Widening Differences in Italian Regional Unemployment[1]

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Abstract

Regional unemployment differentials among Italian regions have widened since the mid 1980s, especially between the leading Northern and Central areas and the underdeveloped South. We suggest that the following elements are important to explain the observed phenomenon: a) employment performance in the South has worsened considerably in the presence of sustained labor force growth; b) labor mobility from the South to the NC areas has sensibly declined with the reduction in earnings differentials and with the increase in social transfers per head; c) real wages in the South are not affected by local unemployment conditions but depend on the unemployment rate prevailing in the leading areas; d) the labor share increased particularly fast in the South during the 1970s, mainly as a consequence of the elimination of institutions that allowed the presence of significant wage differentials; e) a parsimonious description of the increase in regional unemployment differentials is that the Northern and the Southern areas responded in an asymmetric way both to the increase in real social transfers per head and to the reduction in the real price of energy.

JEL classification: J61, J64

Key words: regional unemployment, labor mobility, Italy.

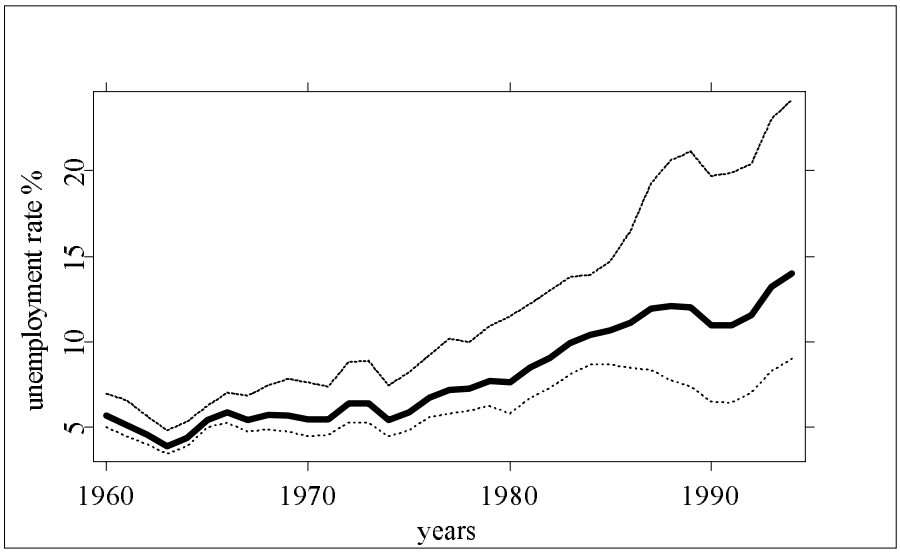

Figure 1: The Italian unemployment rate (1951-1996). Italy, thick solid line; North-Center, dashed line; South, thin solid line.

1 Introduction

Regional unemployment disparities are a well-documented feature of the Italian economy.[1] A relatively novel feature is that these disparities have widened rather sharply since the mid 1980s. Figure 1 plots the Italian unemployment rate from 1951 to 1996 both for the aggregate economy and for two macro regions, the North-Centre (NC from now on) and the South (S from now on)[2] and shows that unemployment differentials between the NC and the S areas have widened since the mid 1980s, mainly because of the rapid increase of Southern unemployment. Since unemployment rates in the South-West have increased faster than in the South-East, there are also signs that the Italian South is not an homogeneous area.

A standard way of illustrating regional convergence or divergence with respect to a selected variable is to use cross section data and regress the average growth rate of the variable over a reference period against the level of the same variable at the beginning of the period. A negative slope coefficient is taken to indicate regional convergence. When applied to our data, this analysis yields the results reported in Figure 2, where the solid line represents the least absolute deviations (LAD) regression line.[3]

Regional unemployment rates diverged over the whole period (upper-left quadrant of Figure 2). There is, however, some evidence of convergence during

[1] See Attanasio and Padoa Schioppa (1991) and Bodo and Sestito (1991).

[2] Since the raw data on regional unemployment and employment drawn from the Quarterly Labor Force have been affected over time by major changes in definitions and survey design, we have reconstructed the relevant data using several sources. See the Data Appendix for details.

[3] We use LAD instead of OLS to reduce the weight of outliers.

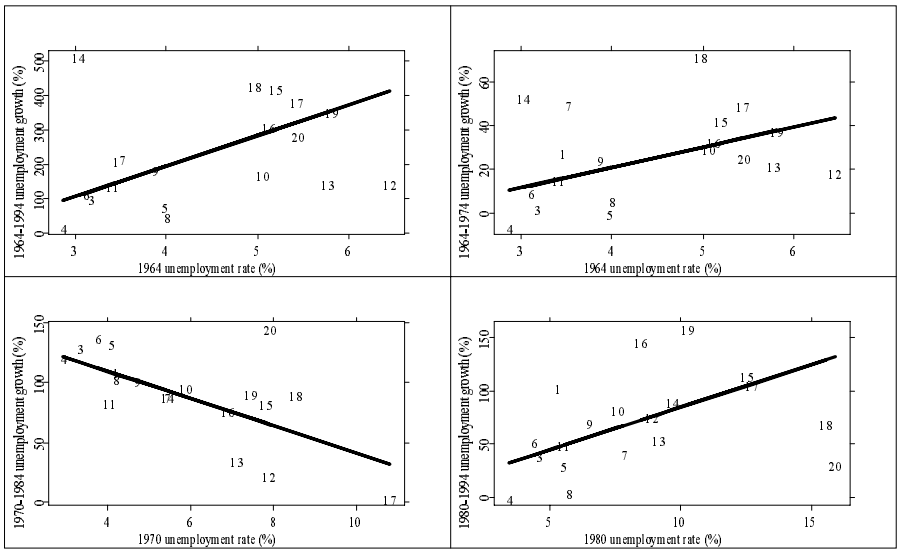

Figure 2: Convergence of Regional Unemployment Rates (1964-1994). The solid line is the LAD line. Regions codes are reported in the Appendix.

the seventies and early eighties (lower left quadrant of Figure 2). Interestingly, the decline in unemployment differentials was especially pronounced during the early 1980s, when the economic downturn led to higher unemployment in the NC regions, and was followed by a sharp increase during the second part of the 1980, when economic recovery reduced unemployment in the NC areas but not in the South (see Figure 3).

The much larger dispersion of regional unemployment rates in recent years is also documented by Figure 4, that plots the densities of regional relative unemployment rates in 1970 and 1994. Notice the marked bi-modality of the 1970 unemployment rates distribution, indicating that in 1970 there existed two fairly distinct groups of regions, one with lower and one with higher unemployment rates. The clustering is much less evident in the 1994 data.

A formal test of persistence of regional unemployment differentials is presented in Table 1, where we show the results of unit root tests of the hypothesis that regional relative unemployment is non-stationary. It turns out that we cannot reject this hypothesis in the large majority of Italian regions. Interestingly, this result is squarely different from the results obtained by Eichengreen (1993), who finds instead no evidence against stationarity. This difference can be easily explained with the choice of the sample period. Eichengreen's data stop in the mid 1980, before the real action starts.

In the presence of persistent and widening unemployment differentials, groups of Italian regions could share a common trend. To investigate this possibility, we group regions into as follows: North-Est (NW), including Piemonte, Liguria and Lombardia; North-East (NE), including Trentino, Veneto and Friuli; Center (C) including Emilia, Toscana, Umbria and Marche (with and without Lazio, the region where the capital city, Rome, is located); South-West (SW), includ-

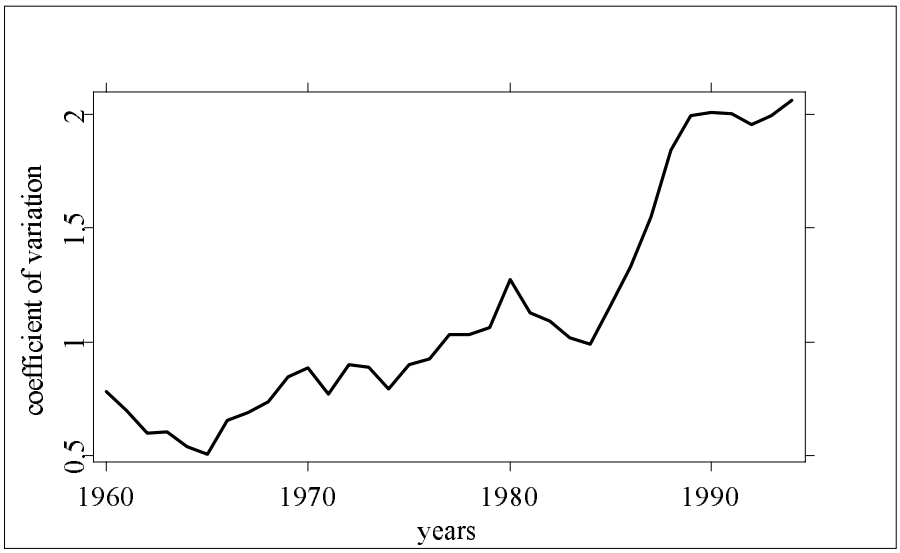

Figure 3: Regional unemployment rates. Coefficient of variation

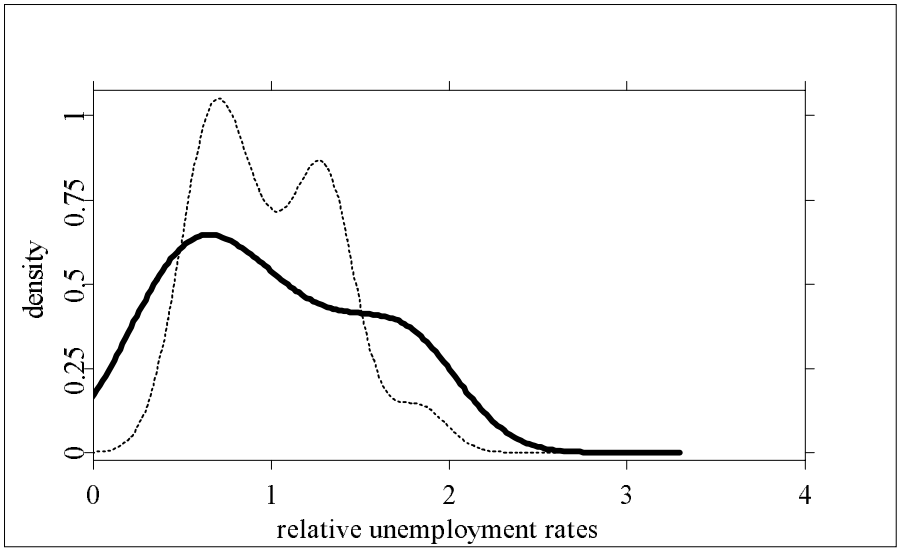

Figure 4: Estimated densities of regional relative unemployment rates: 1970, dashed line; 1994, solid line. Bandwidth selected via Sheather and Jones (1991) plug-in method.

Table 1: Unit root tests of log relative regional unemployment rates: p-values

	ADF	Z	WS		ADF	Z	WS
Piemonte	0.09	0.21	0.34	Marche	0.19	0.11	0.44
Lombardia	0.33	0.59	0.58	Abruzzo	0.93	0.41	0.37
Trentino	0.57	0.72	0.48	Molise	0.68	0.37	0.27
Veneto	0.29	0.27	0.86	Campania	0.06	0.02	0.28
Friuli	0.81	0.17	0.43	Puglia	0.96	0.48	0.53
Liguria	0.23	0.41	0.15	Basilicata	0.07	0.21	0.14
Emilia	0.45	0.84	0.83	Calabria	0.09	0.09	0.12
Toscana	0.48	0.29	0.20	Sicilia	0.46	0.77	0.86
Umbria	0.48	0.39	0.23	Sardegna	0.80	0.91	0.55

Note: ADF is the augmented Dickey Fuller test; Z is the Phillips Perron test and WS is the Weighted Symmetric test. The regressions include a drift and the number of lags is selected by using the AIC criterion.

Table 2: Cointegration analysis of regional unemployment rates (p-values)

Geographical area	p	$r = 0$	$r \leq 1$	$r \leq 2$	$r \leq 3$	$r \leq 4$	$r \leq 5$	$r \leq 6$	$r \leq 7$
NW+NE	6	0.000	0.000	0.001	0.250	0.135	0.070		
NW	3	0.057	0.289	0.099					
NE	3	0.005	0.137	0.538					
CE	5	0.050	0.286	0.682	0.988	0.986			
CE-Lazio	4	0.068	0.407	0.982	0.709				
S	8	0.000	0.000	0.009	0.934	0.128	0.229	0.387	0.547
SW	5	0.002	0.046	0.347	0.472	0.801			
SW-(Sicily+Sardina)	3	0.000	0.014	0.463					
Sicily+Sardinia	2	0.022	0.677						
SE	3	0.077	0.510	0.171					

Note: p is the number of regions in the group; r is the cointegration rank.

ing Campania, Basilicata, Calabria, Sardinia and Sicily; and South-East (SE), including Puglia, Abruzzi and Molise. In the presence of $p > 2$ variables, the existence of a common trend implies that there are $p - 1$ cointegrating vectors within each group of regions. Using Johansen's approach (see Johansen, 1995), we find (see Table 2) that in virtually none of the geographical areas it is possible to find only one common trend.[4] Hence, the view that there are clusters of regions where unemployment rates follow a common long run path might be too simple.

All these findings confirm that, contrary to the US experience and in line with other continental European countries (most notably Spain), unemployment persistence in Italy is high. If we run a regression line through the scatter diagram in Figure 5, the slope coefficient is 2.656 (p-value: 0.000) and the R^2 is 0.76, a substantial difference from the results presented by Blanchard and Katz (1992) for the US.[5]

[4] Results do not change when we use log unemployment.

[5] These authors find that a similar regression line has slope 0.03, wiht a t statistic of 0.2

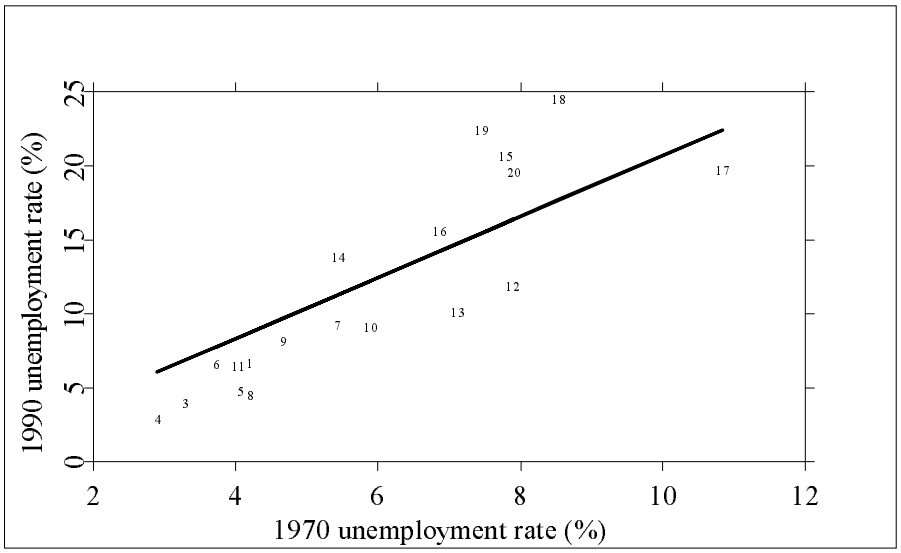

Figure 5: Unemployment persistence in Italy. Regions codes are reported in the Appendix.

How do we explain the observed increase of regional unemployment differentials, especially pronounced since the mid 1980s? This paper shows that higher unemployment in the South is the outcome of poor employment performance in the presence of sustained labor force growth. Despite growing unemployment, labor mobility from the South to the North remained low and relative wages did not adjust to reflect worsened local labor market conditions. Poor employment performance in the South was not necessarily the outcome of negative and contemporaneous idiosyncratic shocks, but could also be interpreted as the delayed response of firms to the removal of institutions allowing for regional differentials in collective labor contracts at the end of the sixties, that increased sharply the Southern labor share during most of the seventies.

The non-stationarity of relative regional unemployment rates suggests that regional rates follow different long run paths. We propose a parsimonious description of the long run evolution of regional unemployment by associating them to the dynamics of tax wedge, the real price of energy and real government social transfers per head. We find that payroll and income taxes and energy prices are positively associated to regional unemployment, especially in the NC areas. More interestingly, we also find evidence that long run regional unemployment in the South is positively associated to real social transfers per head. These transfers increase household income, thus increasing the scope for intra-household transfers and the reservation wage of Southern unemployed individuals. The consequence is higher wait unemployment. In the NC areas, however, regional unemployment is negatively associated to real social transfers per head. We explain this difference as follows: first, social transfers in the NC

and an R^2 which is zero to the second decimal digit.

areas favor retirement and the substitution of the old with the young in the labor market rather than wait unemployment. Second, real social transfers per head affect regional labor demand in an asymmetric way, because the induced higher consumer expenditure is not equally distributed across regions. Since the production of goods and services is more concentrated in the NC area, the positive effects of social transfers on local labor demand is stronger in these areas and weaker in the South, where the negative labor supply effects on regional unemployment prevail.

The uncovered asymmetries in the long run relationship among real social transfers per head, the real price of energy and the tax wedge and regional unemployment suggest that higher social transfers per head and lower real prices of energy during the eighties and the nineties have been associated to widening unemployment differences between the South and the rest of the country, and have more than compensated the opposite association between the higher tax wedge and the distribution of regional unemployment.

The paper is organized as follows. Section 2 presents an account of regional unemployment changes; section 3 looks at regional employment dynamics and at the evolution of the labor share; sections 4 and 5 deal respectively with labor mobility and with wage determination. Section 6 focuses on the long run evolution of regional unemployment and section 7 briefly looks at localization issues. A summary of the evidence is followed by a concluding section devoted to the likely implications of *EMU* for Italian regional labor markets.

2 Accounting for changes

Following Attanasio and Padoa Schioppa (1991), we group Italian regions into 5 macro areas, excluding tiny Val d'Aosta and Lazio, the area where the capital, Rome, and the central government are located, and we decompose in Table 3 the average annual changes of unemployment rates into the percentage changes in labor force participation and the percentage changes in total employment. This decomposition is performed for two sub-periods, 1970-79 and 1980-94.[6] While the former sub-period follows the wage push of the late 1960s, the second sub-period starts with Italian participation to the EMS and with the substantial reduction of union power in industrial relations.

Consider first the industrialized North-West. Compared to the seventies, unemployment increased during the eighties and nineties at about the same pace, as a consequence of the contemporaneous slowdown both of labor force and of employment growth. A similar story holds for the Centre. In the North-East, unemployment growth was much slower during the second sub-period, because labor force growth slowed down in the presence of sustained employment growth. In either period, employment growth has remained relatively fast, at close to 0.6% a year. In the South, employment growth plummeted from more than 0.6% a year during the seventies to negative growth in the 1980s and later. Since labor force growth remained relatively fast in the two periods, especially in the South-West, unemployment increased at a rate close to 1 percentage point a year.

The table makes it clear that the relative increase in unemployment differentials in the South compared to the rest of the country has been associated to:

[6] We use the approximation $\Delta u = \Delta \ln FL - \Delta \ln N$.

Table 3: Decomposition of average annual changes of unemployment rates in the 5 main economic areas of the country.

	Δu	$\Delta \ln FL$	$\Delta \ln N$
$1970-79$			
NW	0.15	0.55	0.40
NE	0.15	0.74	0.59
CE	0.16	0.33	0.17
SE	0.23	0.93	0.70
SW	0.33	0.98	0.65
$1980-94$			
NW	0.17	0.25	0.08
NE	0.06	0.63	0.57
CE	0.16	0.15	-0.01
SE	0.67	0.45	-0.22
SW	0.96	0.93	-0.03
Source: historical statistics based on the Quarterly Labor Force Survey. See data Appendix for details.			

a) faster labor force growth in the South;[7] b) slower employment growth in the 1980s and 1990s. While labor force growth was at least as fast in the 1970s as later, the key change that occurred in the South from the early 1980s onwards was the sharp slowdown in employment growth.

In Table 4 we use administrative data from the INPS archives to look at average net firm growth and average job creation since the mid 1980s in the 5 macro areas.[8] Compared to the regional accounts, these data are limited to employment in the private sector.[9] While net job creation was negative in the NW area, where traditional large manufacturing firms are located, it was positive on average in the NE and CE areas, mainly because of the presence of a dynamic sector of small and medium firms (*industrial districts*), and negative in the South.

Table 5 presents information of firm and job creation disaggregated by firm size . It is clear from the table that small firms with less than 50 employees have added substantially to net job creation in the NC areas but have contributed to net job destruction in the South. Net job creation in the Italian Mezzogiorno has been negative not only among small firms but for all firm sizes. While net job creation was negative in manufacturing both in the NC and in the S regions, especially among medium and large firms, it was positive in non manufacturing industries in the NC area and negative in the S area.

[7] See Bodo and Sestito (1991) for a discussion of labor force participation in the South.

[8] Net firm growth is the difference between new startups and closures, measured with respect to the stock of firms in the previous year. Net job creation is the difference between jobs created and job destroyed in a year, relative to the stock of employees in the previous year. See Contini *et al.* (1992) for a detailed discussion of these data.

[9] An important caveat about these data is that the regional allocation of firms and workers is based upon the firm headquarters rather than on the location of plants. This is a problem for large multi-plant firms. We partly take care of this by aggregating regions into two macro areas, the NC and the S area.

Table 4: Birth and death percentage rates of firms and net job creation by macroarea (average 1986-1995).

	NW	NE	CE	SE	SW
Birth	9.06	9.19	9.87	10.57	10.77
Death	8.28	7.81	8.77	9.88	10.42
Net Firm Growth	0.77	1.37	1.10	0.69	0.36
Net Job Creation	-0.28	1.09	0.52	-0.58	-1.21

Source: our calculations based upon the INPS databank.

Table 5: Birth and death percentage rates of firms and net job creation by macroarea and firm size (average 1986-1995).

	NW			NE			CE		
	S	M	L	S	M	L	S	M	L
Birth	9.23	1.94	1.79	9.33	2.01	1.86	10.00	2.22	2.00
Death	8.42	2.44	1.95	7.92	2.71	2.01	8.87	2.87	1.94
Net Growth	0.81	-0.51	-0.15	1.41	-0.70	-0.14	1.12	-0.64	0.05
Net Job Creation	1.06	-0.52	-2.14	2.05	0.17	-1.34	0.90	-0.30	0.30

	SE			SW		
	S	M	L	S	M	L
Birth	10.67	2.56	1.35	10.88	2.26	0.90
Death	9.96	3.25	2.12	10.51	2.71	2.21
Net Growth	0.70	-0.70	-0.77	0.36	-0.45	-1.30
Net Job Creation	-0.36	-1.16	-0.79	-1.11	-1.59	-1.12

Source: our calculations based upon the INPS databank. S: firms with less than 50 employees; M: firms with 50 to 499 employees; L: firms with more than 1000 employees.

Table 6: Estimates of Eq. (1). Sample period: 1970-1994. Fixed effects estimates.

	$R^2_{1970-94}$	$R^2_{1970-79}$	$R^2_{1980-94}$
North and Centre	0.43	0.40	0.41
South	0.20	0.19	0.22

Note: R^2 is the adjusted R squared of regressions that include regional dummies and the current and the first lag of aggregate employment changes as explanatory variables.

3 Regional employment dynamics

The observed differences in the performance of employment in the Italian regions can be explained either by the fact that regional shocks are more important than common aggregate shocks or by the fact that regional employment responds asymmetrically to common shocks. Clearly, these are not mutually exclusive hypotheses. We investigate them using data from the regional accounts, that measure total standard labor units, inclusive of self-employment. Following Blanchard and Katz (1992), we estimate the following empirical model after pooling together the regions belonging respectively to the NC and to the S areas

$$\Delta \ln N_{it} = \sum_i \alpha_i D_i + \sum_j \beta_j \Delta \ln N_{t-j} + \varepsilon_{ij} \tag{1}$$

where D are regional dummies, i is for region, t is for time, N_i is regional employment, measured by standard labor units, and N is aggregate employment. The adjusted R^2 of these regressions tells us how much of the variation over time in regional employment is accounted for by variations in aggregate employment. The fixed effects estimates of (1) are presented in Table 6, both for the full period (1970-94) and for two sub-periods (1970-79) and (1980-94). The table shows that the adjusted R^2 is much lower in the South than in the rest of the country.

Regional idiosyncracies are clearly associated both to differences in industrial composition and to regional real GNP growth. We illustrate in Table 7 the changes in the sectorial composition of regional employment in the 5 main areas of the country. The relative share of manufacturing employment (including self-employment) has declined from the early eighties in all areas, but especially so in the traditional industrial strongholds of the North-West. In 1994, manufacturing employment in the NW was 35% lower than in 1980. A similar decline (-27.4%) was observed only in the SW, where manufacturing employment is much less important. Even so, manufacturing still employs one out of four workers in the NC areas, compared to one out of 6 in the South-West and one out of 10 in the South-East.

Public employment has further increased in the South, where it employs more people than manufacturing and building combined. Agriculture has rapidly declined in all areas, but especially in the South-East, where it remains more important than manufacturing. The commercial sector has expanded in all areas, but particularly so in the South, where employment in 1994 was more than 20% higher than in 1980. While public service employment grew faster in the South, private service employment increased much more rapidly in the

Table 7: Composition of standard labor units by macroarea and sector (1980 and 1994).

Changes 80-94	Manufacturing	Building	Agricolture	Services	Public Empl.
NW 1980	0.388	0.067	0.066	0.479	0.128
NW 1994	0.281	0.071	0.046	0.602	0.151
NE 1980	0.315	0.077	0.118	0.490	0.165
NE 1994	0.260	0.064	0.075	0.601	0.179
CE 1980	0.320	0.065	0.133	0.482	0.150
CE 1994	0.258	0.054	0.076	0.612	0.172
SW 1980	0.148	0.110	0.226	0.516	0.189
SW 1994	0.109	0.096	0.149	0.646	0.235
SE 1980	0.179	0.094	0.235	0.492	0.179
SE 1994	0.168	0.075	0.122	0.635	0.216
Source: Regional Accounts 1980-94.					

North, and especially in the NE area (+72.7%). These relevant differences in the composition of employment between tradeables and home goods are clearly important sources of idiosyncrasies in the behavior over time of regional employment and unemployment.

Turning to regional GNP growth, Table 8 shows the average percentage growth both of GNP and of its components during three sub-periods: 1970-79, 1980-1994 and 1984-1994. While both private and public consumption have grown faster in the South than in the rest of the country during the eighties and the nineties, private and public investment have exhibited negative growth in the South, especially since 1984. Partly as a consequence of the poor investment performance, the slowdown of real GNP growth in the South during the period 1984-1994 was more significant than in the NC areas.

Poor employment performance in the South during the 1980s and the 1990s is not necessarily the exclusive outcome of negative idiosyncratic shocks taking place during the same period, but could also be the lagged response of firms to negative shocks that occurred much earlier. It is tempting to extend to the Italian South a recent interpretation of high European unemployment in the 1980s and 1990s, that views it as the result of the lagged response of capital to the "appropriation push" of the seventies, when union pressure increased significantly the labor share. In a nutshell, the story goes as follows. With a putty-clay technology, capital is difficult to adjust in the short run, but in the long run both the substitution of capital to labor and the development of more capital intensive technologies can reduce employment and increase the profit share to values even higher than before the appropriation push (Caballero and Hammour, 1998). A closely related story is that, while adverse labor supply shifts have been important for the increase of unemployment during the seventies, wage moderation and rising capital shares can be consistent with high and rising unemployment in the 1980s only in the presence of negative labor demand shocks (Blanchard, 1998).

To illustrate the Italian experience, Tables 9 and 10 show, respectively for the NC and the S areas, the percentage changes in the labor share and in labor productivity in the private sector between 1970 and 1979 and between 1979 and

Table 8: GNP and demand growth in the NC and in the S macro areas.

	1970-79	1780-1994	1984-1994
NC			
% growth in GNP	3.79	1.85	2.10
% growth in CP	4.30	2.17	2.24
% growth in CG	3.04	1.68	1.44
% growth in IP	1.53	0.55	1.25
% growth in IG	-3.79	1.59	1.24
% growth in NX	11.30	3.58	4.67
S			
% growth in GNP	3.71	1.81	1.69
% growth in CP	4.84	2.47	2.38
% growth in CG	3.32	2.21	1.96
% growth in IP	1.83	-0.35	-1.49
% growth in IG	-0.11	-1.67	-1.11
% growth in NX	1.83	2.18	1.07

Source: regional accounts. Note: GNP = real GNP; CP = real private consumption; CG = real public consumption; IP = real private investment; IG = real public investment; NX = real regional trade balance.

1994 and associate these changes to changes in employment, unemployment and the labor force.[10] Figure 6 adds to this evidence by plotting relative profit shares in the North, Center and South. As shown by Table 9, the labor share increased during the seventies in the South and mildly decreased in the Northern and Central regions. During the same period, the unemployment rate increased by close to 3 percentage points in the South and by less than 2 percentage points in the NC areas. Interestingly, the increase in the labor share in the South was accompanied by positive employment growth, that limited the expansion of the rate of unemployment.

During the 1980s and 1990s, the labor share fell much faster in the S than in the NC regions and unemployment boomed to its currently very high levels (see Table 10). While employment growth remained positive in the NC areas, it turned negative in the South where, at the end of the 15-years period, employment was lower than in 1979. Since labor force growth remained high, unemployment had to increase. In the Northern and Central regions, however, labor force growth was only 2 points higher than employment growth, that remained positive. Hence, unemployment did not increase much even in the

[10] It is well known that the relationship between real wages and the labor share depends on the production technology. When the technology is Cobb Douglas, the labor share is constant and does not vary with changes in labor costs. When the technology is CES, however, the labor share s_L varies with the capital-output ratio according to

$$s_{Lt} = 1 - (Ak_t)^{\varepsilon}$$

where k is the capital-output ratio and A is a measure of disembodied technical progress. See Bentolila and Saint Paul (1998). In this case, real wages can affect the labor share only by affecting the capital-output ratio. Even when higher wages lead to a higher k, the labor share increases only if labor and capital are complements in production ($\varepsilon < 0$).

Table 9: Profit share, labor productivity, labor cost, and unemployment in some key regions (1970-1979).

Changes 70-79	Veneto	Piemonte	Puglia	Campania	NC	South
Δu	2.0	1.7	2.1	4.0	1.7	3.2
$\Delta \ln s_L$	-1.9	-17.8	16.8	43.5	-6.1	17.2
$\Delta \ln \frac{Y}{N}$	31.6	33.0	45.7	21.4	33.8	36.4
$\Delta \ln N$	6.9	3.1	8.0	6.2	3.2	7.2
$\Delta \ln FL$	8.9	4.8	10.1	10.3	4.9	10.4

Source: our calculations based on regional accounts and labor force data.

Table 10: Profit shares, labor productivity, labor cost, and unemployment in some key regions (1979-1994).

Changes 79-94	Veneto	Piemonte	Puglia	Campania	NC	South
Δu	1.7	4.8	11.9	15.1	2.2	13.2
$\Delta \ln s_L$	-38.1	-41.8	-46.6	-70.3	-30.5	-50.3
$\Delta \ln \frac{Y}{N}$	41.5	41.1	53.8	34.7	38.6	37.7
$\Delta \ln N$	9.6	-5.1	-3.1	1.5	2.4	-0.4
$\Delta \ln FL$	11.3	-0.3	8.8	16.6	4.6	12.8

Note: see Table 17.

presence of a sharp reduction in the labor share. Notice that, even within the North, there were drastically different situations. A simple inspection of the data for Veneto and Piemonte is sufficient to make the point.

As shown by Figure 6, the capital share in the South declined relatively to the national average during most of the 1970 and started to rapidly recover in the early 1980s. This decline was the result of the rapid increase of relative wages, that was not compensated by labor productivity growth. As discussed in detail by Faini (1993), an important event that hit specifically the South at the end of the 1960s was the elimination of institutional rules allowing for the existence of regional wage differentials in union contracts (*gabbie salariali*). Following this event, only partially compensated by specific payroll tax breaks (*fiscalizzazione degli oneri sociali e sgravi contributivi*), relative labor costs increased rapidly in the South and the profit share fell. As unemployment started to increase, the share partially recovered. With regional wages in the South not significantly affected by the regional unemployment rate (see section 5), however, the recovery in the capital share could not be facilitated by lower real wages and required even higher unemployment rates, thus widening unemployment differentials in the 1980s.

4 Labor Mobility

Most discussions of unemployment disparities in Italy emphasize the substantial decline of labor migration from the Southern to the NC regions that occurred

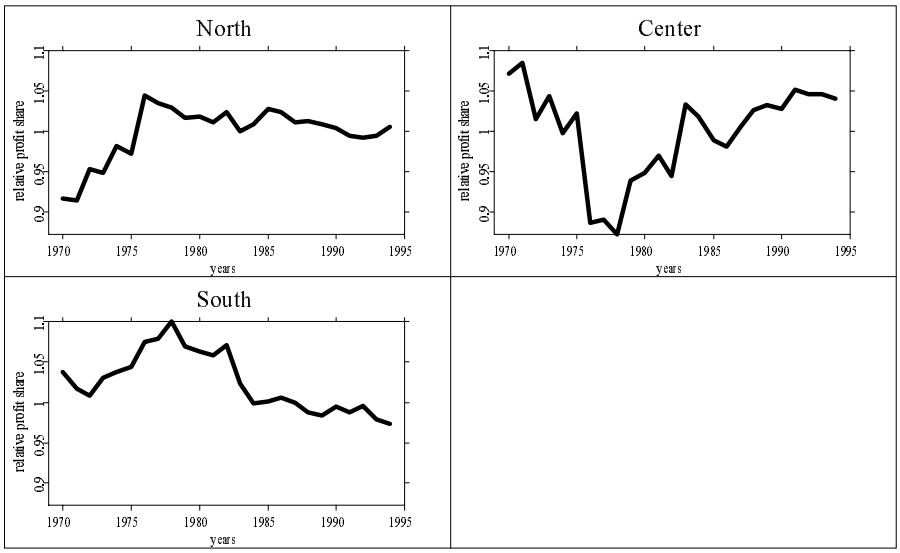

Figure 6: Relative profit shares in the private sector in the North, Center and South.

since the early seventies.[11] The basic facts are illustrated in Figure 7, where we plot net wages in the South relative to net wages in the NC, the migration rate from Southern regions to the rest of the country and real government social transfers per head in the South.

Relative net wages increased during the seventies but remained more or less constant during the eighties and the nineties. The out-migration rate fell substantially in the early seventies and remained low during the eighties and the nineties. Government social transfers per head (*prestazioni sociali*), both in money and in kind, that include unemployment benefits, social assistance, regular and invalidity pensions and health payments, increased almost monotonously during most of the sample period.

As remarked in the literature, one potential reason for the persistently high unemployment rate in the South is the presence of income transfers within Southern households, from the employed and the retired to the young unemployed (See Attanasio and Padoa Schioppa , 1991, Bentolila and Ichino, 1998, and Faini *et al.*, 1996). These transfers finance wait unemployment and maintain high reservation wages in the South (see Brunello, 1992, and Mazzotta, 1998). We do not have a direct measure of intra-household transfers, but we expect the size of these transfers to be influenced both by regional wages and by social transfers from the government, that we measure with government social transfers per head.[12]

[11] Spain has experienced a very similar situation. See Bentolila and Jimeno (1998). The classic references for Italy are Attanasio and Padoa Schioppa (1991), Bodo and Sestito (1991) and Faini *et al.* (1996).

[12] Notice that the relationship between social transfers per head and unemployment is not a causal relationship, since higher unemployment can induce higher transfers.

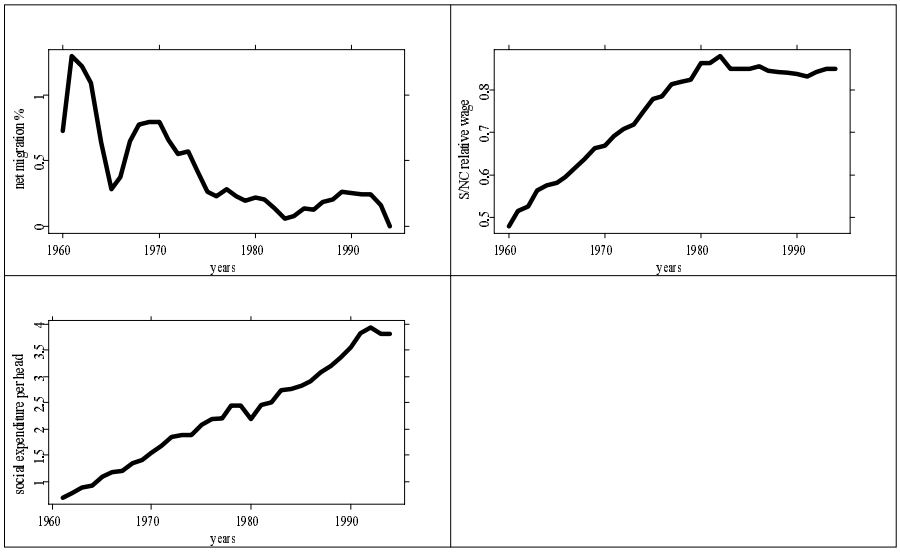

Figure 7: Net migration as a percentage of population, S/NC relative wages in the private sector, and social expenditure per head in the Italian southern regions.

Attanasio and Padoa Schioppa have used data for 6 areas of the country (North-West, North-East, Center, Rome, South-West and South-East) and for the period 1960-86 to estimate an empirical model that associates net immigration flows to local wages, national wages, local and national unemployment.[13] In this section, we add to the existing evidence by estimating migration outflows from the 8 Southern regions to the remaining Italian regions, using data that cover a more recent time period, 1970-1993. The available regional data are pooled together and we use fixed effects methods to control for region-specific unobservable variables. Our empirical error correction model is

$$\begin{aligned} \Delta M_{it} &= \sum \beta_i D_i + \alpha \Delta M_{it-1} + \gamma M_{it-1} + \delta \ln(\frac{W_{it-1}}{W_{Nt-1}}) \\ &\quad + \vartheta \ln U_{it-1} + \kappa \frac{SE_{it-1}}{POP_{it-1}} + \varepsilon_{it} \end{aligned} \tag{2}$$

where M is the percentage of labor outflows with respect to the regional population in the previous year, W_i and W_N are the regional net wages and the average net wage prevailing in the NC area, U is the unemployment rate and SE/POP is government social transfers per head. Our results are presented in Table 11.

Given the dynamic nature of the panel of regions, we use the Anderson-Hsiao estimator. In particular, the lagged value of the change in the migration rate is instrumented by the second lag of the change and of the level of the same

[13] Eichengreen (1993) also presents estimates of migration rates in Italy using a similar sample period.

Table 11: Migration from S to NC.

Variable	Coefficient
M_{-1}	-0.287**
ΔM_{-1}	0.150**
$\ln U_{-1}$	0.0004**
$\ln\left(\frac{W}{W_N}\right)_{-1}$	-0.006**
$\left(\frac{SEs}{POP}\right)_{-1}$	-0.323**
$Nobs$	192
R^2	0.37

Notes: dependent variable: ΔM. Anderson-Hsiao estimates. Instruments: $\Delta M_{-2}, M_{-2}$. 1970-1993. Two stars indicate that the coefficient is significant at the 5% level of confidence. The regression include a constant and regional dummies.

variable. Our evidence is that the rapid increase both of relative wages and of social transfers per head during the seventies and the eighties has significantly reduced migration flows, more than compensating the opposite effects on migration of higher regional unemployment. According to our estimates, a one percentage point increase in relative wages and in social transfers per head reduced migration outflows respectively by 2.786 and by 0.345 percentage points. On the other hand, a one percent increase in regional unemployment increases out-migration from the South by 0.185 percent.

An interesting thought experiment is to estimate the size of migration flows under the assumption that relative wages and real social transfers per head in 1993 are equal to their 1972 levels rather than being at their current levels. Given the low elasticity of migration to regional unemployment, an approximate "back of the envelope" calculation suggests that outmigration from Campania, one of the largest Southern regions, would have increased from about 3 to about 8 individuals out of a thousand per year. Assuming that all the additional migrants flow out of unemployment and of the labor force, the adjusted unemployment rate in 1993 would have been 20.5 rather than 25.5 percent. This experiment suggests that migration is only part of the story and that even resuming migration flows to the levels experienced in the early sixties (9 individuals out of a thousand) would not solve the Southern unemployment problem.

5 Wages and unemployment

Differences in regional unemployment can increase and persist when local wages are not sensitive to local economic conditions. This is the case when wage setting is relatively centralized and wage determination is influenced mainly by the economic conditions prevailing in the leading economic areas of the economy. When a negative shock increases unemployment in a backward region (the South), wages are not significantly affected and higher unemployment can persist in the absence of other adjustment factors. When the same shock hits the leading region (the NC area), however, wages are negatively affected and

the decline in wage growth can contribute to reduce unemployment.

To illustrate this point, we present in the Appendix a standard model of wage determination for the aggregate economy. The key features of this model are imperfect competition in the product market and union wage setting in the product market.[14] The long run labor market equilibrium can be described by the following two equations

$$\frac{P}{W} = P\left[\frac{Y}{L}, \mu\right] \tag{3}$$

$$\frac{W}{P} = W\left[A, \eta, v\right]. \tag{4}$$

The former equation is the price setting curve, that relates the real wage W/P that firms are willing to pay to average labor productivity Y/L and the price markup μ. The second equation is the wage setting curve resulting from union activities in the labor market and relates the real wage that unions demand to the target real wage A, to the elasticity of labor demand and to a measure of the (expected) effect of higher real wages on target wages. Let the price markup μ vary with the real rate of interest r, as in Phelps (1994), with output per head Y/L and with the degree of market integration and competition, C. Using a log-linear approximation and small letters for logs, we can re-write Eq.(4) as follows

$$p - w = \zeta_o + \zeta_1 r + \zeta_2 (y - l) + \zeta_3 C. \tag{5}$$

Turning to the wage equation, the target wage A is assumed to vary with the following variables: the rate of unemployment u, a measure of regional mismatch mm, the tax wedge τ, output per head, the degree of product market competition, that affects the elasticity of labor demand, and a measure of union power UP. We show in the Appendix that v measures the effects of a higher real wage on the target wage. This effect can be decomposed more in detail as follows

$$\frac{\partial \ln A}{\partial \ln W} = \frac{\partial \ln A}{\partial u}\frac{\partial u}{\partial \ln W} + \frac{\partial \ln A}{\partial mm}\frac{\partial mm}{\partial \ln W} \tag{6}$$

where u is the unemployment rate and mm is a measure of regional mismatch. The first term on the right hand side of Eq. (6) is negative because the target wage falls when unemployment increases and unemployment is expected to increase with the real wage. The size of the latter effect is likely to depend on government policy. If the government wants to minimize the deviations of unemployment form a target level, it can use both public employment and monetary policy (and the exchange rate) to accommodate wage increases.[15] In this case, the target wage A is less sensitive to the increase in the rate of unemployment and wage pressure is higher. The second term on the right hand side is likely to be positive, because a higher mismatch increases the target wage (See Nickell, 1998) and a higher central wage can increase the mismatch between leading and backward regions (see Faini, 1999). Overall, the effect of a higher real wage on the target wage can take either a positive or a negative sign.

Using a log-linear approximation of the wage setting equation we obtain

$$w - p = \theta_o + \theta_1 r + \zeta_2 (y - l) + \theta_3 C + \theta_4 \tau + \theta_5 mm - \theta_6 u + \theta_7 UP \tag{7}$$

[14] This setup has become popular in Europe since the work by Layard *et al.* (1991).

[15] See Calmfors and Horn (1985) and Soskice and Iversen (1998).

where we have imposed the restriction that labor productivity shifts the wage and the price setting curves by the same amount. Hence, changes in the level of labor productivity does not affect equilibrium unemployment,[16] that is given by

$$\ln u = \frac{\theta_o + \zeta_o}{\theta_6} + \frac{\theta_1 + \zeta_1}{\theta_6} r + \frac{\zeta_3}{\theta_6} C + \frac{\theta_4}{\theta_6} \tau + \frac{\theta_5}{\theta_6} mm + \frac{\theta_7}{\theta_6} UP \tag{8}$$

and is determined by the intersection of a flat price setting equation with a downward sloping wage equation.

Let u_N be the rate of unemployment prevailing in the leading NC area and u_S be the unemployment rate in the S backward areas. If national wage determination is affected by the economic conditions prevailing in the leading area, equilibrium unemployment is defined as the rate in that area that makes wage setting consistent with price setting. In this specific case, we have

$$\ln u_N = \frac{\theta_o + \zeta_o}{\theta_6} + \frac{\theta_1 + \zeta_1}{\theta_6} r + \frac{\zeta_3}{\theta_6} C + \frac{\theta_4}{\theta_6} \tau + \frac{\theta_5}{\theta_6} mm + \frac{\theta_7}{\theta_6} UP \tag{9}$$

In the absence of changes in the right hand side variables, the unemployment rate in the leading area is tied down to its natural level by the mechanism of price and wage adjustment. Since this mechanism does not work for the backward region, unemployment there is "free" to increase or fall relative to the natural rate prevailing in the dominant region. An empirical implication of the "leading area hypothesis" is that unemployment in the backward region is not cointegrated with the unemployment rate prevailing in the leading area.

When regions characterized by economic asymmetries are politically integrated, as in Germany and in Italy, national wage formation can be dominated by the economic interests of the leading regions.[17] In this case, the failure of regional wages to respond to regional local conditions in some areas of the country can exacerbate unemployment differentials by eliminating an important adjustment mechanism. We empirically investigate this possibility by pooling regional data for 18 Italian regions during the period 1970-94 and by estimating the following empirical model[18]

$$\Delta \ln w_{it} = \sum_i \alpha_i D_i + \beta T + \delta \Delta \ln u_{it} + \eta \Delta \ln p_{mt} + \gamma \ln w_{it-1}$$

$$+ \zeta \ln u_{Nt-1} + \sigma \ln u_{it-1} + \varepsilon_t \tag{10}$$

where small letters are for logs, w_{it} is the real gross wage in region i, p_{mt} is the real price of imported raw materials, u_{it} is the regional unemployment rate, u_{Nt}

[16] See Blanchard and Katz (1997)

[17] See Saint Paul (1997) for a discussion.

[18] In previous work (Brunello *et al.*, 1998) we have investigated the question by using aggregate data and by testing whether a subset of the variables in the right hand side of equation (8) are cointegrated with the national unemployment rate or with the unemployment rate prevailing in the NC area. Our evidence can be summarized with the following two points:

1. aggregate wage setting in Italy depends only on the rate of unemployment prevailing in the Northern and Central areas of the country. Southern unemployment does not affect wage pressure.

2. There is evidence of a long-run cointegrating relationship between unemployment in the Northern and Central areas, the tax wedge, the real interest rate and a measure of union power.

Table 12: Elasticity of real wages to regional and NC unemployment in the private sector.

Variable	All Regions	S Regions
$\Delta \ln u_i$	-0.002	0.017
$\Delta \ln p_{mt}$	0.026**	0.025
$\ln u_{N-1}$	-0.023**	-0.032**
T	0.002**	0.003**
$\ln w_{i-1}$	-0.138**	-0.137**
$\ln u_{i-1}$	-0.012*	-0.024
R^2	0.33	0.35
Nobs	450	200
η_{wu}	-0.087*	-0.175
η_{wun}	-0.167**	-0.236**

Notes: dependent variable: $\Delta \ln w$. Sample period: 1970-1994. One star and two stars when the coefficients are significant at the 10% and at the 5% level of confidence, respectively. White consistent standard errors.

is the unemployment rate prevailing in the NC area, T is a linear trend and ε is the error term. Since changes in the current regional unemployment rate are likely to be endogenous, we use 2SLS estimates. Our selected instruments are the lagged change in regional unemployment, changes in the national rate of unemployment and the first lag of a cyclical indicator, obtained as the residual from fitting regional real GNP on a linear and a quadratic trend.

If the leading region hypothesis is correct, we expect to find that, conditional on the local unemployment rate, unemployment in the NC area attracts a significant coefficient. In the extreme version of the "leading area" hypothesis, local unemployment does not affect local wages, that depend only on unemployment in the leading area. Our estimates are presented in Table 12, where we show the long run elasticities of the real wage both to regional unemployment, η_{wu}, and to unemployment in the leading area, η_{wu_n}. When we consider the entire economy, both regional unemployment and unemployment in the NC area attract a significant and negative coefficient in the wage equation. Moreover, the long run wage elasticity of regional unemployment is about half as large as the long run wage elasticity of unemployment in the leading area. This finding confirms that unemployment in the NC area plays a key role in Italian regional wage determination.

When we focus on the Southern labor market, however, we find no evidence that regional unemployment significantly affect regional wages after controlling for unemployment in the leading area. This result clearly support the view that aggregate wage setting is not affected by Southern unemployment.[19]

As mentioned in the previous section, an implication of the fact that Southern unemployment is not "tied down" by national wage determination is that unemployment in the backward area is not cointegrated with the unemployment rate in the leading area. The presence of a cointegrating relationship would imply the existence of an indirect discipline mechanism, running not from wage

[19] See also the evidence in Casavola, Gavosto and Sestito (1995).

Table 13: Engle-Granger cointegration tests with NC unemployment. Sample period: 1961-1994.

Region	P-value
Abruzzo	0.42
Molise	0.14
Campania	0.43
Puglia	0.84
Basilicata	0.14
Calabria	0.05
Sicilia	0.95
Sardegna	0.44
Note: we cannot reject the null hypothesis of no cointegration when the p-value is higher than 0.05.	

setting to unemployment but from unemployment in the leading area to unemployment in the South. We submit this hypothesis to empirical testing by running the standard Granger and Engle cointegration tests for each Southern region. As shown in Table 13, only in Calabria is there any evidence that local unemployment is cointegrated with NC unemployment.

6 The long run evolution of regional unemployment rates

We conclude our analysis of the potential causes of widening unemployment differences with an exercise that associates the long run evolution of regional unemployment rates to the movements of variables affecting both the supply and the demand for labor. As remarked by Blanchard (1998), the moderate wage growth and raising capital shares experienced by most European countries (and typical of most Italian regions) since the early 1980s could not be explained without considering both adverse labor supply and adverse labor demand shocks.

In our exercise, we try to capture the effects of labor demand variations on regional unemployment by using the changes over time of the tax wedge and of the real price of imported materials. The effects of labor supply variations are captured instead by government social transfers per head, that we have seen have had an important role to play in the reduction of inter-regional labor migration and in the development of regional labor supply. The bulk of these transfers consists of pension payments (79.6% of the total in 1991) while the share of unemployment related benefits is very low by international standards (see Peracchi and Rossi, 1995). Notice that real social transfers per head could also affect regional labor demand when the production of goods and services is not symmetrically distributed across regions. In this case, higher social transfers increase household income and expenditure in all regions, but affect mainly the (derived) demand for labor in the regions where production is concentrated.

We carry out the analysis using the standard non-stationary VAR framework, as described by Johansen (1995). For each region i we estimate the following

Table 14: Main VAR diagnostics and cointegration tests (P-values)

Region	AR 1-2	Normality	$\rho = 0$	$\rho \leq 1$	$\rho \leq 2$
Piemonte	0.060	0.672	0.000	0.348	0.272
Lombardia	0.382	0.390	0.000	0.033	0.075
Trentino	0.124	0.512	0.050	0.471	0.849
Veneto	0.109	0.225	0.051	0.354	0.810
Friuli	0.637	0.171	0.000	0.013	0.063
Liguria	0.151	0.418	0.000	0.117	0.297
Emilia	0.487	0.261	0.002	0.02	0.088
Toscana	0.475	0.102	0.003	0.035	0.063
Umbria	0.764	0.305	0.000	0.001	0.080
Marche	0.094	0.352	0.000	0.087	0.080
Lazio	0.412	0.132	0.000	0.018	0.201
Abruzzo	0.721	0.489	0.055	0.072	0.093
Molise	0.564	0.508	0.232	0.644	0.838
Campania	0.625	0.172	0.000	0.000	0.075
Puglia	0.176	0.138	0.010	0.068	0.109
Basilicata	0.938	0.820	0.000	0.014	0.108
Calabria	0.928	0.405	0.010	0.085	0.185
Sicilia	0.762	0.446	0.002	0.288	0.917
Sardegna	0.597	0.732	0.000	0.000	0.130

P-values of cointegration tests from MacKinnon *et al.* (1996).

VAR

$$\mathbf{X}_{i,t} = \boldsymbol{\mu}_i + \boldsymbol{\Pi}_{i,1}\mathbf{X}_{i,t-1} + \ldots + \boldsymbol{\Pi}_{i,k}\mathbf{X}_{i,t-k} + \boldsymbol{\varepsilon}_{i,t} \qquad (i = 1, \ldots, 19) \qquad (11)$$

where $\mathbf{X}_{i,t} \equiv \{\ln(u_{i,t}), \ln(\tau_{i,t}), \ln(SE_{i,t}/POP_{i,t}), \ln(P_{mt})\}$. Given that the sample size is small (1964-1994), we are forced to use a parsimonious representation. Notice, however, that cointegrating vectors are invariant to variable addition. Moreover, as shown by Abadir *et al.* (1999), finite sample estimator biases in a purely nonstationary VARs are proportional to the dimension of the system and the addition of irrelevant variables has more serious consequences than in the standard stationary case.

The selection of lag length in (11) is accomplished for each region by looking at the standard system diagnostics, that are broadly satisfied (see Table 14). Using the standard 5% level of confidence, we find at least one cointegrating vector for most of the regions, the only exception being Molise.

We summarize our results on cointegrating vectors in Table 15 and in Figures 8-10. Perhaps the strongest result is that real social transfers per head are positively associated to the rate of unemployment in most of the S area and negatively associated to unemployment in the NC area. The positive association found in the South[20] is in line with our results on migration flows from the South to the NC areas. We speculate that higher social transfers per head in the South, by increasing household income and the opportunities for intra-household transfers, reduce the incentive to migrate of the young unemployed

[20] Association, not causation.

Table 15: Regional cointegrating vectors

Region	τ	SE/POP	P_m	P-restr
Piemonte	-8.820	1.409	-0.918	0.283
Lombardia	-8.400	1.498	-1.001	0.582
Trentino A.Adige	-19.710	4.464	–1.523	0.366
Veneto	-17.500	4.370	-0.690	0.724
Friuli V. Giulia	-11.030	1.686	-1.557	0.793
Liguria	0.000	-0.370	0.000	0.601
Emilia Romagna	-5.357	0.982	-1.024	0.109
Toscana	-3.460	0.189	-0.323	0.236
Umbria	0.000	-0.262	0.000	0.790
Marche	-2.753	0.233	-0.199	0.474
Lazio	0.449	-0.458	0.331	0.700
Abruzzo	0.000	-0.136	0.298	0.844
Campania	0.000	-0.974	0.525	0.794
Puglia	5.337	-0.924	2.387	0.533
Basilicata	0.000	-0.644	0.484	0.995
Calabria	-2.487	-0.487	0.000	0.785
Sicilia	-1.302	-0.687	0.485	0.696
Sardegna	0.000	-0.537	-0.414	0.376

The cointegrating vectors are reported in the form $c = \ln(u) + \beta_1 \ln(\tau) + \beta_2 \ln(SE/POP) + \beta_3 P_m$. When more than one cointegrating vector is present for a specific region, the table reports only the first cointegrating vector. The other cointegrating vectors and the loading factors are reported in the appendix. P-restr is the P-value of the restrictions imposed for each region on all the cointegrating vectors and loading factors.

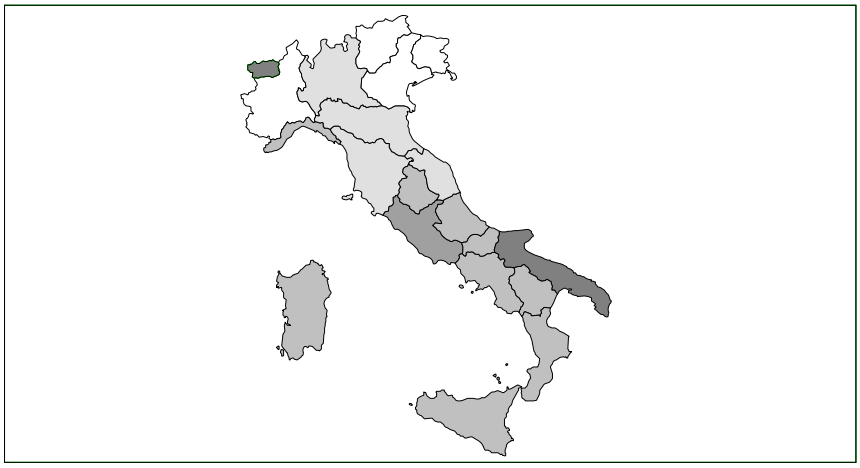

Figure 8: tax wedge in the regional cointegrating vectors: white to dark corresponds to "more negative" (white) to positive (black) coefficients.

and increase their reservation wage, thus encouraging wait unemployment and queueing for public sector jobs.

In the NC areas, higher social transfers also increase household income but encourage instead retirement from the labor force and the substitution of the old with the young, as discussed in detail by Contini and Rapiti (1994). We also speculate that real social transfers per head affect regional labor demand in an asymmetric way, because the induced higher consumer expenditure is not equally distributed across regions. Since the production of goods and services is more concentrated in the NC area, the positive effect on local labor demand is stronger in these areas and weaker in the South, where the negative labor supply effects on regional unemployment prevail.

We also find a positive association between the tax wedge and regional unemployment. This association is particularly strong in the NC areas. Finally, there is evidence of a positive long run association between the real price of materials and regional unemployment in the NC area.

While average tax rates have increased during the eighties and nineties, the real price of imported energy has significantly declined. On the other hand, real social transfers per head have increased both in the NC and in the S. The uncovered asymmetries in the long run association of social transfers per head, the real price of energy and the tax wedge with regional unemployment suggest that the positive association of regional unemployment differentials with higher real social transfers per head and with the lower real prices of energy has prevailed over the negative association between these differentials and the increase in the tax wedge.

7 Localization issues

Non-convergence of unemployment rates may arise if in the presence of increasing returns from localization both expected wages and expected profits depend

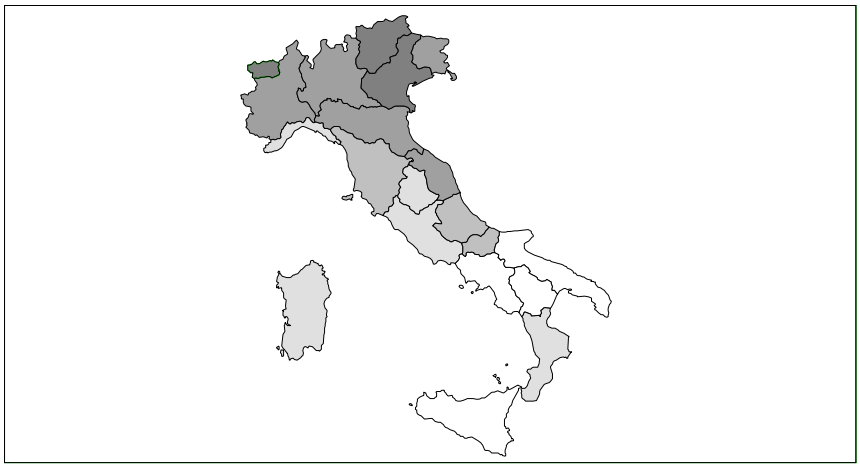

Figure 9: public social transfers in the regional cointegrating vectors: white to dark corresponds to "more negative" (white) to positive (black) coefficients.

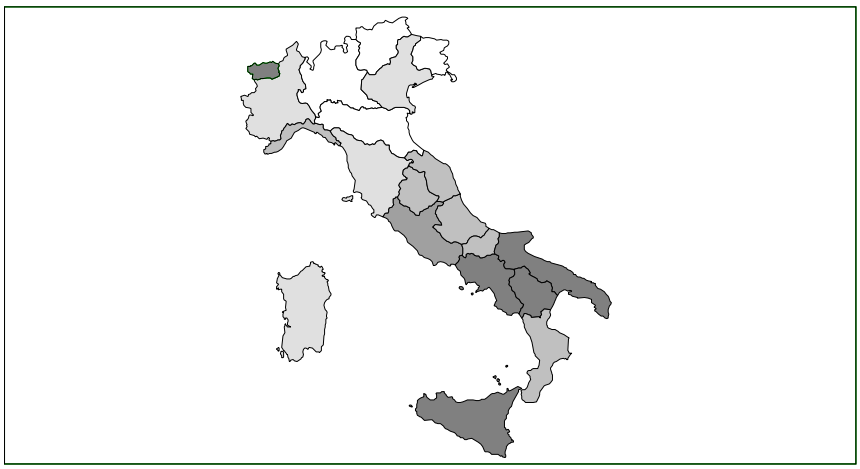

Figure 10: price of raw materials in the regional cointegrating vectors: white to dark corresponds to "more negative" (white) to positive (black) coefficients.

positively on the number of firms operating in a given area. Apart from technological spillovers and availability of specialized inputs and services, labor pooling phenomena may induce localization by increasing wage flexibility and easing employment reallocation when uncertainty and idiosyncratic shocks are allowed. This is consistent with expected profits and wages being given by

$$E(\pi_i) = f\left(z, \frac{L_i}{n_i}, \frac{n_i}{N}\right) \tag{12}$$

$$E(w_i) = g\left(\varsigma, \frac{L_i}{n_i}, \frac{n_i}{N}\right) \tag{13}$$

where $E(\cdot)$ denotes expected values, π_i and w_i are (real) profits and wages in region i, z and ς are generic variables influencing profits and wages, and n_i and L_i and N are respectively the number of firms, the local labor force and the total number of firms. Increasing returns imply that $\frac{\partial f}{\partial (n_i/N)} > 0$, $\frac{\partial^2 f}{\partial (n_i/N)^2} > 0$, $\frac{\partial g}{\partial (n_i/N)} > 0$ and $\frac{\partial^2 g}{\partial (n_i/N)^2} > 0$. As a result, depending upon the initial conditions, non-convergent equilibria in terms of number of firms and employed labor force can occur even in the presence of equal expected returns for workers or firms (Krugman, 1993).

In the Italian experience, the abolition of "gabbie salariali" (*wage cages*) at the end of the sixties led to the progressive convergence both of net and of gross wages among the NC and the S areas. This permanent regional supply shock could have induced firms to switch localization away from the South and in favor of the NC areas. In the presence of increasing returns from geographical concentration, regional disparities in net firm growth and net job creation could also have increased, and this trend could only partially be tempered by the reduction in labor migration flows across regions.

A simple test of the presence of increasing returns can be carried out using the administrative data on net firms growth and on net job creation. In particular, consider the following empirical model

$$nfg_{it} = \sum \alpha_j RD_j + \sum \beta_j YD_j + \sum \gamma_j SD_j + \sum \lambda_j FD_j + \delta \ln S_{t-1} + \varepsilon_{it} \tag{14}$$

where RD, YD, FD and SD are respectively regional, year, firm size and sectorial dummies, nfg is net firm growth, equal to the ratio of the difference between the birth and the death of firms to the lagged stock of firms, and S is the lagged stock of firms. With increasing returns from the localization of firms in a given area, we expect that areas with a larger number of firms also experience higher net firm growth. Hence, we expect that $\delta > 0$. We have estimated the above empirical model using INPS data for the period 1986-1995 and found in no area of the country significant evidence in favor of the increasing returns hypothesis. Visual inspection of Figure 11 makes the point quite clearly and we conclude from this evidence that localization issues have probably played a minor role in the widening of regional disparities between the NC and the S areas.

8 Summary

Regional unemployment differentials among Italian regions have widened since the mid 1980s, especially between the leading NC area and the underdeveloped

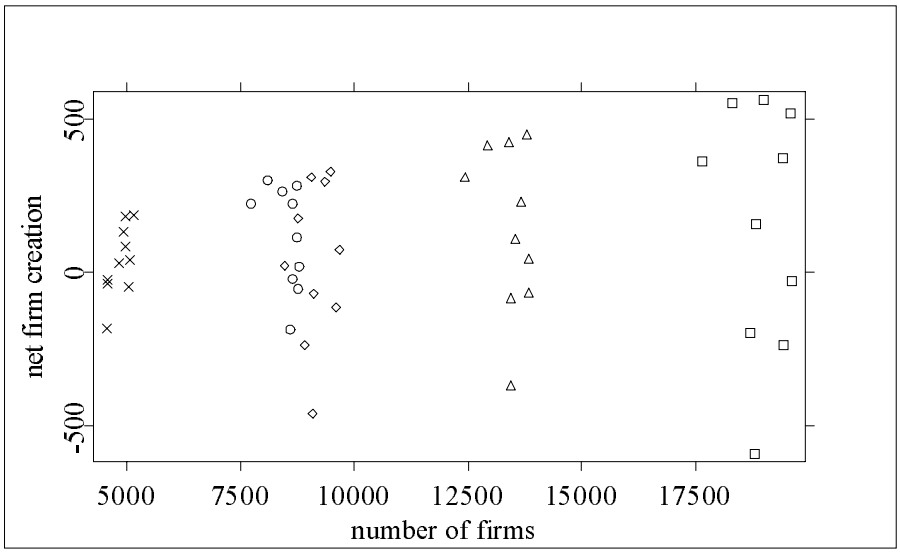

Figure 11: Net firm creation as a function of the number of firms.

South. Our review of the evidence suggest that the following elements are important to explain the observed phenomenon:

1. Employment performance in the South has worsened considerably in the presence of sustained labor force growth. Regional shocks have been more important than common shocks in this poor performance. The labor share increased particularly fast in the South during the 1970s, mainly as a consequence of the elimination of institutions that allowed the presence of significant regional wage differentials. The significant relative slowdown of employment growth in the 1980s and 1990s in the South can be interpreted at least in part as the delayed response to the appropriation push of the 1970s, that was particularly strong in the area.

2. Labor mobility from the South to the NC areas have sensibly declined with the reduction in earnings differentials and with the increase in social transfers per head. This decline has started, however, earlier than the mid 1980s.

3. Real wages in the South are not affected by local unemployment conditions but depend on the unemployment rate prevailing in the leading NC area. Hence, regional unemployment in the South is not tied down by regional wage dynamics.

4. A parsimonious description of long run regional unemployment differentials is that unemployment in the NC and the S areas have varied asymmetrically with the increase in real social transfers per head and in the tax wedge and with the reduction in the real price of energy experienced by the Italian economy since the mid 1980s.

9 Concluding Remarks

In this concluding section, we briefly speculate on the implications of increased market integration in Europe and of the European Monetary System (EMU) for unemployment and its regional distribution in Italy[21].

To a large extent, the current discussion on the labor market effects of EMU is based on the view that Europe is not an optimal currency area.[22] In a nutshell, the argument is that, in the presence of institutions that reduce wage flexibility and labor mobility, negative country-specific shocks can increase national unemployment rates (see Bayoumi and Eichengreen, 1993). Recent empirical evidence shows that two things: a) the correlation between national employment rates have increased (Fatas, 1997); b) regional shocks explain most of the variance of regional unemployment rates in Europe (Vinals and Jimeno, 1995). This evidence suggests that suppressing national currencies could be less costly than originally expected, because the European and the regional components of unemployment in the member states are more important than the national component. Our empirical evidence confirms that regional shocks account for an important part of regional employment dynamics, especially in the Southern and less developed regions.

Market integration and *EMU* are expected to affect, in the medium run, product market competition by increasing transparency. Using the framework presented in the Appendix, higher product market competition affects price setting by reducing price markups. Given wage setting, the upward shift in the price setting equation reduces equilibrium unemployment. Our empirical analysis suggests that labor market equilibrium is defined in terms of the unemployment rate in the dominant NC area. Moreover, we have found that unemployment rates in the less developed S area are not cointegrated with unemployment in the leading area. These results suggests that increased product market competition can reduce unemployment in the NC areas, without necessarily affecting unemployment in the South. A consequence of this could be the further widening of regional unemployment differentials.

Increased market integration is also perceived to increase the incentives that each member country will have to implement labor market reforms, ranging from labor market institutions to social policy.[23] Compared to trade and monetary policy, convergence in social policy and the development of a EU social policy has been slow so far, but there are signs that EU level social policies will become more binding in the future.[24] We have shown that Italian social policy, characterized by the increase in social transfers per head from the government to households, is closely associated to the substantial reduction in inter-regional labor mobility and to the rapid increase in regional unemployment differentials in Italy since the early 1980s. An implication of this finding is that structural changes in this policy, induced by the process of economic integration, can have important effects on the regional distribution of Italian unemployment.

[21] The usual warning is that, since the introduction of the Euro is a major policy regime shift, the Lucas critique implies that past experience has little to offer as a guide to the analysis (see Calmfors, 1998).

[22] See De Grauwe (1997) for a detailed discussion.

[23] See for instance Rama and Tabellini (1998)

[24] See Bean *et al.* (1998) and Pench *et al.* (1999).

10 Appendix

10.1 An aggregate model

Consider an economy populated by identical firms that operate the same technology and sell in monopolistically competitive markets. Output of firm i is

$$Y_i = BL_i^a K_i^{1-a} \tag{A1}$$

where Y is real output, L is labor, K is capital and B is disembodied technical progress. Firms set prices by maximizing profits subject to output demand. The inverse product demand faced by each firm is

$$\frac{P_i}{P} = \left[\frac{Y_i}{Y}\right]^{-\left(1-\frac{1}{\mu}\right)} \tag{A2}$$

where P is the average sectorial price, μ is the price markup and P_i is the individual price.

Each firm chooses employment by maximizing profits after the sectorial wage W has been set. Hence, employment in firm i is

$$L_i = K_i \left[\frac{\mu}{a}\frac{W}{P_i}\right]^{-\frac{1}{1-a}}. \tag{A3}$$

With symmetric firms, prices are equal in equilibrium. Since $P_i = P$, we can re-write the employment equation as follows

$$\frac{P}{W} = \left(\frac{Y}{L}\right)^{-1}\frac{\mu}{a}. \tag{A4}$$

Wage determination occurs at the national level, before prices and employment are set by firms. The central union sets the real wage and explicitly considers the effects of this action on the rate of unemployment.[25] The union loss function is

$$\left\{\frac{1}{2}\left[\ln\frac{W}{P} - \ln A\right]^2 + \frac{\xi}{2}\left[\ln L - \ln L^T\right]^2\right\} \tag{A5}$$

where A is the target real wage and L^T is target employment. The target wage is given by

$$A = A\left(u, mm, \tau, \frac{Y}{L}, \mu, UP\right) \tag{A6}$$

where u is the rate of unemployment, mm is an index of regional mismatch, τ is the tax wedge and UP is union power. This function is minimized subject to the aggregate labor demand. Defining the absolute value of the elasticity of labor demand as

$$\eta = \frac{\mu}{\mu - a} \tag{A7}$$

the selected (real) wage is

$$\ln\frac{W}{P} = \ln A - \frac{\xi\eta}{1+v\eta}u \tag{A8}$$

[25] We ignore wage drift, that is discussed in detail by Brunello *et al.* (1998).

Table 16: Regions standard codes

Region	Code	Area	Region	Code	Area
Piemonte	1	NW	Marche	11	CE
Valle d'Aosta[a]	2	NW	Lazio	12	CE
Lombardia	3	NW	Abruzzo	13	SE
Trentino Alto Adige	4	NE	Molise	14	SE
Veneto	5	NE	Campania	15	SW
Friuli Venezia Giulia	6	NE	Puglia	16	SE
Liguria	7	NW	Basilicata	17	SW
Emilia Romagna	8	CE	Calabria	18	SW
Toscana	9	CE	Sicilia	19	SW
Umbria	10	CE	Sardegna	20	SW

[a] Valle d'Aosta is a small region that is not included in our empirical analyses.

where

$$\frac{\partial \ln A}{\partial \ln \frac{W}{P}} = -v\eta. \tag{A9}$$

Equations (A4) and (A8) are obtained from explicit assumptions on preferences and technology. More generally, we can express the price setting and the wage setting equations as follows

$$\frac{P}{W} = P\left[\frac{Y}{L}, \mu\right] \tag{A10}$$

$$\frac{W}{P} = W\left[A, \eta, v\right]. \tag{A11}$$

When firms are identical and wages are set centrally, the returns to labor and to capital do not depend on the location of workers and firms. Hence, there is no factor mobility in equilibrium.

10.2 Data sources and additional results

Most of the data used in this paper are drawn from the regional accounts and from labor force surveys. The sample period is 1960-1994. The available time series have been built by Banco di Sardegna and Sistemi Operativi srl under the supervision of Giorgio Brunello and Gianni Toniolo. The main sources used in this task are:

Regional accounts data

- ISTAT, Conti economici regionali. Anni 1980-94
- SVIMEZ, I conti economici del Centro-Nord e del Mezzogiorno nel ventennio 1970-89, Il Mulino, 1993.
- ISTAT, Annuario di contabilita' nazionale, 1986
- Unioncamere, I dati regionali 1963-1974, Franco Angeli Editore, Milano, 1976.

- Tirloni, C. and Veronese, G., Banca dati regionali 1960-1991, Fondazione ENI Enrico Mattei.
- CRENOS, Base dati per le regioni italiane 1960-1993, Cagliari 1997
- Picci, L., Lo stock di capitale nelle regioni italiane, Working paper 229, Dipartimento di Scienze Economiche, Universita' di Bologna.
- Rossi, N., Sorgato, A. and Toniolo, G., I conti economici italiani: una ricostruzione statistica 1890-1990, in Rivista di Storia Economica, n.10, 1993.

Labor force data

- ISTAT, Statistiche del Lavoro, vol. 26, 1986.
- ISTAT, Occupazione e redditi da lavoro dipendente 1980-1994, 1995.
- ISTAT; Indagine sulle forze di lavoro (medie annuali).

Additional data used in the paper have been provided by Paolo Sestito of the Bank of Italy.

Variables:

P_m = real price of imported materials and energy. See Brunello, Lupi and Ordine (1998)

UP = unionization rate. See Brunello and Checchi (1997)

τ = average tax wedge. The wedge is the ratio of payroll and income taxes over average wages. See Brunello, Lupi and Ordine (1998).

Table 17: Cointegrating vectors

Region		u	τ	SE/POP	P_m
Piemonte	β	1.000	-8.820	1.409	-0.918
Lombardia	β_1	1.000	-8.400	1.498	-1.001
	β_2	0.000	1.000	-0.288	0.068
Trentino A.Adige	β	1.000	-19.710	4.464	–1.523
Veneto	β	1.000	-17.500	4.370	-0.690
Friuli V. Giulia	β_1	1.000	-11.030	1.686	-1.557
	β_2	0.000	1.000	-0.155	0.166
Liguria	β	1.000	0.000	-0.370	0.000
Emilia Romagna	β_1	1.000	-5.357	0.982	-1.024
	β_2	0.000	1.000	-0.210	0.053
Toscana	β_1	1.000	-3.460	0.189	-0.323
	β_2	0.000	1.000	-0.230	0.137
Umbria	β_1	1.000	0.000	-0.262	0.000
	β_2	0.000	1.000	-0.148	0.108
Marche	β	1.000	-2.753	0.233	-0.199
Lazio	β_1	1.000	0.449	-0.458	0.331
	β_2	0.000	1.000	-0.329	0.000
Abruzzo	β	1.000	0.000	-0.136	0.298
Campania	β_1	1.000	0.000	-0.974	0.525
	β_2	0.000	1.000	0.000	0.231
Puglia	β	1.000	5.337	0.924	2.387
Basilicata	β_1	1.000	0.000	-0.644	0.484
	β_2	0.000	1.000	0.000	0.314
Calabria	β	1.000	-2.487	-0.487	0.000
Sicilia	β	1.000	-1.302	-0.687	0.485
Sardegna	β_1	1.000	0.000	-0.537	-0.414
	β_2	0.000	1.000	0.066	0.183

The cointegrating vectors are reported in the form $c = \ln(u) + \beta_1 \ln(\tau) + \beta_2 \ln(SE/POP) + \beta_3 P_m$. The p-values of the restrictions are reported in Table 15 in the main text.

Table 18: Loading factors

Region		u	τ	SE/POP	P_m
Piemonte	α	-0.489	0.050	-0.157	0.000
Lombardia	α_1	-0.676	0.092	0.000	0.000
	α_2	0.000	0.000	0.778	0.000
Trentino A. Adige	α	0.000	0.022	-0.062	0.000
Veneto	α	0.000	0.021	-0.042	0.000
Friuli V. Giulia	α_1	-0.380	0.000	-0.196	0.000
	α_2	0.000	0.000	-0.714	-0.733
Liguria	α	-0.861	0.000	-0.157	-0.185
Emilia Romagna	α_1	-0.553	0.000	-0.102	0.072
	α_2	-1.258	-0.334	0.000	-1.694
Toscana	α_1	-0.778	0.000	0.000	0.000
	α_2	0.000	0.000	0.506	-1.457
Umbria	α_1	-0.703	0.000	-0.259	0.000
	α_2	2.064	-0.141	0.000	-0.968
Marche	α	-0.690	0.000	-0.251	0.000
Lazio	α_1	-1.241	0.000	-0.330	-0.531
	α_2	0.000	-0.281	0.395	-0.413
Abruzzo	α	-0.238	0.000	-0.176	-0.158
Campania	α_1	-0.391	0.111	0.223	0.000
	α_2	0.000	0.000	-0.868	-1.313
Puglia	α	0.000	0.000	0.000	-0.181
Basilicata	α_1	-0.890	0.146	0.000	0.000
	α_2	0.000	0.000	-0.869	-1.620
Calabria	α	-0.409	0.064	0.000	0.000
Sicilia	α	-0.219	0.094	0.000	-0.363
Sardegna	α_1	-0.855	0.069	0.162	-0.147
	α_2	2.407	0.000	-1.410	0.000

The p-values of the restrictions are reported in Table 15 in the main text.

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