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European Monetary Unification and
The Regional Unemployment Problem

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I. Introduction

Currency unification is regarded in Brussels as an integral part of the 1992 Program to complete Europe's internal market. If the members of the European Community adhere to the schedule implicit in the Delors Report, between 1994 and 1997 (the start and finish of Stage 2 of the currency unification process) they will have replaced their national monies and central banks with a single currency and a European Federal Reserve System.

Resistance to currency unification is motivated by two concerns. The first, which I do not pursue in this paper, is that the "Eurofed," lacking independence from political pressure, will exhibit an inflationary bias. The second, my focus here, is that currency unification, which entails the sacrifice of monetary autonomy (and of a modicum of fiscal autonomy as well), will result in a loss of economic policy instruments that are useful for dealing with autonomous disturbances emanating from abroad.[1]

Since it imposes new constraints on the use of domestic policy instruments, currency unification implies a change in the behavior of the real exchange rate. For countries whose real exchange rates have been perturbed by disturbances emanating from abroad, the new constraints imply a potentially important loss of insulation from foreign shocks. For countries whose real exchange rates have been perturbed by erratic domestic policies, in contrast, the new constraints on policy promise a reduction in the incidence of domestic shocks.

In this paper I consider the implications of currency unification for regional unemployment differentials within countries. Why should the real exchange rate have implications for regional unemployment differentials

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within EC member states? The real exchange rate is the relative price of traded and nontraded goods. Insofar as different regions specialize in the production of traded or nontraded goods, a change in the real exchange rate will have a differential impact on their economic condition.

An implication of currency unification is thus that EC member countries which previously used policy to insulate regional labor markets from real exchange rate disturbances emanating from abroad will be less able to do so. Consider for example the effects of an autonomous appreciation of the real exchange rate. As imported goods become increasingly cheap and exports become increasingly difficult to market abroad, the relative price of traded goods falls; unemployment consequently rises in regions specializing in the production of tradables. As the relative price of nontraded goods rises, their output expands and unemployment should fall in regions specializing in the production of nontradables. The traditional policy response to these imbalances would be monetary expansion to bring back down the real exchange rate.[2] With currency unification eliminating the monetary instrument, this traditional response will no longer be feasible.

In this paper I analyze the regional unemployment problems that arise within Great Britain and Italy as a result of changes in the real exchange rate. One reason for forcusing on these two countries is that loss of monetary autonomy is a new development for both. Sterling and the lira are newly tied to the DM. In the first half of the 1980s Italy repeatedly devalued the lira against the other EMS currencies in order to address her inflation and competitiveness problems; with the removal of capital controls and reaffirmation of her commitment to pegged exchange rates, this

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is now a more difficult option.[3] Britain for many years remained outside

the Exchange Rate Mechanism, permitting sterling to fluctuate against the

other European currencies. She too entered the EMS in the autumn of 1990,

rendering changes in the sterling/DM rate changes much more difficult to

effect.

A further reason for focusing on Britain and Italy is the prominence

and long-standing nature of their regional unemployment problems. There

exist an extensive literature and considerable data on the subject. The

historical behavior of unemployment in different British and Italian

regions can be used to estimate its elasticity with respect to the real

exchange rate and to simulate the effects of the real exchange rate

movements.

Assessing the seriousness of unemployment disparities within Britain

and Italy requires a standard of comparison. Here U.S. experience provides

an obvious metric. The United States has experienced dramatic fluctuations

in its real exchange rate over the last decade and a half. The real trade-

weighted value of the dollar has risen and fallen by more than 15 per cent

over that period.[4] This has given rise to pronounced regional unemployment

problems in the U.S., although not on a scale that has produced pressure

sufficient to force a significant reform of the conduct of U.S.

international monetary policy. I therefore pattern my empirical analysis

after Branson and Love (1988), who have previously examined the

relationship between the real exchange rate and employment for the U.S.

In present circumstances, when, as a result of the 1992 Program,

market structures in Europe are changing rapidly, special care must be

exercised when using historical data to forecast future trends. Historical

relationships between real exchange rates and unemployment may no longer
prevail once labor mobility is enhanced by the continued integration of the
European economy.[5] The fact that there is available for Britain an
exceptionally long time series on regional unemployment may shed some light
on the extent to which the sensitivity of regional unemployment
differentials to real exchange rate shocks is likely to change over time.
I examine the historical relationship between British unemployment and real
exchange rates separately for the 1920s and 1930s and for the 1970s and
1980s in order to gauge the speed with which the relationship is likely to
change.

Before proceeding, three points of clarification are in order. First,
this paper is concerned with the implications of currency unification for
regional unemployment differentials, not for national unemployment rates.
This is not to suggest that the connection between currency unification and
the national unemployment rate is unimportant, only that it is a distinct
question best treated elsewhere. In this paper I consider the impact of
real exchange rate shocks on the dispersion of regional unemployment rates,
holding the national unemployment rate constant.[6] In effect, I assume that
if appreciation of the real exchange rate threatens to increase national
unemployment, domestic officials, prevented by currency unification from
using the monetary instrument, can still respond with an increase in
deficit spending which keeps the overall unemployment rate unchanged.[7]

Second, a premise of the paper is that changes in monetary policy are
capable of altering the real exchange rate. This is appropriate only under
the maintained assumption that monetary policy can have real effects, at
least in the short run.

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Third, the subsequent discussion proceeds on the assumption that shocks to the real exchange rate are autonomous from the viewpoint of policymakers and that the latter respond appropriately. The discussion emphasizes that currency unification, by removing monetary policy as an instrument and imposing new limitations on the use of fiscal policy, tightens the constraints under which policymakers operate and therefore increases countries' vulnerability to foreign disturbances. This is in contrast to a popular view of the role of pegged exchange rates in Europe, which maintains that an important source of real exchange rate variability in the 1970s and 1980s was not foreign disturbances but erratic domestic policies. According to this argument, countries were rendered better off by committing to pegged exchange rates which tie the hands of domestic monetary policymakers and prevent them from acting erratically.[8]

In fact, there is no inconsistency between the two views. The pegged exchange rates of the EMS have already imposed increasingly tight constraints on domestic policymakers. By disciplining erratic domestic policies, the commitment to pegged rates has reduced the variability of nominal exchange rates and contributed to a reduction in the short-term volatility of real exchange rates as well. The convergence of onshore and offshore interest rates over the 1980s suggests that the commitment to pegged rates is regarded as increasingly credible.[9] But policymakers retain the option of changing the exchange rate in order to recover their policy autonomy in the event of a major disturbance. It is this further option that will be lost in the event of current unification.

The argument for a commitment to pegged exchange rates to discipline erratic domestic policymakers is an argument for the EMS as it existed in

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the latter part of the 1980s, when realignments became infrequent. The argument for currency unification is different, namely that it achieves a reduction in transactions costs and encourages other forms of market integration. These benefits should be weighed against its costs. One potential set of costs is associated with the problem considered in this paper: the increase in regional unemployment differentials due to loss of insulation from foreign disturbances.

II. The Debate Over Currency Unification

To the casual observer, it is not obvious that currency unification is a necessary concomitant of completing the internal market. The argument that it is runs as follows. Europe's traditional means of stabilizing its exchange rates, the EMS, has used controls on short-term capital movements to reconcile national monetary autonomy with exchange rate stability. Interest rates have been permitted to vary across European countries at the same time exchange rates are pegged because capital controls raise the cost of shifting financial capital from low- to high-interest-rate countries. In order to liberalize intra-European financial flows as part of the 1992 Program, it has been necessary to remove those controls. Consequently, EC members either must reconcile themselves to the loss of monetary autonomy or revert to floating exchange rates. Floating is unacceptable because exchange-rate fluctuations would disrupt the intra-European commodity and factor flows that the 1992 program is designed to promote.[10] Loss of monetary independence is therefore a necessary corollary of the 1992 program. Since European nations will no longer possess autonomy in the conduct of monetary policy, they may as well reap the efficiency,

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convenience and credibility of a single currency.

The argument that currency unification is a necessary concomitant of a program to free international trade and factor movements can be disputed, however. The United States and Canada, which enjoy a high degree of cross-border capital and labor mobility, do not regard currency unification as a necessary element of their free trade negotiations. Their currencies continue to float against one other without appearing to seriously disrupt trade and factor flows. Mexico and the United States have initiated negotiations for establishing a free trade area without even contemplating currency unification.

Even if floating is unacceptable in Europe, this still need not create an argument for currency unification. The alternative of fixed exchange rates between distinct national currencies remains. Predictions that the removal of capital controls would destabilize the pegged exchange rates of the EMS have not been borne out. The major members of the EMS have maintained almost perfectly fixed exchange rates for fully two years since the removal of all remaining significant capital controls. The danger that, absent capital controls, pegged rates would quickly be subjected to speculative attack would seem to have been exaggerated. It is no longer obvious that arrangements to peg exchange rates are too fragile to survive in an environment of unfettered capital flows, or that monetary unification is essential to render the commitment to pegged rates credible.

Skepticism about the case for monetary unification is buttressed by the observation that loss of monetary autonomy may have significant costs. Monetary policy may be of use in countering domestic unemployment. Consider for example an autonomous appreciation of a country's exchange

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rate. This leads to a decline in the prices of traded goods. As import prices fall, the demand curve for domestically-produced importables shifts to the left, and the prices of domestically-produced importables decline as well. As domestic producers begin to be priced out of export markets, they move back down their supply curves, and export prices (denominated in domestic currency) fall. The real exchange rate (the price of nontraded goods relative to traded goods) appreciates. If wages and other nominally-denominated costs are slow to adjust, unemployment rises in sectors specializing in the production of tradable goods. The problem can be ameliorated by an expansionary monetary policy which raises domestic prices relative to costs and, by depreciating the exchange rate, switches demand toward tradable goods produced locally. With currency unification, this policy response is no longer feasible. The implication is that European nations prepared to sacrifice their monetary autonomy in the name of currency unification run the risk of exacerbating unemployment problems.

To these objections there are standard rebuttals. Many of the shocks to which EMS members are subjected are common to participating countries.[11] The case for asymmetric monetary policies rests on the prevalence of asymmetric shocks; otherwise a common European monetary policy will suffice. If all members of the exchange-rate union experience a simultaneous decline in domestic demand, a simultaneous, coordinated expansion of domestic money supplies will ameliorate the unemployment problem without threatening exchange rate stability.

Moreover, even if shocks are asymmetric and monetary policy is no longer available, there may exist other macroeconomic instruments with which domestic unemployment can be addressed. The obvious candidate is

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fiscal policy. An individual country experiencing an autonomous decline in the demand for its exports can offset the impact on aggregate demand with an increase in deficit spending. The problem with this response is that it is likely to exacerbate the uneven sectoral impact of the shock. Fiscal expansion generally leads to further exchange rate appreciation. By driving up domestic interest rates, fiscal deficits strengthen the nominal exchange rate even while pushing up domestic-currency commodity prices; this combination is the definition of a real appreciation. The relative price of traded goods declines further insofar as government spending falls disproportionately on nontraded goods. Unemployment rises further in sectors producing tradables while falling in sectors specializing in the production of nontradables. Even if the impact of the real exchange rate shock on aggregate unemployment is neutralized, sectors and regions specializing in the production of nontradables will benefit at the expense of those specializing in the production of nontradables.

There is also the question of whether individual nations will retain much fiscal autonomy once factor markets are liberalized. Governments will be required to harmonize their tax rates to prevent the exodus of footloose factors of production. This does not mean that tax rates will have to be equalized, however, since the costs of labor mobility will not fall to zero even after the completion of the internal market, and because the heterogeneity of residents' tastes for different packages of taxes and public programs provides governments scope for catering to different clienteles. Still, greater factor mobility implies pressure for tax convergence, perhaps to the point where the variability of tax rates across European countries falls to the levels of variability that prevail within

the United States.[12]

Factor mobility therefore limits the scope for deficit spending. Running a government budget deficit requires the issue of debt. The debt that governments can market today is limited by the present value of the taxes they can collect tomorrow (taxes which will be used to service accumulated debt obligations). This is evident in the experience of U.S. states, which find their bond ratings downgraded and the interest rates they pay sharply rising when they increase their borrowing.[13] Given the high mobility of factors of production within the U.S., individual states cannot credibly promise to raise future taxes significantly above those prevailing elsewhere in the currency and customs union, since if they attempt to do so footloose factors of production will flee to lower tax jurisdictions. Deficit spending, though not ruled out, may be significantly constrained.

Proponents of currency unification point out that regions of the U.S. already functioning under these constraints do not lobby to secede from the U.S. currency union in order to reduce regional unemployment. The United States has experienced very pronounced real exchange rate swings, with an extremely uneven regional incidence, over the last 15 years. Monetary and fiscal policy in the U.S., although not constrained by an international monetary agreement, have not exactly been targeted toward stabilizing the real exchange rate. The inference is that the regional unemployment problems so worrying to critics of currency unification are in fact entirely tolerable. To this the skeptics respond that the smooth operation of the U.S. currency union reflects the operation of special factors not present in Europe. The U.S. possesses an exceptionally mobile labor force.

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In 1983 only 1.3 per cent of the population of the Federal Republic of Germany moved between lander, compared to 3.3 per cent of the U.S. population who moved between American states.[14] Thus, compared to their European counterparts, American workers exhibit a greater propensity to relocate in response to asymmetric regional shocks. Although state governments in the U.S. may be able to do relatively little to stem the rise in unemployment due to a deterioration in local market conditions, the American labor market can do a lot.

Also contributing to the American economy's tolerance of regional-specific shocks is the country's highly-developed system of fiscal federalism. According to Sachs and Sala-i-Martin (1989), when incomes in a U.S. census region decline by $1, federal tax payments by residents of that region decline by nearly 30 cents. Transfers to that region from Washington, D.C. rise by nearly 10 cents. The impact of regional shocks on inter-regional income disparities is thereby attenuated. Insofar as the locus of regional shocks shifts over time, all regions are rendered better off by risk sharing achieved via the federal fiscal system.[15] No comparable mechanism for fiscal redistribution between EC member states exists at present.

III. Regional Unemployment Disparities in Britain and Italy

I turn now to unemployment in Britain and Italy. The last decade and a half in both countries has been characterized by volatile fluctuations in unemployment at both the national and regional levels. Figure 1 for Britain is dominated by the steady rise in unemployment after 1974.[16] The real exchange rate appreciated steadily over the first half of the period,

Figure 1

Real Exchange Rate and Unemployment in Britain, 1974-87
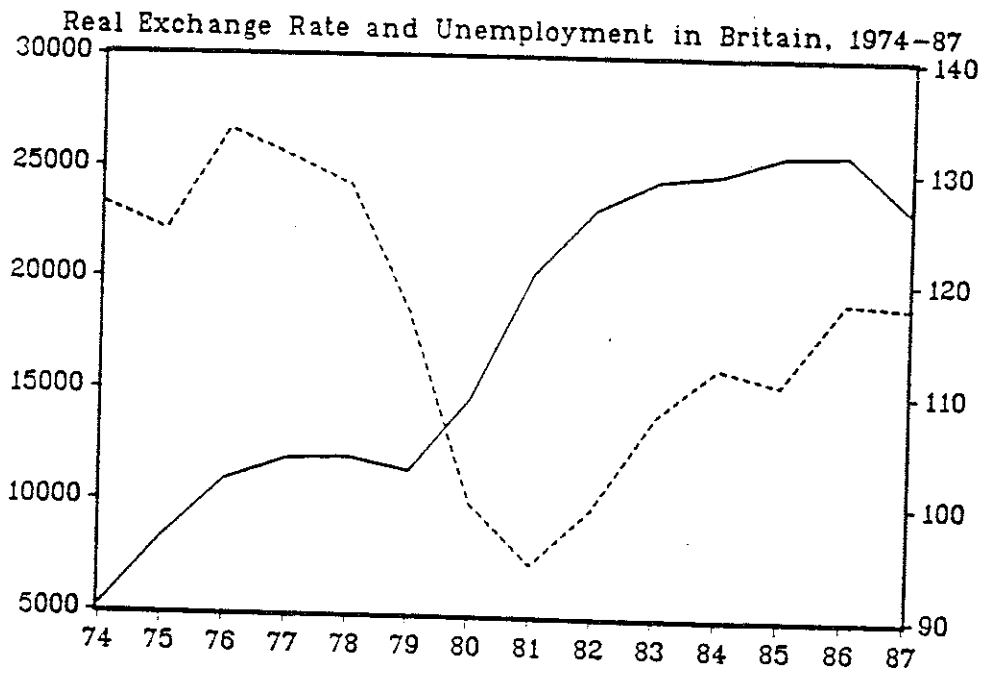
Note: unemployment (left scale) is
in thousands.

——— UNEMP ----- REER

Figure 2

Real Exchange Rate and Unemployment in Italy, 1960–1984
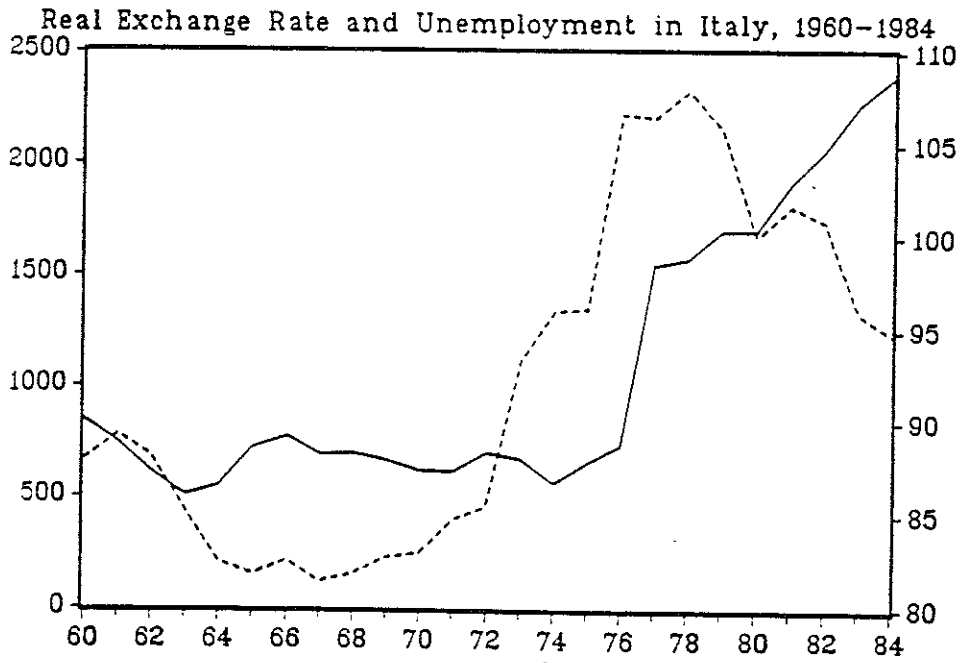
Note: Unemployment in thousands. Pre-
and post–1977 categories combined.

——— UNEMP ...... REER

except in 1975-76, an episode of rapid depreciation of the nominal rate.
Real appreciation in 1979-81 reflected the policy of monetary stringency
initiated by the Thatcher Government to bring down inflation; since the
exchange rate strengthened more quickly than domestic inflation slowed, a
very dramatic real appreciation resulted. As inflation decelerated
subsequently, bringing prices and exchange rates back into line, the real
exchange rate gave back some of the ground it had gained.

Figure 2 for Italy shows a dramatic increase in unemployment in the
mid-seventies, followed by a further increase through the first half of the
1980s. Italy's real exchange rate depreciated with the breakdown of
Bretton Woods and the first OPEC shock, but recovered after 1979 as the
lira was pegged increasingly tightly to other European currencies, leading
in the popular view to a growing problem of exchange-rate overvaluation.

Figure 3 shows the very different rates of unemployment prevailing in
different British regions in 1988. Their standard deviation is 3.46. A
prominent feature of Figure 3 is the North-South divide, with unemployment
well below the national average in the South and East Anglia, slightly
below average in the East Midlands, and above average in the West Midlands,
the North, Wales and Scotland.

In part, the different fortunes of different regions reflect the
composition of economic activity. Wales for example relies for much of its
income and employment on metal manufacturing and on the energy sector (coal
mining and oil refining), which fell on hard times in the 1980s. The North
and Yorkshire-Humberside are similarly oriented toward energy and heavy
manufacturing, particularly minerals, metals and chemicals. Unemployment
in the West Midlands is associated with a higher share of employment in the

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manufacturing sector than any other British region, and with the fact that it depends on a relatively narrow range of industries centering on engineering and motor vehicles which were depressed for most of the 1980s.

Sectors dependent on light manufacturing and services were less severely affected by the post-1979 slump. Employment in the South East, dominated by London, is concentrated in banking, insurance, finance, business services and leasing. The South West relies on public administration, agriculture and defense. In the East Midlands, a higher than average share of regional GDP is generated by manufacturing industry (31 per cent in 1986 compared to a UK average of 25 per cent); those industries are predominantly engaged light manufacturing of products such as textiles, clothing and footwear. East Anglia was similarly insulated by its specialization in light manufacturing (primarily food and beverages) and agriculture.

Figure 4 considers the cyclical responsiveness of unemployment in the post-1979 slump. In the top panel, for low unemployment regions, the South West stands out for its exceptionally low elasticity. Starting from the national average in 1979, unemployment in the South West rose unusually slowly thereafter. In the middle panel, the West Midlands and Yorkshire-Humberside show the opposite pattern; starting from the national average, unemployment rates there rose exceptionally quickly over the 1980s. The bottom panel, for high-unemployment regions, suggests that unemployment in these areas rose at roughly the same rate as elsewhere in Britain.

Figure 5 shows the different levels of unemployment prevailing in different Italian regions in 1988. Their standard deviation is 6.40, or nearly twice the comparable figure for Britain, despite that the average

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Figure 3

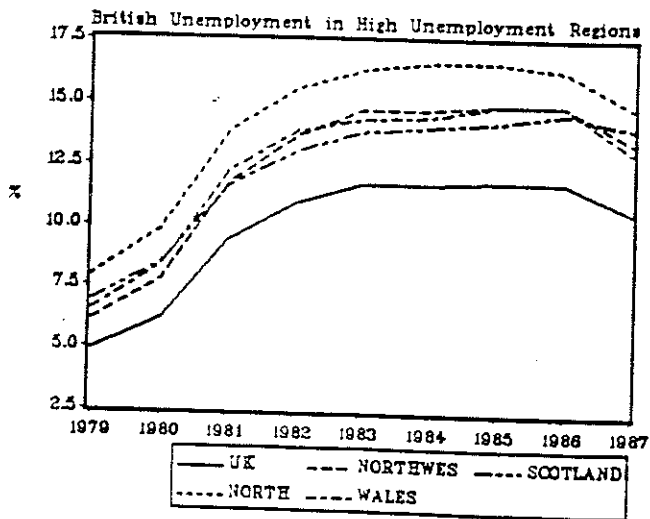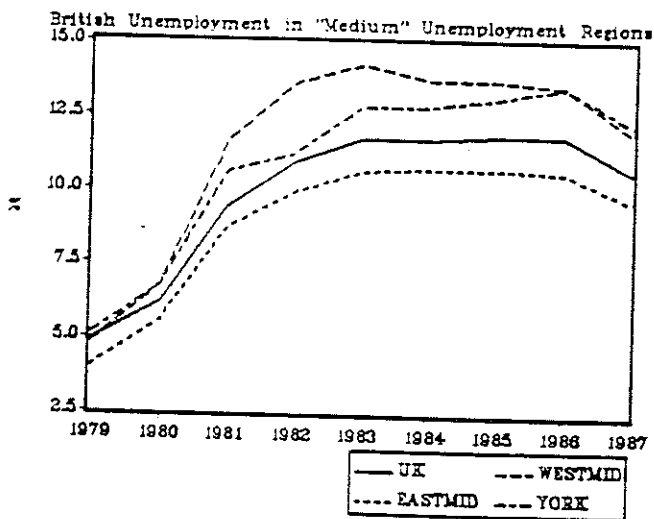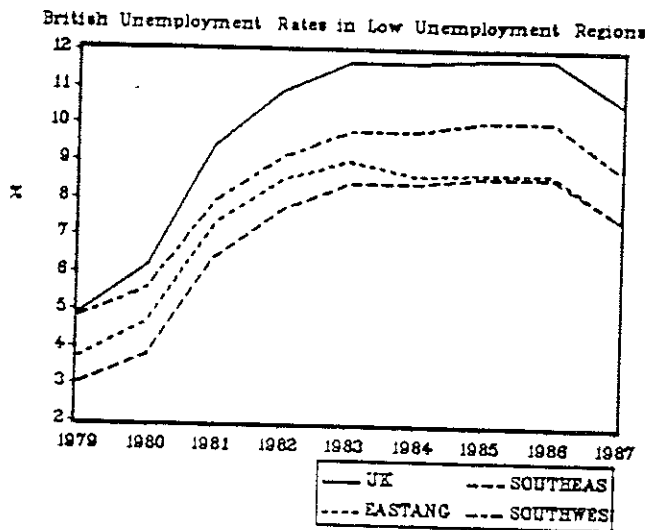Regional Unemployment Rates in Britain, April 1988
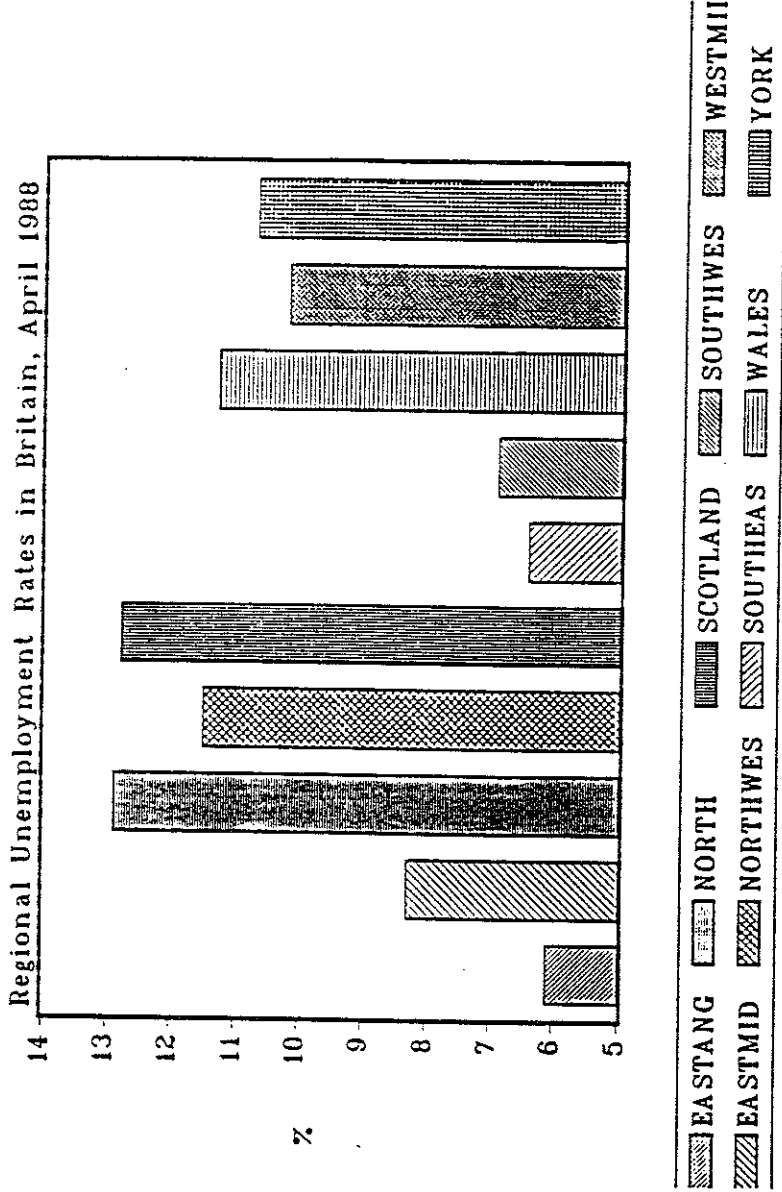
unemployment rate for 1988 was almost exactly the same. The dominant feature of the figure is the North-South divide: unemployment was above 15 per cent in Sardinia, Campania, Sicily and the rest of the South; at roughly the national average of 11 per cent in Lazio (which includes Rome) and Abruzzi; but below ten per cent elsewhere in the Center and in the North.

In Ital s in Britain, differences across regions in the sectoral composition of employment go some way toward explaining these regional unemployment disparities. The North, defined here to include Piedmont, Liguria, Veneto and Emilia-Romagna, accounts for 70 per cent of Italy's manufacturing employment.[17] Piedmont and Liguria specialize in heavy industries such as motor vehicles, iron and steel, and shipbuilding, Veneto in light industries such as footwear and apparel. Small and medium-size firms producing labor-intensive, high-value added products such as ceramics, furniture, scientific instruments and automotive parts are increasingly evident in Emilia-Romagna.[18] Lombardy has the most broadly-based industrial structure, featuring both traditional staples such as textiles, food processing, metal working and engineering, and also newer light industries such as electronics. Its capital, Milan, has a highly-developed service sector: it is the seat of the Italian stock exchange, the site of the country's leading trade fair, and the host of the head offices of most important Italian corporations.

The situation in Campania, Sicily, Sardenia and the rest of the Mezzogiorno is very different. Along with agriculture, these regions rely on heavy industries such as oil, petrochemicals and steel, whose location in the South and whose capital intensity have been encouraged by regional

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Figure 4

British Unemployment Rates in Low Unemployment Regions

| | UK | ··· EASTANG | --- SOUTHEAS | ___ SOUTHWES |

British Unemployment in "Medium" Unemployment Regions

| | UK | ··· EASTMID | --- WESTMID | ___ YORK |

British Unemployment in High Unemployment Regions

| | UK | --- NORTHWES | ___ SCOTLAND | ··· NORTH | --- WALES |

policy. These industries operated at only a fraction of capacity for much of the 1980s, making for high unemployment.

Central Italy (Marche, Umbria, Tuscany and Lazio) combines elements of North and South. The region relies heavily on the tertiary sector. Textiles, chemicals, metallurgy and motor vehicles are all represented in Lazio. The "Emilian model" of small-scale, labor-intensive, high-value-added light industry is increasingly evident as well.

The preceding paragraphs are designed to convey the flavor of regional patterns of industrial specialization. They should not be taken to suggest that industrial composition is the entire explanation for regional unemployment patterns. Even after standardizing for industrial composition, regional unemployment disparities remain. In other words, the same industries tend to have unusually high unemployment rates in high unemployment regions.[19]

IV. Econometric Evidence

To analyze the impact of real exchange rate changes on regional unemployment, I estimate a variant of the model applied previously by Branson and Love (1988) to data for the United States. I regress regional unemployment on unemployment nationwide, on the real exchange rate, and on the real price of energy. Following Branson and Love, a time trend is included where necessary to pick up secular trends not captured by the other variables. Regressions are estimated using ordinary least squares.[20]

In light of the difficulty of measuring the labor force accurately, I use the number of workers unemployed (in thousands) rather than the unemployment rate. Regional and national unemployment are expressed in
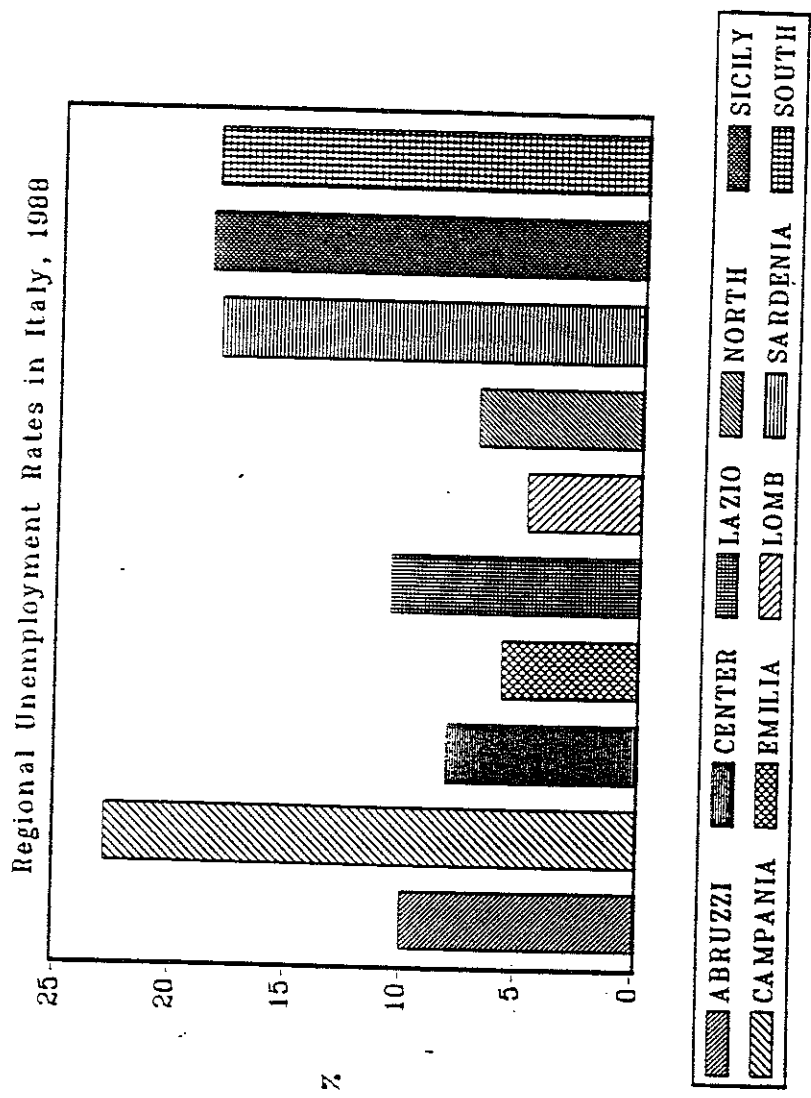
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Figure 5

Regional Unemployment Rates in Italy, 1988

ABRUZZI   CENTER   LAZIO   NORTH   SICILY
CAMPANIA   EMILIA   LOMB   SARDENIA   SOUTH

Table 1

Covariates of Regional Unemployment in Britain, 1974-87
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	R^2
East Anglia	-5.299 (16.68)	1.147 (44.39)	0.003 (2.87)	0.001 (0.13)	.99
East Midlands	-3.800 (13.54)	1.146 (50.25)	-0.001 (1.06)	-0.001 (0.96)	.99
West Midlands	-3.652 (7.51)	1.186 (29.98)	-0.002 (1.40)	0.001 (0.24)	.99
North	-0.719 (1.98)	0.849 (28.73)	-0.002 (1.43)	0.001 (0.31)	.99
North West	-1.293 (12.22)	0.946 (109.87)	0.001 (0.07)	0.001 (1.98)	.99
York	-2.899 (9.15)	1.112 (43.44)	-0.002 (1.712)	-0.002 (1.61)	.99
South East	-4.036 (13.60)	1.206 (49.96)	0.005 (5.17)	0.001 (1.13)	.99
South West	-2.912 (5.62)	0.971 (23.02)	0.005 (2.86)	0.001 (0.45)	.99
Wales	-1.740 (7.07)	0.914 (45.68)	-0.001 (1.27)	0.001 (0.62)	.99
Scotland	-0.830 (1.63)	0.910 (21.95)	-0.001 (0.45)	-0.001 (0.60)	.99

Note: τ - statistics in parentheses.
Source: see text.

logs. Insofar as the cyclical sensitivity of regional unemployment exceeds (falls short of) the cyclical sensitivity of national unemployment, the coefficient on the log of national unemployment should exceed (fall short of) unity. The coefficient on the real exchange rate should be positive (negative) for regions specializing in the production of nontraded (traded) goods, since a decline in the real rate signals an appreciation. The coefficient on the real energy price should be positive for energy-using regions, negative for energy-producing regions.

Table 1 reports regression results for Britain for the period starting in 1974.[21] The elasticity of regional unemployment with respect to national unemployment varies from a low of 0.85 in the North to a high of 1.21 in the South East. Scotland has a relatively low cyclical sensitivity, the East and West Midlands relatively high ones. Once again, industrial composition goes some way toward explaining these regional characteristics. The tendency for employment to hold up relatively well in Scotland, for example, reflects the economy's diversification out of traditional staples (textiles, shipbuilding and metals) into electronics and services.[22] The cyclical sensitivity of unemployment in the Midlands reflects the importance of manufacturing industries (motor vehicles and engineering in the West Midlands, textiles in the East Midlands).[23] The standard deviation of the ten Table 1 coefficients on national unemployment for British regions is 0.13.[24]

These results differ from those reported in previous studies of cyclical sensitivity. For example, Armstrong and Taylor (1985) found, by regressing regional unemployment on national unemployment, that cyclical sensitivity was lowest in the North West, South East and East Anglia,

Table 2

<u>Covariates of Regional Unemployment in Britain, 1974-87, including trend</u>
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	Time	R^2
East Anglia	-6.187 (33.55)	1.335 (45.71)	0.003 (6.09)	-0.002 (3.23)	0.021 (6.94)	.99
East Midlands	-3.427 (9.26)	1.067 (18.21)	-0.001 (0.96)	-0.001 (0.15)	0.009 (1.44)	.99
West Midlands	-4.564 (8.13)	1.379 (15.51)	-0.003 (1.92)	-0.002 (0.92)	0.021 (2.34)	.99
North	0.171 (0.54)	0.660 (13.20)	-0.001 (1.84)	0.003 (2.47)	0.021 (4.02)	.99
North West	-1.192 (8.11)	0.924 (39.68)	0.001 (0.17)	0.001 (2.21)	0.002 (1.00)	.99
York	2.195 (6.91)	0.970 (19.28)	-0.002 (2.02)	-0.001 (0.32)	0.016 (3.19)	.99
South East	4.688 (15.57)	1.344 (28.20)	0.005 (6.71)	-0.001 (0.24)	-0.015 (3.12)	.99
South West	-4.25 (10.51)	1.255 (19.58)	0.005 (4.57)	-0.002 (1.71)	-0.031 (4.76)	.99
Wales	-1.800 (5.01)	0.927 (16.29)	-0.001 (1.23)	0.001 (0.39)	-0.001 (0.24)	.99
Scotland	0.086 (0.14)	0.716 (7.50)	-0.001 (0.30)	0.001 (0.50)	0.021 (2.19)	.99

Note: t - statistics in parentheses.
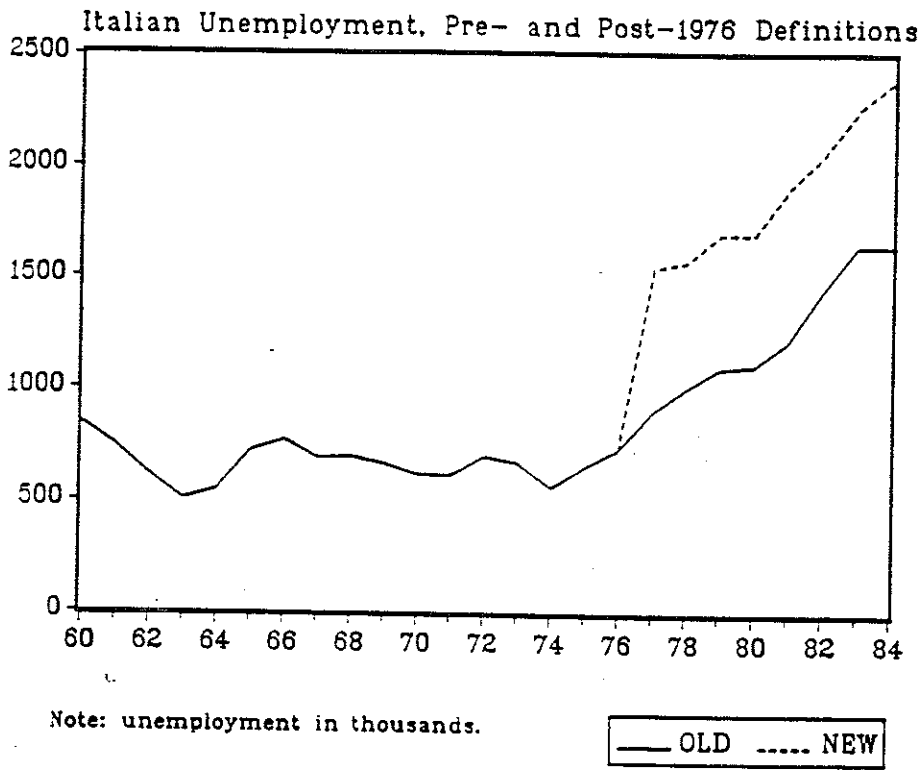Source: see text.

highest in the North, Wales and the West Midlands. Differences between
their results and mine are attributable to the fact that previous studies
fail to control for determinants of regional unemployment other than
unemployment nationwide, whereas the results in Table 1 are partial
correlations controlling for the real exchange rate and the real price of
energy.

Only one of the ten coefficients on the real price of energy, that for
the North West, differs significantly from zero at the 90 per cent level.
Although this plausibly reflects the energy-using character of the region's
industries, it is not clear why the same relationship is not evident for
other industrial areas like the Yorkshire and the Midlands.

Most importantly, three of the ten coefficients on the real exchange
rate in Table 1 differ significantly from zero at the 90 per cent
confidence level, and a fourth, that for Yorkshire and Humberside, comes
close to significance at that level. Six of the ten coefficients are
negative, four positive, indicating considerable regional heterogeneity in
the unemployment response to real exchange rate shocks. Thus, even after
controlling for the business cycle and the relative price of energy, the
real exchange rate significantly affects regional unemployment
differentials in Britain.

The signs of the coefficients on the real exchange rate can be
inerpreted in terms of sectoral composition: employment in the regions with
positive coefficients is concentrated disproportionately in sheltered
sectors (services in the South East, public administration and defense in
the South West, agriculture and light manufacturing in East Anglia). The
positive coefficient for the North West is an anomoly, but unlike the other

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Figure 6

Italian Unemployment, Pre- and Post-1976 Definitions

Note: unemployment in thousands.

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three positive coefficients it differs insignificantly from zero.

Table 2 adds a time trend to the basic regression. Six of the ten coefficients on the real exchange rate now differ from zero at standard confidence levels. Their magnitude remains basically unchanged from Table 1. The positive coefficient for the North West turns negative, reassuringly, although that for Scotland turns positive, albeit insignificantly so.

For Italy, there exist separate definitions of unemployment for the pre- and post-1975 periods. Surveys for the post-1975 period added a third category of unemployed workers to the two categories reported previously.[25] The two definitions are distinguished in Figure 6. Insofar as the national unemployment rate included as an explanatory variable in the regressions is an aggregation of the the dependent variable for the individual regions, the coefficient on unemployment nationwide may capture any implications of the shift. This is not true, of course, to the extent that the change in definition affected measured unemployment differently in different regions. I therefore estimated two variants of the basic equation, one which included among the unemployed only the two categories of workers considered before 1975, the other which included also the third category of unemployed workers for the post-1975 years.

The variation across regions in the cyclical sensitivity of local unemployment to national unemployment is almost exactly the same for Italy as for Britain. In Table 3, which uses only pre-1975 categories of unemployment, the elasticity of regional unemployment with respect to national unemployment ranges from a high of 1.28 for Lombardy to a low of 0.80 for Abruzzi and Molise, with a standard deviation for the nine regions

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Table 3

Covariates of Regional Unemployment in Italy, 1960-84,
Pre-1978 Definitions of Unemployment
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	R^2
Piedmont, Valle d'Aosta, Liguria	-4.067 (6.67)	1.182 (14.33)	0.005 (1.76)	-0.001 (0.74)	.97
Lombardy	-3.215 (2.41)	1.275 (7.09)	-0.009 (1.45)	0.001 (0.003)	.86
Tre Venezie	-1.476 (1.03)	1.095 (5.67)	-0.011 (2.36)	-0.001 (0.02)	.77
Emilia-Romagna, Marche	-0.049 (0.61)	0.889 (8.19)	-0.012 (2.98)	-0.001 (0.34)	.87
Tuscany, Umbria, Alto Lazio, Lazio Meridionale, Campania	-1.732 (3.07)	0.990 (12.98)	0.007 (2.60)	-0.001 (0.65)	.97
Abruzzi, Molise	-2.389 (3.96)	0.800 (9.28)	0.004 (1.45)	-0.001 (1.52)	.92
Puglia, Basilicata, Calabria	-1.259 (1.28)	0.817 (6.14)	0.006 (1.25)	-0.001 (0.008)	.88
Sicily	-1.596 (2.72)	0.828 (10.47)	0.001 (0.27)	0.003 (3.33)	.97
Sardinia	-5.459 (5.07)	1.231 (8.46)	0.005 (0.87)	0.002 (1.11)	.94

Note: t - statistics in parentheses.
Source: see text.

of 0.16. In Table 4, which uses the alternative definition of unemployment, this elasticity ranges from 1.23 (again for Lombardy) to 0.83 (this time for Puglia, Basilicata and Calabria), with a standard deviation of 0.14.[26] Recall that for Britain the comparable high and low values of this elasticity were 1.21 and 0.85, with a standard deviation of 0.13. Thus, the variability in regional responses to the business cycle is almost exactly the same across the two countries.

Only for Sicily and for Abruzzi-Molise is there evidence of a differential response to real energy prices. In contrast, four of the nine coefficients on the real exchange rate in Table 3 differ significantly from zero at the 90 per cent level; in Table 4, six of the nine are statistically significant. (The pattern of signs is identical across the two tables.) Of the six significant coefficients in Table 4, three are positive, three negative, again suggesting considerable regional heterogeneity in unemployment responses to changes in the real exchange rate.

The signs of the coefficients are generally plausible, although there are anomolies. The negative real exchange rate coefficients are for Lombardy, Veneto and Emilia-Romagna, which produce a variety of manufactures and thus should be adversely affected by a real appreciation.[27]

How does the regional variation in the response of unemployment to real exchange rate shocks differ between Italy and Britain? The answer is that the regional disparities created by real exchange rate shocks are more important for Italy. The standard deviation of the regional regression coefficients for the real exchange rate is 0.0028 for Britain but 0.0074 for Italy when Table 3 data are used and 0.0087 for Italy when Table 4 data

are used. Thus, while roughly comparable regional unemployment disparities emerge in the two countries in response to business cycle fluctuations (holding the real exchange rate constant), larger regional unemployment differentials emerge in Italy than Britain in response to real exchange rate fluctuations (holding aggregate unemployment constant). If currency unification reduces insulation to real exchange rate disturbances, then Italy's regional problem will be exacerbated to a greater extent than Britain's.

V. Comparisons with the United States

One way to gauge the seriousness of the regional problems that arise in Britain and Italy in response to real exchange rate disturbances is to view the results through the lens provided by the experience of the United States. Unemployment rates across U.S. regions show a surprisingly weak tendency to move together.[28] Regional disparities in unemployment are a subject of long-standing concern.[29] But although real exchange rate swings cause regional problems in the U.S., these are not of sufficient severity to have led to successful pressure to reform the conduct of U.S. international monetary policy.

Real exchange rate fluctuations have been every bit as important for the U.S. as for Britain and Italy, as Figure 7 shows. Prominent in the figure are the steady real depreciation of the 1970s, which was reversed dramatically with the tight Volker monetary policy initiated in 1979 in combination with growing fiscal deficits once the Reagan Administration took office. After 1974, unemployment seems to have risen when the real

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Table 4

Covariates of Regional Unemployment in Italy, 1960-84, Post-1977 Definitions of Unemployment
(unemployment in logs)

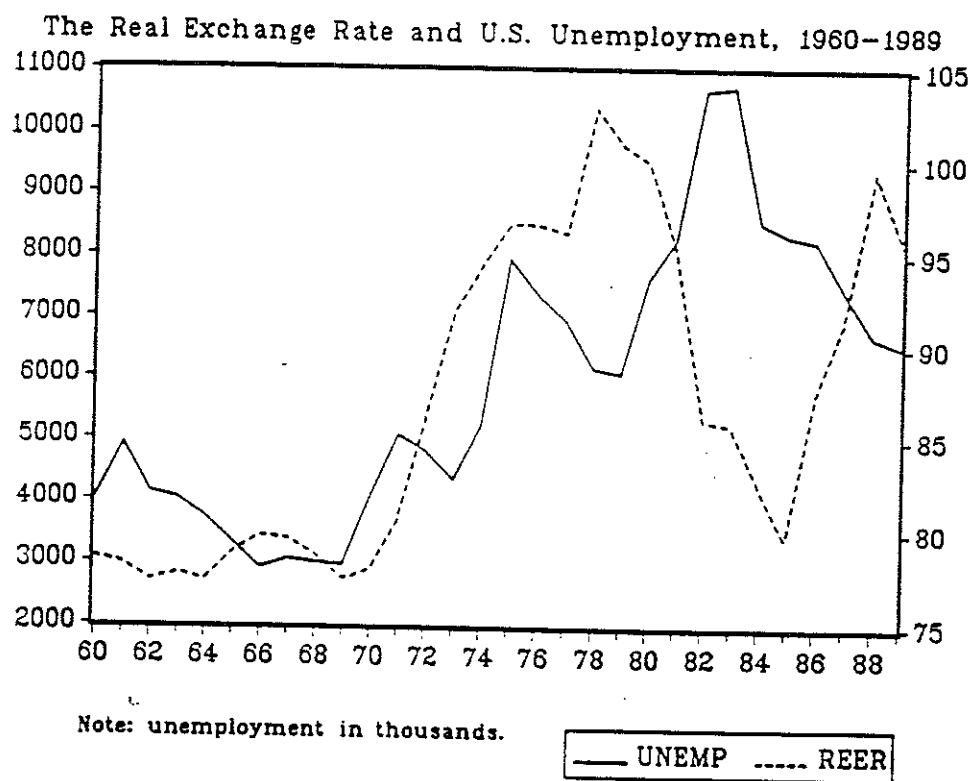| Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	R^2
Piedmont, Valle d'Aosta, Liguria	-3.880 (8.69)	1.148 (18.71)	0.006 (1.90)	-0.001 (1.06)	.98
Lombardy	-2.692 (3.02)	1.228 (10.01)	-0.012 (1.94)	-0.001 (0.06)	.94
Tre Venezie	-1.214 (1.25)	1.041 (7.77)	-0.016 (2.34)	0.001 (0.22)	.89
Emilia-Romagna, Marche	-1.176 (2.19)	0.940 (12.75)	-0.007 (1.94)	00.001 (1.03)	.95
Tuscany, Umbria, Alto Lazio, Lazio Meridionale, Campania	-1.533 (4.04)	0.978 (18.73)	0.006 (2.19)	-0.001 (0.66)	.98
Abruzzi, Molise	-3.452 (7.45)	0.937 (14.71)	0.007 (2.07)	-0.002 (1.93)	.97
Puglia, Basilicata, Calabria	-1.353 (2.04)	0.827 (9.08)	0.006 (1.32)	0.001 (0.47)	.94
Sicily	-2.301 (5.77)	0.907 (16.53)	0.003 (1.17)	0.003 (3.27)	.99
Sardinia	-5.114 (6.88)	1.198 (11.71)	0.003 (0.65)	0.001 (0.91)	.97

Note: t - statistics in parentheses.
Source: see text.

exchange rate appreciated, but no clear relationship is evident for the earlier period.

Table 5 summarizes the results of estimating the same equation as reported for Italy and Britain in Section IV above. The dispersion of regional unemployment responses to national unemployment is remarkably similar to those for Britain and Italy. The elasticity of regional unemployment with respect to national unemployment ranges from 1.12 for the East North Central (home of the cyclically-sensitive motor vehicle complex), to 0.81 for the Mountain states. These findings are consistent with the conclusions of Gellner (1974), who emphasized the cyclical sensitivity of unemployment in the North Central and Northeast for the first half of the period. The standard deviation for the nine regions is 0.12. Recall that the analogous estimates for Britain and Italy were 0.13 and 0.14-0.16, respectively, only slightly larger. This is surprisingly given the presumption of high labor mobility between U.S. regions. It may be that the similarity of results across countries reflects two offsetting effects. One the one hand, differences in the cyclical sensitivity of the demand for labor across regions may be greater in the U.S. than in Britain or Italy. On the other hand, greater labor mobility within the U.S. may damp down the regional unemployment disparities that would otherwise emerge.

There is evidence of a tendency for higher energy prices to raise regional unemployment only for the East North Central (again reflecting the importance of the motor vehicle production) and the East South Central (which traditionally relies on the energy-using steel sector and other industries that act as suppliers to the automotive complex). The negative

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Figure 7

The Real Exchange Rate and U.S. Unemployment, 1960–1989

Note: unemployment in thousands.

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coefficient for the West South Central borders on significance, reflecting the tendency for higher energy prices to reduce unemployment in oil-patch states like Texas and Oklahoma.

Six of the nine coefficients on the real exchange rate differ significantly from zero at the 95 per cent level or better. Three of the six significant coefficients are positive, three negative, again indicating considerable diversity of regional response to real exchange rate shocks. Of all nine coefficients, five are positive.

The standard deviation of the nine estimated coefficients for the real exchange rate is 0.0089, matching almost precisely the Table 4 estimate for Italy. Thus, holding the economy-wide level of unemployment constant, a real exchange rate shock has the same tendency to create regional unemployment disparities in Italy as in the U.S. In striking contrast, Britain is less vulnerable to regional problems caused by real exchange rate disturbances than the United States.

It is tempting to interpret this finding as follows. Regions of the U.S. differ more from one another than do regions of Britain or Italy in terms of the sensitivity of regional economic activity to the real exchange rate. Greater labor mobility between American regions does not free the U.S. from this problem, although it succeeds in reducing the resulting impact on regional unemployment differentials to the same levels as in Italy, and to only somewhat higher levels than in Britain.

Given relatively low levels of labor mobility, it is sometimes suggested that regional disparities within European countries are even more subject to aggravation by any loss of insulation from real exchange rate shocks associated with monetary unification than would regional disparities

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Table 5

Covariates of Regional Unemployment in the United States, 1960-89
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	Time	R^2
New England	-4.073 (3.50)	1.104 (6.70)	0.014 (3.26)	-0.572 (1.46)	-0.032 (5.46)	.78
East North Central	-2.931 (5.91)	1.119 (16.22)	-0.002 (0.97)	0.330 (1.98)	0.001 (0.22)	.98
East South Central	-1.379 (1.59)	0.849 (6.90)	-0.011 (3.42)	0.882 (3.03)	0.012 (2.69)	.95
Middle Atlantic	-2.389 (4.97)	1.034 (15.20)	0.008 (4.25)	0.189 (1.17)	-0.027 (11.06)	.96
South Atlantic	-2.691 (7.33)	1.021 (19.64)	0.005 (3.42)	0.184 (1.49)	-0.001 (0.17)	.99
West North Central	-0.726 (1.99)	0.816 (15.80)	-0.008 (6.22)	0.212 (1.73)	0.007 (3.85)	.98
West South Central	-0.783 (0.74)	0.942 (6.31)	-0.013 (3.19)	-0.566 (1.61)	0.028 (5.19)	.93
Mountain	-1.700 (3.08)	0.807 (10.33)	-0.002 (0.75)	-0.057 (0.31)	0.025 (8.94)	.98
Pacific	-0.800 (1.02)	0.874 (7.86)	0.002 (0.64)	-0.345 (1.30)	0.009 (2.13)	.94

Note: t - statistics in parentheses.
Source: see text.

Table 6. *Insured unemployment rate by administrative division, 1923–38*

	London	South east	South west	Midlands	North east	North west	Scotland	Wales
1923	10.1	9.2	10.6	10.7	12.2	14.5	14.3	6.4
1924	9.0	7.5	9.1	9.0	10.9	12.9	12.4	8.6
1925	7.8	5.9	8.5	9.1	15.0	11.4	15.2	16.5
1926	6.9	5.4	8.4	11.0	17.2	14.7	16.4	18.0
1927	5.8	5.0	7.2	8.4	13.7	10.7	10.6	19.5
1928	5.6	5.4	8.1	9.9	15.1	12.4	11.7	23.0
1929	5.6	5.6	8.1	9.3	13.7	13.3	12.1	19.3
1930	8.1	8.0	10.4	14.7	20.2	23.8	18.5	25.9
1931	12.2	12.0	14.5	20.3	27.4	28.2	26.6	32.4
1932	13.5	14.3	17.1	20.1	28.5	25.8	27.7	36.5
1933	11.8	11.5	15.7	17.4	26.0	23.5	26.1	34.6
1934[a]	9.2	8.7	13.1	12.9	22.1	20.8	23.1	32.3
1935[a]	8.5	8.1	11.6	11.2	20.7	19.7	21.3	31.2
1936[a]	7.2	7.3	9.4	9.2	16.8	17.1	18.7	29.4
1937[a]	6.4	6.7	7.8	7.3	11.1	14.0(17.9)[b]	16.0	23.3
1938[a]	8.0	8.0	8.2	10.3	13.6	17.9(18.4)[b]	16.4	24.8

[a]The figures exclude juveniles under the age of 16 and persons insured under the Agricultural Scheme, who first became insurable in September 1934 and May 1936 respectively.
[b]Figures for the new Northern Division created on 1 August 1936. This consisted of Northumberland (except Berwick district), Durham and the Cleveland district of Yorkshire (previously part of North-Eastern Division) and Cumberland and Westmorland (previously parts of the North-Western Division). Details of the areas contained in all Administrative Divisions can be found in Department of Employment, *British Labour Statistics, Historical Abstract*, HMSO (1971), Appendix E.
Source: *Ministry of Labour Gazette.*

within the U.S. be aggravated by a comparable increase in real exchange rate volatility. The results of this section imply that this suggestion is wide of the mark.

VI. What Does the Future Hold? Evidence from the Past

A possible qualification to any policy implications drawn from these findings is that European labor mobility is likely to increase over time. The out-migration of labor from depressed areas will ameliorate the regional unemployment problems that would otherwise arise. There exist various grounds for this view. First, there seems to be an ongoing tendency for transport costs to fall and for the cultural differentials impeding relocation to diminish. Second, the 1992 Program, by encouraging factor mobility between European countries, may provide a safety valve for unemployed factors of production in depressed regions. If so, inferences drawn from the experience of recent years may overstate prospective regional disparities.

One way to gauge the importance of these arguments is to compare regional disparities in unemployment in recent decades with regional disparities in the past. Transportation technology has improved over time, making it likely that factors of production are more mobile now than in decades past. Barriers to factor movements between European countries are lower now than in decades past. I therefore replicate the preceding analysis of regional unemployment incidence, this time using data for Britain in the 1920s and 1930s, as a way of gauging the speed with which factor mobility tends to change.

There are good reasons for concentrating on the British case. The

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Figure 8

Real Exchange Rate and British Unemployment, 1923-1935

Note: unemployment in thousands
(left scale).

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regional problem was prominent in the 1920s and 1930s and hence attracted

considerable attention. The major policy-related impediments to

interregional mobility characteristic of the contemporary period (housing

restrictions, residence-based unemployment insurance) were already in place

between the wars.[30] Data broadly comparable to those available for recent

decades are also available for the interwar years.

The significance of regional unemployment differentials in interwar

Britain are evident in the published statistics, shown in Table 6. Between

1923 and 1938 unemployment averaged only 8.5 per cent in London but 23.5

per cent in Wales. It was 9 per cent in the Southeast, 10 per cent in the

Southwest and 12 per cent in the Midlands, but more than 17 per cent in the

North East, North West and Scotland.[31] Hence the distinction between Inner

Britain and the Outer Regions, drawn by Department of Labour officials and

other contemporary commentators.

A striking aspect of this dichotomy was that the regional incidence of

unemployment had been reversed between the prewar and interwar eras.

Before World War I, unemployment was consistently lower in the North than

in the South.[32] The unemployment problem of the Outer Regions between the

wars seemed to be associated with the difficulties of Britain's staple

export trades (coal, iron and steel, shipbuilding, textiles and mechanical

engineering). The inference drawn was that exchange rate overvaluation due

to the decision to return to gold in 1925 at the prewar parity had

exacerbated the difficulties of industries producing traded goods, giving

rise to the regional problem.[33]

Yet as Figure 7 shows, the evolution of the real exchange rate and

unemployment after 1925 suggests no simple pattern. Although the real rate

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Table 7

Covariates of Regional Unemployment in Interwar Britain
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	R^2
London	-0.999 (0.89)	0.795 (6.29)	-0.009 (1.44)	0.010 (2.58)	.85
Midlands	-4.887 (3.42)	1.139 (7.07)	0.025 (3.17)	-0.004 (0.76)	.88
North East	-1.133 (1.51)	0.960 (11.35)	0.002 (0.40)	-0.002 (0.93)	.94
North West	-1.346 (2.32)	1.013 (15.46)	-0.006 (1.78)	0.002 (1.09)	.96
South East	-3.702 (2.91)	1.120 (7.78)	-0.009 (1.29)	0.004 (0.96)	.87
South West	-1.911 (2.35)	0.953 (10.39)	-0.009 (1.94)	0.001 (0.44)	.93
Wales	-2.288 (1.24)	1.174 (5.63)	0.007 (0.70)	-0.021 (3.16)	.82
Scotland	-1.675 (2.49)	1.028 (13.54)	-0.012 (3.15)	0.005 (2.21)	.96

Note: t - statistics in parentheses.
Source: see text.

strengthened dramatically starting in 1929, as commodity prices fell more

rapidly overseas than at home, British unemployment rose. Starting in

1931, despite that the devaluation of sterling brought about a depreciation

of the real rate, unemployment continued to rise. Unemployment only fell

after 1932, coinciding with a period of renewed real appreciation

reflecting devaluation of the dollar and the currencies of the European

gold bloc.

Analysis of regional unemployment movements between the wars has been

undertaken previously by Hatton (1986). Hatton regressed regional

unemployment rates on the national unemployment rate and on other measures

of economic performance. Though his results are broadly consistent with

those reported here, his implementation differed. He included data after

1935, despite that the Department of Labour's geographical definition of

regions was revised. In addition, he utilized estimated unemployment rates

rather than number of persons unemployed; the difficulty with the former is

that while monthly counts are available of persons unemployed, counts of

persons in the labor force are available for only one month of the year.

Finally, rather than the real exchange rate and real energy prices, he

examined the impact on regional unemployment disparities of the shares of

exports and investment in national income.

Regression results are reported in Table 7. The elasticity of

regional unemployment with respect to national unemployment ranges from a

low of 0.79 to a high of 1.17, with a standard deviation of 0.13. These

values are strikingly similar to those for the postwar period. The real

energy price shows up as statistically significant at the 90 per cent level

for three regions: higher energy prices reduced unemployment in Wales due

Table 8

Covariates of Regional Unemployment in Interwar Britain
Including the Effects of the 1926 General Strike
(unemployment in logs)

Region	Constant	National Unemployment	Real Exchange Rate	Real Energy Price	Strike Dummy	R^2
London	-1.110	0.738	-0.007	0.014	-0.347	.91
	(1.21)	(6.94)	(1.33)	(3.82)	(2.33)	
Midlands	-4.935	1.114	0.025	-0.002	-0.152	.89
	(3.34)	(6.50)	(3.12)	(0.41)	(0.63)	
North East	-1.065	0.994	0.004	-0.004	0.212	.96
	(1.65)	(13.24)	(0.10)	(1.79)	(2.01)	
North West	-1.342	1.015	-0.006	0.002	0.13	.96
	(2.18)	(14.23)	(1.68)	(0.89)	(0.13)	
South East	-3.837	1.052	-0.006	0.008	-0.421	.93
	(3.85)	(9.09)	(1.18)	(2.18)	(2.59)	
South West	-1.970	0.924	-0.007	0.003	-0.184	.94
	(2.57)	(10.42)	(1.77)	(1.03)	(1.48)	
Wales	-2.124	1.258	0.004	-0.025	0.510	.88
	(1.31)	(6.71)	(0.45)	(4.08)	(1.94)	
Scotland	-1.637	1.047	-0.012	0.004	0.118	.96
	(2.46)	(13.56)	(3.32)	(1.61)	(1.09)	

Note: t - statistics in parentheses.
Source: see text.

to its dependence on coal mining, but increased it slightly in Scotland,
where the shipbuilding industry and its suppliers used coal as inputs. The
explanation for London's positive coefficient is not clear.

Three of the eight coefficients on the real exchange rate are
statistically significant at the 90 per cent level, and two others have t-
statistics of about 1.5. Three of the eight coefficients are positive,
five negative. Their magnitude is large. They range from -0.012 to 0.025,
with a standard deviation of 0.0121. This is about four times as large as
the comparable standard deviation of the estimated real-exchange-rate
coefficients for post-1973 Britain, suggesting that the interwar economy
was more vulnerable to real exchange rate shocks than its postwar
counterpart.

One worries that the large real exchange rate coefficients may be
picking up the effects of shocks to regional labor markets correlated with
real exchange rate movements but not directly attributable to them. An
example is the 1926 coal strike, which idled a portion of the labor force
of Wales but not of other regions, and which coincided with the continued
real appreciation of sterling in the wake of Britain's 1925 return to the
gold standard. (See Figure 8.) Table 8 therefore adds to the equation a
strike dummy for 1926. Its inclusion reduces slightly the size and range
of real exchange rate coefficients; the standard deviation falls from to
0.0121 to 0.0118, but this is still very considerably larger than the
analogous standard deviation for post-1973 Britain.

Thus, the comparison of interwar and contemporary Britain suggests a
decline over time in the sensitivity of regional unemployment differentials
to real exchange rate shocks. This is important to bear in mind when

this response is a matter of dispute. To the extent that currency unification implies constraints on fiscal policy, real exchange rate shocks may raise the overall national level of unemployment. The point of the present paper is that the resulting problem is likely to be primarily one of depressed countries, not one of depressed regions within otherwise prosperous national economies.

How other aspects of the 1992 Program will affect these patterns is unclear. One the one hand, the removal of barriers to labor mobility is likely to further attenuate regional unemployment disparities. Workers in high unemployment regions will have the opportunity to relocate not only to lower unemployment regions within their native country but to lower unemployment regions elsewhere in the European Community. On the other hand, completion of the internal market may lead to additional regional specialization within countries and hence magnify disparities among their regions, as European industry attempts to exploit economies of agglomeration made feasible by their greater ability to sell standardized products throughout the European Community.[34] If so, the dispersion of regional unemployment responses to real exchange rate changes may be accentuated.

pondering the regional effects of the 1992 Program.

VII. Conclusion

This paper has considered the dispersion of regional labor market responses to real exchange rate changes in two of the countries participating in the process of European currency unification. Dispersion arises because real exchange rate movements affect different regions in different ways. The regional question is critical, therefore, if one believes that currency unification, by diminishing policy autonomy and thereby eroding insulation from foreign disturbances, will render countries increasingly vulnerable to major disturbances to their real exchange rates. But it is equally relevant if one believes to the contrary that, by eliminating remaining domestic sources of nominal exchange rate variability, unification will deliver a further reduction in the variability of real rates.

The results are surprising. While there is considerable variation in the response of unemployment across Italian and British regions to changes in the real exchange rate, there is no evidence that the range of responses is greater than in the United States. The range of regional responses is virtually identical in Italy and the United States, and smaller in Britain than in the U.S. Thus, insofar as currency unification implies a loss of insulation from real exchange rate shocks, Britain and Italy appear no more vulnerable than the U.S. to regional problems arising from this source.

This analysis is predicated on the assumption that the national unemployment rate can be held constant, presumably through the use of fiscal policy. To reiterate a point emphasized above, the feasibility of

2. Italy

The surveys used to gather unemployment statistics for Italy were revised in 1977 to reflect new definitions of unemployment. For prior years, two categories of unemployed persons were distinguished: persons separated from a previous position, and new entrants to the labor force in search of their first position. Much of the rise in Italian unemployment in the 1970s is concentrated in the second category, reflecting legally-mandated severance pay provisions which discouraged layoffs and at the same time made it more difficult for recent school leavers to find a first position. The revised surveys after 1976 distinguish persons recently separated from a previous position, new entrants in search of a first position, and other persons in search of work. These data are drawn from Istituto Centrale di Statistica (various issues). Problems of comparability between pre- and post-1975 data are discussed and an attempt to reconcile the two is made by Massarotto and Trivellato (1983).

The Italian real exchange rate was calculated identically to that for Britain, except that both Saudi Arabia and Libya were excluded from the initial list of ten leading trade partners due to the absence of a continuous consumer price index.

No energy price index appears to be available for Italy for the entire period. I spliced together the following series: the price of fuel oil in Turin for 1958-62, the arithmetic average of separate indices for crude petroleum and for petroleum products for 1963-74, and the published index for crude oil and petroleum products for 1975-84. All series were taken from the Annuario Statistico Italiano (various issues). The resulting index was deflated by Italian consumer prices as published in IFS.

Data Appendix

1. Postwar Britain

Data on British unemployment were drawn from Department of Employment and Productivity (1971), supplemented by various issues of the Department of Employment _Gazette_. The standard English regions distinguished by the Department of Employment are the South East, East Anglia, South West, West Midlands, East Midlands, Yorkshire and Humberside, North West and North. Data for Wales and Scotland were also used. I excluded Northern Ireland on the grounds that its labor market is very imperfectly integrated with that of Great Britain, although Irish data could in principle be used.

To construct a time series for the real exchange rate, exchange rates and consumer price indices were first gathered for Britain's ten leading trading partners. Trade was measured as the sum of imports and exports in 1980. A consumer price index for Saudi Arabia is not available for the early part of the sample period; I therefore dropped Saudi Arabia from the sample. (Since British imports from Saudi Arabia are almost entirely oil, the impact of conditions there on the British economy should be captured by real energy prices.) I then computed the real exchange rate as the trade-weighted arithmetic average of foreign consumer prices, converted into sterling using the spot rate, relative to the British consumer price index.

For energy prices I drew the prices of fuel purchased by manufacturing industry from the _Annual Statistical Abstract of the United Kingdom_, deflated by consumer prices, drawn from Feinstein through 1965, from Mitchell (1988) for 1966-70, and from _IFS_ thereafter.

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workers on systematic short time are excluded; thereafter those on systematic short time actually unemployed on the dates of the counts are included in the figures. I calculated the number of unemployed persons in Britain as the sum of the figures for the six English regions (London, South East, South West, Midlands, North East, North West), Scotland and Wales. In contrast to the procedure followed by the British authorities after World War II, London was separated out from the rest of the South East.

The time series for real energy prices is the annual average price of best (Yorkshire house) coal in London, from Mitchell (1988, p.748), deflated by Feinstein's consumer price index. The real exchange rate was calculated by deflating British wholesale prices by a trade-weighted average of the wholesale prices of Britain's principal trading partners, each converted to sterling using the relevant bilateral exchange rate. Wholesale prices for Britain's ten leading trade partners other than Germany were used.[35]

3. United States

Data for the United States on unemployment by state, based on the Current Population Survey, has been published by the U.S. Department of Labor starting only in the early to mid-seventies (depending on the state concerned and the size of the CPS sample). These data appear in the Labor Department's Geographic Profile of Employment and Unemployment (various issues). For earlier years one is forced to rely on estimates of the number of workers unemployed gathered by individual state agencies, as tabulated in the Manpower Report of the President (various issues).

The real exchange rate for the U.S. was calculated to be comparable to those constructed for Britain and Italy, starting with consumer price indices and exchange rates for the country's ten leading trade partners in 1980, excluding Saudi Arabia for lack of a continuous consumer price index, and using trade weights to aggregate. The real price of energy is computed as the consumer price index for energy relative to the consumer price index for all items, both from Council of Economic Advisors (1991).

4. Interwar Britain

The data utilized in my interwar analysis are drawn primarily from the Historical Abstract of Labour Statistics published by the U.K. Department of Employment and Productivity. The number of unemployed workers, by region, is provided on a monthly basis; I took arithmetic averages of the monthly figures. The figures derive from counts of unemployed persons on the registers of Ministry of Labour Employment, Exchanges, Branch Employment Offices and Juvenile Employment Bureaux. Before October 1924

aggregate demand and aggregate employment constant and focus exclusively on the intersectoral reallocation of resources due to a change in relative prices.

7. Recall that in models like those referred to in footnote 2, this fiscal expansion will reinforce the appreciation of the exchange rate, exacerbating any regional disparities produced by the autonomous change in the real rate. This assumes, of course, that national authorities retain autonomy over the conduct of fiscal policy following currency unification. Like other aspects of currency unification, this is a debated point. It is taken up in Section II below.

8. Giavazzi and Giovannini (1989) present some evidence that for a number of European countries the shift to more stable nominal exchange rates under the EMS has also stabilized real rates, presumably by constraining the policies pursued by the domestic authorities.

9. Giavazzi and Spaventa (1990), p.73.

10. Floating would create other problems in Europe -- for example by increasing the cost of operating the Common Agricultural Policy. See Giavazzi (1990).

11. An empirical analysis of the cross-country incidence of shocks is Cohen and Wyplosz (1989).

12. Eichengreen (1990) computes total state tax revenue as a share of state personal income for 9 U.S. census regions and 12 EC member states. Its coefficient of variation is 52 per cent as large in the US as in Europe.

13. Eichengreen (1990) provides evidence using regression analysis of the positive relationship between the required rate of return on state debt and the size of the debt burden.

14. Further comparisons with other countries are provided in OECD (1986).

15. There exist caveats to this argument for fiscal federalism, as described in Eichengreen (1991a). von Hagan has challenged Sachs and Sala-i-Martin's results, suggesting that the redistributive impact of the federal fiscal system is considerably more modest.

16. The data upon which these and subsequent figures are based are discussed in detail in Section IV and in the data appendix.

17. Following King (1985), I also include as part of the North Val d'Aosta, Trentino-Alto, Adige and Friuli-Venezia Giulia.

18. See Bianchi and Gualtieri (1990).

19. Taylor and Bradley (1983) use shift-share analysis to document this for Britain.

1. The extent to which monetary unification implies a loss of fiscal autonomy is a debated point taken up in Section II below. No such controversy attends the issue of monetary autonomy: it is universally acknowledged that with the removal of capital controls and the permanent fixing of exchange rates, an individual European country will no more be able to run an independent monetary policy or sustain a level of interest rates significantly different from those prevailing elsewhere in the European Community than can the State of California run a separate monetary policy than the rest of the U.S. For elaboration, see Eichengreen (1991a, b). Stricly, speaking, the statement in the text is correct only for asymmetric disturbances, since members of a currency union can respond with common policies to disturbances that affect them symmetrically. For example, monetary expansion throughout the currency union, or a union-wide increase in deficit spending, would suffice in response to a business cycle downturn affecting all members of the union. For elaboration, see Section II below.

2. Assuming some inertia in domestic wages and prices, mnetary expansion brings back down the real exchange rate by depreciating the nominal rate. This makes domestic goods more attractive to foreign purchasers, helping to restore demand for them. The monetary expansion might be accompanied by some fiscal restraint to keep the level of aggregate demand constant. Fiscal contraction, according to most models, will only reinforce the depreciation of the real exchange rate occasioned by monetary expansion, assuming a high degree of international capital mobility and of substitutability between domestic and foreign assets. See Sachs and Wyplosz (1984).

3. See Giavazzi and Spaventa (1990). For the last five years, Italy has consistently pursued a policy of overvaluation of the lira, limiting the rise in import prices in order to contain domestic inflationary pressures.

4. I refer to the trade-weighted ratio of domestic to foreign consumer price indices used in the analysis of Section V below, the construction of which is described in the data appendix.

5. Many official impediments to the movement of European labor within the Community have already been eliminated. But time and completion of the rest of the 1992 will be required before labor mobility between European countries reaches the levels that already prevail, say, between regions of the United States. For a discussion of comparative evidence on labor mobility, see Eichengreen (1991a).

6. This is designed to circumvent a criticism by Glick and Hutchison (1990) of other recent studies analyzing the relationship between the real exchange rate and aggregate manufacturing unemployment. Glick and Hutchison criticize such studies on the grounds that they fail to distinguish different reasons why the real exchange rate may change. On the one hand, if the real rate appreciates because of a rise in domestic demand due for example to expansionary fiscal policy, appreciation may be associated with a rise in aggregate manufacturing employment. On the other hand, if the real rate appreciates because of a fall in the demand for traded goods abroad due for example to a foreign recession, aggregate manufacturing employment may fall instead. Here I hold the level of

20. Endogeneity of the explanatory variables, notably the real exchange rate, is unlikely to be a problem insofar as explanatory variables are measured for the entire economy while the dependent variables are for relatively small regions. Any one region's unemployment is unlikely to have a discernible impact on real wages economywide and hence on the nation's real exchange rate, for example. An exception to this statement is when workers in the industries that dominate economic activity in a particular region set the tone for wage negotiations economywide. I return to this point below.

21. Standard definitions of regions used by the Ministry of Labour were revised in 1974, rendering problematic attempts to use pre- and post-1974 data together. There were also a variety of procedural changes in the measurement of British unemployment in the 1980s, which inevitably complicates the interpretation of the time series behavior of the variable.

22. North Sea oil provided an additional boost to Scottish unemployment in the early 1980s. Townsend (1983), p.98.

23. Townsend (1983), pp.118-119.

24. All subsequent comparisons across countries also refer to Table 1 estimates for Britain.

25. See the data appendix for further discussion.

26. The relatively low coefficients for Abruzzi, Calabria and the rest of the South are consistent with the results of Caroleo (1990), who regressed unemployment in the Mezzogiorno on national unemployment and a time trend, obtaining coefficients on national unemployment in the neighborhood of 0.8.

27. Insofar as workers in these manufacturing industries set the tone for wage negotiations nationwide, a rise in their unemployment may put downward pressure on real wages, leading to real exchange rate depreciation. This positive correlation between unemployment and the real exchange rate is the opposite of the sign of the estimated coefficient on the real exchange rate, suggesting that the estimated effect represents a lower bound on the real exchange rate effect. On the other hand, reverse causation may help to explain the positive coefficient for Piedmont-Liguria, the home of much of Italy's heavy industry.

28. Evidence to this effect appears in Eichengreen (1990a).

29. See for example Sum and Rush (1975).

30. For details, see Baines (1991).

31. All references here are to the official unemployment statistics as described by Hatton (1986). The official statistics are likely to have overstated the actual situation by neglecting workers in agriculture, government and domestic service, whose unemployment rates were relatively low. For further discussion, see Garside (1980).

32. Royal Commission and the Poor Laws (1909); Beveridge (1944), pp.73-75.

33. See for example Bowley (1930).

34. Giersch (1949-50), p.91.

35. Germany is excluded because the figures for 1923 would otherwise be dominated by the country's 1923 hyperinflation. On the construction of this series, see Eichengreen (1990b).

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