

The Role of Demand Management Policies in Reducing Unemployment

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"Macroeconomic policy has two roles in reducing unemployment: over the short term it limits cyclical fluctuations in output and employment; and over the longer term it should provide a framework, based on sound public finances and price stability, to ensure that growth of output and employment is sustainable, inter alia through adequate levels of savings and investment."

This quotation appears at the beginning of the Policy Recommendations section of the Organization for Economic Cooperation and Development's recent jobs study (OECD, 1994). However, of the fifty-nine separate recommendations only three concern macroeconomic policies, and but 10 percent of the background analysis is concerned with macroeconomic issues. The three specific macroeconomic recommendations are: (1) **maintaining** demand at a level appropriate for achieving noninflationary growth; (2) fiscal consolidation; and (3) improving the mix of public spending and taxation (as much a microeconomic measure in any case). Likewise most of the contributions to this conference concentrate on structural issues connected with labor markets rather than traditional macroeconomic questions.

Let me state clearly at the outset that I do not wish to argue that this emphasis on the supply side is mistaken. While it is almost certainly

the case that adverse demand shocks have played at least some role in pushing European unemployment to its present levels, the scope for more expansionary macroeconomic policies alone to reverse the trend is distinctly limited, for reasons that will be discussed below. Rather, reducing unemployment levels to something that is socially acceptable will surely require the implementation of various structural measures to improve the functioning of labor markets. One, rather classical, view would be to argue that this is all that is required: if the supply side is put right then the demand side will take care of itself through appropriate adjustments in wages and prices. I think that the presence of various rigidities in the economy make this too sanguine a view and that the likelihood of the labor market measures being successful will be enhanced if accompanied by suitably expansionary macroeconomic policies—in the words of Blanchard and others (1985) a "two-handed" approach. Apart from leading to further unnecessary output losses, a classical strategy of allowing the demand side to adjust automatically through downward wage and price adjustment runs the risk of leading to an early reversal of what may be quite painful supply-side reforms if their benefits are not immediately apparent to the electorate. However, saying that policies toward aggregate demand should be complementary to supply-side policies still leaves many questions unanswered.

In my contribution I shall try to address some of these. I shall start by presenting some evidence on the role of demand factors in the movements in American and European unemployment, and then review the mechanisms by which macroeconomic policies affect unemployment, paying particular attention to persistence mechanisms that lead demand shocks to have supply-side consequences. I conclude that the scope for demand management policies alone to reduce the present very high levels of European unemployment is limited. I shall then go on to consider how macroeconomic policy should be set to complement appropriate unemployment-reducing supply-side measures, taking cognizance of the uncertainty surrounding the equilibrium unemployment rate and the constraints on fiscal and monetary policies. Finally I shall consider the desirability of other policies that might enhance the effectiveness of macroeconomic policies.

Macroeconomic policy and unemployment

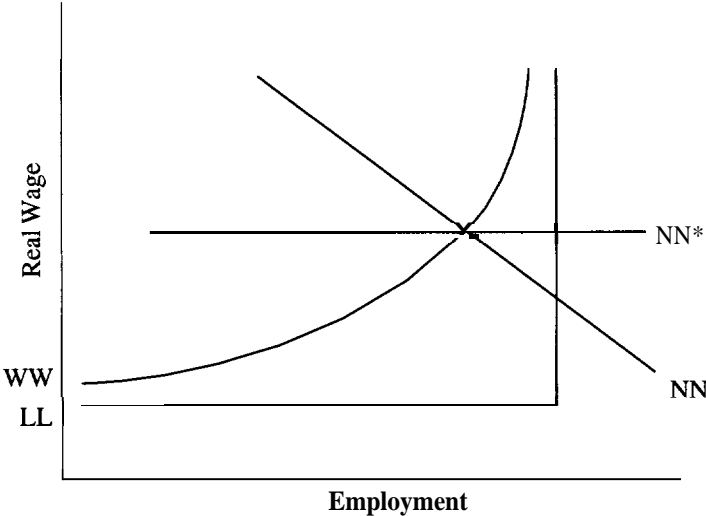
Cyclical unemployment

Figure 1 depicts the conventional framework for thinking about unemployment. Panel A, drawn in **employment/real wage** space, is a straightforward generalization of the usual competitive labor market diagram to allow for imperfections in both labor and product markets. LL is the competitive labor supply schedule, for simplicity, drawn assuming a common reservation wage across the whole labor force and inelastic labor supply above that level. WW is a wage-setting schedule (or in Phelps' 1994, terminology a "surrogate labor supply schedule") describing how wages are set. This could represent the outcome of bilateral bargaining between firms and workers or the operation of efficiency wage considerations. In either case, the premium of the wage over the reservation wage is increasing in the employment rate. NN is a "medium run" labor demand schedule (or more accurately a price-employment schedule) depicting firms' optimal price and employment decisions, given the nominal wage they face and their existing stock of capital. Equilibrium employment, and by residual also unemployment, is then given by the intersection of WW and NN. In the long run, capital can be adjusted, leading the NN schedule to shift outward (inward) as capital accumulates (decumulates) toward its optimal level. We can then also construct a long-run labor demand schedule which allows for this endogeneity of capital; this schedule will be horizontal if there are constant returns to scale, as in N^*N^* . Note that this implies that in the long run an upward shift in the wage-setting schedule will ultimately show up entirely in unemployment with no change in the real wage or productivity; looking at the evolution of real wages or labor shares—as in the old "wage gap" literature—may thus tell us rather little about the ultimate causes of movements in unemployment.

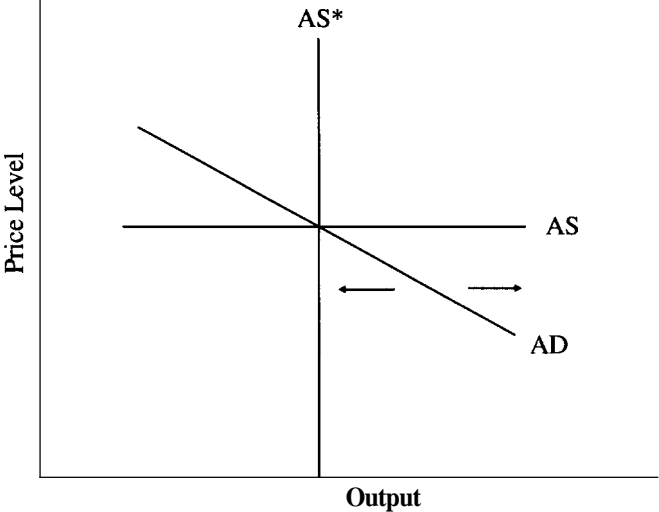
Panel B gives the associated picture in **output/price** space and looks (and behaves) just like the usual aggregate supply/aggregate demand model of introductory undergraduate texts. AD is a conventional downward sloping aggregate demand schedule whereby lower prices elicit higher demand through one or more of the real balance effect, lower interest rates, and improved competitiveness. AS^* is a **pseudo-**

Figure 1

Panel A: The Labor Market



Panel B: The Product Market



classical aggregate supply schedule in which nominal wages and prices have adjusted fully and output is at the level associated with the intersection of NN and WW. However, in the short run, wages and/or prices may be sticky because of contracts or because of informational imperfections. In this case fluctuations in aggregate demand lead to movements along the short-run aggregate supply curve AS (drawn horizontal for the particular case where both nominal wages and prices are instantaneously fixed).¹

If policymakers observe fluctuations in demand sufficiently early and *if* they can take appropriate offsetting policy action sufficiently promptly, then they can stabilize activity and unemployment around its equilibrium level. However, while this analysis might be accepted in principle, in practice most policymakers today would take the view that uncertainty about where the economy is today, let alone where it is going, coupled with uncertainty about the timing and impact of any policy action makes activist policies to eliminate such cyclical fluctuations hazardous. While this suggests that "fine tuning" is impossible, it does not rule out the scope for modest attempts to "coarse tune" the level of activity.

In this simple framework, movements in unemployment can be caused by shifts in aggregate demand which lead to cyclical unemployment, and by movements in the price or wage-setting schedules which are associated with a change in equilibrium unemployment (defined as the level of unemployment associated with full wage and price adjustment). How much of the movements in unemployment is attributable to each sort of disturbance? If we can answer this then we might also get some idea about the scope for activist macroeconomic policies. Studying the causes of the rise in unemployment has, of course, been a huge academic industry in the last decade or so and demand movements have been one of the factors extensively studied. Rather than survey this literature in detail (see Bean, 1994b, for such a survey) I instead report the results of a simple exercise using vector autoregressive techniques which conveys the flavor of this literature. This has the virtue of imposing relatively little in the way of additional untested conditioning assumptions and of obviating the need for objective measures of supply-side variables like union power. However, it turns out that the end results are consonant with those obtained

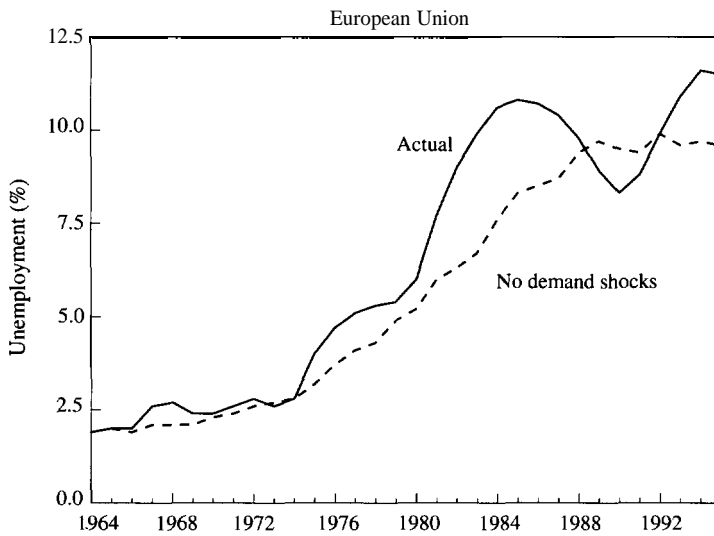
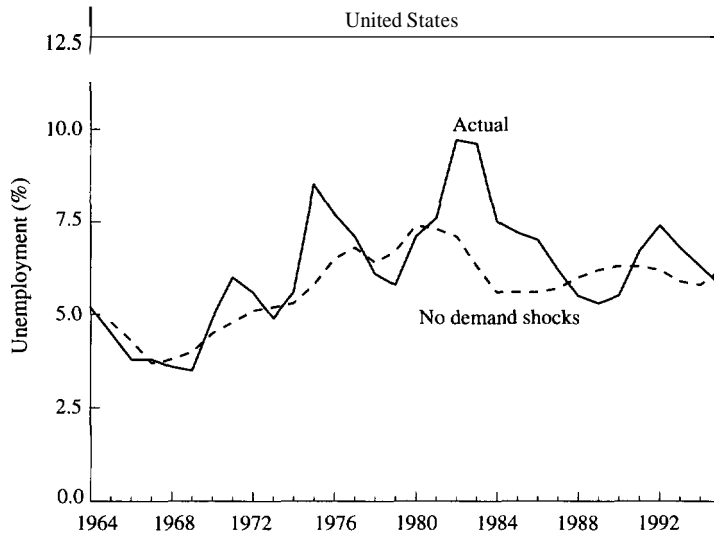
using more traditional structural econometric approaches.

My vector autoregressions contain just three variables: inflation; capacity utilization; and the (logarithm of the) unemployment rate.² The data are annual, the sample period (after allowing for lags) runs from 1964 to 1995 (OECD projections are employed for 1994 and 1995), and the two regions studied are the United States and the European Union (EU). In addition to two lags of each variable and a constant, each equation contains dummies for the aftermath of the two oil price shocks, the first taking the value of unity from 1974 to 1976, the second from 1980 to 1983. These are added in recognition of the fact that this sample is dominated by adverse shocks, concentrated particularly in these periods. However, in subsequent analysis the contributions of the dummies are treated as though they are part of the equation error, that is, as part of the exogenous driving shocks.

As is well known, the estimated residuals from a vector autoregression will in general be a linear combination of the underlying, and economically interesting, disturbances. Thus the residual in the unemployment equation will generally reflect the impact of both demand and supply shocks. In order to recover these underlying disturbances some additional assumptions must therefore be made. Here I assume that contemporaneously disturbances to the wage *and/or* price-setting schedules impinge entirely on inflation and their effect on activity only comes through with a lag. Since the residuals to the inflation and capacity utilization equations are virtually uncorrelated, this provides virtually the same identification as assuming that disturbances to demand impinge only on activity in the short run with the effects on inflation only coming through later. In effect it means that in Figure 1, Panel B, the short-run aggregate demand schedule is rather steep and the short-run aggregate supply schedule is rather flat. In addition to these supply and demand disturbances, the model implicitly contains a third disturbance, most reasonably thought of as a labor force shock which is assumed in the short run to impinge on neither inflation nor capacity utilization.³

Chart 1 displays the time series for U.S. and EU unemployment respectively, together with counterfactual simulations from the model in which there are assumed to have been no demand shocks. It is clear

Chart 1 Effect of Demand Shocks on Unemployment

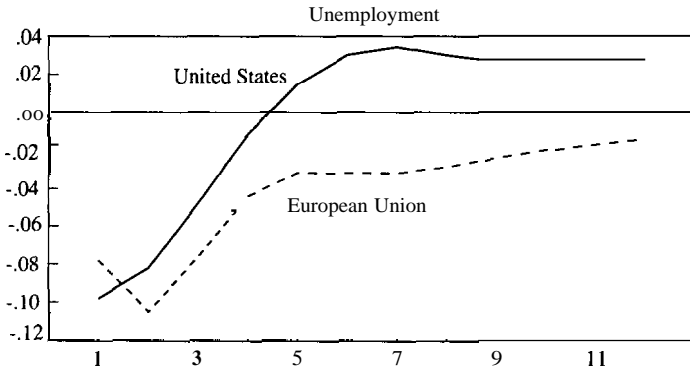
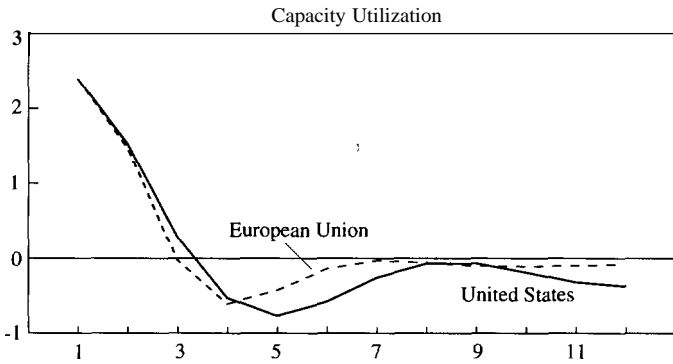
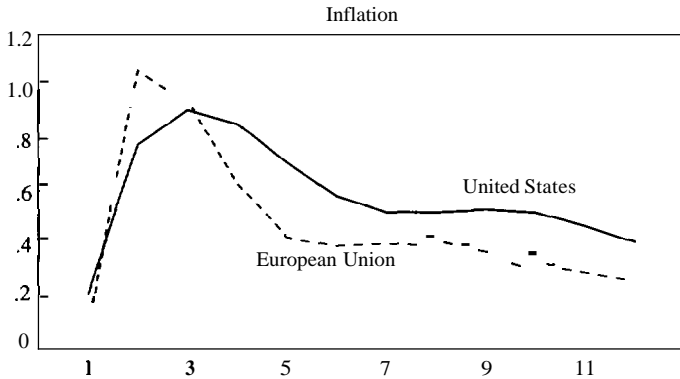


that the United States fits the conventional picture beloved of macroeconomic textbooks quite well, namely movements in unemployment are primarily cyclical fluctuations around a relatively constant equilibrium, or natural, rate of unemployment. In the European Union by contrast, while the contribution of demand shocks is not negligible, it is supply-side disturbances that appear to be the dominant cause of the recent rise in unemployment. Although the precise details of this analysis may not be completely robust to changes in the identifying assumptions, it is in line with the vast bulk of existing empirical work using more traditional econometric methods. For instance, **Layard, Nickell, and Jackman** (1991) find that, in the absence of nominal demand shocks, unemployment in the European Union would have averaged about 2.3 percent in the 1960s and 6.8 percent in the 1980s (based on Table 14, p. 436); the corresponding numbers from the vector autoregressive analysis are 2.1 percent and 7.5 percent. These simulations would appear to suggest that, while unemployment in the United States is currently near its equilibrium rate, unemployment in the European Union is about two percentage points higher than the equilibrium rate,⁴ and that there is a correspondingly small margin for activist macroeconomic policies to reduce it.

The response of inflation, capacity utilization, and unemployment in each country to an expansionary demand shock are plotted in Chart 2; (the EU responses are scaled so as to generate the same first-period effect on nominal demand as in the United States). Two points are worth noting. First, even though the effect on capacity utilization is similar, the effect on inflation in the United States is rather more drawn out. This is indicative of a common finding in the literature that nominal inertia tends to be somewhat greater in the United States than in Europe (see **Bean, 1994b**, for fuller discussion). A corollary is that, given the inside and outside lags associated with the operation of policy, there is in general somewhat more opportunity for countercyclical stabilization measures in the United States than in Europe.

Second, and more significant for understanding the behavior of European unemployment, the effect on unemployment is considerably more long-lasting in Europe (the response in the United States even switches sign after five years, but this may simply be sampling error). This is despite the fact that capacity utilization is back to normal levels.

Chart 2 Response to a Demand Shock



This is indicative of the significant persistence mechanisms that are thought to be present in European labor markets.

Persistence mechanisms

Despite the massive research effort that has gone into investigating the causes of the rise in European unemployment, the basic model underlying Figure 1 has been found wanting in that the current high unemployment rates cannot be explained either by cyclical factors—the degree of nominal inertia is just not high enough to explain the sustained increase in unemployment—or by exogenous shifts on the supply side. In regard to the latter, the effects of the deterioration in the terms of trade following the two oil price shocks, changes in tax rates, the productivity growth slowdown, benefit levels, minimum wages, union power, high real interest rates, increased mismatch, demographics, and a host of other factors have all figured. While some of these have been found helpful in explaining particular episodes, neither singly nor as a group do they seem to be able to account for the continuous high unemployment levels. Rather in addition there appear to be persistence mechanisms present that lead today's equilibrium unemployment rate to be positively related to yesterday's realization of unemployment. As a consequence, temporary disturbances, to either demand or supply, can have long-lasting (or even permanent) effects. The presence of these mechanisms blurs the simple-minded distinction between demand and supply factors because demand shocks end up having longer-term supply consequences.

These persistence mechanisms are usually introduced into macroeconomic work and policy analysis by adding into the Phillips curve or wage equation a term in the **change**,⁵ as well as the level, of unemployment (in the case of full hysteresis it is only the change that appears). Assuming these mechanisms operate in a symmetric fashion, the implication for both disinflation and stabilization policy is that it pays to keep unemployment closer to its long-run equilibrium rate than in the absence of the persistence mechanism (see Layard, Nickell, and Jackman, 1991, p. 525). Consequently, it pushes one toward favoring a gradualist strategy to disinflation and a more aggressive attitude to stabilizing unemployment in the face of shocks, essentially because allowing unemployment to rise a lot today has adverse effects

on the short-run equilibrium unemployment rate in subsequent periods.

The presence of these persistence mechanisms, which are embedded into the equations of the vector autoregressions, imply that one cannot simply identify the gap between the actual and the "no-demand-shock" unemployment rates in the European Union as indicating the margin of unemployment that can be eliminated through demand management policies alone. This is because adverse demand shocks *have* occurred in the past and this will have acted to raise the equilibrium unemployment that prevails in the short run today. (The underlying long-run equilibrium unemployment rate that obtains once all the persistence mechanisms have worked their way out will not be affected unless full hysteresis is present.) Consequently, there will be a limit to the speed at which the gap between the actual unemployment rate and the "no-demand-shock" unemployment rate in Europe can be eliminated through more expansionary macroeconomic policies without re-igniting inflation. Furthermore this approach is overly mechanistic in assuming the persistence mechanisms are symmetric in the sense of operating in the same way in the face of expansionary shocks as to contractionary ones. In practice they are quite likely to be either asymmetric and/or nonlinear, depending on the source of the persistence.

There are four main classes of persistence mechanisms that have been proposed in the literature, two of which operate on the supply (wage-setting) side of the labor market and two on the demand side. The first of the supply-side persistence mechanisms relies on insider membership dynamics and is due to Blanchard and Summers (1986) and Lindbeck and Snower (1988). They argue that the presence of hiring and firing costs gives the existing workforce at a firm bargaining power and an ability to push wages above market-clearing levels. The existing workforce will then try to push up wages, subject to not pricing themselves out of a job. However, if there is an unexpected contraction in demand, and wages and prices do not respond immediately, then employment will fall. The key assumption is that only those left—the "insiders"—will have a say in subsequent wage negotiations. If demand subsequently recovers they will prefer to push for higher real wages than in the *status quo ante* rather than allowing employment to return to its initial position, (subject to the constraint that if wages get *too* high a firm might find it profitable to sack all its

workforce and start anew). The key to whether this mechanism operates in reverse or not would seem to rely on whether the insiders are aware of the reversal of the demand shock. If they are, then other policies would be required alongside a recovery in demand to ensure that it was simultaneously associated with an increase in employment and thus in insider membership (see the section on incomes policies).

The second supply-side persistence mechanism operates through the characteristics and behavior of the unemployed rather than the employed. Phelps (1972) was one of the first to cite the possibility of such a mechanism when he suggested that unemployment leads to reduced rates of skill formation and weakens work habits. On the face of it, it is not clear why such a reduction in worker productivity should lead to higher unemployment, rather than lower wages. However, Blanchard and Diamond (1994) have developed a more subtle version of the story in which firms are assumed to use the unemployment history of potential workers in order to rank them in order of desirability. Because the newly unemployed will have a better chance of being reemployed than the long-term unemployed, other things equal, wages tend to be higher when ranking occurs because the bargaining position of those with jobs is enhanced. Furthermore, and most importantly, persistence can be quite long because the reduction in the perceived average quality of the unemployed that occurs in the face of a contractionary shock will also lead firms to open fewer vacancies so perpetuating the problem (Pissarides, 1992). The mechanisms in operation here seem to be entirely reversible and there is no reason for expecting asymmetries in the response to contractionary and expansionary shocks.

A different explanation of persistence that also focuses on outsider behavior emphasizes the job-seeking behavior of the long-term unemployed, rather than their skill characteristics and the attitudes of employers (Layard and Nickell, 1987). Prolonged lack of success in finding a job leads the long-term unemployed to give up searching, believing that it is a futile exercise, while at the same time they adjust to living on unemployment benefits and earnings from the "black" economy. As a result, the "effective" labor force shrinks. However, a recovery in the demand for labor will not automatically lead to these discouraged workers re-entering the effective labor force, unless it is

accompanied by active labor market policies that keep the long-term unemployed in-touch with the labor market. So here again asymmetries are a possibility.

Turning to the demand side of the labor market, the presence of hiring and firing costs means that firms will only take on extra labor if they expect the demand for it to be long-lived. Consequently if firms are unsure of the permanence of any recovery then they will be disinclined to expand employment. It is often asserted that high levels of firing costs are to blame for the increase in European unemployment. This cannot be correct on average because firing costs should *reduce* the variability of employment, but should not much affect its average level. But the presence of firing costs can explain why employment gets stuck around a particular level for some while (Bentolila and Bertola, 1990). This is because hiring and firing costs create a "zone of inaction" within which the firm is neither hiring nor firing. Thus if firms have generally been shedding labor in response to a contraction in demand or an increase in labor costs, they will not immediately start taking labor back on as soon as demand starts expanding or labor costs begin to fall, but wait until the recovery has proceeded beyond a threshold level that among other things depends upon the degree of uncertainty. This zone of inaction thus generates both **nonlinearities** and asymmetries in the behavior of unemployment.

The final persistence mechanism operates through the capital stock. Consider Figure 1, Panel A, and suppose there is an increase in wage pressure that shifts the wage-setting schedule, WW , up. Equilibrium employment falls. However, the intersection of medium-run labor demand, NN , with WW now lies above the long-run labor demand schedule, N^*N^* , along which capital is also allowed to vary. The mechanism that brings the economy back to long-run equilibrium is capital decumulation which shifts NN in until NN, N^*N^* , and the new WW curves all intersect at the same point. This process of capital decumulation is associated with further increases in unemployment. As stated, there is no reason for this process to be either irreversible or asymmetric. However, an extra dimension is added if the possibilities for substituting capital for labor are **limited**.⁶ The effect of an increase in wage pressure, or a negative demand shock, is to lead to a fall in employment and capital being left idle. If the adverse shock is

maintained, capital decumulation will set in. However when the shock is reversed employment possibilities will be limited by the availability of capital, however low wages may fall. Employment may thus fall rapidly in the downswing, but the speed of recovery in the upswing will be governed by how quickly the capital stock is built up. There is again an asymmetry in behavior.

The various persistence mechanisms thus have rather different implications for the extent and speed to which the gap between actual unemployment and “no-demand-shock” unemployment can be eliminated, and thus also for the short-run room for maneuver for macroeconomic policies. In my view the empirical evidence tends to favor outsider disenfranchisement ahead of insider membership dynamics—for instance, the degree of unemployment persistence across countries seems to be positively related to the duration for which benefits are payable, but not to the degree of unionization (Layard, Nickell, and Jackman, 1991, pp. 433-4; Bean, 1994a)—but there certainly may be some instances where insider membership effects are important, for example, in Spain (Bentolila and Dolado, 1994). The same cross-country evidence also points to the importance of firing costs. Capital constraints seem not to have been an important persistence mechanism in the past—business surveys do not suggest that firms have been constrained by a shortage of capital in recent years—but this might no longer be the case if a sustained and rapid growth in demand were to occur. The bottom line seems to be that, even if appropriate labor market measures are introduced, it is going to be very difficult for policymakers to judge what the current short-run equilibrium unemployment level is. I shall return to this issue later.

Supply effects of macroeconomic policies

We have just considered the possible mechanisms whereby shifts in aggregate demand have longer-term effects on the equilibrium unemployment rate. However macroeconomic policy instruments can also have more immediate effects upon supply. Aside from the obvious channels whereby government spending on infrastructure and training affect the demand for, and supply of, labor, there are a number of other routes worth mentioning briefly. First, the level of taxes will affect the wedge between the cost of labor to the firm and the consumption

value of the worker's wage after tax. In terms of Figure 1, Panel A, if we identify the real wage on the vertical axis with the real value of the wage to the worker, or consumption wage, an increase in any of payroll, income, or consumption taxes would result in an increase in labor costs at a given consumption wage and thus a downward shift in the labor demand schedule, NN, and a decline in employment. Second, movements in the terms of trade will also affect this wedge because what matters to the firm is the cost of labor relative to the price at which it can sell its product, whereas what matters to the worker is the purchasing power of the wage which includes, presumably, imported goods. A depreciation of the currency thus raises the product wage at an unchanged consumption wage. In terms of Figure 1, Panel A, there is thus again a downward shift in the labor demand schedule and a decline in employment. Since a fiscal expansion can be expected to lead to a real appreciation as net exports are crowded out, it will simultaneously reduce the size of the wedge and thus expand employment.

The impact of the wedge—particularly taxes—has received quite a lot of attention in the unemployment literature. However, in my view its role tends to be overstated. What matters crucially in the two experiments just considered is whether the **reservation** wage is also affected. Now the reservation wage will be determined not only by the level and availability of unemployment benefits but also by the level of existing savings, by the workers' expected future earnings against which borrowing may be possible, and by the possibility of support from other members of the household. A permanent deterioration in the terms of trade or a permanent increase in consumption taxes should also reduce the real value of the reservation wage by an equal amount. As a consequence, the wage-setting schedule will also shift downward nullifying the effect on employment. A permanent increase in income or payroll taxes would have some effect because neither of them affect the consumption value of past savings and current unemployment benefits (assuming these are not taxed), but the consumption value of future earnings—which are arguably the most significant component of the reservation wage—would still be **reduced**.⁷ Furthermore if we are in a region where the wage-setting schedule is fairly steep, most of the effect will be shifted onto wages rather than employment anyway.

The other mechanism whereby macroeconomic policies have supply-side effects is through the real interest rate. An increase in the real (post-tax) interest rate raises the cost of capital and leads to capital decumulation and declining employment demand. (In Figure 1, Panel A, N^*N^* shifts down and NN shifts inward over time.) In addition, Phelps (1994) has pointed to a number of other channels whereby increases in real interest rates can shift both the labor demand schedule down and the wage-setting schedule up, in both cases increasing unemployment. Thus macroeconomic policies associated with increased real interest rates, such as higher budget deficits and debt, can have adverse consequences on employment. Such considerations are obviously of less concern to a small economy with a negligible effect on world interest rates than to a large economy like the United States. These real interest rate effects may be an important part of the unemployment jigsaw, but more research here would be useful.

Macroeconomic policies to support supply reforms

What is an accommodating policy stance?

The presence of persistence mechanisms which are not easily put into reverse limits the scope for macroeconomic policy to reduce unemployment in Europe even though demand shocks may have played some part in creating it in the first place; it is not a trivial matter to put Humpty-Dumpty back together again. However, as I indicated at the outset I am in favor of a "two-handed approach in which expansionary aggregate demand policies are adopted *alongside* the necessary improvements to supply—in other words a broadly accommodating approach. However, this begs the question of what exactly constitutes an "accommodating" policy in this context.

On the face of it "accommodating" might seem to imply keeping the inflation rate steady at its present relatively low levels. Certainly such a definition would appeal to many central bankers. Faster demand growth when there is economic slack, coupled with the prompt adjustment of policies to avoid any rekindling of inflation once recovery is under way—the first policy recommendation of the OECD jobs study—also seems to amount to much the same thing. Is there anything more to be said? I think the answer is "yes."

By way of providing a benchmark let us start by looking at the historical experience after the Great Depression. In the United States between 1933 and 1939 real output rose at an average annual rate of 6.2 percent while civilian unemployment declined from 24.9 percent of the workforce to 9.9 percent. The annual inflation rate averaged 3.8 percent over this period, compared to -6.4 percent over 1929-33. In the United Kingdom, where unemployment levels peaked at something nearer that currently seen in Europe today, real output grew at an annual rate of 3.8 percent between 1932 and 1939 while unemployment fell from 15.6 percent of the workforce to 5.8 percent. Inflation averaged an annual 1.5 percent compared to -2.2 percent over 1929-32. Assuming that current labor force trends continue, a reduction in unemployment in Europe to around 5-6 percent by the end of the decade would seem to require an average annual growth rate in the region of 4 percent. Conditional on the implementation of appropriate labor market reforms, such a rate of growth is more likely to materialize if policy is appropriately accommodating. The historical experience suggests that accommodating in this context might actually involve some acceleration in inflation. Now, of course, both the causes of the unemployment and the inflationary background are both rather different from that of the interwar years so direct extrapolation is inappropriate. But does theory suggest anything on this score?

Over the years there has been considerable discussion over the appropriate targets for macroeconomic policy, especially monetary policy. A sizable group of economists, who have advocated explicitly targeting nominal income (including Meade, 1978; Tobin, 1981; Brittan, 1981), and those who favor the use of monetary targets, would presumably argue that in the absence of precise knowledge of movements in the velocity of circulation this is what they are trying to achieve in any case. The good operating properties of a nominal income rule in the face of shocks to private spending and portfolio shifts is well known, something it shares with a policy of targeting the price level (or inflation). In Bean (1983) I argued that a nominal income rule also has good operating properties against supply (technology) shocks in an environment where money wages move sluggishly and the wage-setting schedule is relatively steep. This is because under nominal income targets an unanticipated beneficial technology shock is associated with lower prices than would other-

wise have been the case, and thus also higher real wages than would otherwise have been the case. This rise in real wages is something that is required in equilibrium and when wages are sticky it is most efficient to let it happen through a somewhat lower price level. By contrast a price or inflation target would not allow this to occur and so lead to an excessively large boom.

This might seem to suggest that supply-side improvements to the labor market ought to be accompanied if anything by a rather more restrictive policy stance than implied by stabilizing forces or inflation. However supply-side reforms that improve the functioning of the labor market are not the same as a technology shock. Most of the measures discussed at this conference can loosely be thought of as ways of shifting the wage-setting schedule downward and to the right. The new level of equilibrium unemployment must then be associated with *lower* real wages than would obtain without the supply reform.⁸ If money wages are at all sticky this could nevertheless be swiftly brought about through an *increase* in prices (relative to what was anticipated when the money wage was set). Thus beneficial supply-side developments within the labor market might best be accompanied by an increase in inflation in order to generate a positive price "surprise;" an appendix spells out the analysis more formally. Note, importantly, that this increase in inflation should not engender higher subsequent wage inflation because while inflation is faster than expected by wage bargainers, it is offset by the beneficial effects of the supply-side reform.

In case readers think I have lost leave of my senses in advocating more inflation, it is useful to put some ballpark numbers on the quantitative magnitudes involved. A reasonable estimate for the short-run wage elasticity of the demand for labor is around unity.⁹ Consequently in order to generate extra employment of 5 percent, the real wage *would* need to be 5 percent lower than otherwise. With a predetermined money wage this would require a price level 5 percent higher. However, in practice any beneficial effects from labor market reforms are likely to come through only gradually. A reduction in wage pressure corresponding to a decline in equilibrium unemployment at the rate of one percentage point a year seems around the best that can be hoped for. Assuming the implications of these reforms for

the path of real wages are not built into nominal wages at the **outset**—and if they *are*, then no special action is called for anyway—then the required change in real wages could be accomplished by an inflation rate just one percentage point higher than otherwise would have occurred. This is fairly small beer, and well within the likely control error for any inflation target. So in practical terms, governments **and/or** central banks may not go far wrong in following the objective of stabilizing the inflation rate, although they might do well to err on the side of laxity.

Uncertainty about the equilibrium rate of unemployment

We have seen that there is still considerable uncertainty about the quantitative importance of the various possible causes of the rise in European unemployment. As a consequence, the quantitative impact of labor market policies on the equilibrium unemployment rate is also, rather uncertain. This uncertainty is greatly compounded by the operation of the various persistence mechanisms, which may or may not be easily reversible. Consequently during any recovery, policymakers are likely to be faced with considerable uncertainty as to the prevailing equilibrium rate of unemployment, and therefore also to the appropriate rate of expansion of nominal demand to secure their inflation target. How should policymakers take cognizance of this?

If the world were nice and linear so that a one percentage point reduction in unemployment produced the same absolute change in inflation as did a one percentage point increase in unemployment, and the authorities were indifferent as to the direction of any policy error,¹⁰ then the answer is that it would not matter much. Policy should simply be set according to the "certainty-equivalent" rule whereby the equilibrium unemployment rate is treated as though it is known and equal to the policymaker's best guess of its magnitude, that is, to its expected value. It is not obvious why the authorities objective function should be locally asymmetric, but the world certainly may not be linear. In particular many economists and policymakers probably take the view that a given fall in unemployment tends to have a stronger upward effect on inflation than the **downward** effect of an equivalent increase in unemployment. The old-fashioned Keynesian view that nominal wages were upwardly flexible but downwardly rigid is a

particular variant on this. The wording of the first policy recommendation of the OECD jobs study, namely that "policy should focus on assisting recovery through faster noninflationary growth of domestic demand where there is substantial economic slack, while policies should be adjusted promptly to avoid a rekindling of inflation when recovery is well under way" could for instance be construed as subscribing to the doctrine of a nonlinear response of inflation to the amount of economic slack in the economy. From an empirical perspective there are also good reasons for suspecting such a nonlinear response as wage-equations or Phillips curves with a nonlinear transformation of the unemployment rate (such as the logarithm or the reciprocal) frequently outperform models that just contain the level.

Uncertainty now can have important consequences for the setting of policy because any temporary reduction in unemployment below the equilibrium rate, and with it any increase in inflation, may have to be followed in due course by an even larger increase in unemployment above the equilibrium rate to squeeze the extra inflation out of the system. It is reasonable to believe that this uncertainty about the equilibrium rate will diminish with time and experience. As a consequence, an optimizing policymaker concerned to minimize the total cumulative unemployment associated with maintaining the existing inflation rate will tend to err on the side of caution now by setting a somewhat tighter policy in which the unemployment rate is higher than her best guess (that is, conditional expectation) of the underlying, but presently unobservable, equilibrium unemployment rate. This is a straightforward application of Jensen's inequality and is discussed more formally in an extended footnote.¹¹

Just as with the appropriate definition of what is an "accommodating" policy, it is helpful to have some idea of orders of magnitude. This depends very heavily on the degree of nonlinearity involved in the response of inflation to activity. Since a number of studies suggest the level of wages is quite well explained by the logarithm of the unemployment rate, for example, Blanchflower and Oswald (1994), this seems a natural benchmark to take. Suppose the authorities' conditional expectation of the equilibrium unemployment rate is 8 percent with a standard deviation of 2 percent, which seems a reasonable value for the extent of policymakers' uncertainty. Then the

optimal setting of policy today should be to generate an unemployment rate of $8\frac{1}{4}$ percent (see footnote 11 for details). So just as with our discussion of defining an accommodating policy to complement a set of labor market reforms, the practical implications of uncertainty about the equilibrium rate are fairly modest. (This would not be the case if the wage-setting equation involved a very highly nonlinear response of wage inflation to the unemployment rate.)

There is, however, a caveat to this argument. The story above relies on the assumption that the policymaker's knowledge about the value of the equilibrium unemployment rate is not affected by her particular choice of policy action today; over time she learns more about the state of the economy, but the speed at which that knowledge accrues is not related to her own decisions. In practice, given the imprecision with which econometric relationships are formulated and estimated, it will be difficult to infer the equilibrium unemployment rate associated with relatively stable inflation if the economy is operating with unemployment a long way above that level. Indeed in the extreme case where unemployment above the equilibrium rate exerts no downward pressure whatsoever on inflation, a high unemployment rate would tell the policymaker nothing about the equilibrium rate (other than that it is not even higher). The only way to learn about the limits to demand expansion in this case would be to push unemployment down until the point at which inflation starts to take off. In other words a more expansionary policy may have a payoff in generating experimental knowledge about the limits to such policy.

Fiscal constraints

I now turn to a consideration of the potential sources of demand growth and the limitations on fiscal and monetary policies. The first thing to be noted is that the introduction in Europe of effective labor market policies susceptible of reducing unemployment by five percentage points by the end of the decade, would, at unchanged real interest rates, imply an equiproportionate increase in the capital stock. With a capital-output ratio of around 4 this implies a total increase in investment of roughly 20 percent of one year's output, or assuming it is spread over five years a boost to investment of about four percentage

points of output a year. This is simply the converse of the adverse effects of the decline in investment in the late 1970s and early 1980s and would more than absorb the extra output resulting from the supply-side reforms. In practice, one might expect the increase in investment to be somewhat smaller than this, both because of some upward pressure on global interest rates and the extra jobs created may be of rather low capital intensity, for example, in the services sector.

This raises the attractive prospect of a recovery that is, on the demand side, investment led. However, it would be imprudent to rely on this, especially in the early stages when the impact of any reforms may not yet be clear to producers. Likewise although permanent income should rise as a result of reforms, it may not be immediately reflected in higher consumption. In that case is there any scope for fiscal action? Here the room for maneuver does not look very wide with all OECD countries, except Japan, presently running not only a budget deficit (amounting to 4 percent of GDP across the OECD as a whole and 6.1 percent for Europe) but also a structural budget deficit, that is, correcting for the automatic effects-of the cycle on taxes and spending (amounting to 2.8 percent of GDP for the OECD and 4.1 percent for Europe). However, the room for maneuver depends critically on not only the current level of potential output, but also the prospective rate of growth. Simple reorganization of the government's budget identity tells us that the rate of growth of the debt-output ratio, \hat{b} , is just

$$\hat{b} = r - n + d/b$$

where d is the government's primary deficit (including seignorage revenue) as a fraction of output, r is the real interest rate, n is the rate of growth, and \hat{b} denotes a growth rate. The latest OECD forecasts (OECD, 1994) include medium-term projections for OECD public sector debt and deficits (incorporating some near-term fiscal consolidation). The basic reference path involves an average growth rate until the end of the decade in the range of 2½ to 3 percent. Under this scenario the OECD debt-GDP ratio stabilizes around 73 percent. But a slightly less optimistic projection of growth at a rate ½ percent less a year produces a debt-GDP ratio that is rising steadily and is about ten percentage points higher by the end of the decade. This reflects both the slower growth of the denominator of the debt-GDP ratio and

the fact that slower growth tends to lead to a more pessimistic outlook for the primary deficit itself because taxes are lower and transfers higher.

Now a successful program of structural reforms should be compatible with a medium-term growth rate significantly faster than the OECD's reference scenario. Other things equal, faster growth should thus not only see debt-GDP ratios stabilizing, but actually declining quite rapidly. If a modest fiscal expansion today is required to achieve this growth, then surely it ought to be nothing to worry about. The difficulty is that there may in effect be multiple expectational equilibria present. On the one hand there is a virtuous equilibrium with a temporary fiscal expansion and buoyant medium-term growth. On the other hand if the financial markets are pessimistic about the effects of the structural reforms on the medium-term growth prospects, they may regard the fiscal action as unsustainable and inevitably associated with yet higher debt-output levels in the medium term. This will push up long-term interest rates and have adverse effects on the level of aggregate demand today. This in turn will postpone—perhaps indefinitely—reaping the benefits of the structural reforms. In the present context there is a good chance that the latter case is the relevant one. This suggests (1) that the scope for fiscal action to expand demand is limited in the short term and (2) that any fiscal action is more likely to be successful if it is explicitly temporary.

Exchange rates and monetary policy

If budgetary positions leave little scope for fiscal action,¹² in the short term at least, the burden of maintaining an appropriate level of aggregate demand must rely on monetary policy. In the European Union, however, the scope for independent national monetary policies is limited by the operation of the exchange rate mechanism of the European Monetary System (EMS). As a result of the exchange market turmoil of 1992-93 the previously tight plus or minus 2¼ percent fluctuation bands have been broadened to plus or minus 15 percent for all except Germany and the Netherlands, while sterling has left the mechanism altogether. This gives countries considerable *de jure* national monetary autonomy even without resorting to *realign-*

ments. However *de facto* a number of countries—especially **France**—have not used the new-found monetary freedom to the full and instead kept exchange rates close to the central parities. One view is that maintaining a zone of exchange rate stability in this way will help to put the EMS back on the road to monetary union, as envisaged in the Maastricht Treaty.

Is this altogether wise, or in other words, is exchange rate flexibility a desirable feature of the transition back to reasonable levels of unemployment? Suppose appropriate supply-side reforms are implemented in a particular country, what should happen to monetary policy and the exchange rate? Certainly the supply of goods and services should expand as a result of these measures. As these measures are presumably supposed to be permanent in their effect, permanent income and consumption should also rise, so that private saving should not be much affected. However, higher activity should reduce budget deficits so that national saving will probably increase somewhat. But on the other side of the fence we have seen that we should probably also expect an investment boom to materialize in due course. During the early phases of a recovery one would expect the savings effect to dominate. Given the lack of scope for fiscal action, maintaining an appropriate level of aggregate demand will thus tend to require a loosening of monetary policy and with it a nominal and real depreciation. However, as the effects of the supply reforms become more entrenched and investment begins to take off, the opposite policy will be required, namely tighter monetary policy and a nominal and real appreciation.

Since member countries of the European Union are likely to proceed with labor market reforms at differing speeds, there seems to be good reason for permitting fluctuations in nominal rates as an efficient way of achieving the appropriate movements in real rates. However, the size of these required movements should be kept in perspective. Nothing that is contemplated here rivals the effects on equilibrium real exchange rates of German reunification, and all of them should be readily achievable within the wide plus or minus 15 percent fluctuation band. The danger arises if policymakers seek to confine European monetary policies to a straitjacket by pressing for an early return to formal narrow fluctuation bands—although it is doubtful

whether such bands would be sustainable in any case--or by pushing ahead to premature monetary unification.

Enhancing the effectiveness of macroeconomic policies

Policy coordination

I conclude with a brief discussion of other actions that may enhance the effectiveness of macroeconomic policies, specifically policy coordination and incomes policies. On the first of these the OECD jobs study suggests that "countries should use the policy coordination process to ensure that 'the setting of macroeconomic policy is more consistent across countries...At times this may involve a common strategy, but in the current situation...international cooperation does not require them all to be pushing in the same direction...at the same time.'" It is not entirely clear what is meant by "consistent" in this context ("coherence" appears in a similar context somewhat later in the same paragraph) and as it stands it seems difficult to imagine anything more vacuous!

During the early 1980s a burgeoning literature appeared on international policy coordination; see for example, Buitert and Marston (1985). This literature focused on the international externalities of macroeconomic policies in the form of demand and terms of trade spillovers. Despite the elegance of some of the theoretical developments, however, the quantitative magnitude of the spillovers that policy coordination was supposed to internalize appears to be negligible between the major trading blocs. Worse, even where the spillovers are quantitatively more important, for example within Europe, there is ambiguity over even the sign of the impact of the spillovers on the value of the policymakers' objective function (Bryant and others, 1988). Consequently it may be difficult to know whether the effect on uncoordinated policymaking is to lead to policies that are over or under-expansionary. Given that policymakers are as uncertain over the way the world works as academic economists, the prospects for meaningful practical policy coordination do not look good (Frankel and Rockett, 1988).

Are there any obvious reasons for thinking active macroeconomic

policy coordination is likely to be an important ingredient in any strategy to lower OECD unemployment? Certainly it cannot be an issue as far as the major trading blocs are concerned because most trade is within blocs rather than between them. Even within Europe I am doubtful that policy coordination is anything other than a rather marginal issue, provided that countries have freedom of maneuver with respect to monetary policy. The only potential problem comes in the short run, if the appropriate supply reforms in one country are not swiftly accompanied by increased domestic consumption and investment. In that case an increase in net exports is required and with it a real depreciation, most easily brought about through a monetary relaxation. Since this will in the short run also reduce the demand for foreign goods, and hence employment abroad, it may prompt other countries to level charges of "social dumping," especially if the supply-side reforms lead to a redirection of foreign direct investment away from them and into the reforming country. But the biggest danger here is that "policy coordination," in the guise of inflexible exchange rates, may actually prevent the desirable policies from being undertaken in the first place.

Incomes policy

Traditionally, incomes policies have been thought of as a counterinflationary strategy, but it is perhaps more correct to think of them as a particular supply-side policy that reduces wage pressure and thus also reduces the equilibrium rate of unemployment. The role for a reform of the wage-setting process in achieving a lasting reduction in equilibrium unemployment will be considered by other contributors to the conference. Here I want to briefly note the possible role for a temporary incomes policy to enhance the effectiveness of any expansion in aggregate demand.

Incomes policy, particularly those of a rather *dirigiste* nature, have a bad reputation among both academic economists and policymakers. There are two reasons for this. On the one hand they limit the action of market forces in directing labor from declining to expanding sectors of the economy, and thus reduce economic efficiency. On the other hand they have usually proven difficult to enforce for more than a short period as individual groups of workers find ways around the

controls. When the policy collapses the economy is no better off than before. Only in small economies, such as the Nordic countries and Switzerland, have centralized forms of wage setting shown any durability, presumably because in such economies it is easier to discourage individual groups from seeking to free ride on the restraint of others.

In the past, incomes policies have often been invoked when unemployment has been at historically relatively low levels. A temporary incomes policy may however be useful in economies where unemployment persistence due to insider membership dynamics is important. The key here is somehow to increase the pool of insiders who are responsible for wage negotiation. An incomes policy can prevent the existing pool of insiders from pushing up wages in the face of an expansion in demand, and instead lead to an increase in employment. Provided the new hires become part of the group of insiders, then subsequent wage pressure will be reduced and the increase in employment should be self-sustaining without the continual application of incomes policy and absent further unanticipated shocks.

It could be objected that this is an inferior policy to removing the features that give the insiders bargaining power in the first place. However while some of these, such as firing costs, may be susceptible to government regulation, others, such as the presence of firm-specific skills and the ability of the insiders to harass or refuse cooperation to new hires, are not. Furthermore even when government action can attack the source of insider power directly, it may be politically difficult to do so. In such circumstances temporary controls on incomes may be a useful second-best policy.

A country where I think this may prove useful is Spain. There administrative approval is required for collective dismissals affecting more than 10 percent of the workforce and, severance payments of twenty days' wages per year of service (~~forty-five days'~~ wages in the case of "unfair" dismissals) are required. These firing costs give the incumbent workforce considerable bargaining power, which is further underpinned by the system of collective bargaining under which agreements at the sectoral level provide a floor for subsequent negotiations at the firm level. From 1984 firms were, however, allowed to hire workers on fixed-term contracts of six months' duration (~~renew-~~

able up to five times) which were not subject to the same restrictions. By 1993 roughly a third of those in employment were engaged under this sort of temporary contract.

On the face of it, these temporary contracts are the sort of thing that the OECD jobs study endorses and indeed they have led to increased labor market flexibility in the sense that total employment is now more variable than before. However, as Bentolila and Dolado (1994) document, the effects on unemployment have not been as straightforward as one might expect. One might expect the presence of workers on temporary contracts to undermine the position of permanent workers, who are effectively the insiders in this economy. However, by providing a buffer of variable employment at the margin and thus reducing the layoff probability for permanent workers, they in fact seem to have had the effect of enhancing the bargaining position of the insiders. And unemployment in Spain has remained the highest in the European Union.

The latest (1994) reforms have done away with temporary contracts except for apprentices. However, severance pay requirements remain at their existing levels. Reducing these to more reasonable levels would probably help to reduce unemployment in the medium term—not by making employment more flexible, but by reducing worker bargaining power. However, this is politically difficult to implement when unemployment is high, because its immediate impact would probably be to increase unemployment further. Instead a temporary incomes policy—probably in the form of a floor and a ceiling on wage settlements in order to give some local flexibility—coupled with a demand expansion and a credible commitment to reduce firing costs once unemployment was falling, could make the transition to an economically preferable outcome politically feasible as well.

Conclusions

Despite the fact that adverse demand shocks share part of the blame for the rise in European unemployment, macroeconomic policies alone can carry only a little of the burden in reducing it. The most difficult task facing policymakers now is devising and implementing appropriate, and possibly politically difficult, supply-side reforms.

Once this is done, however, macroeconomic policies can play a useful supporting and cementing role by ensuring that the full benefits of structural reform materialize quickly. Such a supporting macroeconomic strategy will involve sustained robust growth and should aim at maintaining existing inflation rates, or even **permitting** a mild, but temporary, acceleration. Politicians and central bankers should therefore not be unduly alarmed by continuing strong growth in the wake of structural reform. Although such robust growth would help to solve many of the current fiscal difficulties, there seems little room for fiscal action to support demand in the short run. Instead, monetary policy must bear most of the burden. Given that successful reforms will tend to become self-sustaining in due course via their effect on investment, the appropriate monetary policy is likely to involve initial loosening and subsequent tightening. Finally in some countries a temporary incomes policy may prove a useful adjunct in overcoming unemployment persistence due to insider membership effects.

Author's Note: The opinions expressed in this paper are personal and should not be taken as indicative of any official position. I am grateful for the comments of my discussants Stanley Fischer, Takatoshi Ito, and Allan Meltzer.

APPENDIX

Aggregate Demand Policies with a Labor Market Reform

Output is given by the technology

$$(A1) \quad y_t = (1-a)l_t + u_t$$

where y_t is the logarithm of output, l_t is the logarithm of employment, and u_t indexes the level of technology. Competitive labor demand is then

$$(A2) \quad w_t - p_t = b - a l_t + u_t$$

where w_t is the logarithm of the wage, p_t is the logarithm of the price level, and $b = \ln(1-a)$.

The wage-setting schedule is

$$(A3) \quad w_t - p_t = c + d l_t + v_t$$

where v_t indexes the degree of wage pressure. The money wage is set at the start of the period to equilibrate labor demand and wage-setting in expectation

$$(A4) \quad w_t = E p_t + \phi_0 + \phi E u_t + (1-\phi) E v_t$$

where $E p_t$ denotes wage-setters' expectation of p_t at the start of the period (which may, but need not necessarily, be rational), $\phi_0 = (ac+bd)/(a+d)$ and $\phi = d/(a+d)$. Substituting the wage into equation A2 and then the resulting employment level into equation A1 gives output as

$$(A5) \quad y_t = \beta [(p_t - E p_t) + b - \phi_0 - \phi E u_t - (1-\phi) E v_t] + (1+\beta)u_t$$

where $\beta = (1-a)/a$. Equilibrium output under full information, y_t^* , is

$$(A6) \quad y_t^* = \beta(b - \phi_0) + [1 + \beta(1 - \phi)]u_t - \beta(1 - \phi)v_t$$

Hence the deviation of output from equilibrium is

$$(A7) \quad (y_t - y_t^*) = \beta[(p_t - E p_t) + \phi(u_t - E u_t) + (1 - \phi)(v_t - E v_t)]$$

Hence in order to stabilize output, the authorities would need to respond to a reduction in wage pressure (a fall in v_t) by increasing the price level through expansionary policies.

Endnotes

¹Since the real wage exceeds the reservation wage and price exceeds marginal cost if firms have some market power, both workers and firms will be jointly willing to supply the required increase in output so long as wages and prices cannot be adjusted.

²The reason for using the logarithm is the likely convexity of the wage-setting schedule, and reflects the fact that in Europe a given movement in capacity utilization in the 1960s was associated with a much smaller movement in the unemployment rate than during the 1980s.

³These assumptions correspond to the contemporaneous recursive ordering: capacity utilization, inflation, unemployment. With demand shocks assumed to have no contemporaneous effect on inflation the ordering becomes: inflation, capacity utilization, unemployment. Other, non-recursive decompositions have been investigated without altering the main message.

⁴The “no-demand-shock” unemployment rate is not strictly the same as the equilibrium unemployment rate, because sluggish wage and price adjustment will mean that supply-side disturbances do not have their full impact on unemployment immediately. However, the general tenor of the results are not affected by this caveat.

⁵Suppose the Phillips curve is

$$(1) \quad \pi_t = \alpha(u^*_t - u_t) + \pi_t^e$$

where u_t is unemployment, u^*_t is equilibrium unemployment, π_t is inflation, and π_t^e is expected inflation. The equilibrium unemployment rate follows the process

$$(2) \quad u^*_t = \beta \bar{u} + (1 - \beta)u_{t-1}$$

where \bar{u} is the long-run equilibrium unemployment rate. Substituting into the Phillips curve gives

$$(3) \quad \pi_t = \alpha\beta(\bar{u} - u_t) - \alpha(1 - \beta)(u_t - u_{t-1}) + \pi_t^e$$

⁶In the context of the diagram, the labor demand schedule, instead of being downward sloping, is an upside-down and backwards-facing L.

⁷Empirical evidence also suggests that it is the change, rather than the level, of the wedge (or its components) that matter. See for instance, Newell and Symons (1986) who in across-country study of sixteen OECD countries, report that 43 percent of any tax or terms of trade change is shifted onto product wages in the short run, but an average long-run effect of almost exactly zero.

⁸One might object that our earlier analysis demonstrates that in the long run, when capital is variable, no fall in real wages need occur. However, in the short run, capital is not variable, and furthermore, the increase in profitability associated with the decline in real wages will probably be necessary to elicit the extra investment that should occur subsequently.

⁹The wage elasticity conditional on the capital stock is actually the ratio of the elasticity of substitution between capital and labor to capital's income share. For a Cobb-Douglas technology this should be in the range 3-4. With adjustment costs to labor present, a somewhat smaller value

would be appropriate for evaluating a short-run elasticity. Much of the empirical work on the aggregate demand for labor actually suggests a *long-run* wage elasticity of around unity; in Bean (1994b), however, I argue that these studies are unlikely to have uncovered the true wage elasticity and instead estimate a combination of the labor and capital demand schedules.

¹⁰ For instance if preferences were quadratic in inflation and unemployment.

¹¹ As a simple example, suppose that inflation, π_t , is generated by the accelerationist Phillips curve

$$(1) \quad \pi_{t+1} = \pi_t + f(u_t, u^*)$$

where u_t is unemployment, u^* is equilibrium unemployment, $f_1 > 0$, $f_{11} < 0$, and $f(u^*, u^*) = 0$. There are two periods ($t=1, 2$), inflation starts at zero (that is, $\pi_0 = 0$) and must also end at zero ($\pi_2 = 0$). Thus

$$(2) \quad f(u_1, u^*) + f(u_2, u^*) = 0$$

The equilibrium rate, u^* , is uncertain during period $t=1$, but that uncertainty is resolved before the start of period $t=2$. The authorities then pick current unemployment, u_1 , in order to minimize the expected cumulative level of unemployment, $u_1 + u_2$, subject to equation 2. The associated optimality condition is

$$(3) \quad E[f_1(u_1, u^*)/f_1(u_2, u^*)] = 1$$

where E denotes the expectation operator. In the absence of uncertainty about u^* , this is satisfied at $u_1 = u_2 = u^*$. However, with uncertainty, $u_1 > u^*$ is generally optimal.

As a particular (relevant) example, let $f(u, u^*) = \alpha \ln(u^*/u)$. Then equation 2 implies that $u_2 = (u^*)^2/u_1$ while equation 3 becomes $E[u_2/u_1] = 1$. Hence

$$(4) \quad u_1^2 = E[u^{*2}] = \{E[u^*]\}^2 + Var[u^*]$$

¹² But I certainly do not rule out the possibility of deficit-neutral actions to improve the structure of the tax and spending system. In particular, moving toward an income support system that subsidizes work rather than idleness is highly desirable.

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