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Regional Adjustment to Employment Shocks: Italy 1960-1994

Marco Leonardi

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Dipartimento di Economia Politica
Università degli Studi di Milano - Bicocca
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Marco Leonardi
Centre of Economic Performance, LSE
London

Abstract

In this paper I study the dynamic response of regional variables to employment shocks in Italy 1960-94. Considering an univariate model I find low persistence of the regional unemployment rate in deviation from the national mean. This confirms previous results (Eichengreen 1992) and suggests that some other mechanisms besides migration are at work to restore regional labour market equilibrium in Italy. Using multivariate VAR analisys we obtain that movements in partecipation rather than in migration of workers explain the low persistence of regional relative unemployment in the average Italian region. Wage response to employment shocks has very mild effects on employment and migration dynamics. Adjustment dynamics are very different in the North and the South. The southern regions show a very persistent unemployment and very low interregional migration in response to employment shocks.

The lack of interregional migration in the South could be an explanation of the growing gap in unemployment rates between North and South, at least for the part not due to changes in regional natural rates.

Introduction

The prospect of the monetary union has brought about a large number of papers on the characteristics of optimal currency areas. This research follows three main lines. The first line attempts to measure the extent to which European countries are hit by asymmetric shocks evaluating the correlation of output shocks across countries (Bayoumi and Eichengreen 1994) or across countries and industrial sector (Helg, Manasse, Monacelli and Rovelli 1995). The conclusion is generally that while shocks are symmetric across core European countries, they are not across the peripheral ones. This suggests that the outer countries in Europe may not be part of an optimal currency area.

The second line of research deals with the consequences of EMU on the industrial structure of the member countries. The main idea is that liberalisation will generate more specialisation and more asymmetric shocks. Hence the need for exchange rate adjustment (Krugman 1991 and Krugman and Venables 1993).

The third area of research looks at wages and labour supply as alternative adjustment mechanisms to the exchange rate. According to the optimal currency theory the loss of the exchange rate is more costly in terms of unemployment the less flexible are prices and wages and the less mobile is the labour force.

The aim of this paper is to document the adjustment dynamics of Italian regions to employment shocks using regional data in a framework of VAR analysis. We refer closely to the literature that studies the adjustment of regional macro variables to employment shocks. Blanchard and Katz (1992) show that regional relative unemployment rates[1] across the US exhibit little persistence thanks to the equilibrating role of workers' migration, the role of wage adjustment being much less important. Decressin and Fatas (1994) run a similar analysis on the regions of EU member countries concluding that the adjustment role of migration is less effective across regions in Europe. Bayoumi and Prasad (1995) come to the same conclusion comparing the dynamics of employment and wages per industrial sector in the US and in the EU countries. In the case of Spain the results are pretty similar to those of Decressin and Fatas (Jimeno and Bentolila 1995).

[1] Regional relative unemployment rate means the regional rate in deviation from the national mean.

The starting point for Italy is Eichengreen (1992). He finds that although the responsiveness of migration to regional labour market disequilibria is much greater in the US than in the UK and Italy, however the deviations of regional unemployment rates from the national average are of similar persistence. This suggests the hypothesis that some other mechanism besides labour mobility is at work to restore regional labour market equilibrium in Italy such as labour force participation or relative wage adjustment. We verify this hypothesis applying the same VAR technique used in the literature for the US, EU and Spain. We extend the analysis to account for the effect of wage adjustment and to give more precise estimates of migration dynamics. We highlight the different characteristics of the adjusting mechanisms in the northern and in the southern regions in search of an explanation for the different persistence in their unemployment rates. We believe that different adjustment dynamics across regions may be responsible for different persistence in regional unemployment (relative to the national mean) and the growing gap in unemployment rates between North and South.

Section 1 considers the extent of persistence in unemployment rates across Italian regions and discusses the aggregation of the regional series in larger areas (North, Centre and South). Section 2 presents the univariate analysis for each variable and discusses the technique used to distinguish the effects of regional specific shocks from those generated by common shocks. Section 3 replicates Blanchard and Katz VAR using the regional series of unemployment, employment and participation to the labour force, then extends the analysis estimating a different VAR that focuses on the response of migration. Section 4 assesses the adjustment role of wages and evaluates the effect of wage adjustment on employment and migration dynamics. Section 5 concludes.

1-Italian Regional Unemployment

Chart 1 presents the time series path of the unemployment rates of all Italian regions between 1960 and 1994 grouped in five categories[2]:

[2] Clearly the aggregation criteria are somewhat arbitrary but necessary for the benefit of a clearer comparison of the results. These different areas of the country include regions that are homogeneous in their industrial structure. Attanasio and Padoa Schioppa (1991) and Eichengreen (1992) use the same categories but leave Lazio aside in view of

Northwest = Piemonte, Valle d'Aosta, Lombardia, Liguria

Northeast = Veneto, Trentino Alto Adige, Friuli

Central = Emilia Romagna, Toscana, Marche, Umbria, Lazio

Southeast = Puglia, Molise, Abruzzi

Southwest = Campania, Basilicata, Calabria, Sicilia, Sardegna.

Chart 1 indicates extreme persistence in unemployment rates throughout the period, with the rate in the South consistently higher than in all other regions. No area has changed its relative position during the period except for Northeast and Northwest, which have always had very close rates. The most striking feature of the chart is the widening gap between the South and the rest of Italy beginning from 1976. The cause of the growing gap may be due to the effects of the oil shocks of the seventies and eighties, which hit the southern regions with greater power and persistence. At the end of the eighties the shock was almost completely absorbed in the North while it was still persistent and painful in the South. This paper studies the dynamic adjustment of wages and the labour force in response to employment shocks. We believe that the different characteristics of the adjusting mechanisms in the northern and in the southern regions could provide an explanation for the different persistence in their unemployment rates.

2-The Univariate Analysis

The first step in the analysis deals with the univariate characteristics of each variable separately. The regional data belong to the data set Eni Fondazione Enrico Mattei and have been obtained on the basis of various ISTAT sources[3]. Since we are studying the adjustment dynamics to idiosyncratic (region-specific) shocks, we need to distinguish the region-specific part of the shock from the common part. The idea is that we can analyse regional variables in deviation from the national mean only if

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its peculiarity in terms of share of employees in the public sector. I include Lazio in my analysis because it doesn't affect my results in any substantial way.

[3] See data appendix for details.

regional variables do not differ in their elasticity to common shocks (those that affect the national mean). If the elasticity varies across regions and is significantly different from one, we have to take this fact into account building a new variable.
We determine the elasticity of the regional unemployment rate with respect to the national mean estimating:

$$u_{it}=a_i+b_i u_t+e_{it} \quad , \qquad (1)$$

where u_{it} is the regional rate of unemployment and u_t is the national variable.
The results are given in Tab 1. Clearly the elasticities of the regional rates to the national mean are very different across regions. We then obtain the regional relative unemployment rate subtracting from the regional rate b times the national rate[4].
The Dickey Fuller unit root test on the regional relative unemployment rate gives a non-stationarity result in 7 regions out of 20. Considering the low power of unit root test in small samples, we prefer for theoretical reasons to believe in the stationarity of the regional relative unemployment rate: we reject the null hypothesis and consider the series stationary.
The most appropriate univariate model for almost all the Italian regions is an AR2.
We estimate for every region:

$$u_{it}=a_i+b_{1i}u_{it-1}+b_{2i}u_{it-2}+e_{it} \ .$$

For ease of comparison we aggregate the regional series in larger areas as defined above using fixed effect technique for panel data, therefore endowing every region with its own specific constant. We run the same model on the aggregate series.
The results are given in Tab 2 and the corresponding impulse response function in Chart 2. We don't notice any major difference in the adjusting behaviour of the univariate series among North, Centre and South and we don't expect it to be so since univariate analysis is obviously not very informative at this stage.
More interesting is the comparison with other countries. We compare our results with other studies in Tab 3 and we give the impulse response in Chart 3. The

[4] Variables built in this way are often called in the literature "betadifferences". The use of betadiffereces instead of ordinary deviations from the mean results in less persistence of the relative unemployment rate because we depurate the variables from the effects of common shocks.

unexpected feature of the chart is the comparable persistence of regional relative unemployment in US and in Italy.

This confirms Eichengreen's results (1992). In a comparative study of regional labour markets in the US, UK and Italy, Eichengreen analyses the migratory response to shocks in the three countries. He estimates an Error Correction Model to measure how quickly regional unemployment rates go back to their long run level with respect to the national rate. His results show that, although migration is a far more efficient adjusting mechanism in the US than in Italy, however the deviations of regional unemployment rates from their long run relationship with the national rate are of similar size and persistence.

Considering six different Italian regions (Northeast, Northwest, Centre, Lazio, Southeast and Southwest), Eichengreen finds a stable long run relationship (cointegration relationship) between regional and national unemployment rates. Given that regional and national unemployment rates are cointegrated, he uses the associated error correction model to calculate the speed of adjustment of regional unemployment rates:

$$\Delta u_{it}=a_i+b_i\Delta u_{it-1}+c_i(e_{it-1})+z_{it} \quad ,$$

where z_{it} is an error and e_{it} is the cointegration relationship given by the residual of the regression of the regional unemployment rate on the national rate (equation 1).

Eichengreen's estimates for the six Italian regions show a surprisingly high average error correction term (c=0.34) which means that one third of the deviation of the regional unemployment rate from its long run relationship with the national rate is eliminated every year. The average error correction term for the nine US regions he considers is only 0.26, smaller than the comparable average for Italy. This suggests that some other mechanism besides labour mobility is at work to restore regional labour market equilibrium in Italy such as labour force participation or relative wage adjustment.

We try to verify this hypothesis using a multivariate VAR framework to analyse the joint dynamics of unemployment, participation and wages in response to regional specific shocks. We first replicate Blanchard and Katz VAR using regional data on

unemployment, employment and participation, and then we extend the analysis to the dynamics of relative wages.
To complete the univariate analysis we run the Dickey Fuller test on the regional relative series of labour force participation and employment and we reject the hypothesis of unit roots for both.

3-Multivariate Analysis

In this section we first present the replica of Blanchard and Katz VAR applied to the Italian regions, we then develop the analysis introducing migration and wages and assessing their role as adjustment mechanisms.
The multivariate VAR is particularly simple in our case in that we have shown with the univariate analysis that we are dealing with stationary variables and therefore we don't need to take into account the possibility of cointegration among the series. We estimate a VAR in levels based on the hypothesis of stationarity of the univariate series of regional relative employment, unemployment and participation rate:

$$y_t = c+A_1 y_{t-1}+.....+A_k y_{t-k}+e_t,$$
$$e_t \sim iid\ N(0,\Sigma) \quad ,$$

where y_t is the vector of endogenous variables and c is a vector of constants.
To determine the optimal number of lags we use the likelihood ratio test:

$$(T-c)(\log|\Sigma_1|-\log|\Sigma_2|) \quad ,$$

where c is a small sample correction parameter and Σ_2 is the unrestricted estimate with n+1 lags while Σ_1 is the restricted estimate with n lags. Given the short sample of data and the results of the test we consider two lags for each variable.
The interaction among the three variables is best understood graphically through impulse response functions. Impulse response functions are based on the moving average representation of the VAR:

$$y_t = c+e_t+\Pi_1 e_{t-1}+\Pi_2 e_{t-2}+..\quad ,$$

where e_t is the white noise innovation process.

Impulse response functions trace the dynamic response of the endogenous variables to a one standard deviation shock to one of the errors. The ambiguity in their interpretation lies in the correlation among the errors of the different equations. To identify the system we use Cholesky ortogonalization i.e. we decompose the variance covariance matrix of the errors in the product of two inferior triangular matrices:

$$G^{-1}\Sigma G'^{-1}=I \quad ,$$

where Σ is the non diagonal variance covariance matrix, G is a non singular inferior triangular matrix, and I is the identity matrix. The transformation is such that the new innovations $u_t=e_tG^{-1}$ satisfy $E(u_tu_t')=I$ and are neither correlated across time nor across the equations. The triangular matrix implies the hypothesis that in any given period the shocks to a certain variable have contemporaneous effects on all the subsequent variables in the VAR but not viceversa. The consequence of that is that the ordering of the variables in the VAR is important. Following Blanchard and Katz we put employment first followed by unemployment and participation. Therefore we imply that a demand shock to employment has an immediate effect on unemployment and participation but the opposite is not true: shocks to unemployment and participation affect employment only with a time lag.

We estimate:

$$\begin{aligned}
logn_{it} &= a_{i10}+a_{i11}(L)logn_{it-1}+a_{i12}(L)u_{it-1}+a_{i13}(L)logp_{it-1}+e_{1it}\\
u_{it} &= a_{i20}+a_{i21}(L)logn_{it-1}+a_{i22}(L)u_{it-1}+a_{i23}(L)logp_{it-1}+e_{2i}\\
logp_{it} &= a_{i30}+a_{i31}(L)logn_{it-1}+a_{i32}(L)u_{it-1}+a_{i33}(L)logp_{it-1}+e_{3it} \quad ,
\end{aligned}$$

where $logn_{it}$ is log of employment, $logp_{it}$ is log of participation rate and u_t is the unemployment rate.

A positive demand shock to the regional relative employment level leads to a decrease in unemployment, an increase in the participation rate and a flow of

migration from other regions. The decomposition of the change in employment in the variations of unemployment, participation and migration are given in Tab 4. Migration is not an explicit variable in this VAR but is residually determined as the difference between the change in employment and the change in unemployment and participation.

Tab 4: Decomposition of standard deviation shock to relative employment.
Percentage of the variation in employment level.
Sources: Blanchard and Katz (1992), Decressin and Fatas (1994) Jimeno Bentolila (1995).

	year1	year2	year3
EU (51 regions 1975-87)			
unemployment	21	30	25
participation	74	43	31
migration	4	27	45
US (51 states 1958-1990)			
unemployment	18	17	16
participation	29	20	13
migration	52	62	70
SPAIN (17 regions 1976-1994)			
unemployment	36	39	33
participation	23	18	18
migration	41	43	49
ITALY (20 regions 1960-1994)			
unemployment	26	20	10
participation	59	52	54
migration	15	28	36

Tab 4 indicates that in the typical Italian region unemployment accounts for about 25% of the variation in employment after the first year, participation for about 60% and migration for the remaining 15%.

Relative to other countries the striking features of the Italian case are the high responsiveness of the participation rate and the low responsiveness of interregional migration of workers. One year after the shock migration accounts for about 50% of the initial change in employment in the US, for about 40% in Spain and only for 15% in Italy. However the average Italian region experiences a fairly rapid adjustment of relative unemployment which accounts for little more than 10% of the initial employment change after 3 years. As in the analysis of Eichengreen (1992) we have obtained a fairly rapid return of relative unemployment to the national mean (comparable to the results for the US), the slow response of migration notwithstanding. The improvement given by the multivariate VAR techniques is that we have established that participation rate seems to bear most of the adjustment

burden. The impulse response functions corresponding to the above decomposition are shown in Chart 4.

We want to explore now the differences in the adjustment dynamics of the different areas of the country. Therefore we run the model on the aggregated series for each area. We find that the results obtained for the “average” Italian region hide sharp differences in the behaviour of different regions. As it’s clear from Tab 5 and Chart 5 and 6, northern and southern regions exhibit very different adjustment dynamics. While in the northern regions unemployment seems to be hardly persistent and migration is an effective equilibrating mechanism, the opposite is true in the South where relative unemployment is highly persistent and the role of migration is negligible.

Tab 5: Decomposition of standard deviation shock to relative employment.

Percentage of the variation in employment level.

	year1	year2	year3
NORTH (7 regions)			
unemployment	3	2	3
participation	67	56	57
migration	30	42	40
CENTRE (5 regions)			
unemployment	17	13	5
participation	25	27	22
migration	58	60	73
SOUTH (8 regions)			
unemployment	43	37	21
participation	67	60	64
migration	0	3	15
ITALY (20 regions)			
unemployment	26	20	10
participation	59	52	54
migration	15	28	36

Up to now migration has been considered a residual variable obtained as the difference between the change in employment and the change in unemployment and participation. As such the results for migration probably contain large errors. Gros (1996) notes that Blanchard and Katz results are likely to overestimate the role of migration, in that a similar flow of migrants is not plausible even in the US.

In the attempt of getting around this critique we have introduced in the VAR an explicit proxy for interregional migration of workers. The available data are limited to people transferring their official residence from one region to another and therefore include migration for every reason and not only for work. The data span from 1960 to 1994 and are obtained from ISTAT.

We estimate the following VAR:

$$\log n_{it} = a_{i10}+a_{i11}(L)\log n_{it-1} +a_{i12}(L)u_{it-1}+a_{i13}(L)\log m_{it-1}+e_{1it}$$

$$u_{it} = a_{i20}+a_{i21}(L)\log n_{it-1}+a_{i22}(L)u_{it-1}+a_{i23}(L)\log m_{it-1}+e_{2it}$$

$$\log m_{it} = a_{i30}+a_{i31}(L)\log n_{it-1} +a_{i32}(L)u_{it-1}+a_{i33}(L)\log m_{it-1}+e_{4it} \quad ,$$

where $\log m_{it}$ is the log of the immigration rate (number of immigrants divided for regional population).

The results are given in Tab 6 and Chart 7 and indicate a slightly less relevant role for migration and a more persistent unemployment rate for the average Italian

region. However the differences in regional dynamics are maintained and the response of migration is far less effective in the south than in the north, while unemployment is more persistent.

Tab 6: Decomposition of standard deviation shock to relative employment.
Percentage of the variation in employment level.

	year1	year2	year3
NORTH (7 regions)			
unemployment	17	7	7
participation	80	64	63
migration	3	29	20
CENTRE (5 regions)			
unemployment	25	25	25
participation	65	46	40
migration	8	20	38
SOUTH (8 regions)			
unemployment	50	50	60
participation	40	40	28
migration	10	8	12
ITALY (20 regions)			
unemployment	33	27	26
participation	60	58	58
migration	7	15	16

5-Adjustment Through Wages.

The role of wages in the adjustment dynamics is twofold. From the demand side a positive shock to employment should be smoothed by the increase in wages, from the supply side higher relative wages should encourage more participation and migration. We split the analysis in two, first we trace the response of wages to an employment shock and then we study the effect of wages on migration.

As a proxy for data on wages (which are not available on a regional basis) we use compensation of employees inclusive of social security contributions. As price deflator we use the consumer price index of employees households relative to the regional capital of each region[5]. The data span from 1960 to 1992 and come from ISTAT sources. Chart 8 documents persistence in real income differentials across

[5] See data appendix for details. We may agree that these data are not very accurate, however they fit our analisys well since they include both the public and the private sector of the economy. Therefore we don't need to restrain our analisys to manifacturing wages as Blanchard and Katz for the US and Jimeno Bentolila for Spain.

regions throughout the period. Northeast is the only region whose relative position has changed over the period.

We estimate the following VAR with two lags per each variable:

$$\begin{aligned} logw_{it} &= a_{i10}+a_{i11}(L)logw_{it-1}+a_{i12}(L)logn_{it-1}+a_{i13}(L)u_{it-1}+e_{1it} \\ logn_{it} &= a_{i20}+a_{i21}(L)logw_{it-1}+a_{i22}(L)logn_{it-1}+a_{i23}(L)u_{it-1}+e_{2it} \\ u_{it} &= a_{i30}+a_{i31}(L)logw_{it-1}+a_{i32}(L)logn_{it-1}+a_{i33}(L)u_{it-1}+e_{3it} \quad , \end{aligned} \qquad (2)$$

where $logw_{it}$ is the log of employees compensation in real terms.

Choleski identification of the system implies that the current shock to wages affects employment and unemployment but not viceversa. This hypothesis is plausible within the framework of an insider-outsider wage setting model where the workers in employment at time t set the wage for time t+1.

The results for the average region in Tab 7 indicate the employment level in t-1 has a positive effect (0.21) on the level of real wages while employment in t-2 has a negative effect (-0.26). The coefficient signs are consistent with the identification restrictions: first a change in employment level affects wages, then wages affect the new employment level. The regional unemployment rate has negligible influence on regional real wages. Both the coefficients of u_{it-1} and u_{it-2} are very low (0.04 and 0.06) and not significative.

The second column in Tab 7 shows that real wages have first a negative then a positive effect on relative employment. The coefficients (-0.033 and 0.05) are very low though statistically significative. Unemployment has a negligible effect on employment. The last column gives the sign and entity of the effects on relative unemployment.

Tab7: Results of system (2). Coefficients and T statistics in brackets.

Regressors	equation $logw_{it}$	equation $logn_{it}$	equation u_{it}
$logw_{t-1}$	0.68(21.83)	-0.033(-2.8)	-0.015(-2.65)
$logw_{t-2}$	-0.10(-4.13)	0.05(5.22)	0.010(2.15)
$logn_{t-1}$	0.21(2.13)	0.83(19.85)	0.02(1.33)
$logn_{t-2}$	-0.26(-2.6)	0.02(0.59)	-0.01(-0.95)
u_{t-1}	0.04(0.60)	-0.14(-1.52)	1.06(25.06)
u_{t-2}	0.08(0.34)	0.15(1.49)	-0.12(-2.86)

The adjustment dynamics is shown in Chart 9. A one standard deviation shock to employment causes a decrease in unemployment of 0.32 times the initial shock in

the first year and a moderate increase of real wages, which fades away by the third year. Chart 10 and 11 give the results for the northern and the southern regions. The response of wages is of similar entity across the regions and reaches its peak at about 0.25% of the initial shock.

We want now to focus on the effect of wage adjustment on employment dynamics. To this extent we set to zero the coefficients of wages in the employment equation and reestimate the system[6]. The results are given in Chart 12: comparing employment dynamics with and without wage feedback the effect of wages on employment seems to be very modest.

Blanchard and Katz analysis leads to a similar result for the US. Estimating a bivariate VAR with real manufacturing wages and employment they find a low wage response to employment shocks (at the highest 0.4% of the initial shock after 6 years). Furthermore, eliminating wage feedback from the employment equation, they conclude that the effect of wages on job creation and migration is very modest. Nonetheless regional relative unemployment is not persistent thanks to workers' migration which is very sensitive to unemployment differentials[7].

In general the low effect of wages on employment dynamics can have two partially overlapping reasons:

1) The link between labour demand and wage might be weak and an increase in the relative wage doesn't induce a significative destruction or migration of firms;
2) Workers' migration is insensitive to regional wage differentials and an increase in the relative wage doesn't induce immigration.

From our previous estimates we have obtained that migration is a much more effective adjustment mechanism in the northern regions than in the southern, we want now to address the question whether migration is induced more by the change in regional wages or in unemployment levels.

To this extent we compare the results of the following VAR with its analogous without wage feedback in the migration equation:

[6] This exercise is subject to the Lucas critique in that we have to assume the invariability of labour demand when we eliminate wage feedback on employment.

[7] Jimeno and Bentolila do not use the VAR approach to determine the response of wages. They regress the real regional wage on wages of other industries, wages of other regions, the national and regional unemployment rate, and productivity. They conclude for high rigidity in the regional wage (its elasticity to the regional unemployment rate is 0.07).

$$logw_{it}=a_{i10}+a_{i11}(L)logw_{it-1}+a_{i12}(L)u_{it-1}+a_{i13}(L)logn_{it-1}+a_{i14}(L)logm_{it-1}+e_{1it}$$

$$logn_{it}=a_{i20}+a_{i21}(L)logw_{it-1}+a_{i22}(L)u_{it-1}+a_{i23}(L)logn_{it-1}+a_{i24}(L)logm_{it-1}+e_{2it}$$

$$u_{it}=a_{i30}+a_{i31}(L)logw_{it-1}+a_{i32}(L)u_{it-1}+a_{i33}(L)logn_{it-1}+a_{i34}(L)logm_{it-1}+e_{3it}$$

$$logm_{it}=a_{i40}+a_{i41}(L)logw_{it-1}+a_{i42}(L)u_{it-1}+a_{i43}(L)logn_{it-1}+a_{i44}(L)logm_{it-1}+e_{4it}$$

Chart 13 reveals a virtual inefficacy of wage adjustment in inducing workers' immigration[8].

6-Conclusions

With reference to the theory of optimal currency areas and to previous similar studies on other countries we have studied the adjustment dynamics of Italian regions to idiosyncratic employment shocks.

We have first considered the univariate dynamics of the regional relative unemployment rate. At the stage of univariate analysis, in accord with Eichengreen (1992), we have found a low persistence of regional relative unemployment, comparable to US results.

Using multivariate VAR analysis we have investigated Eichengreen's hypothesis that some other mechanism besides migration work to restore regional labour market equilibrium in Italy. We have obtained that movements in participation rather than in migration of workers explain the low persistence of the regional relative unemployment for the average Italian region.

We have then extended the analysis to account for wage adjustment. Wage response to employment shocks is of similar entity in all Italian regions, but the effect of wage changes on employment and migration dynamics is negligible everywhere.

Finally we have compared the dynamics of adjustment in the North and in the South. The southern regions show a much more persistent regional unemployment in response to employment shocks compared to the central and northern ones, even

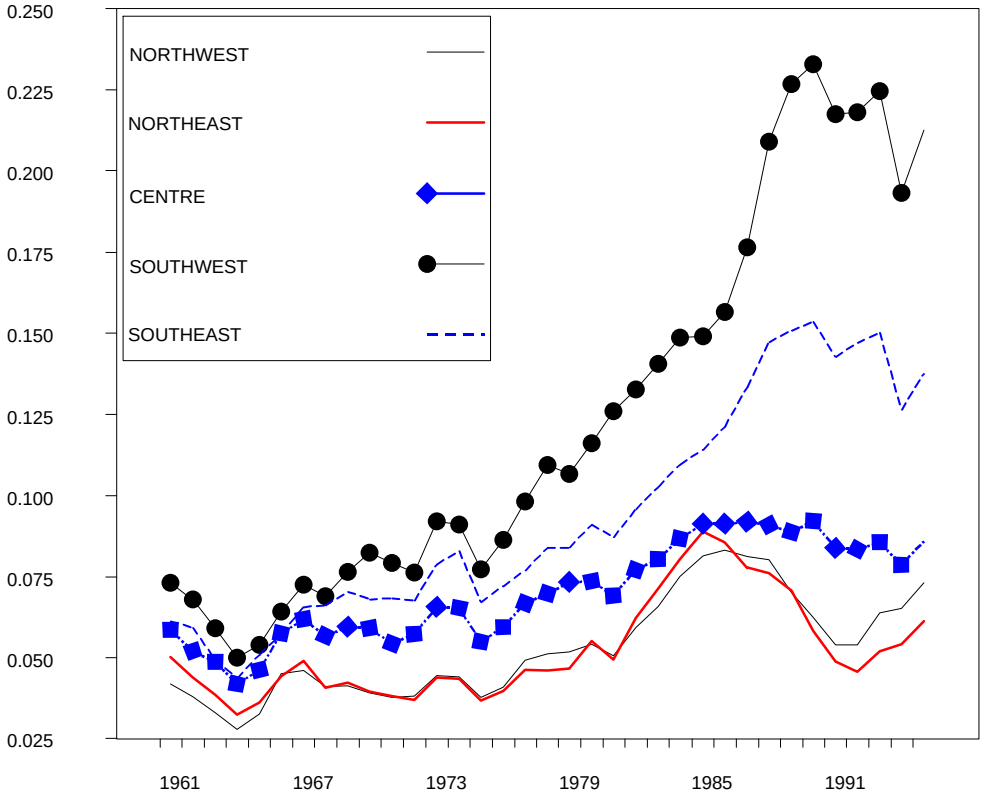
[8] Eichengreen (1992) finds that migration elasticity to local wages is much higher in the US rather than in UK or Italy. For Spain Jimeno and Bentolila (1995) report various studies concordant in their low estimates of migration elasticity to real wages.

accounting for different regional natural rates of unemployment. The reason seems to lie in the different response of migration (virtually absent in the South) rather than in the dynamics of wages which seem to be equally slow in every area of the country.

The lack of interregional migration in the South may be a candidate explanation of the growing gap in unemployment rates between North and South, at least for the part not due to changes in regional natural rates.

Only microeconometric studies can give clearer results about the adjustment dynamics explored at the macro level in this paper.

Chart 1: Regional Unemployment Rate 1960-1994.



Tab 1: Results of the Regression $u_{it}=a_i+b_i u_t+e_{it}$ for each Region.

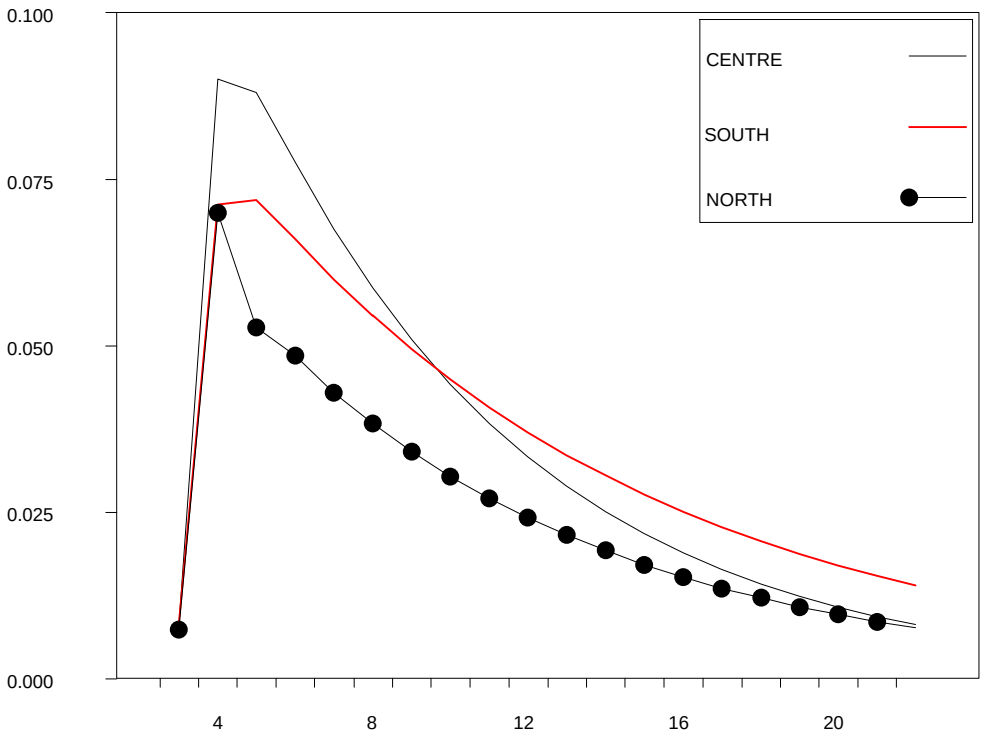
Standard Errors in Brackets.

REGIONI	a_i	b_i
PIE	0.00 (0.003)	0.67(0.041)
VAA	-0.02 (0.007)	0.67(0.091)
LOM	0.01 (0.004)	0.43(0.058)
TAA	0.01(0.005)	0.29(0.070)
VEN	0.02(0.005)	0.40(0.074)
FVG	0.00(0.004)	0.67(0.060)
LIG	0.01(0.003)	0.73(0.040)
EMI	0.02(0.005)	0.33(0.060)
TOS	0.00(0.002)	0.73(0.028)
UMB	0.02(0.005)	0.70(0.064)
MAR	0.00(0.002)	0.56(0.026)
LAZ	0.05(0.003)	0.49(0.043)
ABR	0.03(0.003)	0.63(0.046)
MOL	-0.03(0.008)	1.47(0.10)
CAM	-0.05(0.008)	2.26(0.10)
PUG	-0.01(0.004)	1.48(0.050)
BAS	-0.01(0.001)	1.81(0.12)
CAL	-0.04(0.009)	2.33(0.11)
SIC	-0.04(0.011)	2.12(0.13)
SAR	-0.03(0.006)	2.08(0.083)

Tab 2: Results of Regression $u_{it}=a_i+b_{1i}u_{it-1}+b_{2i}u_{it-2}+e_{it}$ with Fixed Effects. Coefficients and Standard Errors in Brackets.

u_{it}	u_{it-1}	u_{it-2}
NORTHWEST	0.63 (0.085)	0.17 (0.085)
NORTHEAST	0.97 (0.10)	-0.03 (0.10)
CENTRE	0.98 (0.08)	-0.03 (0.08)
SOUTHEAST	0.89 (0.10)	0.008 (0.10)
SOUTHWEST	1.05 (0.07)	-0.12 (0.07)
NORTH	0.74 (0.06)	0.13 (0.06)
SOUTH	1.02 (0.06)	-0.10 (0.06)
ITALY	0.94 (0.03)	-0.02 (0.03)

Chart 2: Impulse Response Function of Relative Unemployment to a One Standard Deviation Shock. Graphed Using Estimated Coefficients in Tab 2.



Tab 3: Results of regression $u_{it}=a_i+b_{1i}u_{it-1}+b_{2i}u_{it-2}+e_{it}$ with Fixed Effects. For Other Countries the Sources are Blanchard and Katz, Decressin and Fatas and Jimeno and Bentolila. Coefficients and Standard Errors in Brackets.

u_{it}	u_{it-1}	u_{it-2}
EEC	0.97 (0.033)	-0.48 (0.033)
US	0.87 (0.032)	-0.16 (0.032)
ITALY	0.80 (0.039)	-0.17 (0.039)
SPAIN	0.90 (0.038)	-0.01 (0.038)

Chart 3: Impulse Response Function of Relative Unemployment to a One Standard Deviation Shock. Graphed Using Estimated Coefficients in Tab 3.

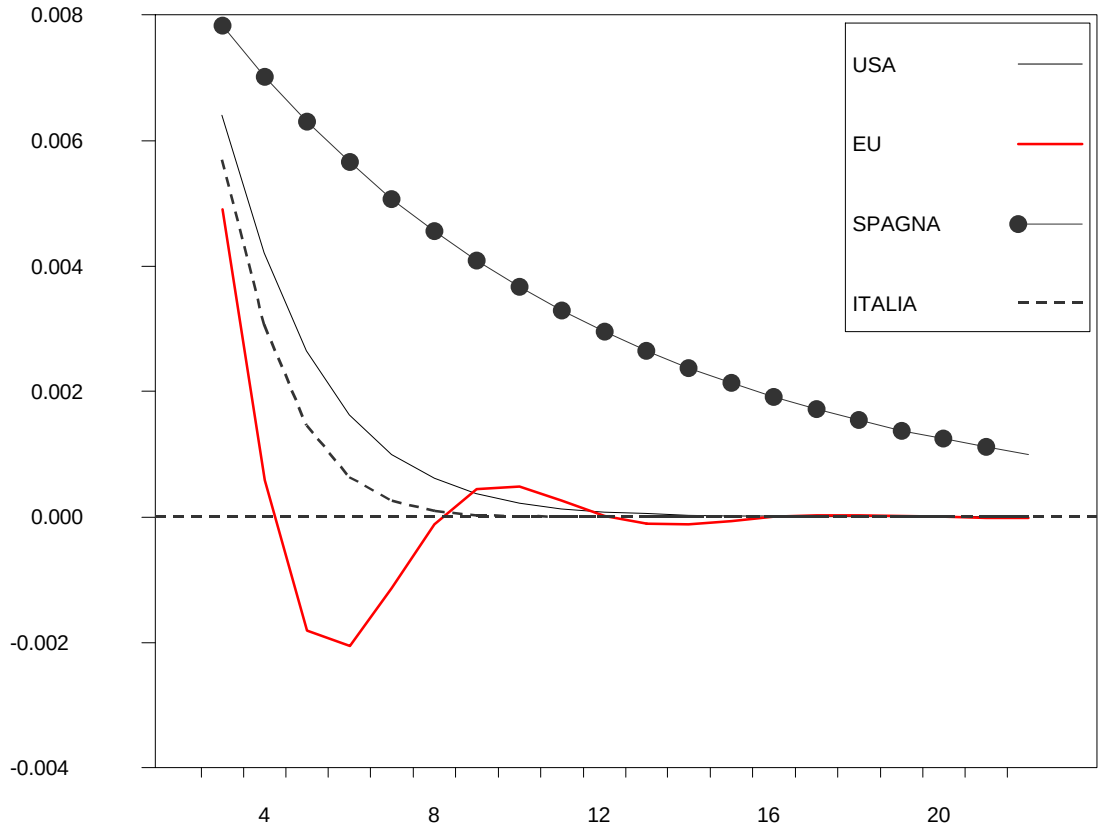


Chart 4: Average Italian Region

Dependent Variables: n = Regional Relative Employment

u = Regional Relative Unemployment

p = Regional Relative Participation

Impulse Response of Employment, Unemployment and Participation to One Standard Error Shock to Employment.

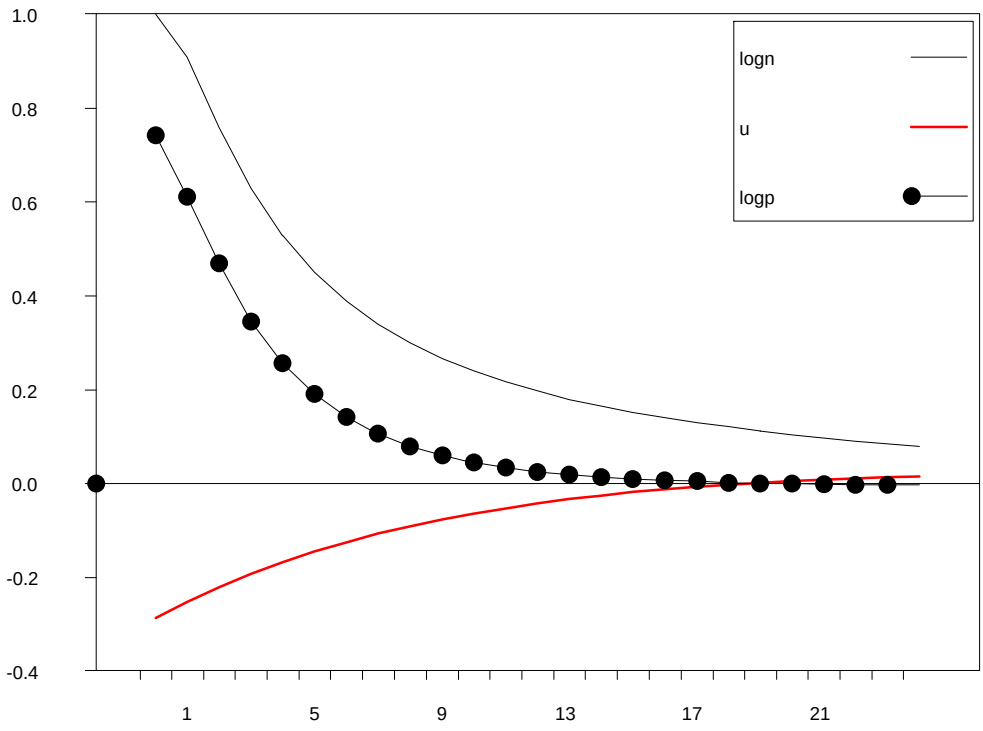


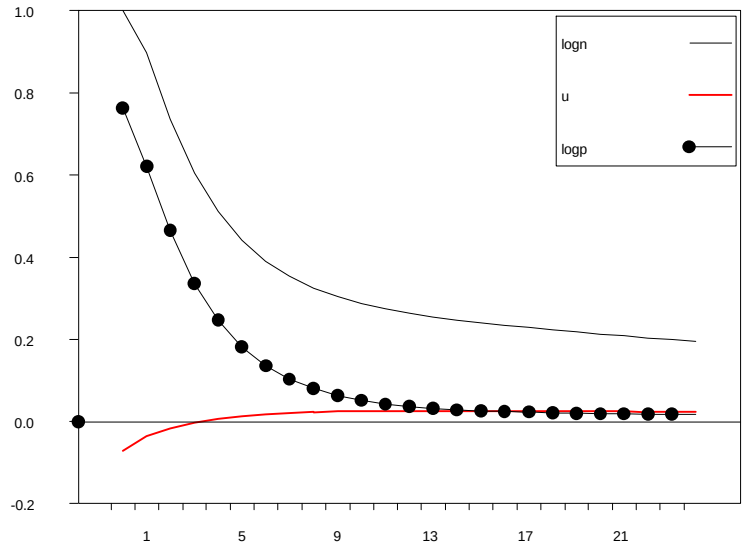
Chart 5 and 6: North (above) and South.

Dependent Variables: n = Regional Relative Employment

u = Regional Relative Unemployment

p = Regional Relative Participation

Impulse Response of Employment, Unemployment and Participation to One Standard Error Shock to Employment.



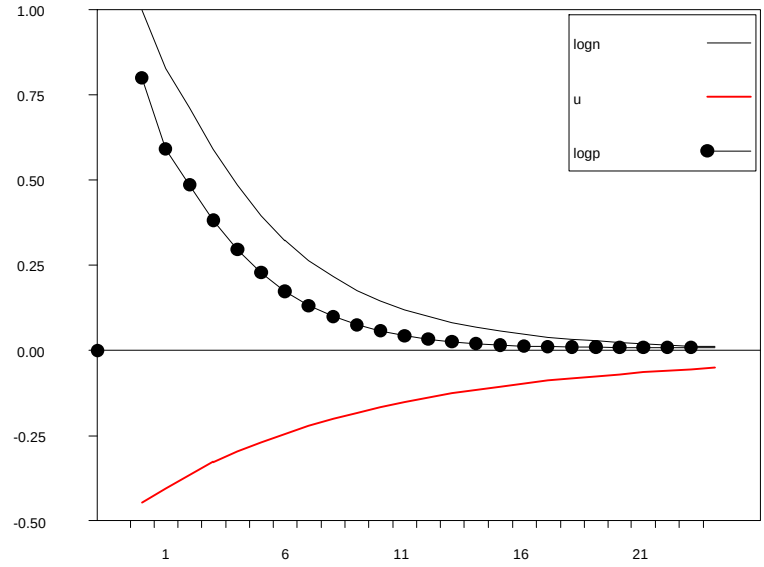


Chart 7: Average Italian Region

Dependent Variables: n = Regional Relative Employment

u = Regional Relative Unemployment

m = Regional Immigration Rate

Impulse Response of Employment, Unemployment and Migration to One Standard Error Shock to Employment.

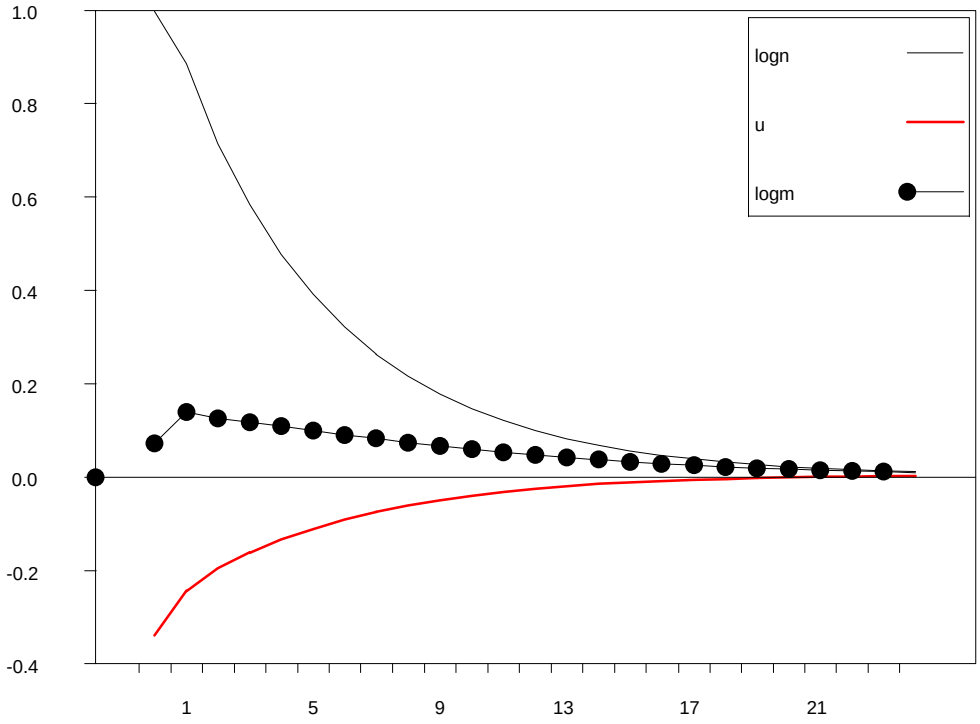


Chart 8: Compensation per Employees in Real Terms 1960-1992

The Price Index Used as Deflator is a Weighted Average of Consumer Price Indexes of the Capital of Each Region.

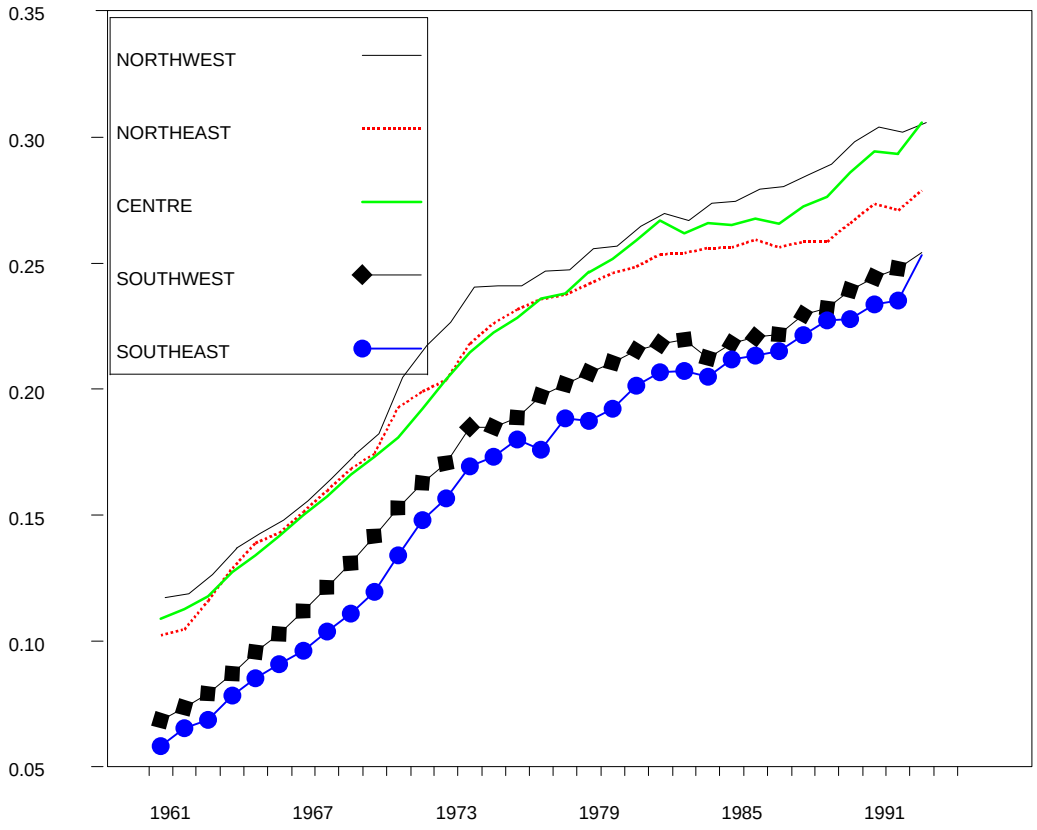


Chart 9: Average Italian Region

Dependent Variables: w = Regional Relative Wage

n = Regional Relative Employment

u = Regional Relative Unemployment

Impulse Response of Wages, Employment and Unemployment to One Standard Error Shock to Employment.

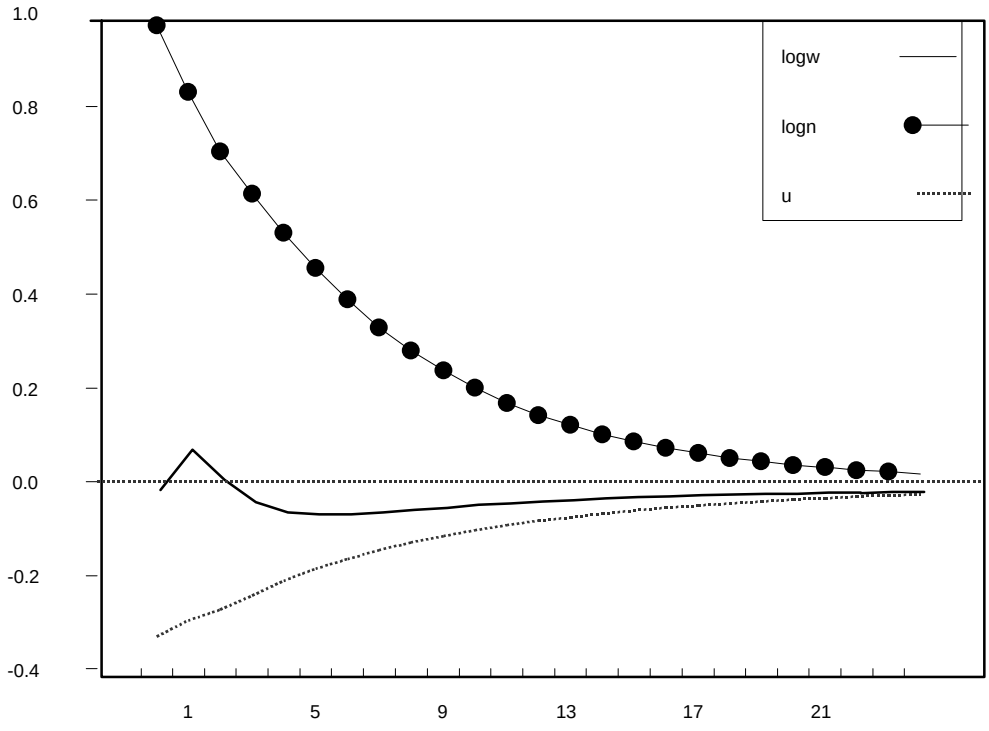


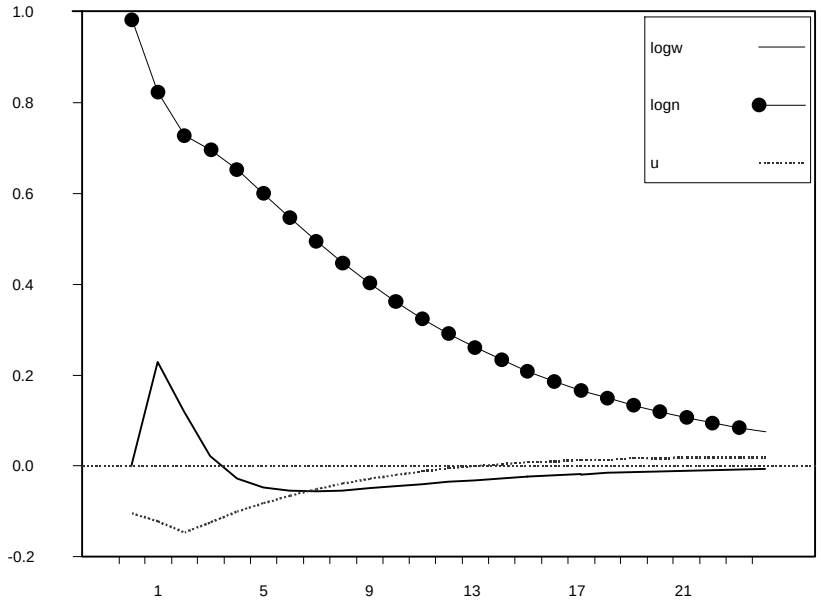
Chart 10 and 11: North (above) and South

Dependent Variables: w = Regional Relative Wage

n = Regional Relative Employment

u = Regional Relative Unemployment

Impulse Response of Wages, Employment and Unemployment to One Standard Error Shock to Employment.



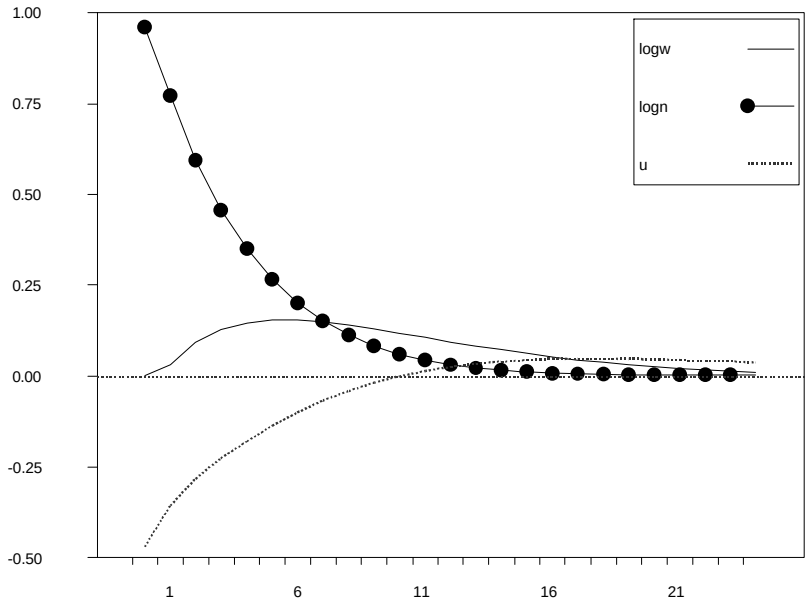


Chart 12: Employment Response With and Without Wage Feedback.

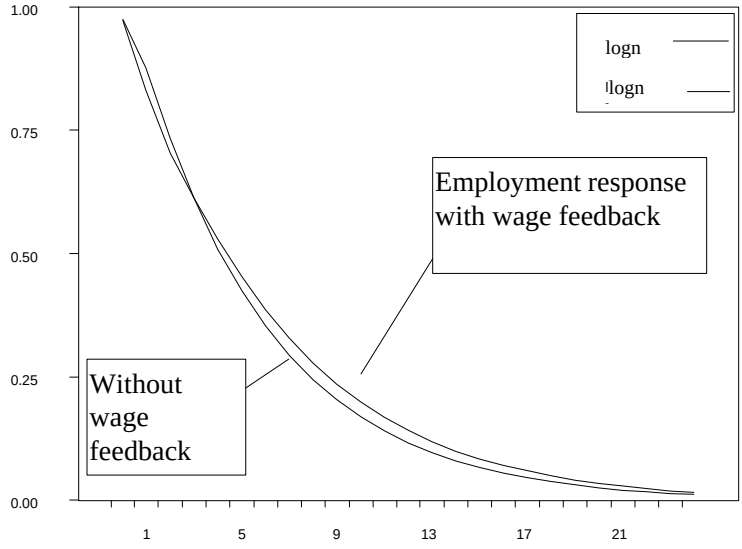
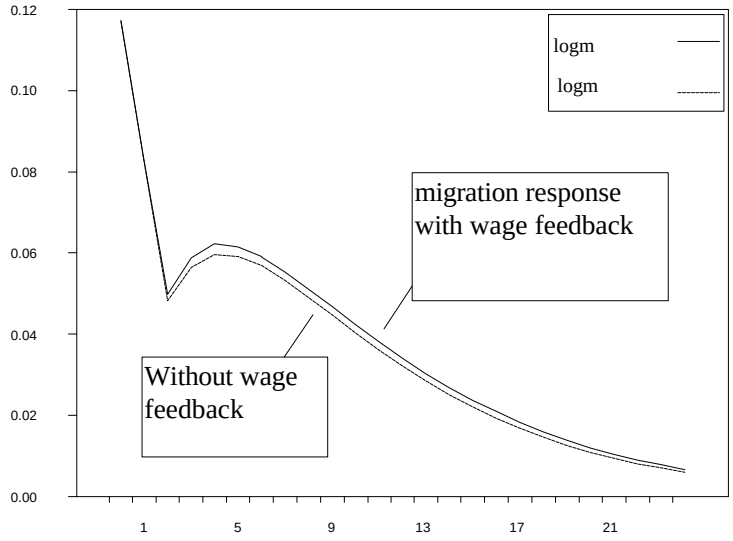


Chart 13: Migration Response to an Employment Shock With and Without Wage Feedback.



DATA APPENDIX

All the data used in this paper belong to the regional data base of Fondazione Enrico Mattei and were obtained with the kind support of Professor Andrea Ichino.

EMPLOYMENT:

Total number of employed in thousands. Sources: from 1960 to 1966 the data were obtained by Annuario di Statistiche del Lavoro, 1970. From 1967 to 1976 data come from Attanasio and Padoa Schioppa (1991). From 1977 to 1984: Statistiche del Lavoro, ISTAT. From 1985 to 1994: Rilevazione delle forze di lavoro, ISTAT.

UNEMPLOYMENT RATE:

Total unemployment rate defined as the rate of total number of unemployed to the total labour force. Total labour force is the sum of the total number of employed and the total number of unemployed. Sources: see employment

PARTICIPATION RATE:

Defined as the rate of total workforce to the working age population (15-64 years).

IMMIGRATION RATE:

Defined as the rate of the total number of people enrolled on the list of local administrative office because of a residence transfer from a region to another to the total residing population. Sources: Annuario Statistico Italiano, ISTAT.

EMPLOYEEES COMPENSATION:

Rate of total employees compensations to the total number of employees in each region. Sources: 1980-1994: Conti Economici Regionali, ISTAT. 1970-1984: Annuario di Contabilità Nazionale, ISTAT. 1963-1970: I Conti Economici Regionali, Unioncamere. 1959-1963: “Calcolo del reddito prodotto” in Supplemento a Moneta e Credito, Tagliacarne.

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