unemployment, and widening the gaps between high unemployment rates in the periphery and low ones in the core.

This paper, however, proposes to examine a relationship between the culture of migration in the early 1970s and the high unemployment rates which followed. An important distinction specific to this notion is that we do not wish to examine a specific direction of migration, where people always leave the same regions (the periphery) in favor of the same destination regions (the core). Rather, we wish to learn about the general flexibility, resourcefulness, and determination to obtain work as measured by people's mobility. Intuition would suggest that regions characterized as dynamic, with people arriving and departing according to employment opportunities, would be less likely to experience persistently high unemployment rates than more static regions. When not many employment opportunities are available, people leave and, thereby, are not counted as part of the region's unemployed. Conversely, when the labor market is looking up in a certain region, workers arrive and integrate themselves in the economy, helping it to prosper. It is important to emphasize that the same methodology of collecting migration data from a time preexisting the high unemployment rates is necessary in order to avoid simultaneous causality and endogeneity of migration. If data on migration and unemployment rates are collected for the same years, it would be impossible to ensure that it is in fact the migration culture producing an effect on unemployment rates, and not vice versa. Specifically, we would suspect high unemployment rates to encourage more outward-bound migration, and low unemployment rates to encourage more inward-bound migration.



## 6 – Conclusion and Policy Recommendations

This paper examines European regions’ characteristics – ranging from demographic to economic – to explore the puzzling and alarming high unemployment rates grown synonymous with the continent since the 1970s. Through the use of regional data to explore the initial conditions present in fourteen European countries in the early 1970s, the study reveals robust relationships between three factors and the unemployment rates witnessed throughout our 1970-1990 observation period. First, we find a positive association between a young population in the early 1970s, with many persons between the ages of zero and fourteen, and unemployment rates in the years that follow. The reasoning for this phenomenon lies in a “scarring” effect on young job candidates who enter a dismal labor market and often encounter early unemployment, hurting their employment chances in the long term. Next, we detect a negative relationship between a region’s income, as measured by the logarithm of GDP per capita, in the early 1970s and unemployment rates in the years that follow. We attribute this relationship to high-income regions’ ability to fund superior institutions and policies aimed at assisting the job search of the unemployed. Finally, we find a positive relationship between a proportionally large services sector in the early 1970s and unemployment rates in the years that follow. Deindustrialization caused substantial structural unemployment. Entire regions of workers skilled for highly specific jobs were laid off and faced difficulties as they tried to adjust to a services economy.

While the United States saw similar rises in its unemployment rates in the 1970s, it recovered much faster than Europe, and has never experienced rates as high as those of, for example, Spain (currently around 27 percent). Still, with the economy suffering since the 2008 financial crisis, and unemployment rates rising to uncomfortable levels of eight to nine percent over the last few years, it is useful to draw some lessons from Europe’s experience. While there

is little action to be taken in order to prevent the emergence of young populations, it is helpful to be aware of age structure when designing job-search assistance programs. Similarly, it would be futile (and probably disadvantageous) to attempt to resist change and innovation which might bring about structural unemployment. The solutions might lie therefore in preparedness for new types of employment. Offering classes which teach computer skills and coding in schools, for example, is a good way to prepare students for today's labor market.

Additionally, as mentioned earlier, Active Labor Market Policies (ALMPs) are a pillar of many countries' efforts to combat high unemployment rates. The effectiveness of these is under heated debate and should be considered before funds are invested. A study on ALMPs in Poland finds that job-search assistance programs are "cheap and effective" (Bukowski et al., 2008), especially when addressed to people unemployed for a relatively short amount of time. These kinds of programs not only reduce the duration of the job search, but also ensure that candidates obtain jobs for which they are more qualified, thereby increasing job stability (Crepon et al., 2005). On the other hand, the same study on ALMPs in Poland finds training programs targeted to the youth to be ineffective. Similarly to our suggestion that schools begin exposing students to areas of study relevant to the market's needs, W. Norton Grubb (1999) and James Heckman (2006) emphasize early education rather than training programs to assist the youth.

Further, a particularly heated debate these days concerns whether the government, both in European countries and in the U.S., should keep stimulating the economy by creating demand, in accordance with Keynesian macroeconomic theory. Stimulating the current economy requires government spending which exceeds tax revenue, leading governments to borrow money and thus increase their debts. The U.S. Government, for example, passed the American Recovery and Reinvestment Act of 2009 (ARRA), and borrows money in order to spend it on

infrastructure, education, health, and energy. The U.S. Government likewise provided federal tax incentives, and offered higher unemployment benefits as well as other social welfare programs. While some economists (Krugman, 2009) are wary that a decrease in these measures will impede recovery and cause the U.S. to fall deeper into recession and experience higher unemployment rates, others (Barro, 2011) warn that growing debts may lead to another recession, and encourage austerity.

In summary, awareness of the population structure and the labor market's needs, as well as research regarding the effectiveness of different unemployment-alleviating measures are necessary in order to prevent persistently high unemployment rates. Moreover, it is important to determine whether more government spending is necessary now in order to avoid the persistently high unemployment rates present in Europe. Likewise, we must consider the sustainability of such spending and measures. If the economy does not recover in the near future, we may be at risk of accumulating monumental debt without experiencing a recovery. For this reason, we must ensure that we are benefiting as much as possible from every stimulating initiative, and that all spending is effective.

## Tables and Figures:

**Table 1: The 0-14 Age Group (Early 1970s) and the Unemployment Rate (1990)**

(1) Country	(2) Number of regions	(3) Mean % of population accounted for by persons aged 0-14	(4) Standard deviation	(5) Mean unemployment rate	(6) Standard deviation	(7) Standard deviation of the log of GDP per capita
Austria	9	<b>25.79</b>	3.87	<b>3.09</b>	0.94	0.26
Belgium	9	<b>24.20</b>	2.53	<b>7.60</b>	3.16	0.18
Switzerland	25	<b>24.95</b>	3.63	<b>1.91</b>	0.77	0.18
Germany	11	<b>22.34</b>	3.06	<b>6.74</b>	2.25	0.20
Denmark	3	<b>23.01</b>	2.07	<b>8.14</b>	0.84	0.10
Greece	8	<b>26.44</b>	1.95	<b>4.79</b>	2.41	0.21
Spain	18	<b>27.64</b>	3.02	<b>16.25</b>	6.23	0.19
Finland	5	<b>21.35</b>	0.98	<b>2.88</b>	2.05	0.25
France	22	<b>23.99</b>	2.55	<b>8.76</b>	2.11	0.18
Italy	20	<b>24.15</b>	3.99	<b>10.62</b>	6.83	0.31
The Netherlands	11	<b>27.28</b>	1.82	<b>7.65</b>	1.74	0.13
Portugal	7	<b>28.49</b>	6.03	<b>5.44</b>	3.55	0.40
Sweden	8	<b>20.83</b>	0.92	<b>1.85</b>	0.70	0.09
United Kingdom	9	<b>24.15</b>	1.08	<b>6.32</b>	1.99	0.11
Total	165	<b>24.84</b>	3.59	<b>7.24</b>	5.55	6.59

*Notes:* The table presents the mean share of population accounted for by persons aged 0-14 across the regions of each of the sample's countries'. It likewise shows the mean unemployment rate across the regions of each of the sample's countries', as well as the standard deviations from the mean for both variables. Column (7) presents the standard deviations from the mean of the log of GDP per capita across the regions of each of the sample's countries'.

**Table 2: Services Sector's Share in Employment (early 1970s) and the Unemployment Rate (1990)**

<b>Country</b>	<b>Number of regions</b>	<b>Mean % of labor force in services</b>	<b>Standard deviation</b>	<b>Mean unemployment rate</b>	<b>Standard deviation</b>
Austria	9	<b>41.53</b>	10.38	<b>3.09</b>	0.94
Belgium	9	<b>54.47</b>	8.26	<b>7.60</b>	3.16
Switzerland	25	<b>19.52</b>	5.70	<b>1.91</b>	0.77
Germany	11	<b>53.64</b>	8.01	<b>6.74</b>	2.25
Denmark	3	<b>68.42</b>	8.74	<b>8.14</b>	0.84
Greece	8	<b>26.83</b>	10.01	<b>4.79</b>	2.41
Spain	18	<b>40.38</b>	11.73	<b>16.25</b>	6.23
Finland	5	<b>46.36</b>	9.85	<b>2.88</b>	2.05
France	22	<b>55.32</b>	6.14	<b>8.76</b>	2.11
Italy	20	<b>51.82</b>	7.61	<b>10.62</b>	6.83
The Netherlands	11	<b>54.46</b>	7.02	<b>7.65</b>	1.74
Portugal	7	<b>31.84</b>	10.54	<b>5.44</b>	3.55
Sweden	8	<b>52.02</b>	8.90	<b>1.85</b>	0.70
United Kingdom	9	<b>53.76</b>	6.48	<b>6.32</b>	1.99
Total	165	<b>44.22</b>	15.51	<b>7.24</b>	5.55

*Notes:* The table presents the mean share of employment devoted to the services sector across the regions of each of the sample's countries'. It likewise shows the mean unemployment rate across the regions of each of the sample's countries', as well as the standard deviations from the mean for both variables.

**Table 3: Relationship between our Three Variables and the Unemployment Rate**

Independent Variable	Effect on Unemployment Rate in...			
	1975	1980	1985	1990
Share of population accounted for by persons aged 0-14	<b>0.084**</b> (0.039)	<b>0.194**</b> (0.074)	<b>0.269**</b> (0.126)	<b>0.256**</b> (0.103)
Logarithm of GDP per Capita	<b>-2.721***</b> (0.657)	<b>-4.064***</b> (1.062)	<b>-1.951</b> (1.508)	<b>-7.244***</b> (1.481)
Share of labor force employed in services	<b>0.0236*</b> (0.014)	<b>0.0892***</b> (0.023)	<b>0.0639*</b> (0.037)	<b>0.172***</b> (0.037)
Number of observations	<b>93</b>	<b>121</b>	<b>129</b>	<b>160</b>
R <sup>2</sup>	<b>0.535</b>	<b>0.804</b>	<b>0.774</b>	<b>0.747</b>

*Notes:* The table presents regression results where the independent variables are: “Share of population accounted for by persons aged 0-14,” “Logarithm of GDP per Capita,” and “Share of labor force employed in services.” The unemployment rate is the dependent variable. Data for all independent variables is from the early 1970s, and data for unemployment rates is from 1975, 1980, 1985, and 1990. Regression coefficients are presented with robust standard errors in parenthesis. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table 4: Regression Results Using Birth Rate as the First Explanatory Variable**

Independent Variable	Effect on Unemployment Rate in...			
	1975	1980	1985	1990
Birth rate	<b>0.967*</b> (0.522)	<b>2.624**</b> (0.905)	<b>4.607***</b> (1.476)	<b>3.022**</b> (1.411)
Logarithm of GDP per Capita	<b>-3.062***</b> (0.642)	<b>-4.840***</b> (1.030)	<b>-2.805**</b> (1.317)	<b>-7.907***</b> (1.560)
Share of labor force employed in services	<b>0.019</b> (0.014)	<b>0.076***</b> (0.022)	<b>0.0389</b> (0.034)	<b>0.130***</b> (0.036)
Number of observations	<b>93</b>	<b>121</b>	<b>129</b>	<b>159</b>
R <sup>2</sup>	<b>0.529</b>	<b>0.807</b>	<b>0.787</b>	<b>0.726</b>

*Notes:* The table presents regression results where the independent variable: “Birth rate” replaces the independent variable: “Share of population accounted for by persons aged 0-14,” providing an additional method to measure the effect a young population has on unemployment rates. The unemployment rate is the dependent variable. Data for all independent variables is from the early 1970s, and data for unemployment rates is from 1975, 1980, 1985, and 1990. Regression coefficients are presented with robust standard errors in parenthesis. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table 5: Regression Results for 1990, Using Share of Employment in the Different Branches of the Services Sector**

Using the entire services sector	Share of population accounted for by persons aged 0-14	<b>0.256**</b> (0.103)
	Logarithm of GDP per Capita	<b>-7.244***</b> (1.481)
	Share of labor force employed in entire services sector	<b>0.172***</b> (0.037)
	Number of observations	<b>160</b>
	R <sup>2</sup>	<b>0.747</b>
Using the commerce branch only	Share of population accounted for by persons aged 0-14	<b>0.265**</b> (0.123)
	Logarithm of GDP per Capita	<b>-6.627***</b> (1.669)
	Share of labor force employed in commerce	<b>0.187**</b> (0.075)
	Number of observations	<b>160</b>
	R <sup>2</sup>	<b>0.708</b>
Using the transportation branch only	Share of population accounted for by persons aged 0-14	<b>0.269**</b> (0.127)
	Logarithm of GDP per Capita	<b>-6.520***</b> (1.643)
	Share of labor force employed in transportation	<b>0.346**</b> (0.124)
	Number of observations	<b>160</b>
	R <sup>2</sup>	<b>0.709</b>
Using the credit branch only	Share of population accounted for by persons aged 0-14	<b>0.336**</b> (0.130)
	Logarithm of GDP per Capita	<b>-7.835***</b> (1.804)
	Share of labor force employed in credit	<b>0.501***</b> (0.114)
	Number of observations	<b>160</b>
	R <sup>2</sup>	<b>0.719</b>
Using the administration branch only	Share of population accounted for by persons aged 0-14	<b>0.213*</b> (0.110)
	Logarithm of GDP per Capita	<b>-5.736***</b> (1.496)
	Share of labor force employed in administration	<b>0.472***</b> (0.118)
	Number of observations	<b>160</b>
	R <sup>2</sup>	<b>0.732</b>
Using “other” services only	Share of population accounted for by persons aged 0-14	<b>0.307**</b> (0.127)
	Logarithm of GDP per Capita	<b>-5.611***</b> (1.693)
	Share of labor force employed in “other” services	<b>0.110***</b> (0.030)
	Number of observations	<b>155</b>
	R <sup>2</sup>	<b>0.712</b>

*Notes:* The table presents regression results comparing the effect of the share of employment in the services sector, as a whole, with the effect of employment in specific branches of the services sector on the unemployment rate in 1990. Data for all independent variables is from the early 1970s, and data for the unemployment rate is from 1990. Regression coefficients are presented with robust standard errors in parenthesis. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

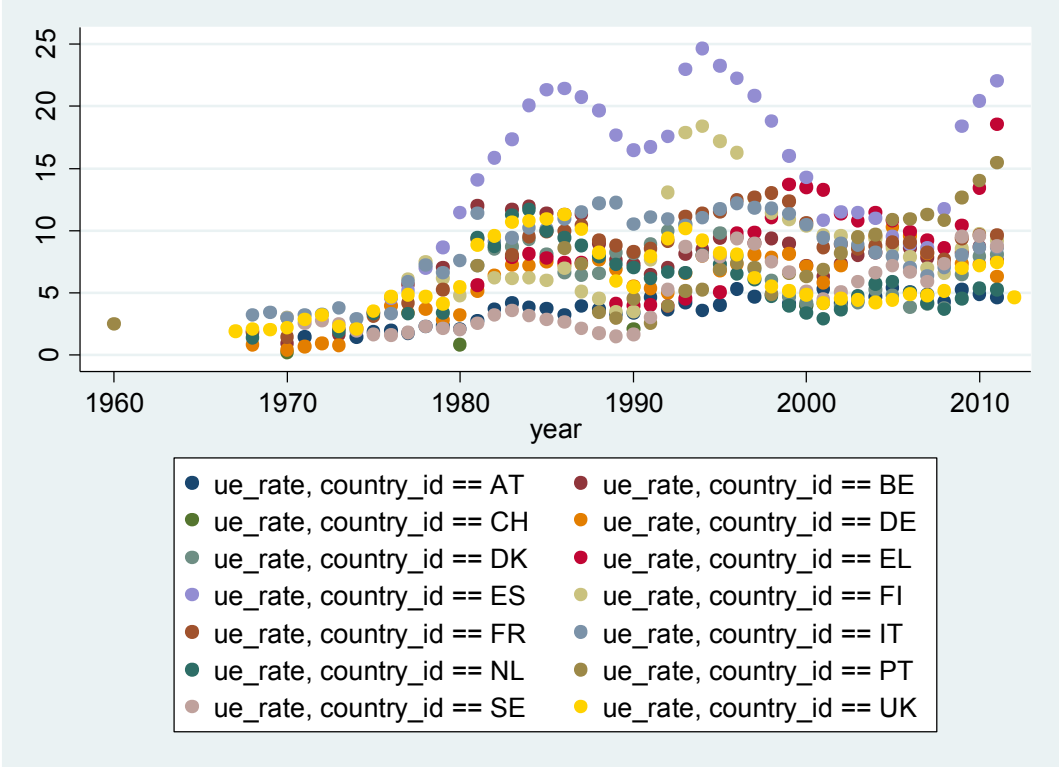
**Table 6: Regression Results Adding Arriving and Departing Migration Shares of the Population as Explanatory Variables**

Independent Variable	Effect on Unemployment Rate in...	
	1985	1990
Share of population accounted for by persons aged 0-14	<b>0.250*</b> (0.135)	<b>0.274**</b> (0.100)
Logarithm of GDP per Capita	<b>-4.446***</b> (1.506)	<b>-6.042***</b> (1.399)
Share of labor force employed in services	<b>0.047</b> (0.035)	<b>0.149***</b> (0.033)
Share of arriving migrants in the population	<b>0.739**</b> (0.287)	<b>-0.574</b> (0.308)
Share of departing migrants in the population	<b>-0.865**</b> (0.323)	<b>0.839***</b> (0.256)
<b>Number of observations</b>	<b>118</b>	<b>144</b>
<b>R<sup>2</sup></b>	<b>0.803</b>	<b>0.792</b>

*Notes:* The table presents regression results where the shares of arriving and departing migrants in the population are added to the list of independent variables, and the unemployment rate is the dependent variable. Data for all independent variables is from the early 1970s, and data for unemployment rates is from 1985 and 1990. Regression coefficients are presented with robust standard errors in parenthesis. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

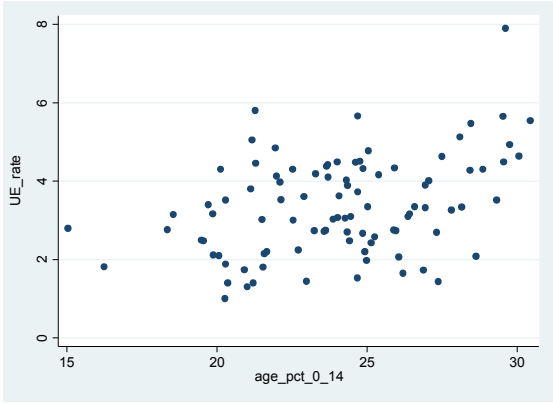


**Figure 1: Persistent Unemployment Rates over the Years in Fourteen European Countries**

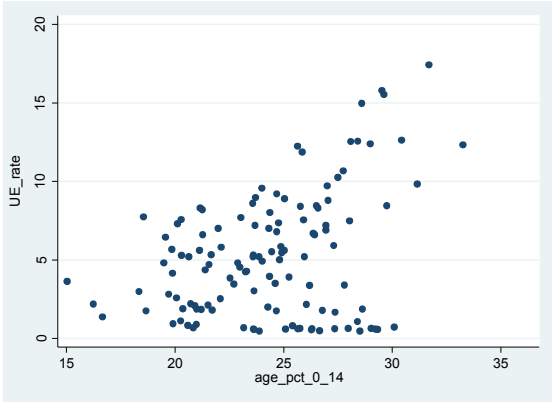


*Notes:* The figure plots unemployment rates (vertical axis) and years (horizontal axis) as it presents the unemployment rates of the sample’s countries from 1959 to 2012, demonstrating the persistence of high unemployment rates since the 1970s.

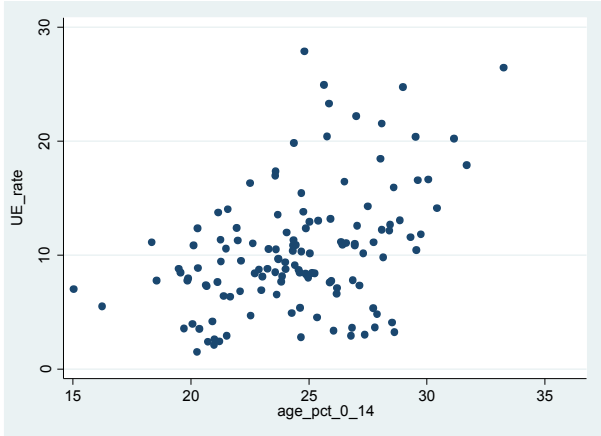
**Figure 2: The 0-14 age group in the early 1970s and the unemployment rate in 1975**



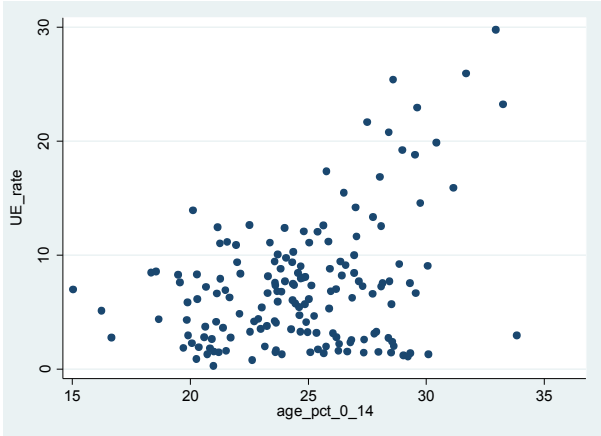
**Figure 3: The 0-14 age group in the early 1970s and the unemployment rate in 1980**



**Figure 4: The 0-14 age group in the early 1970s and the unemployment rate in 1985**

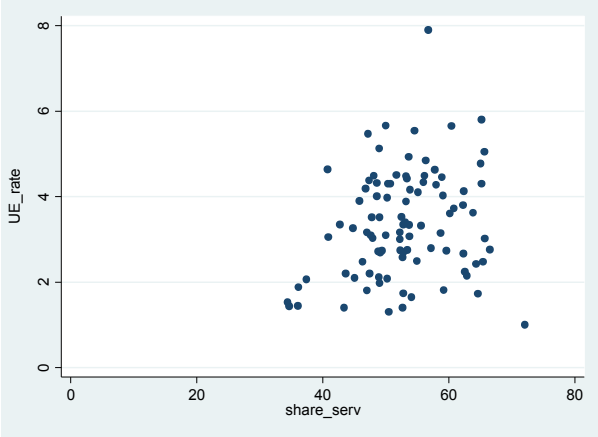


**Figure 5: The 0-14 age group in the early 1970s and the unemployment rate in 1990**

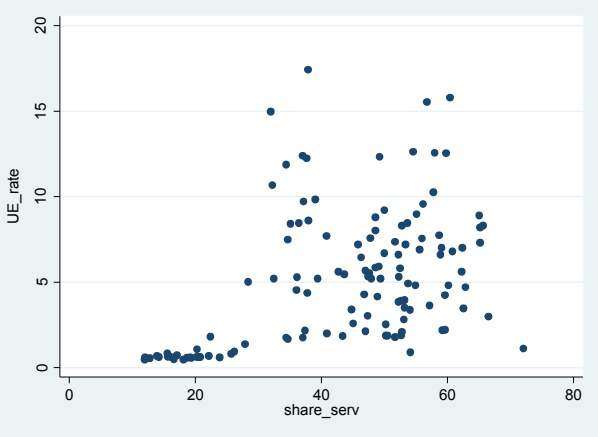


**Notes:** Figures 2-5 present the positive association between the share of the population accounted for by persons aged zero to fourteen in the early 1970s and the unemployment rates in 1975, 1980, 1985, and 1990, respectively.

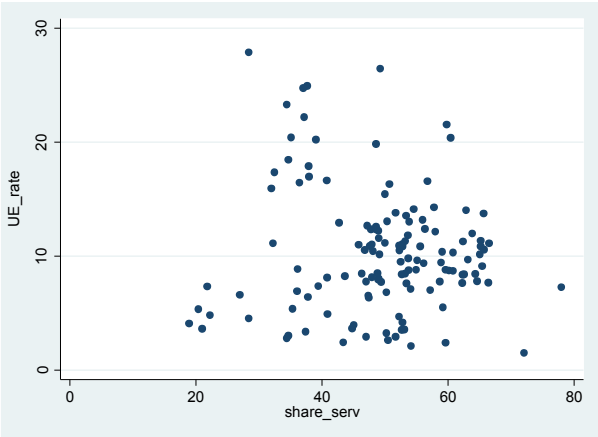
**Figure 6: Share of employment in services sector in the early 1970s and the unemployment rate in 1975**



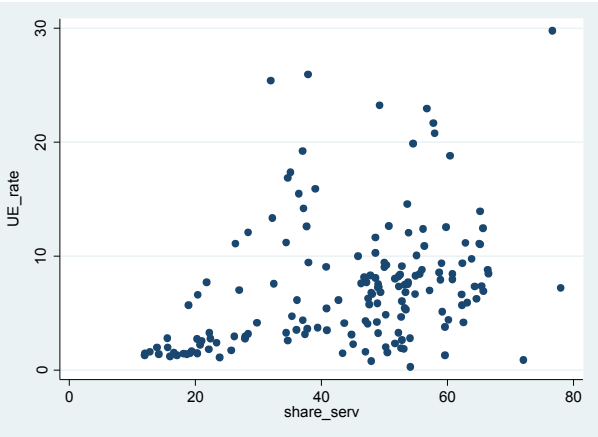
**Figure 7: Share of employment in services sector in the early 1970s and the unemployment rate in 1980**



**Figure 8: Share of employment in services sector in the early 1970s and the unemployment rate in 1985**



**Figure 9: Share of employment in services sector in the early 1970s and the unemployment rate in 1990**



**Notes:** Figures 6-9 present the positive association between the share of employment invested in the services sector in the early 1970s and the unemployment rates in 1975, 1980, 1985, and 1990, respectively.

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\*Data was obtained through consultation of the sample's countries' censuses and statistical yearbooks.