

INTRANATIONAL LABOR MIGRATION, BUSINESS CYCLES AND GROWTH

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Abstract. This paper investigates labor market dynamics in European regions and US states. We investigate the role that migration plays in the adjustment of labor markets to both long-term evolutions and region-specific business cycles. Our analysis, by combining regional and country data, uncovers the different adjustment that takes place within and across countries. These results are used to understand how the process of European integration will change the way European labor markets operate and its effects on growth and business cycles.

1. INTRODUCTION

Labor markets are a central piece of most macroeconomic models. The predictions of models of economic growth depend on the extent to which labor mobility reduces differences in regional income per capita and helps to adjust markets to changes in economic opportunities that require a geographical reallocation of factors of production. At the same time, different assumptions about the labor market have implications on the propagation of business cycles.

Moving away from aggregate data and studying disaggregated units (regional or sectoral) has recently been a fruitful area in the study of macroeconomic phenomena, producing many insights about the behavior of macroeconomic aggregates. There are two advantages to the use of disaggregated data. First, it allows us to test theories for which the standard aggregate data does not provide enough degrees of freedom. Second, the study of geographical units serves as a bridge between closed-economy models of economic fluctuations and international finance models for open economies. This paper makes use of regional labor market data for Europe and the US to understand the adjustment that takes place in response to both long-term evolutions and short-term economic fluctuations.

For Europe, our sample covers 14 current members of the European Union (all except for Luxembourg). We disaggregate the five largest countries in the sample into 45 regions so that the resulting 54 regions are comparable in size to the US states. Our dataset allows us two types of comparisons. First, within Europe, our mixed sample of regions and countries provides information on the extent to which national borders are relevant for labor market adjustment. Second, the comparison with the US, a more

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integrated area from an economic, political and cultural point of view, can be used to forecast the future evolution of European regional labor markets. The process of European economic integration, possibly fostered by the creation of a single currency in January 1999, will change, at least in some dimensions, the economic environment of labor markets and will bring them closer to regional labor markets in the US.

We start our analysis by reviewing some of the long-term trends in regional labor markets. Our results can be summarized in three set of findings. First, European regions are characterized by a low degree of labor mobility. This degree is not only much lower than in the US, but has been declining since the mid 70's. This decline is a general one and affects regions as much as countries. Second, the persistence of regional employment growth rates is higher in US states than in European regions. Third, and related to the lack of labor mobility, regional differences in unemployment rates in European countries are much more persistent than among US states. Interestingly, this persistence is much more pronounced within than across European countries.

In the second part of the paper we analyze the adjustment of labor markets in response to region-specific shocks. We find that these shocks cause permanent changes in the employment share of a region both in Europe and the US. Migration is the main adjustment mechanism in the US. Inflows of workers to booming regions not only helps the economy to adjust to the initial increase in labor demand but it creates additional persistence as there is a build-up effect after the shock. In Europe, changes in regional participation rates bear most of the employment adjustment. Surprisingly, both in Europe and the US, unemployment rates react very little and their response is not very persistent.

The paper is structured as follows. Section 2 presents the data and the level of disaggregation chosen. Section 3 studies long-term evolutions of regional labor markets. Section 4 analyzes the response to region-specific shocks. Section 5 discusses the implications of our results for the future evolution of European migration and Section 6 concludes.

2. THE LEVEL OF REGIONAL DISAGGREGATION

The sample contains regions and countries from the European Union and the United States. For the United States, our sample includes 51 regions (the 50 US states plus the District of Columbia). For Europe, our sample covers 14 of the countries that are current members of the European Union (Luxembourg is excluded). For 5 of those countries we have disaggregated regional data. The regional data include 8 regions for France, 8 for Germany, 7 for Spain and 11 for Italy and the UK.¹

¹ Data descriptions and sources are available in the Data Appendix.

Our analysis takes advantage of the mixed composition of our European sample (countries and regions) to better understand how national borders define within- and across-country labor market dynamics. In our analysis we study 4 types of samples:

- *US*. The sample of US states which includes 51 regions.
- *EU54*. The mixed sample of European countries and regions, which includes 54 regions. More precisely, it includes regional data on 45 regions from France, Germany, Spain, Italy and the UK, plus the remaining 9 countries (Belgium, Denmark, Greece, Ireland, the Netherlands, Portugal, Sweden, Finland and Austria). Sometimes we will look at a subsample of EU54, namely the one composed of pure regional data. We will refer to this subsample as *EU45*.
- *EU14*. Country data from the 14 EU countries being considered.
- *Germany, Italy, UK*. Regions belonging to each of these countries, to analyze within-country dynamics.²

The EU54 sample allows us to compare Europe and the US at a similar level of disaggregation. These 54 European regions are similar in size to the US states. The average population of a European region (4.1 million) is about 22% larger than that of the average US state (3.4 million). The variation in population size is much smaller across the European regions: the standard deviation equals 1.42 million whereas the respective value for the US is 3.66 million. The two largest regions in this regional subdivision for Europe have populations which are comparable to those of Texas and New York. Other large regions such as Belgium, Portugal, Greece, the Bassin Parisien, Ile de France, Bavaria and Baden-Württemberg have populations comparable to those of Pennsylvania, Ohio, Illinois and Florida and which are less than half the size of the population of California. In terms of region size, this subdivision not only leaves us with a fairly homogeneous sample but it also maximizes the availability of data and should ensure that the results we obtain are comparable to those for the US.³

Before starting our analysis we should note that regions are defined by political borders and not by economic arguments. Ideally one would like to use information that has been collected based on geographical labor markets. In some cases the regional units actually used in the analysis are not a good approximation to well-defined geographical labor markets.⁴

² Although regional data is also available from France and Spain, the short duration of the sample does not allow us to extract any robust conclusions from the isolated analysis of those countries.

³ Regional data for all the countries being treated as single regions in our sample is either unavailable or very incomplete.

⁴ The states of New York and New Jersey are a good example of how the regions used in the analysis might not be good approximations to geographical labor markets.

3. LONG RUN TRENDS

In this section we look at the long-term evolutions of three labor market variables: employment, unemployment and migration

3.1 EMPLOYMENT

Starting by the sample of 54 EU regions, we can see that there is a significant amount of persistence in the growth rates of regional employment. Regions that grew faster in the first half of the sample continued their faster pace in the second part of the sample. Figure 1 summarizes this information by plotting average annual employment growth rates for all the 54 EU regions during the first (1966-77) and second half (1977-94) of the samples.⁵ Table 1 presents the results of running a cross-section regression of the type

$$\Delta n_{i,1977-94} = \alpha + \beta \Delta n_{i,1966-77} + \epsilon_i$$

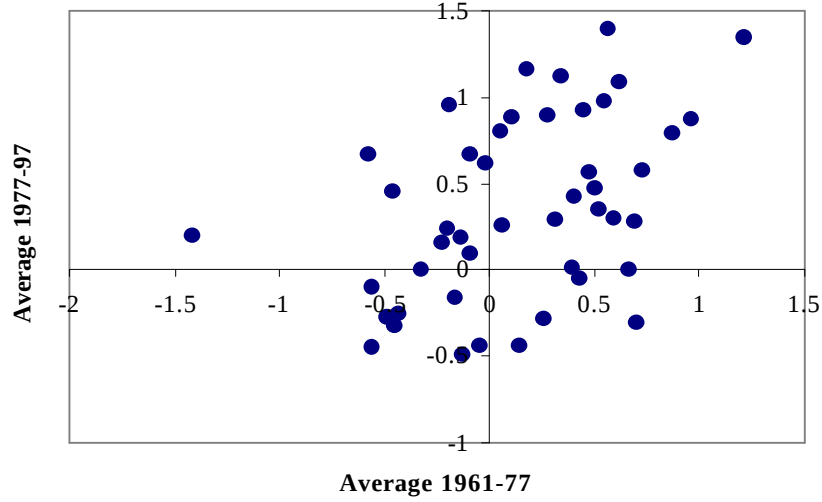
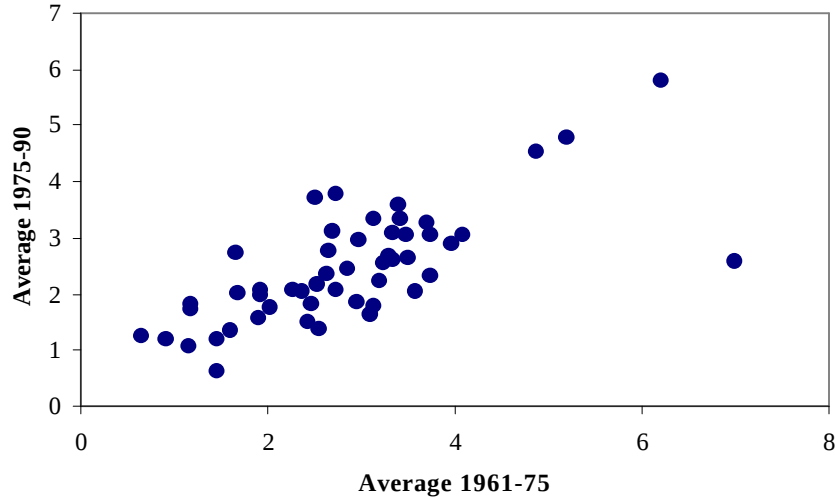
where Δn_i represents the average regional employment growth during the period considered.

For the EU54 sample, the coefficient is negative and non significant. If one excludes West Berlin and the Spanish regions (which are clear outliers) one obtains a significant coefficient of 0.41 and an R^2 of 0.19.⁶ How does this compare to the US? Figure 2 presents the data and the second row of Table 1 the results of the regression. The slope is strongly significant, its value is 0.74 and an R^2 is equal to 0.64.

Consequently, at first sight, there is significant more long-term persistence of employment growth in the US than in Europe. The persistence of European regional employment growth rates becomes larger if one looks at employment growth rates within countries. If we do a similar analysis for the five countries for which regional data is available we find strong persistence that varies across countries. For the EU45 sample (excluding the Spanish regions, which leaves us with a total of 37 regions) the coefficient is highly significant and equal to 0.56 (with an R^2 of 0.29). Stronger results are found if we perform similar regressions using only regions that belong to the same country. Both the coefficient (the highest in the case of Germany, 1.26) and the R^2 increase (higher than 0.75 for Germany and the UK).

⁵ In order to maximize the available data, we split the sample in different years for France (1971-80 and 1981-90). Berlin and the 8 Spanish regions are excluded from Figure 1 because, for different reasons, they are clear outliers.

⁶ The limited availability of data for the Spanish regions and the fact that the second half of the sample corresponds to a period of unprecedented destruction of jobs, results in a behavior that is very different from the other European regions. To be able to include them in a meaningful way in a regression such as the one in Table 1 we would need to demean the regional variables using the evolution of the national aggregate.

Figure 1. Employment Growth Trends: EU Regions**Figure 2. Employment Growth Trends: US States**

We can confirm that persistence of regional employment growth rates is larger within countries than across countries by looking at Figure 3, which plots national employment growth rates for the EU14 sample. There is little cross-country persistence and, as the last row of Table 1 indicates, the regression yields a negative coefficient and an R^2 of 0.05.

3.2 UNEMPLOYMENT

Figure 4 plots regional unemployment rates minus the EU-wide unemployment rate at the beginning and the end of our sample (1968 and 1987).⁷ We run a cross-

⁷ For France the starting year is 1974 and for Spain, 1977.

Table 1. Persistence of Employment Growth Rates

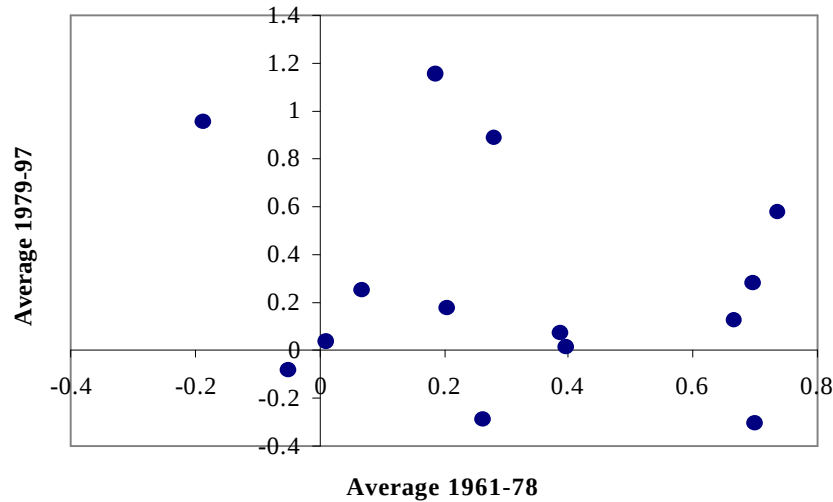
$$\Delta n_{i,1977-94} = \alpha + \beta \Delta n_{i,1966-77} + \epsilon_i$$

Sample	β	R^2	Sample	β	R^2
EU54	-0.14 (0.27)	0.01	Germany (**)	1.26 (0.31)	0.76
EU54 (*)	0.41 (0.13)	0.19	Italy	0.62 (0.41)	0.19
EU45	-0.13 (0.29)	0.01	UK	0.81 (0.12)	0.83
EU45 (*)	0.56 (0.14)	0.31	US	0.74 (0.07)	0.66
EU14	-0.34 (0.42)	0.05			

Standard errors in parentheses

(*) Berlin and Spanish regions not included

(**) Berlin not included

Figure 3. Employment Growth Trends: EU Countries

section regression of these two variables

$$u_{i,1987} = \alpha + \beta u_{i,1968} + \epsilon_i$$

where u_i is defined as the difference between regional unemployment rates and the European unemployment rate. Table 2 summarizes the results. The regression line has a slope of 1.09 (with a standard deviation of 0.28) and the R^2 equals 0.18.

If we restrict our sample to only regions (EU45), the regression produces a similar coefficient. As it was the case of employment growth rates, removing the Spanish regions significantly improves the regression. Country by country, we find not

only persistence but in some cases increased dispersion of unemployment rates, as the regression coefficient is larger than 1.

If we use the EU14 country sample, the persistence is less pronounced as both the size of the coefficient and the fit of the regression are smaller.

This may now be compared to Figure 5 which shows the same for the US. The slope of the regression line is 0.20 and the R^2 equals 0.09. Therefore, regional unemployment rates display much more persistence in Europe than in the US.

Table 2. Persistence of Unemployment Rates

$$u_{i,1987} = \alpha + \beta u_{i,1968} + \epsilon_i$$

Sample	β	R^2	Sample	β	R^2
EU54	1.09 (0.29)	0.20	Germany	3.72 (3.11)	0.19
EU45	0.99 (0.30)	0.19	Italy	3.46 (1.69)	0.31
EU45 (*)	0.99 (0.23)	0.33	UK	1.68 (0.41)	0.64
EU14	0.71 (0.97)	0.04	US	0.21 (0.08)	0.09

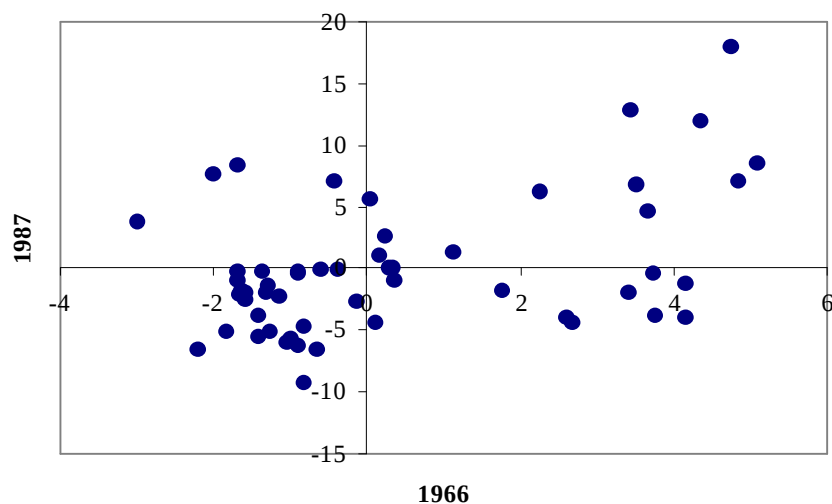
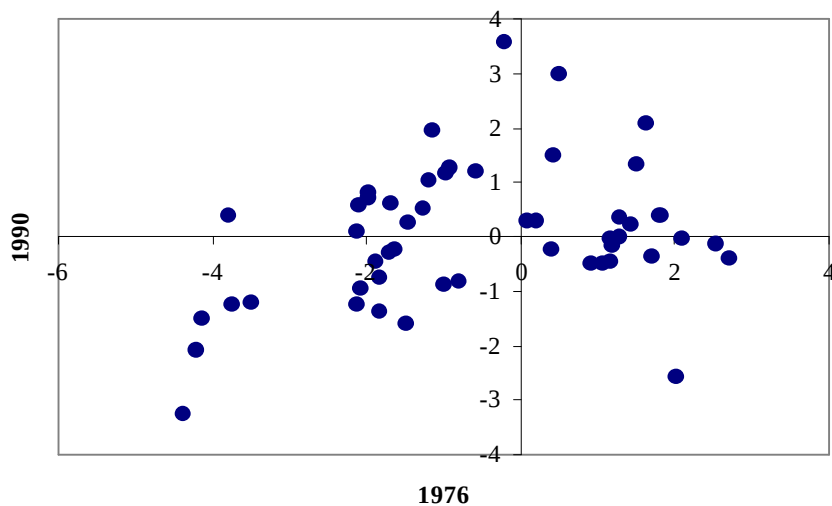
Standard errors in parentheses

(*) Spanish regions not included

The persistence of unemployment rates has to be interpreted with great care given that the results are sensitive to the starting and ending years. Despite this, the conclusion seems to be clear, while in the US there is very little persistence of regional unemployment rates, in Europe, regional unemployment displays significant amount of long-term persistence. In fact, in some cases, the rising unemployment rate of the 70's and 80's has led to growing regional disparities. Surprisingly, this trend is more pronounced within countries than across countries. This seems an indication of the lack of internal adjustment mechanisms such as migration at the level of regional labor markets.

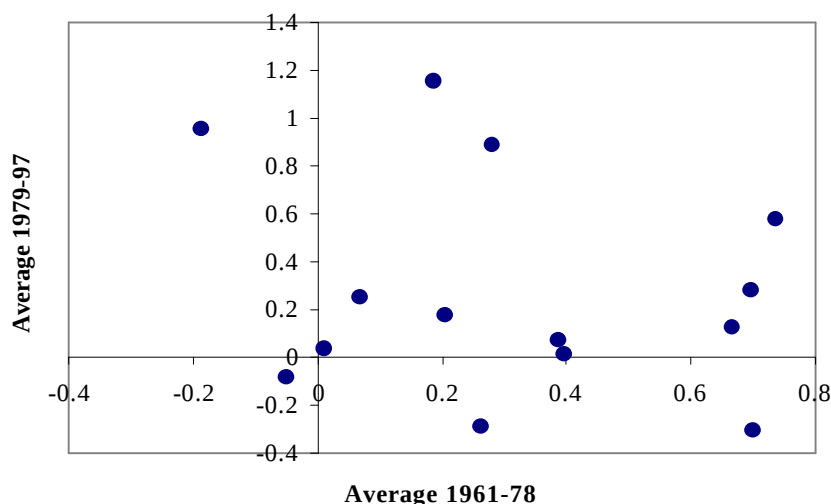
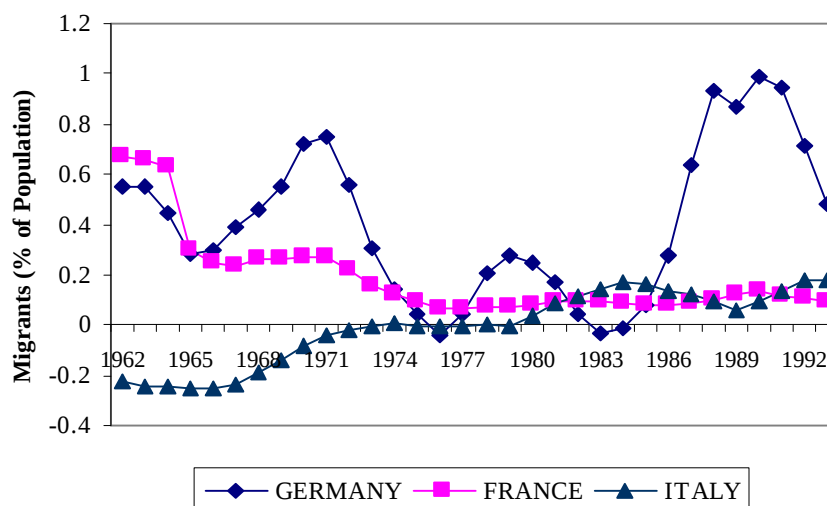
3.3 MIGRATION

Migration figures are, in general, more difficult to compare both over time and across countries. In addition, international responds, in many instances, more to shifts in political attitudes towards migration than to changes in economic conditions. Regarding internal migration data, there are wide cross-country differences with respect to the availability and method of collection of the data. While some countries (e.g. Germany) keep reliable figures on gross flows (region of origin and region of destiny), other countries do not have as reliable and detailed figures.

Figure 4. Unemployment Trends: EU Regions**Figure 5. Unemployment Trends: US States**

Figures 7 and 8 look at the average flow of net international migration as a per cent of total population for Germany, France, Italy, Japan and the US. For all countries, with the exception of Italy and France, there is no clear trend. The case of Italy is interesting as migration switches from emigration to immigration during the sample period.

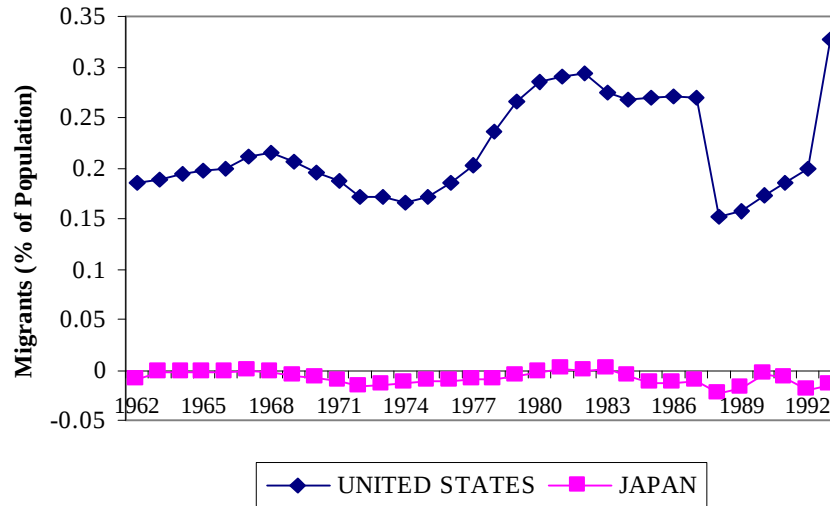
Interestingly, the observed trend for Italy has also taken place in other Southern European countries such as Spain, Portugal or Greece. For example, while in the decade 1960-70 there was an average of more than 250,000 migrants leaving Portugal, Spain or Italy every year, in the decade 1984-94 the flow was more than 50,000 in

Figure 6. Unemployment Trends: EU Countries**Figure 7. Migration Trends: European Countries**

the opposite direction.⁸

To study within country migration, we start by looking at data on the proportion of the population who changes region of residence. Table 3 summarizes the results of

⁸ Country-to-country flows, when available, indicate that this trend is heavily influenced by the changes in the pattern of intra-EU migration. Emigration figures for Italy, Spain and Portugal in the 60's are of similar magnitude that the immigration numbers for France and Germany. On the contrary, in the 90's, migration figures for Italy, France and Germany are all positive and amount to about two thirds of the total migration in the EU from non-EU countries. These numbers seem to indicate that while in 1960 there were significant flows within the European Union and very little from countries outside of the EU, in the end of the 80's and early 90's, most of the flows originated outside of the EU.

Figure 8. Migration Trends: US and Japan**Table 3. Proportion of Population who changed residence**

Annual Data	1970	1980
US - States	3.4	3.3
US - Counties	6.5	6.2
Germany - Länders (11)	1.8	1.3
England and Wales (8)	1.5	1.1
Norway - Counties (19)	3.0	2.3
Multi-year Data	1965-70	1975-80
US States	9.6	9.7
US Counties	17.1	19.5
French Regions (21)	6.5	7.9

an OECD study.⁹

There are significant cross-country differences. Taking into consideration differences in the sizes of the regional units, the ratio is between two and five times larger in the US than in Germany. For example, for the comparable units of German Länders and US states, mobility in the US (3.3) is almost three times higher than in Germany (1.3). Similar differences are found between the US and other European countries such as France or the UK.

A second important observation is that there is evidence that interregional mobility has decreased over time in European countries, which confirms the figures for intra-EU migration. The number of people who has changed region of residence has declined over time.¹⁰

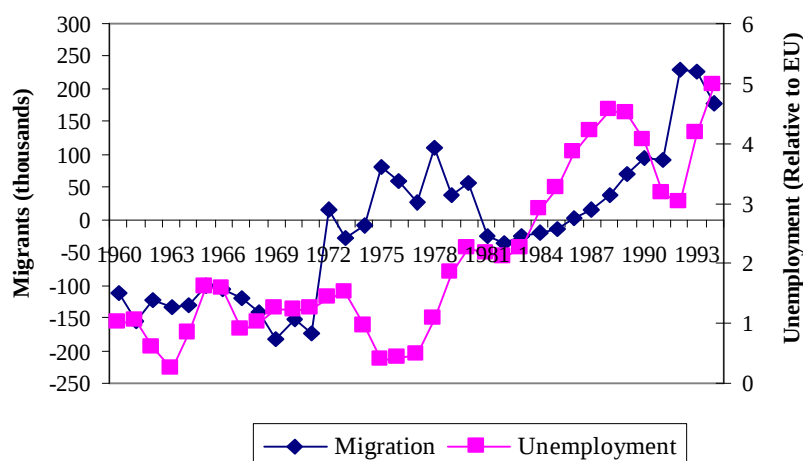
⁹ Source: OECD (1986).

¹⁰ The only exception in Table 3 is France. However, the numbers of migration for the period 1970-75

An interesting question is to what extent the decline in migration responds to regional economic disparities. There is evidence that migration responds to differences in regional income. Barro and Sala-i-Martin (1991) document that US states with low income per capita are those with larger population outflows and, moreover, migration is quite persistent over time.¹¹ In the EU, the migration trends described above clearly indicate that during the 60's and 70's there was significant migration from poor to rich regions (or countries).

A second relevant factor for migration is disparities in unemployment rates. Here, the decrease in migration is puzzling given the increase in the differential of unemployment rates between the receiving and sending countries. Figure 9 shows the sum of net migration of Italy and Spain and the difference between their unemployment rate and the average unemployment rate in the EU15.

Figure 9. Migration and Unemployment: Spain and Italy



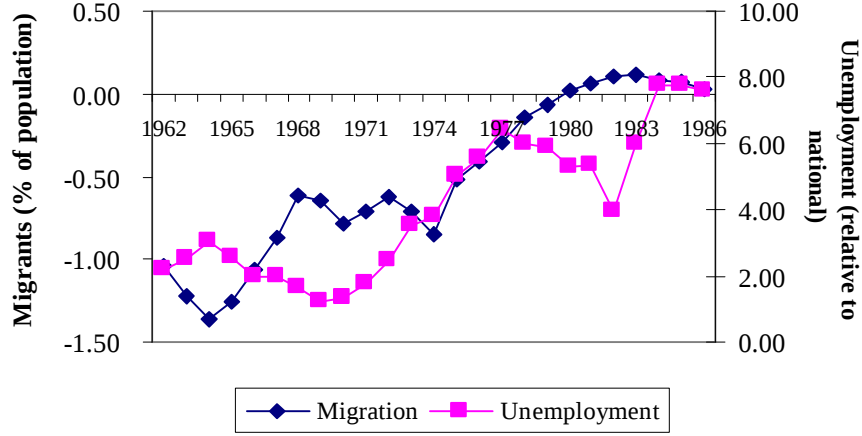
As it is evident in Figure 9, the trend towards falling migration coincided with a trend towards larger disparities of regional unemployment rates.

Additional evidence can be found by looking at migration within one of these countries, Spain.¹² If we look at one of the poorest Spanish regions with one of the highest unemployment rates, Andalucia, we can confirm the apparently paradoxical evolution of migration. Migration from Andalucia to richer Spanish regions in Spain

were 8.7, which indicates that migration has declined after 1975.

¹¹ In fact, this has been one of the mechanisms that explains the observed convergence of income per capita in US states. According to Barro and Sala-i-Martin (1991), without controlling for migrants' human capital, migration could account for as much as a third of the estimated convergence rate. However, after allowing for a reasonable amount of migrants' human capital, the contribution of migration is no more than 10 percent of the estimated rate of convergence.

¹² See Bentolila and Dolado (1991) for an analysis of regional migration in Spain.

Figure 10. Migration and Unemployment: Andalucia

or other European countries was large during the 60's and 70's. Since then, not only the numbers have decreased but, in recent years, the trend has been reversed and we observe net migration into Andalucia from other Spanish regions. See Figure 10.

Overall, the evidence on migration in Europe across and within countries is consistent. On average, there is less migration among European regions than among US states. In Europe, migration has decreased over time and, surprisingly, this fall has coincided with an increase in the relative unemployment of the regions that have been traditional sources of migratory flows.

Why did European interregional migration fall? There are several factors that have contributed to this trend. The most important factor is the generalized increase in unemployment rates. All empirical studies of migration show a strong negative effect of migration to increases in aggregate unemployment. In addition, the convergence of regional income per capita and the enlargement of the welfare state in some of the relatively poor countries has reduced the incentives to migrate.

4. THE SHORT RUN

In previous sections we have observed that, both in the US and Europe, there are distinct regional labor market evolutions. How do these variables react to shocks that have a significant region-specific component? How does the response of migration shape the pattern of regional business cycles? These are the questions to which we seek answers in this section.

4.1 THE FRAMEWORK

Our starting point is to think about the evolution of employment in a region. With substantial specialization of production on a regional level, the dynamics of

employment, unemployment and labor force participation at a regional level will differ from those we observe at a macroeconomic level. In general, the long-term evolution of employment in any region is intimately linked to the trend in demand for the goods produced in that region and the changes in the qualities that potential migrants perceive. In addition to following some kind of trend, employment may be subjected to shocks resulting from changes in demand. The effect of such changes on employment can be more or less permanent, depending on the degree of regional specialization in production and the relative propensities of firms and workers to migrate between regions.¹³

For example, we can think about a region which experiences a positive shock for the goods in which it specializes.¹⁴ Initially one would expect the unemployment rate to fall, the labor force participation rate to rise and, to the extent real wages are flexible on a regional level, a rise in the real wage. The new equilibrium could be achieved in many different ways. First, the higher wage and lower unemployment rates may set off a wave of immigration which would bring wages, unemployment and labor force participation rates back to their equilibrium levels, while leaving relative employment in the region permanently higher. Second, part of the initial positive shock to employment might be reversed by a rising wage level, a lack of qualified personnel, increasing congestion and lower investment subsidies which would induce firms to leave the booming region. Depending on the relative degree of mobility of capital and labor, the flexibility of wages and the response of fiscal incentives, the adjustment can be very different.¹⁵ The persistence and type of labor-market shocks is also relevant for the decision to migrate. Hojvat-Gallin (1998) develops a model where the decision to migrate explicitly depends on current and future labor market conditions.

4.2 UNEMPLOYMENT

The starting point of our analysis is to look at the behavior of the unemployment rate. The unemployment rate is an indicator of the adjustment of labor markets to regional shocks. Our variable of study is regional unemployment rates relative to the unemployment rate of the aggregate. We calculate

$$u_{it} = U_{it} - U_{at}$$

¹³ One could also think about region-specific shocks that are not related to industry specialization but to regional economic policies. Davis, Loungani and Mahidhara (1997) and the chapter by Clark and Shin in this book analyze separately the effects of regional and industry shocks.

¹⁴ This shock could be a sudden change in the demand for the goods in which the region specializes or an improvement in the technology used in the production for those same goods.

¹⁵ For a more formal description of these arguments see Blanchard and Katz (1992).

where U_i denotes the regional unemployment rate and U_a the aggregate one (Europe or the US).

Given our prior that regional unemployment rates display a tendency to return to their mean, we estimate the univariate process followed by unemployment using levels.¹⁶ Allowing for two lags we run for the EU and the US samples

$$u_{it} = \alpha_i + \beta_1 u_{it-1} + \beta_2 u_{it-2} + \nu_{it}$$

Table 4 shows the results while the impulse responses caused by a one standard deviation shock in relative unemployment are shown in Figure 11.¹⁷ While the size of the shock is fairly similar, 0.8% in Europe and 0.84% in the US, its effects are more persistent in European regions. Table 4 also displays regressions for regional unemployment rates at the national level. The results are quite similar as those of the EU54 sample.¹⁸

Table 4
Regional Relative Unemployment

$$u_{it} = \alpha_i + \beta_1 u_{it-1} + \beta_2 u_{it-2} + \nu_{it}$$

	β_1	β_2		β_1	β_2
EU54	1.1953 (0.0338)	-0.3539 (0.0336)	Germany	1.1765 (0.0764)	-0.1613 (0.0858)
EU45	1.1488 (0.0384)	-0.3298 (0.0375)	Italy	1.1243 (0.0809)	-0.2112 (0.0825)
EU14	1.5161 (0.0428)	-0.6213 (0.0430)	UK	1.0740 (0.0705)	-0.1221 (0.0751)
US	0.9194 (0.0399)	-0.2387 (0.0368)			

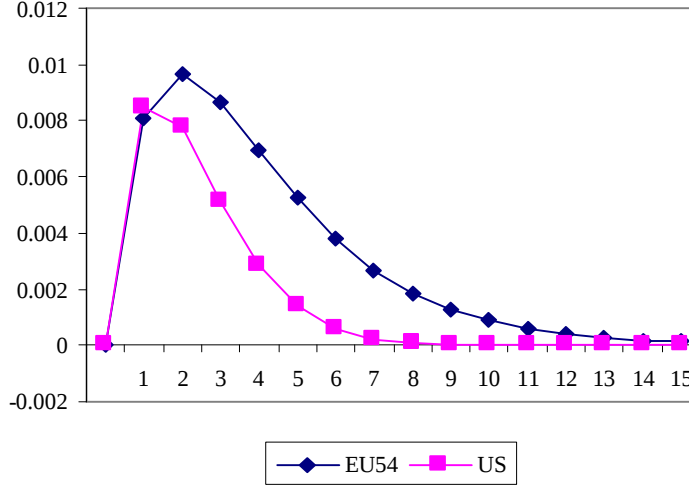
Standard errors in parentheses.

In light of the rigidities of European labor markets, the small difference in persistence between European and US unemployment is surprising. In fact, previous studies of persistence of regional unemployment rates have found even more striking results. Both Eichengreen (1993) and Decressin and Fatás (1995), using different methodologies, show that European regional unemployment rates return to their natural rates faster than those of US states. For example, Decressin and Fatás (1995) construct

¹⁶ Notice that given the observed persistence in regional relative unemployment rates we also allow for region-specific fixed effects, i.e. different regional natural unemployment rates.

¹⁷ Sample: Europe 1966-1987, US. 1970-90.

¹⁸ The only difference is that, given the smaller size of the sample and the documented dispersion of German and Italian unemployment rates, non-explosive behavior could only be obtained after detrending the series.

Figure 11. Persistence of Regional Unemployment Rates

region-specific unemployment rates by allowing different responses of regions to aggregate shocks. For each of the regional units, they run a regression of the type

$$U_{it} = \alpha_i - \beta_i U_{at}$$

where U_i denotes the regional and U_a the aggregate unemployment rate (Europe or US). One can then construct region-specific unemployment rates from the residuals of the regression so that

$$u_{it} = U_{it} - (\hat{\alpha}_i - \hat{\beta}_i U_{at})$$

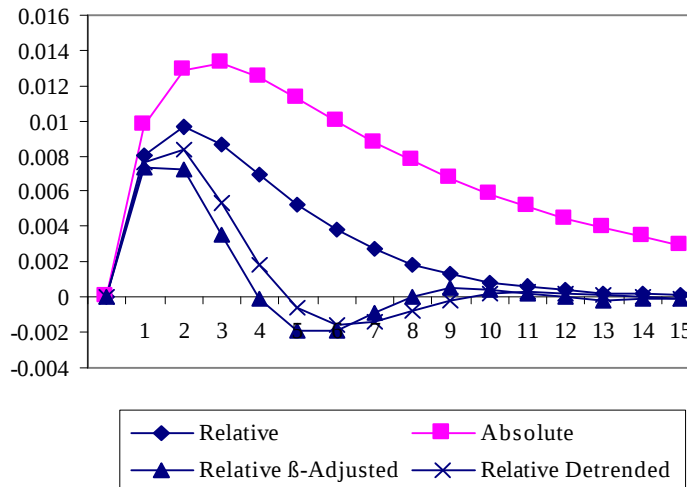
is the measure of region-specific unemployment. The justification for this adjustment is that the cyclical response to aggregate shocks might be different across regions.¹⁹ Following the procedure of Decressin and Fatás (1995), we have constructed cyclically adjusted series of regional unemployment and obtained a level of persistence for European regional unemployment which is indeed lower than that of the US states. Results (labeled β -adjusted) are displayed in Figure 12.

These results, which confirm those of Eichengreen (1993) using cointegrating techniques, support the existence of natural rates of relative unemployment at the regional level. To shed further light on this issue, we have also run similar regressions using absolute European regional unemployment rates (not measured relative to the aggregate). Now the persistence is much larger and confirms the prior that regional labor markets in Europe are very rigid.

¹⁹ The construction of these region-specific variables is similar in spirit to the analysis of Eichengreen (1993) using cointegrating techniques where the cointegration equation, in levels, allows a different coefficient for each of the regional unemployment rates.

Why is it that the ‘*beta*-adjusted’ regional unemployment rates display a lower degree of persistence? The above procedure might be detrending the series and, thus, eliminating part of its persistence. Given that unemployment in Europe increased in almost all regions during our sample, by allowing the β_i ’s to be different across regions we allow each of the regional unemployment trends to have a different slope. To illustrate how important this detrending might be we have detrended both the regional and aggregate unemployment rate and then calculated relative unemployment (as the difference between detrended regional and aggregate unemployment rates). The degree of persistence falls and becomes almost equivalent to when we used cyclically-adjusted relative unemployment rates (see Figure 12).

Figure 12. Measuring the Persistence of Regional Unemployment
Impulse Response. Annual Data



4.3 EMPLOYMENT

We now study the behavior of relative employment. While in the case of unemployment it was natural to start from the assumption that regional shocks do not have permanent effects on the unemployment rate, in the case of employment we will allow shocks to have permanent effects, i.e. we will model the time series in growth rates.²⁰

We estimate the univariate process followed by regional relative employment growth in Europe and the US allowing for two lags, we run

$$\Delta n_{it} = \alpha_i + \beta_1 \Delta n_{it-1} + \beta_2 \Delta n_{it-2} + \eta_{it}$$

²⁰ We have checked for unit roots and we could reject the null for only two out of the 54 regions at 5% significance. Also, using levels instead of growth rates does not significantly change most of the results we present, although it has clear implications about long-term responses to regional shocks.

This regression pools the entire sample and allows for region-specific fixed effects. n_i stands for the logarithm of employment in region i minus the logarithm of employment in Europe (or the US). Table 5 shows the estimates and Figure 13 the impulse response function of employment to a one standard deviation shock for EU54 and the US.²¹

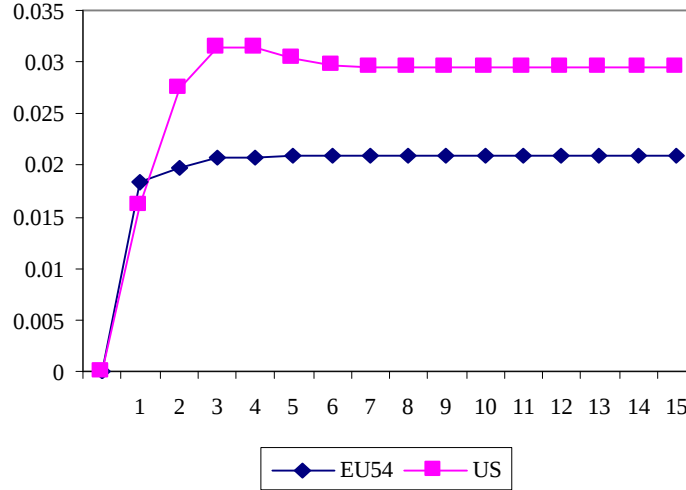
Table 5
Regional Relative Employment Growth

$$\Delta n_{it} = \alpha_i + \beta_1 \Delta n_{it-1} + \beta_2 \Delta n_{it-2} + \eta_{it}$$

Δn_{it}	Δn_{it-1}	Δn_{it-2}	Δn_{it}	Δn_{it-1}	Δn_{it-2}
EU54	0.0756 (0.0366)	0.0434 (0.0369)	Germany	-0.0267 (0.3575)	0.3575 (0.0963)
EU45	0.0738 (0.0404)	0.0617 (0.0407)	Italy	0.0176 (0.0750)	-0.1501 (0.0717)
EU14	0.5120 (0.0553)	-0.1010 (0.0553)	UK	-0.3264 (0.0727)	0.1397 (0.0746)
US	0.7404 (0.0421)	-0.2349 (0.0412)			

Standard errors in parentheses.

Figure 13. Persistence of Regional Employment
Impulse Response. Annual Data



Although the size of the initial shock in Europe and in the US is similar (1.8 and 1.5 percentage points respectively), it has substantially weaker long-run effects in

²¹ Sample: 1966-1987 for the US and 1966-94 for Europe. Some early years missing for some countries, see data appendix.

the former than in the latter. This is confirmed by the analysis of Italy, France, the UK and Germany with n_{it} being now equal to the logarithm of regional employment minus the logarithm of national employment. The within-country pattern is indeed very similar. Only in the case of Germany one observes any further increase in employment after the shock. Both for the UK and Italy, the permanent effects of the innovation are equivalent to the initial shock.

Overall, shocks to regional employment have much stronger effects in the US than in Europe. Although the impact effect is similar in both areas, there is a build-up effect in the US which is not present in Europe. This could be caused by a stronger response of interregional migrational flows to regional shocks in the US. At the root of this finding could also be a higher degree of regional specialization of production in the US than in Europe. To have a more precise answer we now to study the behavior of migration.

4.4 MIGRATION

Given the evidence on the short-term dynamics of employment and unemployment a natural question to ask is the extent to which migration can explain some of the observed differences between Europe and the US.

Because of the lack of homogeneous data on migration is very difficult to establish cross-country comparisons of labor mobility. In general, migration studies using aggregate data tend to find that the relevant variables have limited impact on migratory flows.²²

Eichengreen (1993) using aggregate data studies the responsiveness of regional migration to wage and unemployment differences. The results seem to confirm previous studies as the size of the elasticities are generally small. Although higher wages and lower unemployment tend to attract migrants, the size of the response is too small to favor a quick return to regional balance. In a comparison between three countries, migration is more responsive in the US than in the UK while migration across Italian regions is the least responsive to economic conditions.²³

Studies using gross migrational flows are consistent with the above results. Jackman and Savouri (1992) for the UK and Decressin (1994) for Germany, find that wage

²² See Greenwood (1975) and Greenwood (1985) for surveys on internal migration in the US and Herzog, Schlottmann and Boehm (1993) for a review of studies from other countries.

²³ Quantifying these effects is difficult as some of these results are not robust when applied to different data sets or different methodologies. For example, in a study of net migration across UK regions, Pissarides and McMaster (1990) find that it is differentials in wage growth, and not levels, what influences migration. Differences in regional unemployment rates have an effect on migration but the speed of adjustment is very small. Their estimates suggest that even 10 years after the initial shock, half of the unemployment differential is still present.

and unemployment differentials can explain gross migrational flows. Once again, the speed of adjustment is small.

A result which is common to most of the studies that use European data is that aggregate unemployment significantly reduces migration. For given differences in regional unemployment rates or wages, during periods of recession we observe less geographical mobility.

A second strand of the literature studies microdata on migration with similar conclusions although, in most cases, migration is more sensitive to economic incentives.²⁴ The effect of unemployment and wage differential is present in studies for the US (Herzog and Schlottmann (1988)), the UK (Hughes and McCormick (1989) or the Netherlands (Van Dijk, Folmer Herzog and Schlottmann (1989)). In all cases, being unemployed significantly increases the probability of migrating. Interestingly, a direct comparison of the previous three studies suggests that the effect of the unemployment status is the highest in the Netherlands followed by the UK and the US. Being unemployed increases labor force migration by 181% in the Netherlands, 93% in the UK and only 34% in the US.²⁵ After controlling for employment status the period after migration, there is clear evidence that migration in the Netherlands is, in most cases, associated to individuals who have already found a job in the region to which they are moving. In the case of the US, the estimates provide, on the contrary, evidence that there exists a large amount of speculative migration (workers move to booming areas before having found a job in those areas).

An interesting result of microdata, which confirms some of the results of aggregate data, is the influence of the area unemployment in the decision to migrate and the difference between the US and Europe. While high area unemployment increases the probability of migration in the US, it reduces it in the Netherlands.²⁶

In summary, internal migration is responsive to wage and unemployment differences but the speed of adjustment is too small to allow for a quick reduction in regional imbalances. Across countries, the evidence suggests that migration is more responsive in the US than in European countries. Beyond the size of the response, two other characteristics emerge: there is more speculative migration in the US than in Europe and the conditions of the area from which the migrant moves seem to have a perverse effect in some European countries.

4.5 EMPLOYMENT DYNAMICS, UNEMPLOYMENT AND MIGRATION

²⁴ See DaVanzo (1978), or Hughes and McCormick (1989).

²⁵ See the survey of Herzog, Schlottmann and Boehm (1993) for details on the cross-country comparison of these figures. Also note that it is very difficult to establish accurate international comparisons using these studies because of the differences in methodology and construction of the data.

²⁶ See Herzog, Schlottmann and Boehm (1993).

Because of the difficulties of finding consistent measure of migration, it is difficult to do cross-country studies. At the same time, some of the studies discussed above do not distinguish properly between long-term trends and short-term dynamics. For that reason, a dynamic analysis of the joint behavior of employment, unemployment and labor force participation might help understanding how labor markets adjust to regional disparities in the short run.

We have in mind the framework described in Section 4.1 and, for that reason, we allow for long-term trends in all of our variables. We analyze the joint behavior of regional relative employment, relative unemployment rates and relative participation rates in response to labor demand shocks, which will explain the deviations of the three variables around their long-term trends.²⁷

The fact that there is an identity that links participation rates, employment rates and migration, allows us to get an indirect measure of the amount of migration in response to region-specific shocks. The system we estimate for both Europe and the US is set out below.

$$\begin{aligned}\Delta n_{it} &= \lambda_{i10} + \lambda_{11}(L) \Delta n_{it-1} + \lambda_{12}(L) e_{it-1} + \lambda_{13}(L) p_{it-1} + \epsilon_{i1t} \\ e_{it} &= \lambda_{i20} + \lambda_{21}(L) \Delta n_{it} + \lambda_{22}(L) e_{it-1} + \lambda_{23}(L) p_{it-1} + \epsilon_{i2t} \\ p_{it} &= \lambda_{i30} + \lambda_{31}(L) \Delta n_{it} + \lambda_{32}(L) e_{it-1} + \lambda_{33}(L) p_{it-1} + \epsilon_{i3t}\end{aligned}$$

All variables are defined relative to their aggregate (Europe or US) counterparts so that n_{it} , e_{it} , and p_{it} are equal to

$$\begin{aligned}n_{it} &= \log(N_{it}) - \log(N_{at}) \\ e_{it} &= \log(E_{it}) - \log(E_{at}) \\ p_{it} &= \log(P_{it}) - \log(P_{at})\end{aligned}$$

where E_i and E_a stand for the regional and aggregate employment rate (employment divided by the labor force) and P_i and P_a stand for the regional and aggregate labor force participation rate (labor force divided by the working-age (15-64) population).²⁸

²⁷ Our econometric specification is symmetric and cannot distinguish between the effects of negative and positive demand shocks. Davis, Loungani and Mahidhara (1997) present evidence of the asymmetric effects of regional shocks.

²⁸ Equivalently, since $\log(E_{it}) \approx -U_{it}$

$$e_{it} \approx -u_{it} = -(U_{it} - U_{at})$$

Because we are interested in analyzing the effects of exogenous changes in regional labor demand we need to identify them in some way. Following Blanchard and Katz (1992) and Decressin and Fatás (1995), we associate unexpected changes in regional relative employment within the year with changes in labor demand, which is a plausible assumption as long as the largest fraction of these unexpected changes is not due to exogenous changes in labor supply or migration.²⁹ Consequently we allow current changes in relative employment to affect unemployment and participation rates but not vice-versa. We then trace the effects of an innovation in relative employment (the effect of ϵ_{i1}) to understand the dynamic effects of an innovation in labor demand on relative employment, employment rates and participation rates.

Figures 14 and 15 show the impulse responses of employment, employment rates and labor force participation rates to a one standard deviation innovation in relative employment. We have included migration, which is measured indirectly as the difference between the response of employment and the sum of the employment rate and labor force participation changes.

Essentially, in Europe a one-standard-deviation innovation in regional employment raises relative employment by 1.7 percentage points, the relative participation rate by 1.20, and the relative employment rate by 0.46 points. In the US the respective figures are 1.44 for relative employment, 0.26 for relative participation, and 0.43 for relative employment rates. Therefore, although the size of the initial impact on employment is similar in both areas, the adjustment that it triggers is very different. While in Europe changes in unemployment rates and labor force participation explain almost 100% of the change in employment, in the US, a third force, migration, can account for more than 50% of the change in regional employment.³⁰

The important role of unemployment and labor force participation in European regions is also present in the years that follow. According to the impulse responses, even after 7 years, these two variables account for 50% of the changes in regional employment.

The point that seems to be common to both the US and Europe is that the rise in the employment rate accounts for a small portion of the gain in employment in response to a positive regional labor demand shock. The main difference arises from the roles played by labor force participation and migration. In the US from the first year onwards net immigration accounts for 52% of the increase in regional employment

²⁹ See Hojvat-Gallin (1998) for an explicit treatment of different types of shocks.

³⁰ Although the results for the US might seem to contradict some the evidence, reviewed in Section 4.4, on the slow response of migration to regional imbalances, it is important to notice that our analysis allows for permanent regional differences in unemployment. Migration causes a state to quickly return to its natural unemployment rate. Our results do not imply that state unemployment rates are quickly equalized.

Figure 14. Labor Market Adjustment: Europe
Impulse Response. Annual Data

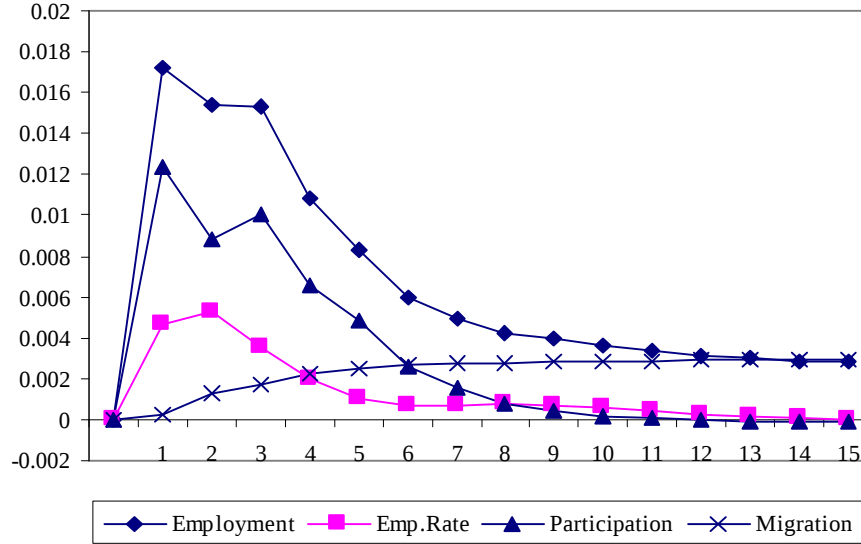
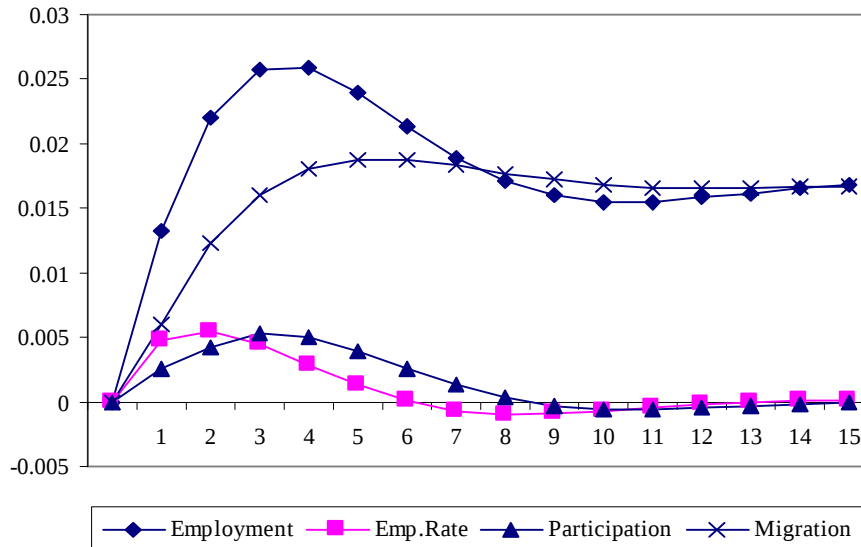


Figure 15. Labor Market Adjustment: US
Impulse Response. Annual Data



whereas in Europe it is only after the eight year that immigration accounts for a similar proportion of the rise in employment. The reverse holds for regional labor force participation: in Europe its increase accounts for more than 70% of the rise in employment in the first year and more than 50% in the second whereas the respective figures for the US are 18% and 17%.

Lastly, when we look at the long-run responses to regional shocks, there is a marked difference between Europe and the US. Once again, in the case of the US there is a build up in employment following the shock. The permanent effects on employment are larger than the initial impact. In the case of Europe, there is a clear

reversion to the trend by regional employment. There is very little migration even in the long run.³¹

What is the role played by wages in the adjustment to region-specific shocks? Blanchard and Katz (1992) show that, in the US, there is little change in wages in response to regional labor demand shocks. This suggests the presence of rigidities in the labor market, which do not allow the wage to adjust in response to a fall in the labor demand fall. The fall in labor demand and the lack of job opportunities are, therefore, larger than what the fall in relative regional wages might indicate. In the case of Europe, regional wage rigidities are even larger given that, in most countries, wage bargaining is centralized at the national level.³²

We have checked whether the European response is due to the fact that people are reluctant to migrate across countries in Europe or whether they are reluctant to migrate even within their countries in response to labor demand shocks. To do so we have run a similar VAR for Germany, Italy and the UK, where variables are all defined relative to their national counterparts. Figures 16, 17 and 18 show the results. They confirm that changes in the participation rate is the main adjustment mechanism. Once again, except for Italy, the role played by the employment rate over both the short and long run is negligible. Also, in Italy and Germany we observe a clear reversion of regional employment to the initial level. In the UK this reversion is much slower but, at the same time, labor force participation perfectly follows the evolution of employment. The net result is that in the three countries, migration plays very little role at any horizon.³³

Here it is important to note that our results do not imply that within countries labor does not move in response to interregional economic disparities. Note that in our trivariate system we have allowed for region-specific fixed effects. Consequently we are not explaining steady migrational flows between regions (e.g. a steady flow of migrants from Ireland to the UK or from southern Italy to the northern Italy). Such steady flows are driven by structural disparities between regions rather than by labor demand shocks.³⁴

These results for European regions clearly show that that changes in labor de-

³¹ In both Europe and the US, the response of employment is less persistent in the three-variable VAR than in the univariate analysis, suggesting that the other two variables can help predicting changes in employment. This is consistent with a model where the three variables are jointly determined.

³² To verify this claim, we have run a four-variable VAR, including wages, for our sample of European regions. There is no response of regional relative wages to labor demand shocks.

³³ Mauro and Spilimbergo (1998) run a similar VAR for Spanish regions distinguishing between workers with different skill levels. They find that while low-skilled workers respond in manner similar to the one we describe here, high-skilled workers are more likely to move in response to regional shocks.

³⁴ See De Grauwe and Vanhaverbeke (1993) for an analysis of these flows.

Figure 16. Labor Market Adjustment: Germany
Impulse Response. Annual Data

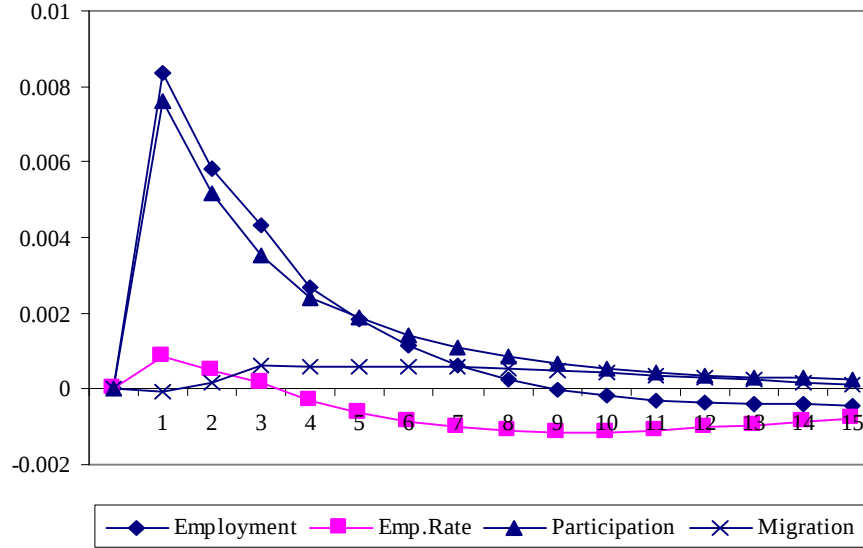
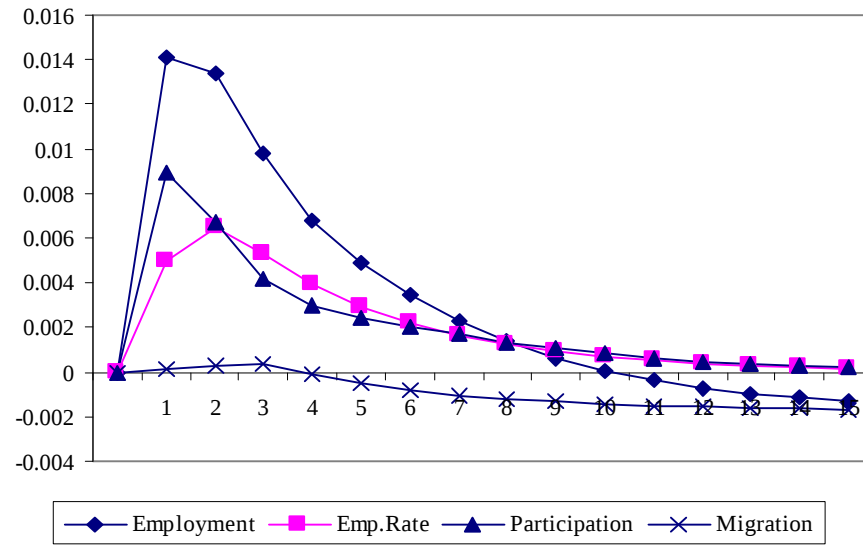


Figure 17. Labor Market Adjustment: Italy
Impulse Response. Annual Data



mand are to a large extent met by people moving in and out of the labor force. The interpretation of the permanent effects have to be taken with great care given that the choice of introducing employment in growth rates and the other two variables in levels conditions the joint response of these three variables in the long run. In fact, if we include participation and unemployment rates in differences we obtain that regional shocks have larger permanent effects and are mostly absorbed by changes in labor force participation. Figure 19 displays the results.

Our results confirm evidence by Burda and Wyplosz (1994) who find that in Germany over the period from 1970 to 1988 the gross flows from out of the labor force

Figure 18. Labor Market Adjustment: UK
Impulse Response. Annual Data

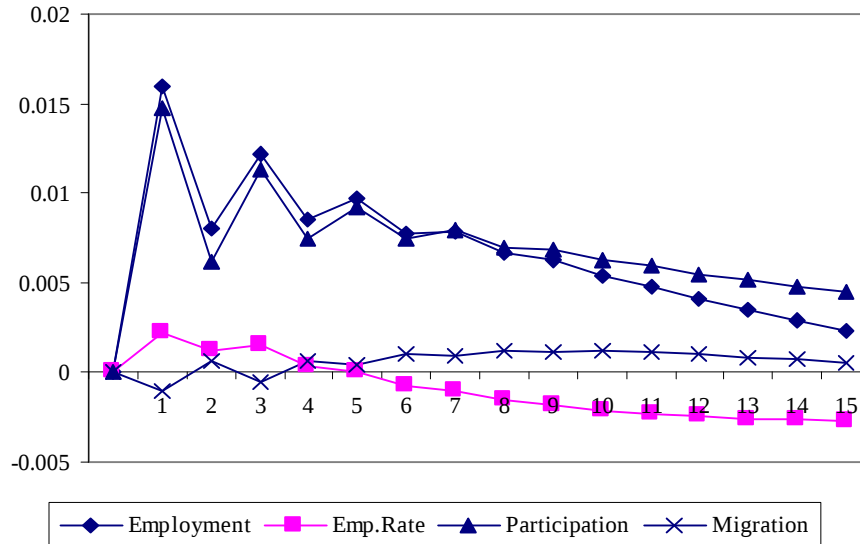
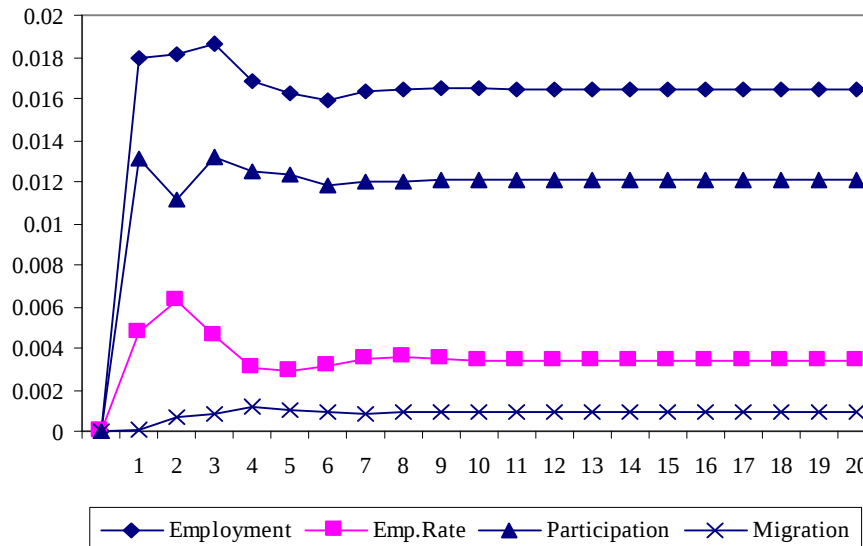


Figure 19. Labor Market Adjustment: Europe

Impulse Response. Annual Data
(All variables in the VAR in growth rates)



to employment often were considerably larger than the gross flows from unemployment to employment. There are several mechanisms that can explain the empirical relevance of these flows. Moreover, some of them are more likely to operate on the regional rather than the aggregate level. For example, employers in Europe rely considerably on early retirement to adjust the size of the workforce in their firms.³⁵ Further, in the 1980's an increasing number of employees qualified for disability pensions: Emerson

³⁵ In France, around 50% of the 55-64 year old are either unemployed or have left the labor force. Source: The Economist, July 25th-31st 1992, p57.

(1988) notes that during the 1970's and 1980's the number of people on disability pensions in Europe rose enormously and traces this to changes in eligibility criteria. These criteria have become more heavily weighted by social and economic factors rather than strictly medical ones.³⁶ For this reason, it is not surprising that these mechanisms operate more at the regional level than at the national level. Some of these social tensions are the strongest when the restructuring of a specific industrial sector has most of its effects concentrated on a specific geographical area.

5 IMPLICATIONS FOR EUROPEAN MIGRATION

Our results for migration show that European labor markets are not well integrated. Do we expect a significant change of these patterns as national borders lose their economic significance and legal barriers to international labor mobility disappear? Are US labor markets a good model of what lies ahead for Europe? The evidence we gathered in this paper seems to suggest that the answer to both of these questions is no. First of all, we have documented a substantial trend towards reduced migration after the mid 70's. This reduction is also present within countries and goes in the opposite direction of what would be predicted by any migration model given the contemporaneous increase in unemployment differentials. The traditional origins of migration, mainly countries in Southern Europe, have experienced a return of previous migrants turning a consistently large emigration flow into net immigration. Within these countries, migration to rich regions and urban and industrial areas has also declined.

At the same time that we have seen a decline in the size of these flows, we have seen a change in their composition. Migration of high-skilled and qualified workers has remained much more stable than the migration of manual low-skilled workers, which has sharply fallen in the last 20 years. In some European regions, or countries, this is a source of concern because migration will then work to increase regional disparities instead of diminishing them.³⁷

To be able to predict the future evolution of European migration, one has to understand the causes of the falling trend in migration in the last two decades. There are four factors that have contributed to the sharp fall in migration. First of all, there has been a decrease in demand for unskilled labor, one of the main sources of

³⁶ The number of people on disability pensions in Germany rose from 1.746 million in 1975 to 2.332 million in 1983 which amounts to 10% of the employed. For the UK the numbers are 450 000 and 737 000, for the Netherlands they are 344 000 and 673 000 (12% of the employed). Apparently in the Mezzogiorno in Italy two and a half times as many people were on disability insurance than on regular pensions in the early 1980's (see Emerson, 1988). In the US the number of people on disability insurance actually declined from 4.129 million in 1975 to 3.865 million in 1983.

³⁷ See Begg (1995) for a discussion of the case of Ireland.

migration during the 60's and early 70's. Second, some of the demand for low-skilled workers has been met by migration from countries outside of the European Union. The evidence we presented in Section 3 on net migration into the European Union showed increased flows from neighboring countries and some of the traditional sources of low-skilled migrants, Spain or Italy, have seen a surge in immigration of this type of workers from North Africa.

The third factor is the generalized increase in European unemployment since 1974. Many empirical studies have shown that an increase in aggregate unemployment reduces overall interregional migration. Not only migration becomes less attractive because of the lack of opportunities in other areas, but in some cases, previous migrants are the first ones to lose their jobs, which generates a flow back to poorer regions.

The last factor is the convergence of regional income per capita, which, reduces the incentive to migrate. In addition to the higher income per capita, some of the poor regions benefit from an increase in fiscal and regional transfers as the size of the welfare state has expanded.

These four factors combined with other structural problems that restrict mobility (such as the rigidities in housing markets) are responsible for the current low level of European migration. Will the progressive integration of European economies alter these factors? There is no doubt that the elimination of barriers to labor mobility together with the integration of European economies and the transparency that the creation of a single currency adds, will have beneficial effects on labor mobility. However, all these changes will only have minor effects on the four factors that explain the recent evolution of intra-EU migration. The biggest change could come from a general reduction in unemployment rates in EU regions that helped uncover new migration opportunities. If, in addition, this reduction in unemployment originates in the elimination of some of the general rigidities in European labor markets and an increase in competitiveness of labor markets due to increased integration, then we might observe a larger increase in mobility. But even if this change takes place, this increase is very likely to affect mainly high-skilled workers. If this is the case, labor mobility will not work in the direction of reducing regional imbalances and it might even increase those disparities.³⁸

6 CONCLUSIONS

This paper has analyzed the evolution and adjustment mechanisms of European

³⁸ The evidence on Faini et al. (1997) suggests that interregional labor mobility in Europe is the highest among high-skilled workers and that increases in household income raises the probability of migration.

and US regional labor markets. The degree of labor mobility is a key element that can explain some of the general differences between both economic areas. In the US, the high degree of labor mobility creates an environment that allows certain states to consistently grow above the average and where there are no persistent differences in unemployment rates.

European labor markets, on the contrary, are marked by low labor mobility. The first consequence being that employment growth rates are less persistent than in the US. Although there is evidence that migration responds to regional economic disparities, the speed at which it does is small and has been decreasing since the second half of the 70's. This trend towards smaller migration, also strong within countries, is more surprising when compared with the evolution of regional unemployment rates. Some of the regions where unemployment rates have increased the most have switched from being a source of migrants to receiving immigration from other regions.

The analysis of the short-term adjustment of labor markets is consistent with the above view. In the US, regional fluctuations are mainly absorbed by migration. This response propagates regional shocks and adds persistence to the initial impact on regional employment. Speculative migration, shown to be much larger in the US than in Europe, is probably a main factor that explains the quick response of workers to regional business cycles. In Europe, we find that migration is practically absent in the adjustment process. In response to a decrease in regional employment, labor force participation rates fall and unemployment increases. Surprisingly, it is not the unemployment rate but the fall in participation rates that accounts for the majority of the fall in employment.

Will European labor markets change as a result of further economic integration and the reduction of barriers to international labor mobility? The intranational evidence of European countries suggests that the change, if any, will be minor. Regional migration within countries is not only small but has decreased, despite an increase in regional unemployment dispersion. This decrease in migration is rooted in the functioning of European labor market institutions, rigid labor markets and the overall high rate of unemployment, all of them discouraging any type of mobility, including geographical mobility. Only if the European unemployment rate was reduced to levels that created tightness on certain regions, migratory flows could reverse their recent trend. However, the composition of these flows is likely to be biased towards qualified workers, which might work in the direction of increasing regional imbalances.

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8 APPENDIX

European Regions

Country	Region	Country	Region
Germany	Schleswig-Holst./Hamburg	France	Ile de France
	Niedersachsen/Bremen		Bassin Parisien
	Nordrhein-Westfalen		Nord Pas-de-Calais
	Hessen		Est
	Rheinland-Platz/Saarland		Ouest
	Baden-Wurttemberg		Sud-Ouest
	Bayern		Centre-Est
	Berlin		Mediterrane
	Nord-Ovest	UK	North
	Lombardia		York and Humberside
Italy	Nord-Est		East Midlands
	Emilia Romagna		East Anglia
	Centro		South-East
	Lazio		South-West
	Campania		West-Midlands
	Abruzzi-Molise		North-West
	Sud		Wales
	Sicilia		Scotland
	Sardegna		Northern Ireland

Data Sources

Regional data on unemployment

OECD, Regional Employment and Unemployment, 1960-87. Original sources and years. France: 1954, 1962, 1968, 1974-87 (INSEE; Labor Force Survey). Germany: 1960-87 (Stat. Bundesamt; Employment: Microcensus, Unemployment: Registered Unemployed). Italy: 1960-87 (ISTA; Labor Force Survey).³⁹ Spain: 1977-87 (INE; Labor Force Survey). UK: 1965-87 (Employment:

³⁹ In this data set, the regional unemployment data for Italy has a considerable statistical break

Establishment Survey, Unemployment: Registered Unemployed). Regional data on employment expanded to 1994 using national sources.

National data on population, labor force and employment

OECD economic outlook.

Regional data on working-age population (15-64 years old) is:

EUROSTAT, Regional Databank: REGIO, 1991. Periods covered by our data are France 1975-87, Germany 1975-87, Italy 1975-87, UK 1975-87, Spain, 1981-87.

Migration data on EU countries

Eurostat, Statistiques sur la Migration, 1996

We thank Larry Katz for providing us with the regional data for the US. The 51 regions for which data are available include the 50 states and the District of Columbia. Employment data comes from establishment surveys and comprises non-agricultural employment only. For the trivariate system the unemployment and population data come from the CPS (last census: 1980). To obtain regional labor force data CPS unemployment is added to establishment employment which is normalized so that it is equal to the CPS number in 1976. Working age population data also comes from the CPS. For a more precise description of the data sources see the Data Appendix of Blanchard and Katz (1992).

in 1976-77. Before 1977, the national total was considerably larger. We adjusted pre-1977 figures by multiplying them with the ratio of national unemployment to total regional unemployment.