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UNEMPLOYMENT: GETTING THE QUESTIONS RIGHT -
AND SOME OF THE ANSWERS

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ABSTRACT

This paper analyzes the issue of persistent high unemployment. It focuses on two channels of persistence. The first is capital accumulation. The paper analyzes investment decisions under imperfect competition, focusing in particular on the effects of demand and cost shocks on investment, capital composition and bankruptcies, and their effect on employment and unemployment. The second is labor supply. The paper analyzes the various channels through which the unemployed may become disenfranchised, leading to higher equilibrium unemployment. In both cases, it briefly reviews and assesses the available empirical evidence. It ends by drawing several implications.

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The first Chelwood Gate conference on unemployment in 1985

(Economica 1986) could claim major accomplishments. For the first time, the European experience of high unemployment was analyzed within a largely common framework, and similarities and differences across countries systematically examined. But, at the end of the conference, the sense of elation at the progress achieved was mixed with uneasy feelings. There were at least two reasons. First, it was not clear within that framework how one could explain what appeared to have become, by 1985, persistent high equilibrium unemployment. Second, the diversity of explanations across countries, which laid the blame alternatively on increases in tax wedges, shifts in Beveridge curves and assorted time trends, was, given the commonality of unemployment experiences, very much unsettling.

Thus, Chelwood Gate 2 was born. The research program which is reflected in the papers presented at this conference has focused naturally on two tasks. The first has been to further unify and refine the common framework. The second has been to extend that framework so as to explain persistent high unemployment. Fortunately for researchers, unfortunately for Europe, equilibrium high unemployment is still with us, giving us three more years of data and making the question just as topical as it was three years ago.

Has the goal been achieved or should we already be preparing Chelwood Gate 3? It would be presumptuous for me to give a general assessment. But, just as at the end of Chelwood Gate 1, I have mixed

feelings. This time, they have a different origin. I am afraid that the research program may have been overambitious. The model estimated in the country papers is a rich one, allowing in particular for a putty-clay technology, allowing for differences across firms and dealing explicitly with aggregation, estimating the complete structure of demand. While much is learned, the very richness of the model makes it harder to see how the model can --in its analytical version-- and does --in its empirical incarnations--, explain what I see as the crucial issue, the persistence of high unemployment. Thus, in this paper, I present a barebone version of the model, one which, I hope, preserves its logic, allows to focus on the main issue at hand and to discuss, in that light, the results obtained in the country papers.

In section 1, I go back one step and present the Chelwood Gate 1 model as embodied in the Solow and Bean papers presented at that conference. This provides a convenient way of introducing the central issues. Sections 2 and 3 extend that model by focusing on channels for persistence. Both rely on the simple idea that prolonged unemployment leads to decreases in factors of production, leading to higher equilibrium unemployment. Section 2 examines the role of capital accumulation. Section 3 examines the role of effective labor supply, the possibility that prolonged unemployment effectively disenfranchises part of the labor force. Section 4 discusses a few odds and ends and briefly speculates on policy implications.

Section 1. Chelwood Gate Mark 1

Like any model aimed at explaining employment, Chelwood Gate Mark 1 was fundamentally a model of labor demand and labor supply. The model was however eclectic, recognizing the imperfectly competitive nature of goods markets and the complex nature of wage bargaining in the labor market¹. What follows is a simple version of that model. Its purpose is to introduce the central issues and it does not do full justice to the original. In particular it ignores the open economy nature of European economies. It also ignores most relevant dynamics ; but this is only to introduce them and focus on their implications in the next two sections.

1. Price setting, wage setting and aggregate demand.

The model builds on three equations. The first is price setting by firms under imperfect competition. The second is wage setting, which results from bargaining between firms and workers. The third is aggregate demand.

Price setting

Imperfect competition in the goods market and the recognition that firms actually set prices and thus real product wages, is an important element of any story about unemployment. The Dixit-Stiglitz version of Chamberlinian monopolistic competition has proven to be a most useful workhorse and I follow tradition :

At any point of time, there is a given number of firms. Each faces a demand function given by

$$y_i = y - c(p_i - p), \quad c > 1$$

where all variables (here and later) are in logarithms, all constants (here and later) are ignored. y_i is demand for good i , y is aggregate demand. p_i and p are the nominal price of good i and the price level respectively. Ignoring fixed costs of production, production is characterized by:

$$n_i - k_i = a(y_i - k_i - q_i), \quad a > 1$$

where n_i , k_i , q_i are employment, the capital stock, and total factor productivity of firm i respectively². At any point in time, the capital stock is given from the past. There may be fixed costs ; this is not relevant until we endogenize capital and the number of firms.

Profit maximization delivers a price setting equation for each firm:

$$p_i - E p = b(-q_i + (a-1)(E y - k_i - q_i) + (E w - E p)) ; \quad b = (1+c(a-1))^{-1},$$

$$0 < b < 1$$

Together with this price equation come an employment and an output equation for each firm. Ignoring for an instant the E 's on the right hand side, the relative price chosen by each firm depends on three terms, which the firm takes as exogenous. The first is total factor productivity. The second is aggregate demand, scaled by the firm's capital stock and productivity : an increase in y leads the firm to increase its price, as well as its output supply and employment. The third is the aggregate real wage, the nominal wage divided by the price level. An increase in the aggregate real wage leads the firm to increase its relative price, and to decrease supply and employment. This is an

important point : from the point of view of each firm, both aggregate demand and the aggregate real wage are independent forces, and both beyond its control.

The E 's stand for expectations and allow for price decisions to be made not on the basis of current values of y , w or p , but on the basis of past expectations of those variables. The motivation is to allow for potential effects of aggregate demand ; the exact specification of what E exactly stands for may be quite complex, as work on staggering has shown. For analytical purposes, assuming either that E stands for expectations held as of one period earlier, or even more crudely that $E x = x(-1)$ for any x is enough to make most points.

By symmetry, all firms act identically, so that the price setting equation implies :

$$(1) \quad p - E p = b((a-1)(E y - k - q) - q + (E w - E p))$$

Wage setting

Chelwood Gate 1 was, I think rightly, agnostic as to the specifics of wage setting. Having rejected the Phillips curve black box, we are just starting to explore relative empirical merits of efficiency wages, insider-outsider and other theories of wage setting ; it is far too early to impose heavy structure on an aggregate wage equation. Following Chelwood Gate 1, I assume the wage setting equation takes the form :

$$(2) \quad w = E p + c(n - \underline{n}) + z$$

where \underline{n} is the labor force, and z is a vector of variables influencing wage bargains. One standard interpretation of this equation is as the

outcome of the choice of the expected real wage and employment by a monopoly union facing a labor demand schedule, but other interpretations are possible. Again, E stands for expectation, generously interpreted, may include among other things total factor productivity q , or perhaps actual labor productivity, $y-n$; it may include taxes, measures of mismatch. All of those were included in one or the other of the wage equations estimated for Chelwood Gate 1. As will be abundantly clear, the exact form of the wage setting equation and what z includes turn out to be crucially important, and we shall need to dig deeper into where equation (2) exactly comes from. I defer digging to later.

Aggregate demand

Here, I stay well short of the treatment of aggregate demand in Chelwood Gate 1 and 2. Given the issues at hand, all I need is the possibility of shocks to aggregate demand and a negative effect of the price level on the level of demand. Thus, I assume :

$$(3) \quad y = x - p$$

where y is again aggregate demand, and x is the vector of variables which affect aggregate demand.

2. Equilibrium and actual unemployment rates

Equations (1) to (3) characterize the economy. Given a specification of the E 's, one can easily characterize the actual level of unemployment. Or, assuming that the E 's stand for actual values, one obtains equilibrium unemployment. I look at them in reverse order. Having

done so, I use the results to describe the main conclusions of --and the issues raised by-- Chelwood Gate 1.

Equilibrium unemployment

Equilibrium unemployment is defined as the level of unemployment which would prevail, were all expectations equal to actual values. While when we introduce dynamics, the definition would have to be explicit as to what past values of unemployment are taken to be (equilibrium, actual ?), this issue does not arise here yet.

When expectations are equal to actual values, the price equation (1) becomes:

$$(1') \quad p-w = -q + (a-1)(y-k-q), \text{ or using the production function}$$

$$p-w = -q + ((a-1)/a)(n-k)$$

Thus, while aggregate demand and real wages are taken as independent influences by firms, equilibrium (so defined) implies a relation between the real wage and aggregate demand. Equivalently, the second line implies, just as under perfect competition, a relation between employment and the real wage, a pseudo labor demand relation.

The wage equation is simply :

$$(2') \quad w-p = c(n-n) + z$$

It is clear that those two equations alone determine the equilibrium real wage and level of unemployment. The real wage set by bargaining must be consistent with the real wage that firms are ready to pay. In the useful Layard-Nickell (1987) terminology, the target real

wage, from wage bargaining, must be consistent with the warranted real wage, the wage implied by price setting. Or, put yet another way, unemployment must reconcile the income claims of firms and workers. The aggregate demand relation, as usual, plays no other role in equilibrium than to determine the price level or the rate of inflation.

Solving for equilibrium unemployment, and denoting it by a star, gives :

$$(4) \quad \underline{n} - n^* = ((a-1)+ac)^{-1}((a-1)(\underline{n}-k) - aq + az)$$

The equilibrium level of unemployment depends on three sets of factors, the ratio of capital to the labor force, total factor productivity and whatever factors belong to z .

By contrast, actual unemployment depends on aggregate demand. Its properties depend on the exact characterization of what the E.'s stand for. One example makes the basic point :

Actual unemployment

Assume that, for both workers and firms, $E_p = p(-1) + (p(-1) - p(-2))$, and that for all other variables, expectations are equal to actual values. Then, equations (1), (2) and (3) become :

$$(1'') \quad p = bw + (1-b)(p(-1) + (p(-1) - p(-2))) + b(a-1)(y-k-q) - bq$$

$$(2'') \quad w = p(-1) + (p(-1) - p(-2)) + c(n - \underline{n}) + z$$

$$(3'') \quad y = x - p$$

Note, from the first equation that there is no longer a simple relation between the real wage and the level of aggregate demand, or between the

real wage and employment. Solving the first two equations for prices gives :

$$(5) \quad p-p(-1) = (p(-1)-p(-2)) + (b/a)(ac+a-1)(n-n^*)$$

This equation has a definite air of *deja vu*, giving the rate of change of inflation as a function of the deviation of the unemployment rate from its equilibrium value. Inflation accelerates or decelerates depending on whether the rate of unemployment is below or above equilibrium, a Phillips curve like relation. Unemployment is in turn determined by aggregate demand and the production function :

$$(6) \quad \underline{n} - n = \underline{n} - (1-a)k - a(x-p) + aq$$

Together, equations (5) and (6) imply that, given x , actual unemployment converges to equilibrium unemployment.

3. Conclusions from Chelwood Gate 1

Within that broad framework, much of Chelwood Gate 1 was focused on two main issues. The first was that of how much the increase in unemployment was an increase in equilibrium unemployment, or instead an increase in actual unemployment over its equilibrium value. The answer was quite unanimous : while the increase in unemployment had been in part due to demand, by 1985 actual and equilibrium rates roughly coincided : this was reflected in the relative constancy of inflation rates.

The second and central issue was that of what explained this increase in equilibrium unemployment, of the respective contributions of $(\underline{n}-k)$, q and z . This is where the picture was more confused, both conceptually and empirically :

Specifications varied in essential ways. One important difference was for example the treatment of productivity in the wage equation. Should one assume that z did not include productivity, in which case the model had the unappealing implication of predicting steadily declining unemployment? Or, should one assume that z included productivity, and if so in what form? Should it be total factor productivity --either actual or trend-- , or should it be labor productivity --either actual, $n-k$, or trend, n^*-k ? The approach of Layard and Nickell for example was to assume a priori that neither $n-k$, nor q could affect equilibrium unemployment, to assume that z had the form $z = q - ((a-1)/a)(n-k) + z'$; this implied that the increase in unemployment could only be explained by factors in z' , not by changes in capital intensity or in productivity growth.

Even when specifications were common, results differed in essential ways. This was reflected most vividly in Bean et al's summary table (table 4) of the decomposition of the increase in equilibrium unemployment, constructed using a common model specification but reaching drastically different results across countries.

The false dichotomy between equilibrium and actual unemployment

Why didn't Chelwood Gate 1 give a convincing explanation of high persistent unemployment? Fundamentally, this came from too sharp a dichotomy between equilibrium and actual unemployment.

Part of the appeal of the Chelwood Gate 1 model was indeed that very dichotomy, which gave a way of organizing thoughts about movements in

unemployment. The image of unemployment given by the model was one of aggregate demand driven fluctuations in actual unemployment around an equilibrium level which itself moved in response to movements in z , q and $(n-k)$. One could then think separately of factors affecting actual and equilibrium unemployment. But it was precisely this dichotomy which did not fit the experience of the 1980's, in which a sharp, aggregate demand induced increase in unemployment had been followed by an increase in equilibrium unemployment. Thus, it was this dichotomy which had to be abandoned for progress to be made.

It was clear that the dichotomy was at best a conceptual convenience. After a period of high actual unemployment, if nominal rigidities were suddenly lifted, the economy could not and would not return instantaneously to its previous level of unemployment. Costs of adjusting labor would for example lead firms to increase employment only gradually. But, were this the only factor involved, the economy would return fairly quickly to its previous level of equilibrium unemployment and the dichotomy embodied in the model above would still provide a useful conceptual shortcut for all but the short run. The question was therefore whether there were factors which would be triggered by high actual unemployment and would imply a very slow return, or perhaps no return at all, to previous levels of unemployment, explaining the European experience.

Two such channels were already suggested at Chelwood Gate 1, and both of them are explored at more length at this conference. The first, which was emphasized in the papers by Dreze and Sneessens on Belgium, and

by Malinvaud on France, is that of capital accumulation. A long period of high unemployment may lead to capital decumulation, increasing equilibrium unemployment. This channel is present, but not emphasized, in the model above. The second was emphasized by Gregory in his paper on Australia. A long period of high unemployment may lead to changes in the structure of labor markets, and to the disenfranchise of part of the labor force, increasing equilibrium unemployment. I explore both of them in turn, examining their logical structure as well as the empirical evidence presented in the country papers³.

Section 2. Capital Accumulation and the Persistence of Unemployment

That the dynamics of capital accumulation can amplify the effects of factor prices on labor demand and unemployment is an old idea, dating far beyond Chelwood Gate 1. The response of investment decisions to changes in real wages or other factor prices under perfect competition is well understood⁴. How must the story be modified when we allow for imperfect competition? After all, the real product wage is now a decision variable of firms. Does it make sense to think of investment as depending on the wage, on aggregate demand? I first review the logic of capital accumulation decisions under imperfect competition before turning to the empirical evidence.

1. Capital accumulation : the firms' decisions

The monopolistic competition framework introduced earlier provides a natural structure to think about investment decisions⁵. Ignore for the moment the decision of firms as to whether to operate or to shut down (for example, assume that there are no fixed costs, and that there is a given number of firms, assumptions to be relaxed later). It is straightforward to derive the (logarithm of the) optimal capital stock for firm i , kd_i :

$$kd_i \cdot k_i = (y_i - k_i - q_i) - (1/a)[r - (w-p)], \text{ where}$$

$$y_i = (y + cq_i) - c(1 - (1/a))r - c(1/a)(w-p)$$

where r is the (logarithm of the) real user cost of capital. E.s could and should be introduced as they were earlier but this is not the point I want to focus on here. The first line follows from cost minimization, and

gives kd_i given y_i . The second line gives optimal y_i when the firm can choose both factors freely. Combining both to eliminate y_i gives :

$$(7) \quad kd_i - k_i = (y - k_i - q_i) + cq - (1/a)[(ac+1-c)r + (c-1)(w-p)]$$

Just as for price, employment and output decisions before, each firm perceives two independent economy-wide forces as relevant to its investment decisions. The first is aggregate demand ; other things equal, aggregate demand affects optimal capital one for one (in elasticity terms). The second is factor prices, the aggregate real wage and user cost of capital. Factor prices have the usual two effects on investment, cost and substitution effects. An increase in the user cost decreases optimal output and optimal capital intensity. An increase in real wages decreases optimal output but leads firms to shift to more capital intensive methods of production.

Going from optimal capital to investment requires a specification of costs of adjustment. This part is well travelled ground, which there is no need to retrace. When the firm has adjusted to its desired capital stock, its relative price is given by :

$$(8) \quad p_i - p = -q + (1 - (1/a))r + (1/a)(w-p)$$

which is nothing else than the factor price frontier (adjusted for the mark up from monopoly power which should appear in the -neglected- constant term). Long run marginal cost is independent of the level of output.

2. Capital accumulation and unemployment

Just as before, while each firm takes aggregate demand and aggregate real wages as given, these are determined at the aggregate level by the interaction of firms decisions, wage setting and the aggregate demand relation. Here, the steps are the same as in section 1; the outcome, given k , is characterized by equations (1) to (3); but now k changes over time. If for firms, expectations (the "E.s") are equal to actual values, then there is a relation between real wages and aggregate demand, namely equation (1'); otherwise, there may not be any simple relation between real wages and aggregate demand. Thus, even at the aggregate level, we can still think of investment as depending on both aggregate demand and real wages.

There is no point in tracing through the dynamics of different shocks. I first work out the long run effects (once capital has adjusted) on equilibrium unemployment of changes in z . Then, I consider one example of dynamic adjustment, which reintroduces fixed costs and bankruptcies and allows to make a number of relevant points.

In the long run, from equation (8), the equilibrium relation between prices, wages and user cost is :

$$(9) \quad p-w = (a-1)r - aq$$

Thus, if the user cost is fixed (in real terms), the real wage is fixed from price setting in the long run. Firms will choose prices so as to reestablish that real wage. Combining this with the wage setting equation, which for the moment, we still take to be

$$(2) \quad w-p = c(n-\underline{n}) + z$$

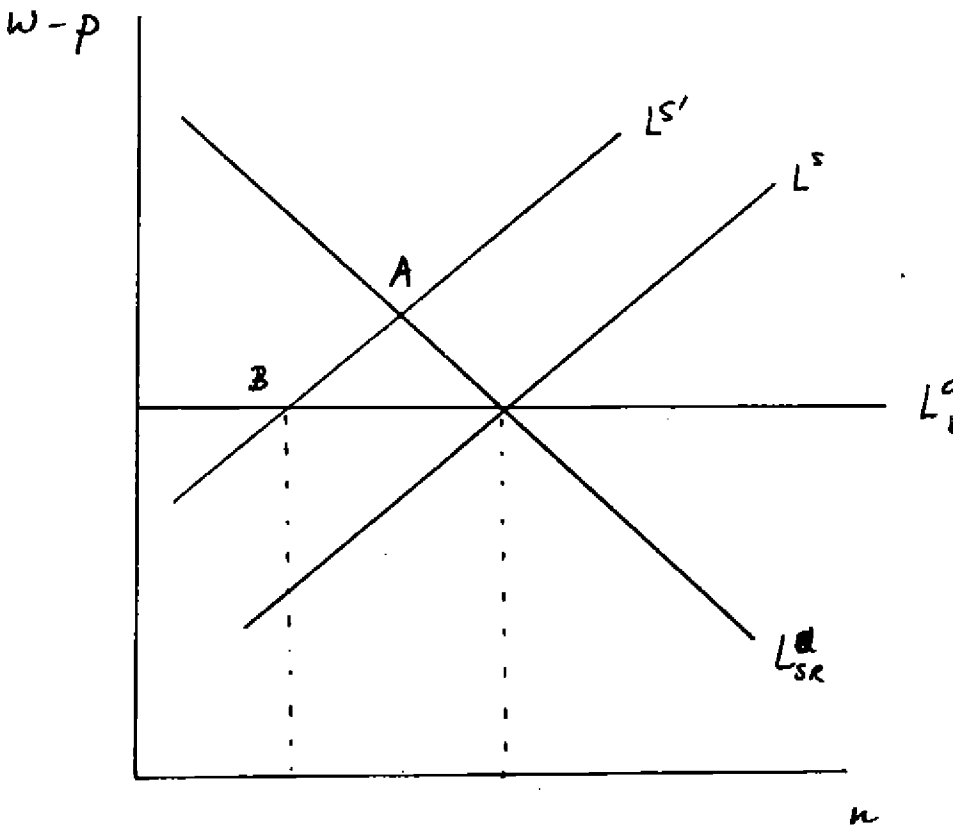


Figure 1.

we get an expression for the long run level of equilibrium unemployment :

$$(10) \quad n - \bar{n} = (1/c)(-(a-1)r + aq - z)$$

The level of unemployment has to be such as to reconcile the target real wage with the warranted real wage, which is independent of z . The effect of z on equilibrium unemployment is clearly larger in the long run than in the short run. This is shown in figure 1 : short run aggregate "labor demand", equation (1'), is downward sloping ; long run aggregate "labor demand", equation (10), is horizontal. An increase in z shifts labor supply, equation (2) inwards, leading to A in the short run, B in the long run. The increase in z leads to a short run increase in real wages, triggering capital decumulation, further increasing equilibrium unemployment over time.

Shocks to aggregate demand still do not affect long run equilibrium unemployment (they obviously could if they implied a permanent change in interest rates and the user cost, as indeed they have done in the 1980's). But to the extent that they can temporarily affect unemployment -to the extent that E_s are not equal to actual values-, they can have substantial effects on capital accumulation, thus leading to increases in equilibrium unemployment along the path of adjustment. The dynamics of adjustment can be very rich. Consider the following example:

Suppose that the economy is a Dixit-Stiglitz economy, where each firm must, in order to produce, pay fixed -capital- costs. Assume also that, once fixed costs have been paid, the firm only needs to use labor, so that marginal cost is constant. With free entry, the number of firms

is such that there is zero net profit, that the size of the demand facing each firm is such as to generate operating profits which cover capital costs. Assume further that E.s for firms are equal to actual values.

Using those assumptions in equation (1') gives a simple price setting equation :

$$p = w - q$$

The wage setting and aggregate demand equations are as before, with, in the wage setting equation, $E_p = p(-1)$. This allows for nominal rigidities and an effect of aggregate demand on unemployment. Thus :

$$w = p(-1) + c(n-n) + z$$

$$n = y - x - p$$

where the last relation between output and employment comes from the assumption of constant returns to labor.

Consider the effect of an increase in z , say an increase in workers' militancy, which leads to an increase in nominal wages given prices. Firms increase their nominal price to maintain their markup. The increase in the price level reduces aggregate demand, reduces the demand facing each firm. Thus, the market becomes too small to support all of them, and some firms go bankrupt. Employment decreases. This process however goes on ; given the increase in the price level, workers further increase the nominal wage, leading to further increases in prices, further reduction in demand, further bankruptcies. This process goes on until unemployment leads workers to accept the warranted real wage. In equilibrium, real wages are unchanged, but the number of firms, capital (fixed costs) and employment are all smaller⁶. While this has described

the effects of z , the same analysis can be used to study the effects of a demand contraction. While a demand contraction has no long run effect, it leads for some period of time to bankruptcies and decreases in capital and in employment. Even when the initial demand contraction disappears, firms need to be reopened for the economy to return to its initial equilibrium.

In addition to giving a simple handle on the interaction between capital accumulation and unemployment, this example is useful in other ways. Consider, in passing, those two points : (1) capital decreases here without any movement in real wages or user costs ; this would make life difficult for investment functions based on factor prices. (2) While the problem is clearly a problem of unwarranted wage demands, firms will perceive it partly as a problem of wages and partly as a problem of demand, as the demand they face keeps shifting adversely over time ; this suggests the dangers of using firms' perceptions to characterize the origin of unemployment, as is done in some European countries.

3. Capital accumulation and unemployment. Lessons from Chelwood Gate 2.

The interaction between capital accumulation and unemployment is the first main theme of Chelwood Gate 2. The basic theme is simple and very much consistent with the analysis above : the increase in real wages in the 1970's and the demand contraction of the 1980's have led to a large relative decline in capital accumulation, which has contributed to the increase in equilibrium unemployment.

Conceptually, this effect is already fully captured in the price setting equation, and in the model of section 1. Equation (4) makes clear

how equilibrium unemployment is likely to be affected by the level of capital accumulation. A decrease in capital shifts marginal cost upwards, leading firms to increase their price given wages, or equivalently, to decrease the wage that they offer at any level of employment. This will, unless workers accept the required fall in the real wage lead to an increase in equilibrium unemployment.

The papers at this conference go however beyond relying on their estimates obtained from price equations. There are indeed a few good reasons to think that empirical price equations will not fully capture the effects of capital decumulation on price setting and thus on unemployment:

The first, which is investigated at length in the papers is the putty-clay nature of technology. Suppose that the decrease in investment rates in Europe hides a sharp decrease in the number of machines, partly compensated by a shift towards higher capital intensity machines. The number of jobs consistent with full employment of machines has fallen more sharply than the capital stock numbers might suggest. Or, and this is again related to putty-clay, the underlying marginal cost curve (remember that the price setting equation is, under the assumption of constant elasticity of demand just a parallel translation of marginal cost) may be much more non linear than suggested in the price equation above. Firms may be able to satisfy demand at roughly constant marginal cost until they hit a capacity constraint at which they cannot increase employment at any positive real wage. Finally, firms may use delivery lags or rationing (permanently ?) instead of increasing prices, so that again the estimated price equation may not reflect the slope of the marginal cost curve.

For all those reasons, the papers use an alternative, complementary, approach, and estimate the level of employment consistent with full employment of capital under a strict short run Leontief assumption. While those papers use a more sophisticated approach, they confirm what a first pass examination of the data would suggest. Profit rates decreased sharply in the 1970's and have only recently started to recover : the profitability index computed by the EEC, which is normalized to equal 100 over the 1960's stood at 60 in 1975, 65 in 1980 and stands now at approximately 75⁷. How much of this profit slump is due to demand and how much to cost shocks is an important (and well defined, as I have shown above) question, to which we do not have yet an answer. This decrease in profitability has affected investment. The table below gives investment rates in Europe and their relation to the growth rate of output:

Table 1

(EEC12)	Investment/GNP ratio	Growth rate of GDP
: 70/61 :	23.1%	4.8%
80/71 :	22.5	3.0%
87/81 :	19.5	1.6%

Source : European Commission

Investment rates have indeed gone down. But if we take marginal K/Y to be roughly equal to 2, they appeared to have gone down by less than would have been predicted from the decrease in output growth, suggesting that part of investment has taken the form of an increase in capital intensity. Table 2, which gives average capacity utilisation rates in manufacturing for EEC countries makes this last point simply.

Table 2

Capacity utilization in manufacturing industry

	Peak73	Trough75	Peak79/80	Trough82/83	January88
EEC9	86.4	75.0	83.9	76.4	84.2

Capacity utilization is now close to historical peak values.

Whether or not we must interpret this as telling us that economy wide employment cannot be increased is open to question. I do not believe so and return to the issue in section 4. However it surely tells us that firms have decreased capacity in line with the slowdown in output, and that capital accumulation is surely responsible for part of the increase in equilibrium unemployment.

This section has highlighted the potential role of capital in generating persistence of unemployment. As a transition to the next section, note however the importance of wage setting in the background. How capital accumulation affects wages is all important for persistence and amplification. In particular, a central issue is that of what productivity term belongs to the wage equation. If for example, wages depend on actual labor productivity rather than, say, on total factor productivity, efforts by firms to reduce costs by shifting to more capital intensive techniques will be self defeating. This is for example the line of argument used by Hellwig and Neuman(1987) to explain the increase in unemployment in Germany. More generally, there is an obvious loose end in the argument that capital shortages are to blame for high unemployment.

Granted the decrease in capital, we still have to explain why unemployed workers do not accept lower real wages in the face of such high unemployment.

Section 3. Labor Supply and the Persistence of Unemployment

The traditional representation of wage setting had long been in terms of a Phillips curve relation, between unemployment and wage inflation given price inflation. It is clear that the current experience requires us to go beyond such a black box relation. The natural starting point in Europe is with wage bargaining between unions and firms. While this also is an age old subject, recent work has suggested new and important twists. Again, I review the current state of thought and then turn to the empirical evidence.

1. Persistence of unemployment and membership effects

If wages are set by bargaining between unions and firms, one would not expect the unemployed and the employed to have the same weight in bargaining. Quite simply, one would expect the employed workers to have more weight in bargaining. This simple remark would seem rather obvious and hardly controversial ; it has however important implications, and in particular suggests a very natural channel for unemployment persistence. The lower the number of workers employed today, the lower is bargained employment likely to be tomorrow.

The argument was stated by Gregory at Chelwood Gate 1 and applied by him to the case of Australia. It has been the subject of substantial research since then. In Blanchard and Summers (1987), we pushed the argument to its logical limit, by looking at the case where unions are

monopoly unions, with membership equal to employment at the time of bargaining. We showed, not surprisingly, that employment would follow a random walk. Low employment would lead those who remained employed to try to preserve their jobs, not to lower wages to create new ones. Movements in actual unemployment would translate one for one in permanent changes in equilibrium unemployment, an effect which has come to be known as hysteresis (see papers in Cross (1988)).

The following variation on the model of section 1 makes the point simply. Assume that all firms operate under constant returns to labor ($a=1$), and that all E_i 's for firms are equal to actual values. This implies :

$$(11) \quad p = w - q \quad \text{and} \quad n = y - q$$

Aggregate demand is still given by $y = x - p$, so that replacing p from (11) gives a derived demand for labor :

$$n = x - w$$

Given this derived demand, assume that the union chooses the nominal wage w before it knows x , thus based on E_x rather than x , and that it chooses the wage so that, in expected value, its members are employed. Assume finally that membership is given by $n(-1) + d(\underline{n} - n(-1))$. If $d=1$, membership is equal to the labor force ; if $d=0$, membership is equal to last period employment. Then, the wage equation takes the form :

$$w = E_x - n(-1) - d(\underline{n} - n(-1)),$$

and the behavior of employment (unemployment) is given by :

$$(12) \quad \underline{n} - n = (1-d)(\underline{n} - n(-1)) - (x - E_x)$$

All the dynamics of unemployment come from membership effects. If $d=0$, when unions only care about the currently employed, and under rational expectations for the union, employment follows a random walk.

This limiting case is, like all limiting cases, both revealing and too strong. It is probably safe to assume that, except perhaps in those countries where bargaining takes place at the national level, unions are indeed mostly concerned about the interests of the employed and, perhaps, the recently laid off. But the argument neglects the bargaining power of firms which presumably have the option, perhaps at some high cost, to bypass unions and go to the unemployed⁸. It also neglects the fact that for many low skill jobs, insider effects are likely to be weak. And thus, if we are to explain persistent high unemployment along those lines, we must explain why the unemployed exert little or no pressure on wage bargaining.

2. Disaffection and the persistence of unemployment

That the long term unemployed appeared to have little effect on wage setting was also emphasized at Chelwood Gate 1 by Layard and Nickell in their analysis of unemployment in the UK. It also has been the subject of heavy research since then.

The argument that long term unemployment may lead to the loss of skills, reducing human capital and thus decreasing equilibrium employment dates back at least to Phelps (1972). That high unemployment today comes

from the fact that the long term unemployed have become unemployable does not however seem to capture the current European experience. What appears to be at work is a more complex, more diffuse, change in attitudes towards unemployment.

Despite a move since the early 80's toward a less generous unemployment benefit system, unemployment in Europe is, for the most part and for the better, not a life threatening experience. In times of low unemployment however, there is a stigma associated with being unemployed. Being unemployed reflects on the individual, rather than on society. A period of high unemployment, which leads to very high rates of long term unemployment among specific groups changes their attitudes. Being unemployed becomes normal, rather than deviant behavior. The fact that others are unemployed also makes being unemployed less unattractive. The low probability of getting jobs leads the unemployed to decrease their search effort. Beyond those changes in attitudes, deeper changes take place which further alleviate the burden of unemployment. For example, the family structure adapts, with a higher proportion of young workers staying at home to survive more easily on their unemployment benefits. Government programs develop to provide short term employment to target groups; those programs have ambiguous effects on equilibrium unemployment. Early on, they may prevent the development of an unemployment culture; the Swedish experience provides evidence in favor of that effect. But by providing cheaper labor to firms and allowing the unemployed to go back and forth between unemployment and short term employment opportunities, they decrease the pressure of unemployment on

wages. All these effects make unemployment more tolerable. They also decrease however the pressure that unemployment puts on wages, thus potentially increasing equilibrium unemployment.

3. Membership and disaffection effects : empirical evidence

In contrast to the approach used to study the implications of capital accumulation, the papers limit themselves for the most part to the estimation of aggregate wage equations. While conceptually this is precisely what is needed, I suspect that we have learned everything we can from aggregate wage equations, and that we need to go much further.

There are two reasons to be skeptical of what can be learned from such equations. The first is the issue of simultaneity. Can we really hope to identify, when we use yearly data, the wage and the price setting equations ? Under many specifications of wage bargaining, all the variables affecting price decisions will also affect wage setting. More importantly in the present context, the effects suggested above are likely to affect wage bargaining slowly over time. The pressure from a given level of unemployment on wages may slowly decrease over time, as the long term unemployed slowly change attitudes, as the laid off workers are slowly ignored in wage negotiations. Testing whether unemployment comes in levels or in first differences is a very coarse test in this context.

What should then research be focused on ? Given the tentative nature of many of the hypotheses sketched above, I believe that we should still be at the shopping stage, gathering qualitative and quantitative evidence which sheds light on those aspects of the labor market, looking

at the disaggregated evidence from specific industries. And here, there is plenty of evidence to gather. For example:

On the difference between the employed and the unemployed, between insiders and outsiders : At the beginning of 1987, in the UK, 34% of manufacturing workers worked overtime, a figure just equal to the cyclical peaks in 1974 and 1977, significantly above the 26% overtime figure for 1981 and the 29% observed in the recessions of 1973 and 1976. In June of 1985, 45% of those who were employed thought that they could find a job quickly if they became unemployed compared to 40% in 1977 when the unemployment was only half as high⁹. The differential between minimum and average wage appears to have narrowed in many countries : in France for example, the ratio of the minimum wage to the wage of a skilled worker (P3 in the French classification) has increased from 57% in 1973 to 67% in 1985¹⁰. In the UK, relative wages of workers around the median earnings level have decreased since 1979¹¹. The evidence on the incidence and the concentration of long term unemployment is well documented (see for example the papers in Cross (1988))

On the change in attitude with respect to unemployment and changes in family structure. British libraries in the Midlands make available pamphlets with the title : "Leaving School : what you should know about social security benefits." In France, among those under 50 who have been unemployed for more than two years, 25% are effectively not looking for a new job, compared to 15% for those unemployed for less than a year. Among those above 50, the numbers are respectively equal to 44% versus 25%. Among 25 years old male workers in France, 55% of those who are unemployed

live at home, compared to 30% for those who work¹². The unemployment rate in Spain is of 45% for young workers, but reaches 60% for those living at home.

We clearly have to go beyond such anecdotal evidence. We have to understand how the unemployed affect wage bargaining. This surely depends on labor market and goods market structure and institutions, on how easy it is to create new firms, on whether collective agreements automatically extend to new firms and so on. I do not think we fully understand those aspects of the labor market. But both the logic of wage bargaining, and the anecdotal evidence strongly suggest that the dynamics of labor supply are a central channel of persistence of equilibrium unemployment.

Section 4. Missing Parts and Policy implications

While many details are still fuzzy, a broad framework is emerging. With it also emerges a broad consensus about the causes of high persistent unemployment. The increase in unemployment is attributed to a variety of supply and demand factors, with supply factors dominating the scene in the 1970's, and demand factors playing a major role in the further increase in unemployment of the early 1980's. These original factors have in large part disappeared. But unemployment has not ; the reason is to be found in capital and labor supply effects : high actual unemployment has led to an increase in equilibrium unemployment.

In this last section, I want to touch on two issues. First, should we plan further research within this broad framework, or are some important angles still left out ? Second, taking our tentative conclusions about the causes of persistent unemployment at face value, what policies should we be recommending ?

1. Could we be on the wrong track ?

Many other explanations have been adduced to explain European unemployment¹³. Many focus on changes in industrial structure, a factor which is not emphasized in the above framework. That factor was not discarded a priori. It was considered at Chelwood Gate 1 : results on movements in mismatch indices were reported by Layard and Nickell for the UK, and by Franz and Konig for Germany. Those indices, computed by

looking at the relation between unemployment and vacancy rates by industry, region or occupation, did not reveal any obvious increase, suggesting, contrary to common perceptions, that there had been no drastic change in the pace of industrial reorganization¹⁴. I suspect that however that the dismissal may have been too fast:

One of the characteristics of the current unemployment situation is the disproportionate incidence of unemployment among unskilled workers. The ratio of unemployment rates of semi- and unskilled manual workers to the total unemployment rate is equal to 1.9 in the UK, compared to 1.2 in the US. At the same time, there is at least anecdotal evidence of shortages of skilled workers. This suggests that we may not have looked in the right direction: a mismatch index by skill may well reveal higher mismatch.

What could explain such a mismatch? One line of explanation, which has not received the quantitative attention that it deserves, has been developed by Piore and Sabel (1984). Put in more neoclassical terms than their own, the argument is the following. Changes in the nature of markets and in the nature of products have led over the last fifteen years to a movement away from mass production to what they call "flexible specialization". Such a shift translates into a change in relative demands for skilled and unskilled labor. If the wage for unskilled workers is inflexible downwards, or if skilled-unskilled wage differentials are rigid, this shift translates into unemployment of unskilled workers, and an increase in real wages for skilled workers. It is clear that this line of explanation does not explain the sharp increase

in unemployment of the early 1980's. It also does not easily explain why, for example, the wage of skilled workers relative to the average wage has not increased over the last five years, while the reverse held for the wage of low skilled workers. But it may well be part of the overall story and deserves more attention.

2. What implications should we draw ?

Suppose that it is indeed the case that, because of capital and labor supply effects, equilibrium and actual unemployment are roughly equal. Does this imply that there is no room for reflation ? Put another way, if demand policies were aimed at decreasing actual unemployment, would equilibrium unemployment stay high or follow quickly in tow ?

Consider the capital accumulation constraint. The computation given in the papers of employment at full capacity utilization suggests a stringent short run barrier to employment expansion, a marginal cost curve which turns vertical at levels of employment close to current levels. By contrast, price equations suggest a much more gently sloping marginal cost curve, suggest that increased employment may require increases in markups, but may nevertheless be technically feasible. How can we tell ? History gives us a nearly clean experiment and a good hint of the answer.

In 1939, the US economy which had gone for 9 years with high unemployment was suddenly confronted with a very large increase in demand, due to the war effort and intertemporal speculation by consumers in anticipation of future shortages and price increases. With respect to

capital accumulation, the situation was not quite the same as for Europe today. Capital accumulation had been very slow throughout the 1930's and by 1939, the capital stock stood at 15% below its 1930 level. But capacity utilization numbers were lower in most sectors than they are in Europe today. Nevertheless the increase in production over the next two years was truly remarkable : Even in those sectors in which capacity is easily defined and measured, capacity utilization increased to unprecedented levels. Capacity utilization in steel ingots production, which stood at 61% in August 1939 had increased to reach 99% in October 1941. For cotton spindling activity, capacity utilization increased over the same period from 85% to 126%... The index of the ratio of private output to capital which had stood at .68 in 1938 (roughly its mean value during 1915-1940) stood at .85 in 1941 (and at 1.05 in 1945...). And, as is well known, unemployment decreased by 8% from 1939 to the eve of Pearl Harbor in 1941, most of the decrease being due to an increase in civilian rather than military employment

This does not imply that the same feat could be achieved by Europe, especially without pressure on inflation. Indeed inflation, measured by a wholesale price index, which had remained low until early 1941, started increasing at 2% a month from February on, largely because of supply bottlenecks. But it makes an important point : the capital constraint is not as rigid as it sounds, and the "capital constrained employment" figure derived in the country papers at this Conference is probably not the upper bound on employment. Furthermore, if profitability is there, higher investment can relax the constraint fairly quickly over

time¹⁵. And profitability appears now to be sufficient for investment to take place in response to an increase in demand.

What about labor supply effects ? The strict model of hysteresis presented in section 3 implies that any change in actual unemployment will be followed by an equiproportionate decrease in equilibrium unemployment. This is too sanguine a view. The change in mentalities and institutions from ten years of high unemployment cannot be suddenly undone by an increase in aggregate demand. I do not think that we understand the labor supply mechanisms at work to have strong views as to how fast unemployment can be safely decreased. Most of the leads reviewed in the previous section suggest that progress will be faster if an increase in aggregate demand is combined a major effort aimed at reenfranchising those who do not participate in the labor market.

FOOTNOTES

¹ When referring to "Chelwood Gate Mark 1", I have in mind mainly the papers by Bean and Solow, and the country papers which use that framework. As will be clear below, some of the papers of Chelwood Gate 1 were already developing the themes which are emphasized in Chelwood Gate 2.

² This is the first place where putty-clay may make a difference. This excludes the possibility that, for $n-k$ large enough, the marginal product of labor is zero.

³ The reader of the Conference volume will realize that the model I develop looks on the surface quite different from the Dreze-Sneessens disequilibrium model which underlies the estimated country models. While a full discussion of the differences would lead to another paper, the following remarks may be useful:

I see the main difference between the two as the formalization of how markets clear or do not clear in the short run. I assume that, at any point in time, firms set a price and are then willing and able to satisfy demand, although perhaps at a loss. In contrast, the Dreze-Sneessens approach sees firms as facing a vertical marginal cost at full capacity, or labor shortages, so that some firms end up rationing demand because of insufficient capital or labor.

The issue of short run rationing is an interesting one, and ~~and~~ the formalization of the market as a set of micromarkets in disequilibrium may give useful empirical insights. The construction of "capital-constrained employment", "demand constrained employment" and "full employment" series is a simple --although, as I shall argue below, potentially misleading if

taken too literally-- way of summarizing and organizing the evidence on the movements of capital, capacity, the labor force and output. Whether however there is short run rationing has, I believe, little bearing on the medium run issues which are the focus of the conference and of this paper. On those medium run issues, on the logic and the role of capital accumulation or wage bargaining, I see no substantial difference between the two formalizations. And I find mine analytically more convenient...

4 See for example Bruno and Sachs (1985), for a clear presentation and an application to the European experience of the 1970's.

5 A more elaborate analysis of investment decisions under imperfect competition, closer in spirit to the model used at this conference, is developed by Sneessens (1987). See also Malinvaud (1980).

6 Solow in his Chelwood Gate 1 paper suggested an interesting twist to that story. If the decrease in the number of firms leads to an increase in monopoly power (this is not the case given the Dixit-Stiglitz formalization, but would be under the Hotelling-Weitzman approach), the new equilibrium is characterized by higher markups, lower warranted real wages. This may require an additional decrease in unemployment. The same is true if low activity decreases flexibility, or productivity, decreasing the wage that firms can afford to pay. (See Blanchard and Summers 1988).

7 These numbers are from the Annual Report of the EEC (1987). Lee (1986) gives recent numbers for nine OECD countries

8 The argument also neglects the role of capital accumulation. In choosing wages and the level of employment, the union must also take into account the effect on capital accumulation and the rate of profit. This tends also to decrease membership effects.

- 9 **Blanchard and Summers (1988)**
- 10 **Glaude and Hernu (1986)**
- 11 **Adams (1987)**
- 12 **Cezard (1986)**
- 13 **Krugman (1987) provides a survey.**
- 14 **This is explored in Modigliani et al (1987).**

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