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GERMANY AND THE EUROPEAN DISEASE

by

John Davis and Patrick Minford

ABSTRACT

This paper is concerned with the growth of unemployment in Europe in the late 70s and early 80s. Unemployment has risen to double digit rates in many countries, rates which are not considered likely to fall much in the rest of the 80s. A theory - 'the disease' - is expounded, with empirical evidence from the Federal Republic of Germany. The disease is characterised by high unemployment and low output growth, these being systematic rather than the consequence of some temporary phenomenon such as the downphase of the business cycle. Consequently we present a 'natural rate' explanation as an underlying determinant of unemployment with consideration given to the role of the business cycle in recent German unemployment. The latter role is examined with the use of a full macroeconomic model of the Federal Republic. The model is new-classical with two of its most distinguishing features being the assumption of rational expectations throughout and the endogenous determination of natural rates. We find that the natural rate of unemployment in Germany more than trebled its 1973 level by the end of the 70s, reaching 1.21 million by 1982 before falling to 1.16 million in 1983. We suggest that Germany may have caught the now familiar 'British disease' - that is, the prevention of real wage adjustment via unemployment benefits and social aid.

Germany and the European Disease[1]

by

John Davis and Patrick Minford*

Unemployment in Europe has risen during the 70s and early 80s to double digit rates, rates which are not considered likely to fall much in the remaining years of the 80s. This is so in enough countries to encourage some to speak of a 'European disease'. Those of us who live in Britain have long been familiar with the 'British disease', as have the Dutch with their 'Dutch disease' (supposedly related to North Sea energy resources). This paper suggests that these earlier national ailments are precursors of the general European one to which attention has more recently been drawn - notably by Professor Giersch who has spoken of a 'market sclerosis' in Europe, especially in the labour market (Giersch, 1985). (Also see OECD (1985, p.38)).

However, in spite of this provocative general opening we wish to focus in this paper on West Germany, and thus to highlight a specific case of what may well be a general phenomenon.[2] Our motivation is fourfold: to widen the analysis of the possible disease to a country in which there is wide interest; to stimulate other European researchers to work along the lines of analysis portrayed here; to follow up the echoes sounded in the comments of authoritative national students (e.g. Giersch, op. cit., and de Grauwe, Kratianni and Nabli, 1985), and finally, to utilize a full macroeconomic model of the Federal Republic of Germany in this direction of research.

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In the next section the theory behind the 'disease' is expounded. This is followed by some empirical work on the natural rate of unemployment in Germany. Section IV presents a cross-country comparison of the disease. We then use a full macroeconomic model of the FRG to analyse the role of the business cycle in recent German unemployment, before concluding in the final section.

II. A theory of 'the disease'

The disease under discussion is characterised by high unemployment and low output growth, these being systematic rather than the consequence of some temporary phenomenon such as the downphase of the business cycle. This suggests we must look for a 'natural rate' explanation. This is not to deny that the recent world recession has had a part to play; in a later section we will discuss the role of the business cycle, once we have isolated the underlying natural rate phenomenon.

We begin with an outline of the basic open economy model in so far as it relates to the natural rate of unemployment.[3] It is assumed that industry is competitive and distributed into two sectors, unionised and non-unionised (or 'competitive') in a way that is outside firms' control. Firms are able to buy capital goods on an international market at a world real rental cost which is enforced domestically by perfect capital mobility. Each firm enjoys constant returns to scale but is limited by a fixed factor ('entrepreneurship'), so that marginal product declines as the industry expands. It buys imported inputs at a given world price.

Accordingly, we write the demand for labour in each sector by profit-maximising firms as;

$$L_u^d = (\underset{-}{w_u}, \underset{-}{T_F}, \underset{+}{e}, \underset{+}{k}) \qquad (1)$$

$$L_c^d = (\underset{-}{w_c}, \underset{-}{T_F}, \underset{+}{e}, \underset{+}{k}) \qquad (2)$$

where u, c subscripts stand for union and competitive sectors respectively, L^d = labour demand, w = real wage, T_F = labour tax rate (as fraction of wage) paid by employer, e = real exchange rate (price of domestic goods relative to price of imported goods, in common currency, rise = appreciation), k = aggregate (positive) effect of technological progress, real rental on capital, and fixed factor supplies. The expected signs are indicated over the variables.

We complete the description of firms' activities by writing down their production function (we only need the economy's aggregate) as a supply of output equation:

$$y = (\underset{+}{L_u^d + L_c^d}, \underset{+}{k}) \qquad (3)$$

where y = total output of the economy. To avoid aggregation problems we assume the production functions of union and non-unionised industry are identical.[4]

We now turn to the behaviour of workers and unions. Unions maximize the present value of their potential members' aggregated real incomes by setting the union wage. This gives rise to a variable mark-up equation of the form:

$$w_u = m(UNR, P^{ue}, k)w_c \qquad (4)$$

(+ − +)

where m (= one plus the mark-up) is a function of UNR (= the unionisation rate), k, and P^{ue} (= unanticipated inflation). UNR enters as a proxy for the elasticity of demand for union labour, it being argued that the more unionized an industry, the greater the difficulty of substitution of non-union for union labour in that industry, whether in union firms or by the expansion of non-union firms. P^{ue} enters because unions find it convenient - in order to minimize the transactions costs of controlling work conditions - to draw up nominal wage contracts with only partially contingent price clauses; hence a surprise rise in prices will reduce the real union wage.

It is assumed that firms choose workers' hours given the union-set wage rates. Therefore unionized workers are rationed in their labour supply. We assume that total labour supply of hours in the economy is such that the marginal rate of substitution of leisure for goods equals the <u>marginal</u> net real wage available. This is, for union and non-union workers alike, the real wage in the competitive market (which is assumed to be continuously cleared), minus benefits lost and taxes paid through working extra. Because of the wide differences in individual tax/benefit circumstances tight restrictions across the parameters of benefit, tax, and real wage variables are unlikely to hold and we write labour supply, L^s, generally as:

$$L^s = (w_c, b, T_L, POP) \qquad (5)$$

(+ − − −)

where b = real unemployment benefit, T_L = tax rate (fraction of wage) paid by employee, POP = size of (registered) working age population (because this also acts as a proxy for demographic trends, the sign is left ambiguous).

The labour market equations are completed by the equilibrium condition in the competitive sector:

$$L^s - L_u^d = L_c^d \qquad (6)$$

and by the unemployment relation:

$$U = POP - L^s \qquad (7)$$

where U = unemployment. (7) states that those registered as potential workers will draw unemployment benefits if not working and still therefore under normal European practice be counted as unemployed (this is of course an over-simplification).

(6) taken with (1), (2), (4) and (5) yields a solution for w_c, w_u, L_u^d, L_c^d, L^s, in terms of e, T_F, b, P^{ue}, T_L, UNR, k, and POP. Using (3) we can then solve for y, and from (7) for U. The set-up, the economy's 'supply side', is illustrated in Fig. 1.

Quadrant (a) in Fig. 1 shows the equation of the production function (3); quadrant (b) shows SS, the equation of labour supply (5), and DD, total labour demand $L_u^d + L_c^d$ in terms of w_c from (1), (2), and (4) the mark-up relation.

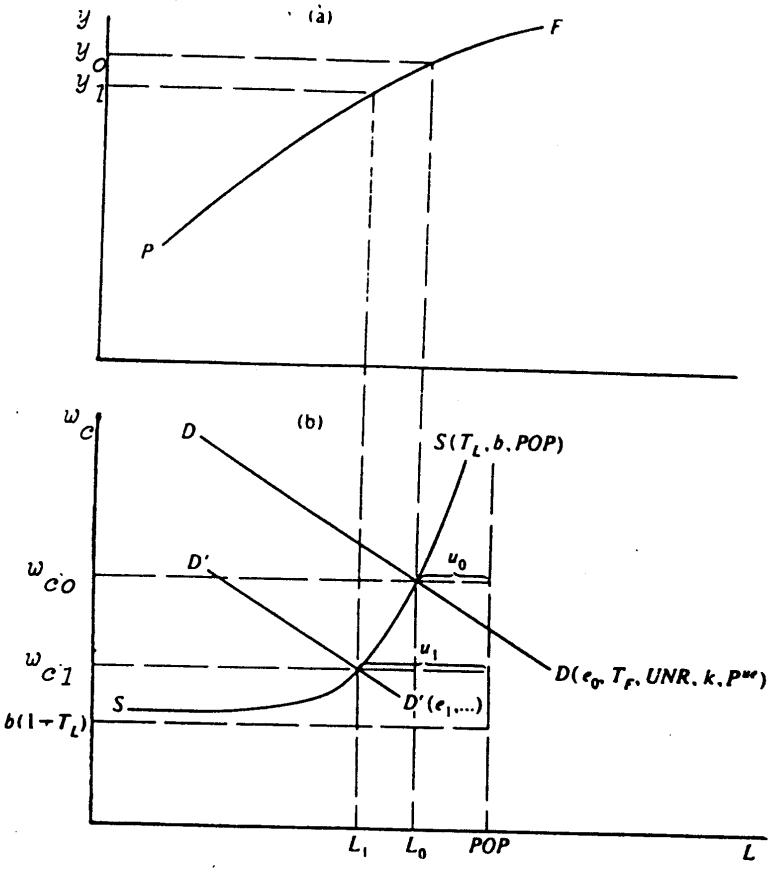


Figure 1.

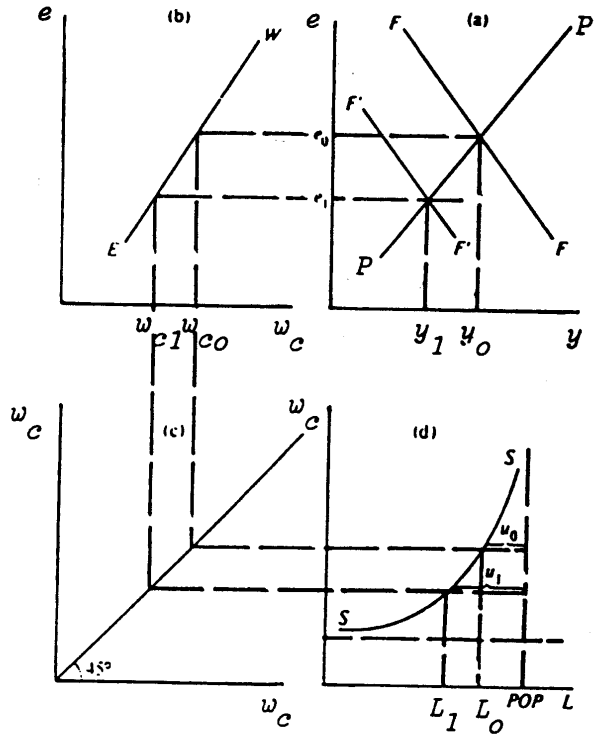


Figure 2.

We may now conveniently extract from this an open economy supply curve, relating output supply to the real exchange rate, holding the other variables constant. Thus as we lower e, shifting DD to the left, we trace out a falling output path along the PF curve corresponding to the DD/SS intersection; this is illustrated by the points (w_{c1}, y_1, L_1) corresponding to D'D'. This is shown in Fig. 2, quadrant (a), as PP. We trace through in quadrants (b)-(d) the correspondence between the real exchange rate, real wages, employment and unemployment, for given other variables. (Note that changes in all these other variables will shift both the PP and EW curves, and changes in T_L, b, POP will shift the SS curve. Also note that the shift in PP due to P^{ue} is the 'Phillips curve' effect.)

We now introduce the last relationship, required to close the open economy model in equilibrium. It will have been observed that the open economy aspect has added e, the real exchange rate, as a supply side determinant; were this a closed economy, e would be absent, and there would be a unique equilibrium supply, corresponding to that which can be produced given labour market equilibrium. This is the usual vertical aggregate supply curve set-up. However the addition of e has produced an upward sloping supply curve; the reason being that as e rises, the terms of trade improve and with them profits, enabling firms to induce a higher labour supply profitably.

To close the model we specify a current account balance (x) equation and set it to equilibrium:

$$0 = x = \underset{+}{(WT}, \underset{-}{e}, \underset{-}{y}) \qquad (8)$$

where WT = the volume of world trade (or output). (8) simply states that the demand for imports by domestic residents must be equal to the demand for domestic exports by foreign residents, equilibrium occurring through e, our index of relative home to foreign prices. We can if we wish generalise (8) to allow for an equilibrium net transfer (e.g., inwards and a current account deficit for an LDC, outwards and a surplus for a mature capital exporting country). The FF curve in Fig. 2, quadrant (a), illustrates (8). If this was a 'small' open economy, then the FF curve would be horizontal. But in this model this is not an appropriate assumption. Full equilibrium of the economy - with corresponding 'natural rates' - occurs at the intersection of the FF and PP curves. So one may think of PP as describing the short run supply curve of the economy, the intersection FF/PP as determining the point of equilibrium.

There are a number of ways in which these relationships can be grouped for econometric investigation. In practice we wish to determine aggregate unemployment (U), real wages (w), output (y), and the real exchange rate (e). So we require four relationships.

We choose the following representation:

(1) a 'supply curve' of labour relating average wages to unemployment, taxes, benefits and union power.

(2) a 'demand curve' for labour, conditional on planned output, relating unemployment to real wage costs (= real wages adjusted for employers' taxes).

(3) a price = marginal cost function; price depends on real wage costs, other costs, and output. This function can be simply transformed into a relation between the real exchange rate, real wage costs, etc., as

follows: if $\log P = \alpha \log W + (1 - \alpha) \log P_F + \ldots$, (where P = price level, P_F= foreign price level converted into domestic currency, W = nominal wage) then $e \equiv \log P - \log P_F = (\frac{\alpha}{1-\alpha})$ $(\log W - \log P) + \ldots =$ $\frac{\alpha}{1-\alpha}$ $\log w + \ldots$.

((2) and (3) are our analogue of the marginal product of labour curve and the production function.)

(4) an external current balance condition which relates output to the real exchange rate and to world trade volume; this can be thought of as a 'demand curve' for domestic output under the restriction of current balance.

This formal outline has not discussed the substantive issue of what determines the shape of the supply curve of labour. The theory so far has been relatively standard, including the impact of benefits on search time of the unemployed, the empirical evidence indicating a fairly modest effect on duration of search and so on labour supply.[5]

However, our theory departs from standard search theory in respect of a crucial category of unemployed whom we will call 'long-term unemployed'. If a person's benefits are 'high' enough and last indefinitely, then he or she may have very little chance of finding a job whose pay matches those benefits in terms of utility. 'High' here is to be related to this person's marginal value product. This person may search in some sense, but the search will be degenerate.

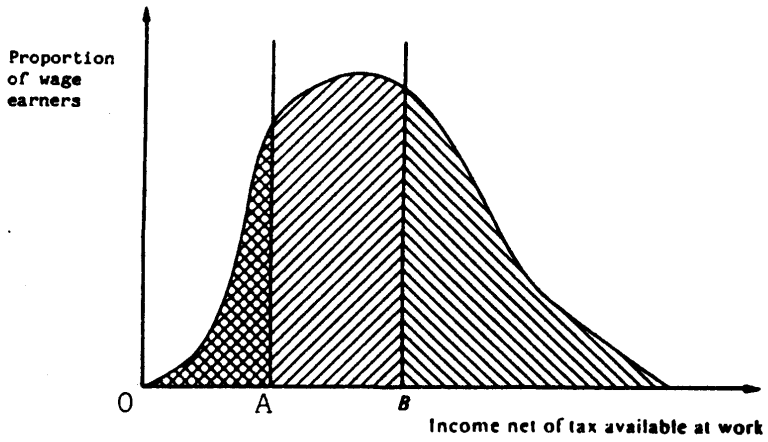
The situation can be depicted in Fig. 3, which shows the distribution of population by their potential wages (their expected marginal value product).

Suppose there are two systems of benefit - a 'flat rate' benefit based on need ('social aid' as it is called on the Continent, 'supplementary benefit' in the UK), and a benefit based on previous income designed to assist those searching for new jobs (usually this will award some benefit/income ratio which may decline over time spent unemployed subject to some ceiling above which benefits do not rise). Let A represent the gross wage equivalent (in utility) of the flat rate benefit; let B represent the gross wage equivalent for the ratio benefit system.

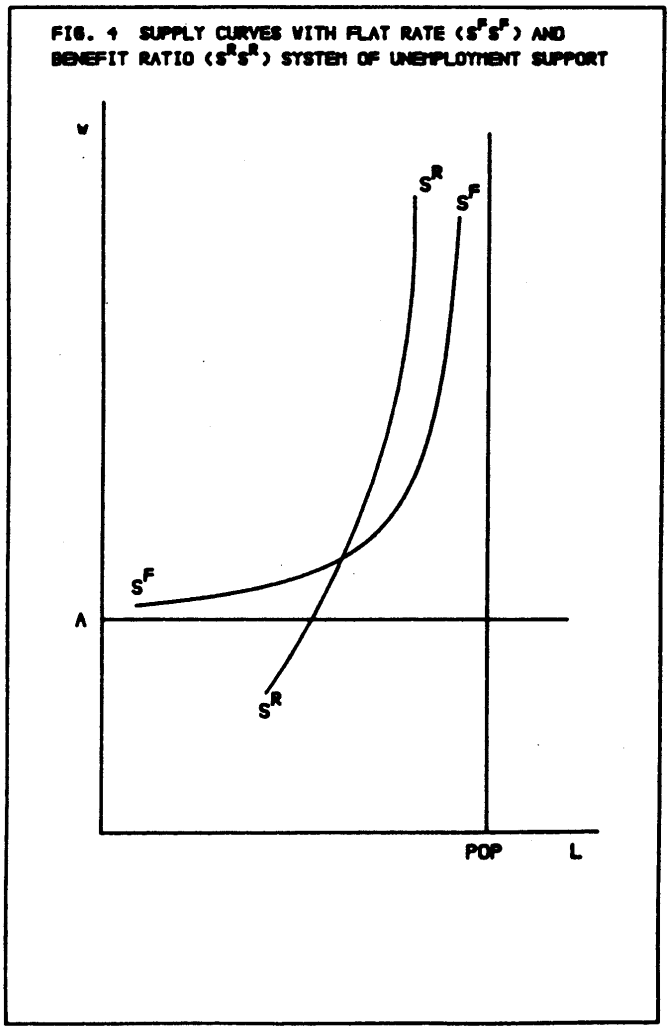
In Fig. 3, there are correspondingly two types of person. First there are those whose marginal product is more than A who will want a job but who if unemployed will search for a duration affected by the benefit/income ratio schedule; these people are the people of normal search theory. Secondly, there are those whose productivity is less than A. If, as seems likely for such unskilled workers, their distribution of wage offers is highly concentrated, then these workers will not desire work; they will be long-term unemployed.

Consider now what the supply curve of labour with respect to average wages would resemble with solely a flat rate benefit system. As average wages dropped, the wage distribution would shift leftwards, including more and more people in the area below A. As average wages tended to A, labour supply would of course tend to zero. By contrast, as average wages rose, wage distribution would eventually shift to the right of A altogether;

Figure 3.



A = Flat rate benefit 'cut off' point
B = Earnings related benefit 'cut off' point } see text



labour supply would then tend to the total 'labour force', excluding some frictional unemployed (searching for the minimal duration). This supply curve is shown as S^FS^F in Fig. 4. Notice how the elasticity of supply varies along it, reaching an 'infinite elasticity' at low wages ('real wage rigidity').

Next consider the supply curve with a benefit-ratio system only. Search would be higher for all workers when laid-off and consequently labour supply would be displaced leftwards more or less equally at all wage levels though less at high wages for which the ceiling applies - S^RS^R in Fig. 4. In this case, the supply elasticity will typically be low; the unemployment will depend on the size of the benefit/income ratio.

The implication of this analysis is that the benefit system will crucially affect the shape of the supply curve. This shape in turn will affect how the economy behaves, particularly in the dimension of real wage flexibility. A benefit system that awards a modest benefit/income ratio with a reasonably short time limit (a year, say), is not likely to affect unemployment much and will not prevent real wages falling if a negative shock hits the labour market. A flat rate system, where the flat rate is high relative to productivity for significant numbers of low-paid workers, will set a floor below real wages and a negative shock will induce unemployment rather than real wage adjustment.

III Some empirical work on the natural rate for Germany, 1961-83.

We have identified four key equations required to solve for the 'natural rate' of unemployment, real wages, output, and the real exchange rate. They are, to recap: a supply curve of labour, a demand curve for labour, a price-cost function, and an external balance condition.

Before we present some empirical findings we first briefly explain the German system of unemployment benefits/social aid in relation to our earlier theory. During the first year of unemployment the recipient is entitled to 63% of his previous net wage or salary (Arbeitslosengeld).[6] Beyond a year, the unemployed person may receive Arbeitslosenhilfe - a ratio of 53% of previous net pay. A ceiling occurs with the previous income basis being DM 1305 a week[7] (approximately 1.7 times average earnings (Minford et al 1985)). This statutory benefit ratio system, on its own, should exhibit a supply curve of labour similar to that depicted by S^RS^R in Fig. 4, i.e. low elasticity with respect to wages.

However, besides the statutory benefit ratio, the unemployed can receive 'social aid' (Sozialhilfe)[8] including housing assistance (Wohngeld); this money is administered by the local authorities on a discretionary basis, so that it might be presumed that it would be withheld from an unemployed person who was say refusing a low-paid job.

However, as is well-known from British experience, establishing such refusal and then withholding benefits is difficult and, therefore, likely to be rare (in Britain it hardly occurs). Furthermore, since the late 70s standard rates have apparently been set for these benefits to 'guide' local discretion; 'illustrative' figures informally provided by German officials for 1981 indicate that these rates were substantial totalling for example 365 DM per week for a man with a non-working wife and 2 children aged 8 and 12, and implying an indefinite replacement ratio of over unity if his potential wage was less than 80% of average earnings, and of around 0.75 if he can achieve average earnings (in the first six months only this man's ratio would be higher still). Social aid (including Wohngeld) had reached DM 12.5 billion (about 1% of GDP) by 1978, and DM 16.5 billion by 1982.

Indeed it appears to have been an aim of the Social Democrat Government of this time to turn the social aid system into a national system of 'decent' minimum living standards much as was aimed for by the UK supplementary benefit system. To our knowledge this philosophy has not changed in Germany since the accession of the Christian Democrats,[9] just as it has not changed in Britain under Mrs. Thatcher's government.

This situation is therefore similar to that in Britain, and would imply a UK-style model; however, it would be emerging late in the sample period. This would suggest, in terms of Fig. 4, that the German benefit system results in the supply curve of labour flattening at the lower end of S^RS^R moving some way to that shown by S^FS^F. This in turn could produce a large rise in unemployment among workers whose marginal product

lay below average earnings. (This may reflect the fact that the proportion of registered unemployed out of work for more than one year has risen to 28.5% (May 1983) from 7.0% (May 1975) - made up largely by young unskilled workers (see Hallett (1985, p. 182) and Ginneken and Garzuel (1983, p.116)).

Table 1 below shows the results of estimation of the four equations, together with the implied long-run coefficients. The results in Table 1 are encouraging. All the variables in the model are signed as expected. Both UNR and grossed up benefits are reasonably well determined, especially so when we expect a strong impact to be felt only after the mid-1970s (see Fig. 7 in the case of UNR). Although the coefficient on unanticipated inflation is statistically insignificant the variable is retained since theoretically we would expect a zero effect only in the case of full indexation of wages, which did not occur in Germany following the Monetary Law of 1948 (see Bruno and Sachs (1985, p.244)). The important variables in the demand for labour equation - real income and the product wage - are both well determined. The product wage enters with a one-period lag which reflects costs of adjustment.

When the equations in Table 1 are solved out simultaneously for the natural rate of unemployment they indicate that for some 12 years the natural rate in Germany did not rise significantly from its 1961 level of 230 thousand. The rise in the natural rate occurred after 1974 - about the same time as the possible regime change discussed above. Also, the analysis is consistent with explaining the three major recessions in Germany - those of 1967, 1975 and 1981/3. In each of these periods actual unemployment rose above the natural rate as a result of negative shocks to the economy. However, after 67/68 and 75/76, unemployment returned to its natural level (rising post-1974) as the effect of these shocks died away. This can be seen from Fig. 5 below. We consider recent German unemployment in section V later.

Table 1: The German Equations *

Estimated equations (instrumental variable estimation (AR1 transformed where ρ_1 is significant), ρ_1 not reported where insignificant, t - statistic bracketed, s = standard error of the regression, DW = Durbin-Watson statistic)

(1) Supply of Labour:

$$\log w_t = \underset{(7.25)}{0.80} \log w_{t-1} + \underset{(2.76)}{2.22}\, UNR_t$$

$$\underset{(-4.14)}{-0.089} \log U_t + \underset{(2.32)}{0.17} \log (b_t (1 + T_{It}))$$

$$\underset{(-0.62)}{-0.47}(INFL_t - E_{t-1}INFL_t) \underset{(-1.89)}{- 0.88} \log POP_t + \underset{(1.44)}{7.07}$$

$$\bar{R}^2 = 0.99$$

annual, 1962-83 s = 0.02

(2) Demand for Labour

$$\log U_t = \underset{(2.32)}{0.41} \log U_{t-1} \underset{(-4.86)}{- 9.64} \log y_t$$

$$\underset{(2.61)}{+ 5.05} \log (w_{t-1}(1 + T_{Ft-1})(1 + VAT_{t-1})) \underset{(1.87)}{+ 0.16t} \underset{(4.31)}{+ 56.18}$$

$$\rho_1 = \underset{(2.17)}{0.45} \qquad \bar{R}^2 = 0.97$$

s = 0.208

annual, 1962-83

(3) Real exchange rate (price-cost function):

$$e_t = \underset{(3.53)}{0.81} \log (w_t(1 + T_{Ft})) + \log (1 + VAT_t)$$

$$\underset{(-2.67)}{- 0.026t} \quad \underset{(2.26)}{+ 1.47}$$

$$\rho_1 = \underset{(3.67)}{0.616}$$

$\bar{R}^2 = 0.77$

$s = 0.038$

$DW = 1.40$

annual, 1962-83

(4) External balance condition

$$\frac{XVOL}{0.24\, y^*}_t = \underset{(2.87)}{1.72} \log WT_t \underset{(-2.76)}{- 3.07} \log y_t$$

$$\underset{(-3.04)}{-0.67} \left[e_t - \log(1+VAT_t) \right] \underset{(2.77)}{+ 21.6}$$

$DW = 1.28$ $\quad \bar{R}^2 = 0.47$ $\quad s = 0.037$ annual, 1961-83

Implied long-run coefficients

$$\log w_t = 10.85\, UNR_t - 0.43 \log U_t + 0.85 \log (b_t(1 + T_{Lt})) - 4.32 \log POP_t$$

$$\log U_t = -16.41 \log y_t + 8.597 \log (w_t(1 + T_{Ft})(1 + VAT_t)) + 0.28t$$

$$e_t = 0.81 \log (w_t(1 + T_{Ft})) + \log (1 + VAT_t) - 0.026\, t$$

$$\log y_t = 0.56 \log WT_t - 0.22 \left[e_t - \log(1+VAT_t) \right]$$

where:-

*		denotes equilibrium value of variable;
log	=	natural logarithm;
E_t	=	expectation formed in time t;
w	=	gross average weekly earnings of employees in industry (deflated by the consumer price index);
UNR	=	unionisation rate, proportion of union membership to employees;
U	=	unemployment;
b	=	real average net benefits, including Sozialhilfe;
T_L	=	employees' national insurance and tax deductions - fraction of employees' gross wages and salaries;
INFL	=	rate of inflation (consumer price index);
y	=	real gross national product;
T_F	=	employers' costs (other than w), indirect costs expressed as a fraction of gross wages;
VAT	=	value added tax rate, net indirect taxes expressed as a fraction of nominal income;
POP	=	working population;
XVOL	=	real trade balance (excluding terms of trade effects);
WT	=	index of world trade;
e	=	real exchange rate (rise = appreciation).

The 0.24 in the XVOL equation is the mean proportion of exports in y^*, thus the right hand side coefficients can be interpreted as long-run elasticities.

(Source of variables in Appendix).

* NOTE

In the supply of labour equation we normalise on real wages giving a supply price of labour equation. This has a relevant practical advantage. If the economy has been operating over the sample period in the elastic portion of the supply curve shown in Fig. 4 (high 'real wage rigidity'), then normalising on real wages will give better determined results than normalising on unemployment. (This is the same argument as used under conditions of high capital mobility for estimating interest rate rather than capital flows equations). Also see Minford (1983). We choose to enter logU rather than U into this supply equation because our theory suggests that at high unemployment levels a 1% change in benefits will have a larger absolute effect on unemployment than at low unemployment levels because the slope of the supply curve will be flatter. We choose (the log of) unemployment as the dependent variable in the demand for labour equation for empirical convenience, to match up with the supply price equation.

IV. Cross-country comparison: the European disease recapitulated

Figure 5 shows what this model suggests is the 'natural' rate of unemployment for West Germany - alongside the actual rate. The key feature that stands out is that there has been a sharp upward tendency in the underlying forces creating unemployment.[10]

The contributory causes are charted in Figures 6 (real benefits), 7 (unionisation rate), 8 (tax and other non-wage costs on employers), and 9 (employees' tax and national insurance deductions).

The charts we have just discussed depict an example of the European disease. This disease has the following characteristics:

(1) Benefits act like a floor beneath real wages from the supply side, both driving them upwards as politicians push up benefits from the 'best' of motives, and preventing them from falling when falling external demand for example requires such adjustment.

(2) Unemployment results as this rising or downwardly rigid real supply price rides up the demand curve for labour, the total demand curve consisting of both labour/capital substitution (output constant) and contraction effects on output (via external substitution).

(3) This falling employment (rising unemployment) is mirrored, via the production function, in reduced output; hence high unemployment and low output growth are two sides of the same coin.

FIGURE 5: WEST GERMANY: UNEMPLOYMENT (U) AND EQUILIBRIUM UNEMPLOYMENT (U^*).

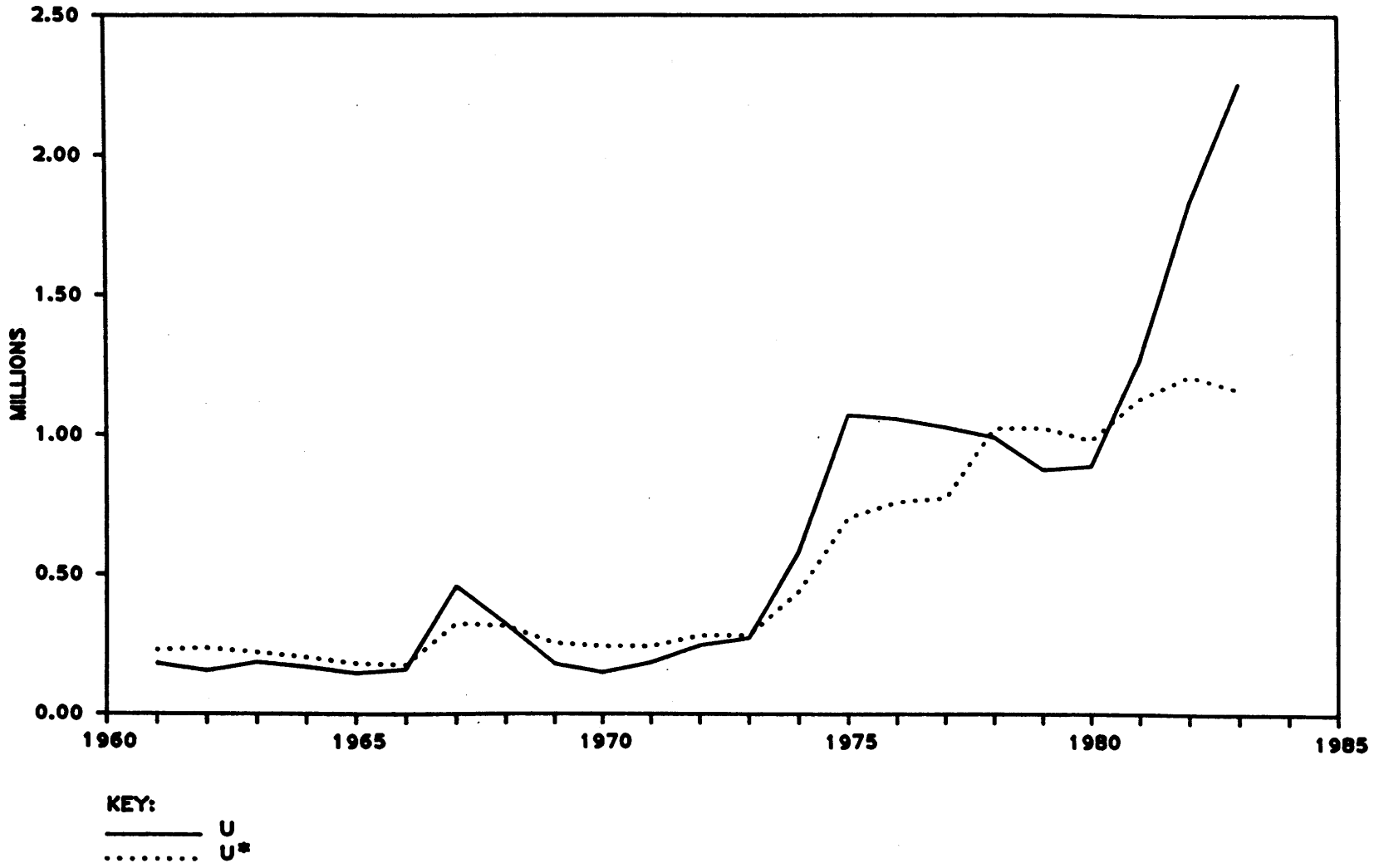


FIGURE 6: LOGARITHM OF REAL UNEMPLOYMENT BENEFITS, INCLUDING SOZIALHILFE (b).

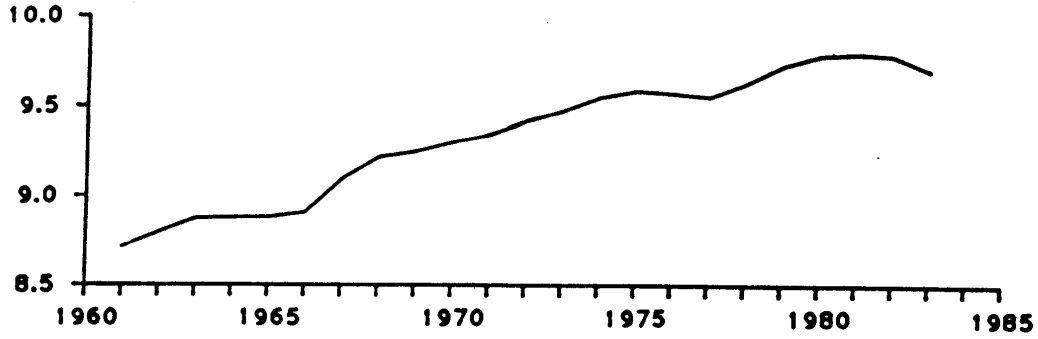


FIGURE 7: UNIONISATION RATE (UNR). PERCENTAGE OF EMPLOYEES IN UNIONS.

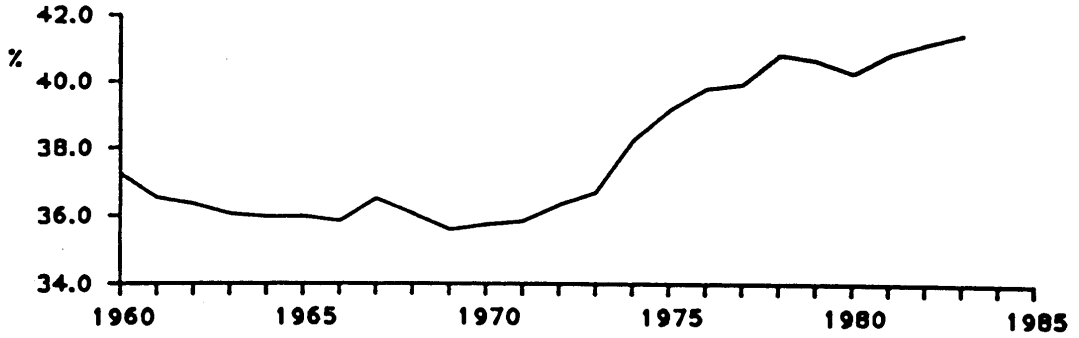


FIGURE 8: EMPLOYERS' NATIONAL INSURANCE CONTRIBUTIONS AND NON-WAGE COSTS (T_F). INDIRECT COSTS AS A PROPORTION OF GROSS WAGES.

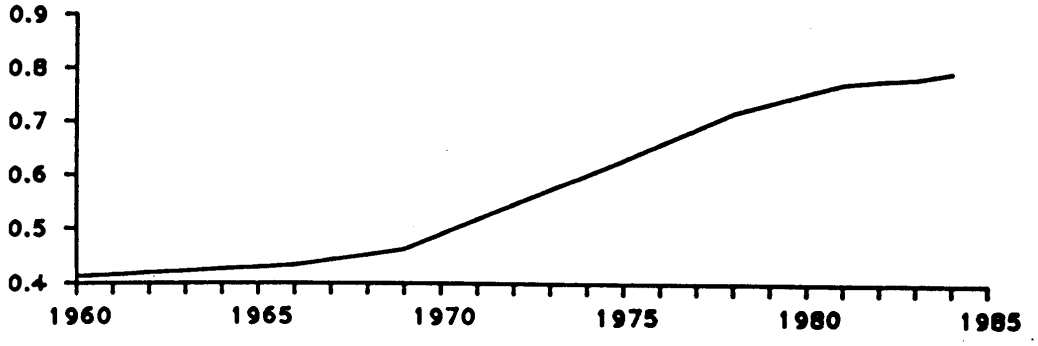
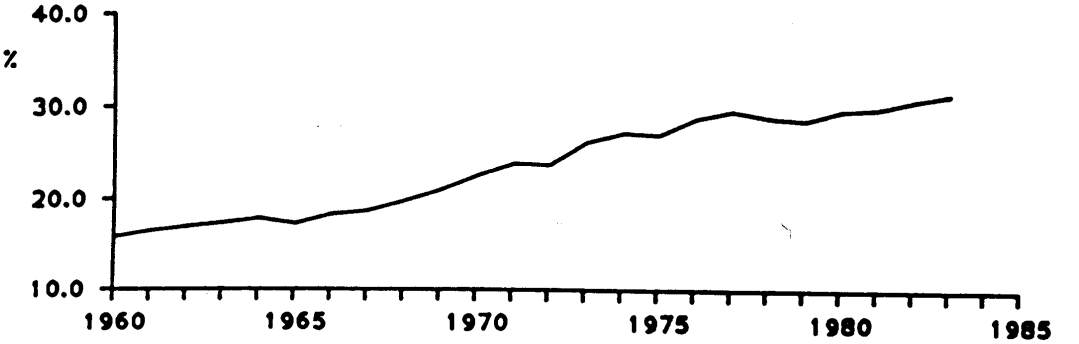


FIGURE 9: EMPLOYEES' DIRECT TAX AND NATIONAL INSURANCE CONTRIBUTIONS AS A PERCENTAGE OF EMPLOYEES' GROSS INCOME (T_L).



Thus (3), the European disease, is produced by (1) and (2), the causal mechanism. It must be clear how the latter can give rise to such descriptive phrases as 'real wage rigidity', 'labour market sclerosis', 'failure of the labour market to work/adjust'.

Unemployment has risen elsewhere in Europe, though far from uniformly. The following is a partial list of recent rates (February 1985):

Table 2: Unemployment rates in major European countries

Belgium	14.5
France	10.9
West Germany	9.2
Holland	16.1
Italy	14.1
Sweden	3.0
Switzerland	1.2
U.K.	13.0
(Memorandum)	
U.S.	7.3

The suggestion made in this paper is that to understand unemployment one should examine the mechanism of government intervention through unemployment support and specifically how far it acts as a floor beneath real wages. It should be emphasised that one can have both high replacement ratios and substantial wage flexibility, if 'work tests' are rigorously applied (i.e., if people are forced to take low-paid jobs rather than stay on benefits). Tough work tests may well account for the low unemployment in Sweden and Switzerland, both of which award generous

benefit ratios; in the former the unions administer and partly finance the benefits, while in the latter local authorities (cantons) provide both administration and finance.

In France and Italy, systems of unemployment support are extraordinarily complex, comprising formal benefit ratios, social aid, family allowances, and (in Italy) special lay-off compensation. French replacement ratios range, depending on work income, from 0.96 to 1.32 for those unemployed for up to a year; they fall to 0.77 to 1.10 in the second year of unemployment; and then supposedly fall dramatically in the third year (to 0.25 to 0.57). However, to renew early year entitlements a person needs only to get another job for a short time; and this cycle can keep someone in quite good circumstances on the dole for long periods. In Italy, the ratios range, depending on work income, from 0.73 to 0.9 from one year indefinitely. The shadow economy also is very large (estimates of over 25% of GDP are dominant) and presumably raise the effective ratios substantially.[11] It seems reasonable to assume that these expensive systems of support create substantial real wage rigidity.[12]

In Holland, the income from North Sea energy appears to have been spent in a large increase in government expenditure[13] and welfare benefits in particular. Replacement ratios there appear to have been even higher than elsewhere in Europe (in 1979, the statutory benefit ratio was 80% in the first year of unemployment, 75% for the succeeding two years; but there was a minimum flat rate benefit of 424 Fl - £105 - per week). The

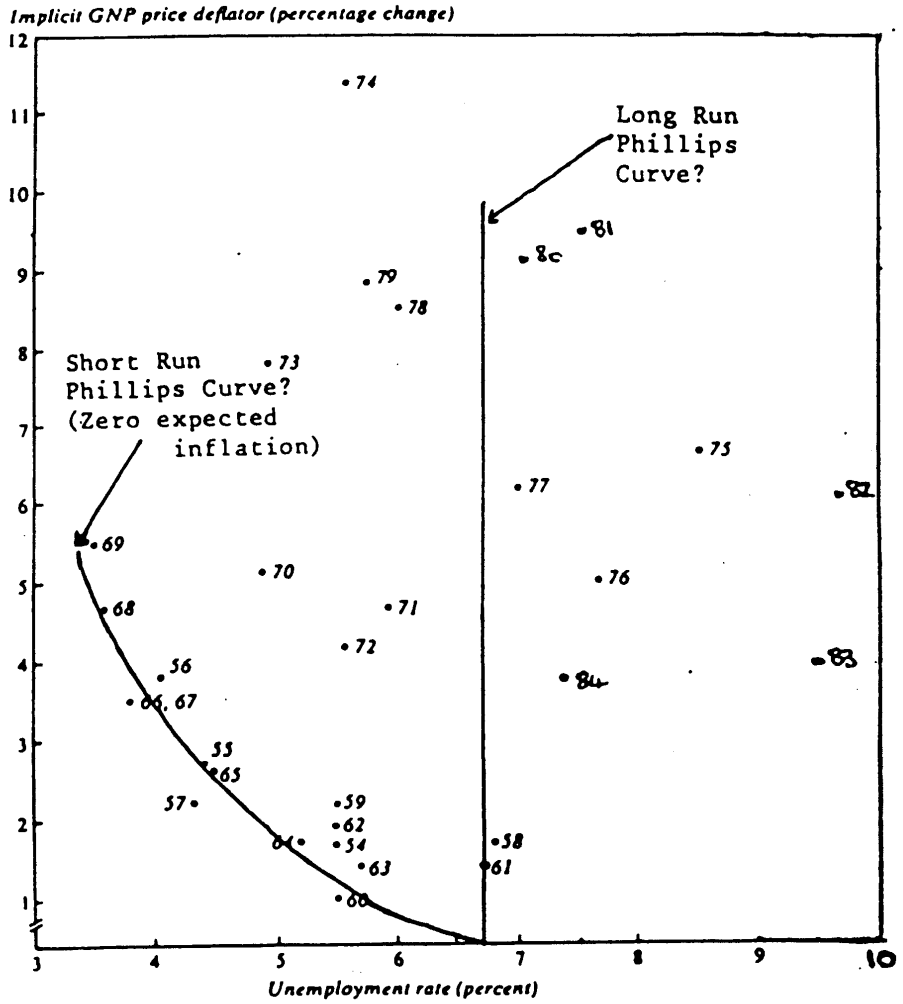
'Dutch disease' is supposedly produced by the resource windfall itself. Yet inspection of Fig. 2 indicates clearly that this cannot be so; such a windfall loosens the external balance condition, permitting higher employment and output - the commonsense conclusion (it requires extraordinary perversity to believe a country must be damanged by an income windfall!).

The suggestion of this paper is that the Dutch disease arose from the way in which the income was spent. By raising benefits, labour supply was reduced, shifting the supply curve by more than could be absorbed by the higher external earning capacity of the economy - i.e., in Fig. 2 the PP curve shifts left by more than the FF curve shifts right. (Similar comments apply to the British version of the Dutch disease).

The principal non-European country with which all this can be contrasted is the U.S.A., where unemployment support is limited to one year or less depending on the state and 'supplementary benefit' consists of food stamps and some other discretionary vouchers. Because of the size of the country and high mobility, one would expect search time to be higher than in a European country, with a higher frictional unemployment rate; the US evidence suggests that the natural rate has not risen significantly from a region of 6-7% (see Fig.10).

Real wages in the USA have not risen at all on average for the last ten years, indicating a considerable flexibility; real wages appear to have fallen at the bottom end of the pay spectrum to absorb a rapid growth in the labour force in mainly service industries.

Figure 10: Changes in Prices and Unemployment Rates, 1954-79, and Phillips Curves for US



V. The role of the business cycle in recent German unemployment

Implicitly, the estimate of the cyclical component of unemployment falls out of our earlier estimate of the natural rate, as the difference between actual and natural rates. The implicit estimate is shown in Fig. 11 below.

In this section we attempt to identify the main shocks that have produced this cyclical experience. This is done with the use of an annual macroeconomic model of the Federal Republic. The model is new-classical with two of its most distinguishing features being the assumption of rational expectations throughout (with terminal conditions being used to solve for forward rational expectations) and the endogenous determination of natural rates. The model has 31 endogenous variables, including 7 behavioural equations. It accommodates both stock and flow equilibrium and the balance sheets of the external, government and private domestic sectors. Accordingly, with fully flexible prices, real wealth effects are integrated into both the domestic and overseas sectors. The model allows for an open economy with trade and capital flows and at the same time integrates the private sector's portfolio balance. Capital flows implicitly underlie the determination of exchange rates and interest rates with financial markets assumed to be efficient.[14]

It is natural to look for three main sources of shocks; those from German monetary and fiscal policy, and from external effects (e.g. world trade). Figs. 12-14 below show measures of German monetary and fiscal expansion and the growth of world trade in the late 70s and early 80s.

FIGURE 11: ACTUAL UNEMPLOYMENT – EQUILIBRIUM UNEMPLOYMENT AS A PERCENTAGE OF THE WORKING POPULATION.

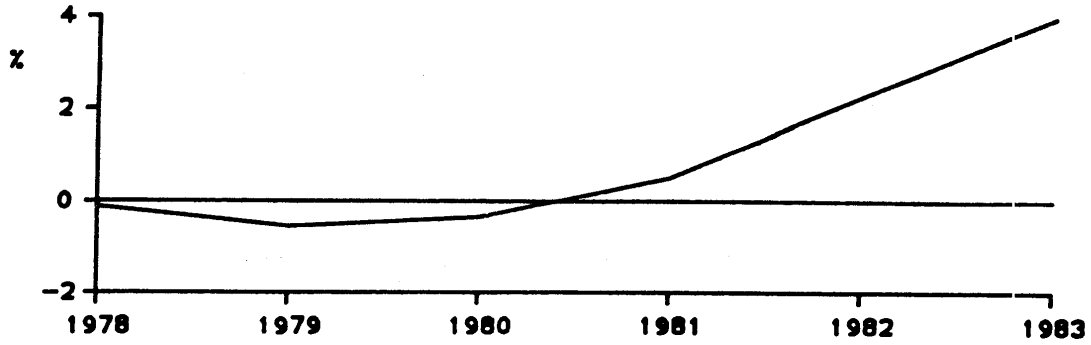


FIGURE 12: RECENT GERMAN MONETARY SHOCKS (% pa CHANGE IN REAL M1).

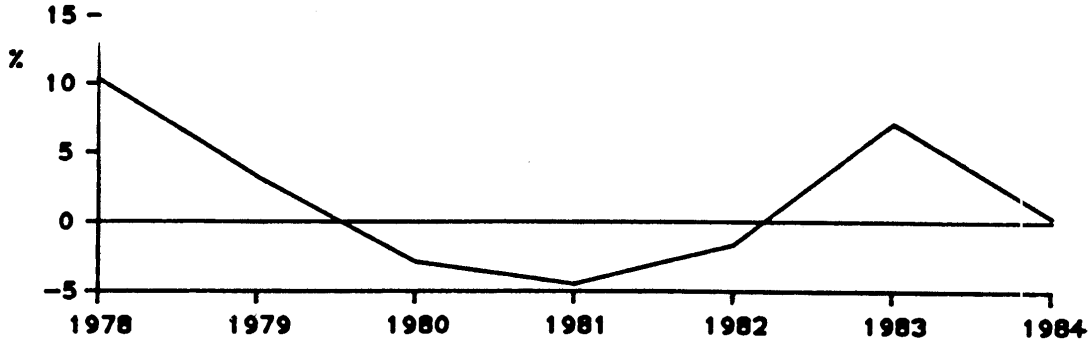


FIGURE 13: RECENT GERMAN FISCAL SHOCKS (CHANGE IN THE REAL BUDGET DEFICIT AS A % OF REAL GNP).

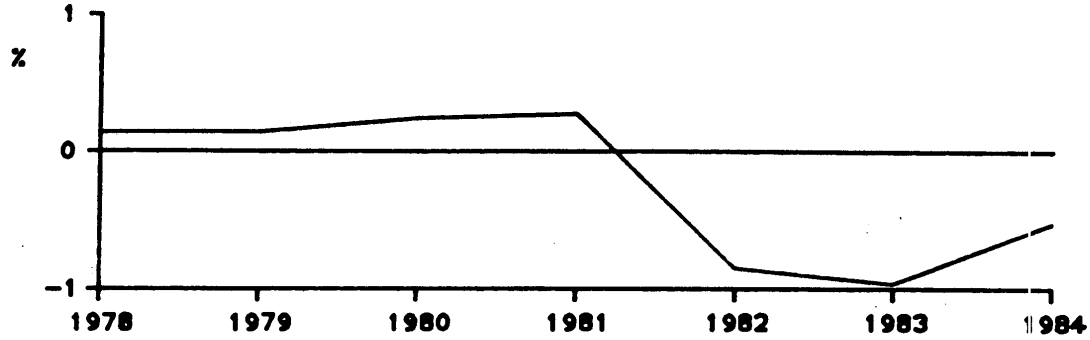
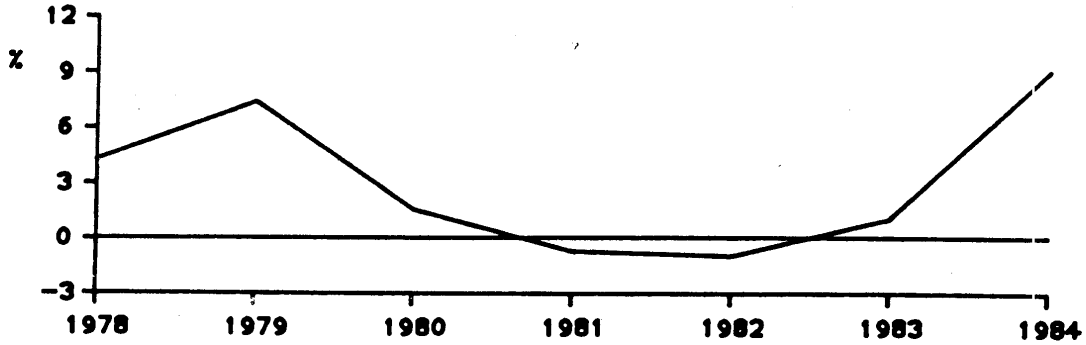


FIGURE 14: RECENT WORLD TRADE SHOCKS (% pa CHANGE IN WORLD TRADE).



It can be seen that over the 80-2 period the real money stock fell, particularly in 81. With regard to fiscal policy, the real budget deficit[15] steadily grew over the 78-81 period, before falling sharply in 82. This fall continued into 83 and 84. Finally, the growth of world trade began to slow down as the 70s ended and in fact was negative in 81 and 82.

Thus we expect the cyclical component of unemployment to be affected by these three negative shocks to the German economy. Table 3 shows the shocks (unanticipated) that were simulated by the model, these shocks being representative of the patterns shown in Figs. 12-14.

Table 3: Shocks (unanticipated) simulated by the model.

Year	MP	FP	WT
1981	-7%	0	-5%
1982	-5%	-1%	-5%
1983	0	-1%	-5%
1984	-5%	-1%	0

where:

MP = Monetary Policy - change in inflation through change in nominal money supply;

FP = Fiscal Policy - Change in real government expenditure as a proportion of real GNP;

WT = World Trade - Change in growth rate of total volume of world trade;

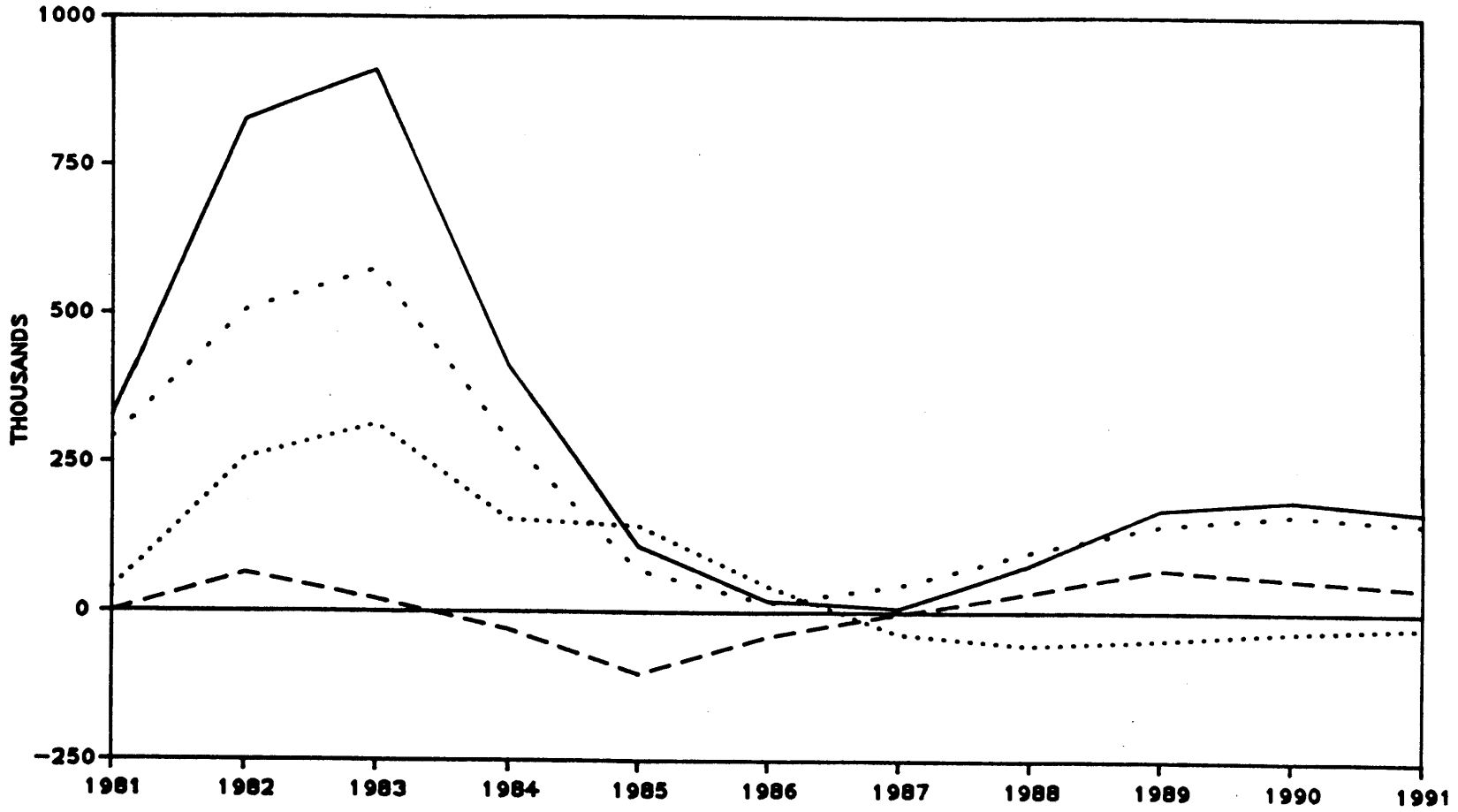
- = reduction.

Fig. 15 below shows the accumulated effect on unemployment (differences from base) of each of these three simulations, together with the total effects on cyclical unemployment (U-U*) of the three simulations combined. Fig. 15 suggests that we may have captured some of the recent business cycle. It is also interesting to note that the cyclical component we are seeking to identify here (i.e. for 81-83) is somewhat larger than that of the two previous recessions in Germany referred to above (see page 16). This may be due to the fact that in these other two periods Germany did not experience three shocks as severe as those described above simultaneously. For example, the growth in world trade continued to be positive for every year except 1975, whilst the growth in real M1 was negative only in 73 and 74. True, the real budget deficit fell around both these times, but in no one year did all these three variables actually fall (unlike in 82).[16] Of course, a full analysis of these other periods utilising our model would be necessary before definitive conclusions could be made, but this section suggests that we have gone a good way towards explaining the behaviour of recent unemployment in Germany, over and above that of the natural rate. Finally, the simulations shown here are consistent with the slow down in the growth of unemployment since 1983,[17] with the actual level expected to return to its natural level in the absence of further unanticipated shocks.

VI Conclusion

Germany may have caught the British disease, which has apparently become general in Europe. The disease is the prevention of real wage adjustment via unemployment benefits, and its manifestation is high unemployment and low growth. The natural rate of unemployment in Germany

FIGURE 15: EFFECT ON UNEMPLOYMENT OF RECENT SHOCKS (SEE TABLE 3), DIFFERENCES FROM BASE.



rose from only 282 thousand in 73 to 1.21million by 82, before falling back to 1.16 million in 83. Actual unemployment in excess of this is cyclical, the result of macroeconomic shocks, but while substantial, it should decline steadily as the business cycle continues its recovery, in spite of 'conservative' macro policies. The clear implication of this paper is that if we want a lasting reduction in unemployment in many European countries, then action to remove labour market distortions and in particular action to increase real wage flexibility needs a high priority. We have not argued that demand factors do not matter - indeed we have shown that they do tnrough shocks to the economy - rather, we have sought to demonstrate that supply factors are also important in analysing unemployment in Europe today.

APPENDIX

Source of variables used in German equations:

Variable	Definition and Source
w	Gross average weekly earnings of employees in industry. Statistisches Taschenbuch 1984, Arbeit und Sozialstatistik, 5.3, deflated by P (see INFL below).
UNR	Proportion of union membership to employees. 1. Statistisches Jahrbuch für die Bundesrepublik Deutschland, editions from 1962-84. 2. Sachverständigenrat zur Begutachtung Gesamtwirtschaftlichen Entwicklung, Gegen Pessimismus, Jahresgutenachten 1982/3, p. 268 (updated from Bevölkerung Erwerbstatistigkeit, Sachverständigenrat, 1984/5).
U	Unemployment. Source as in 2. for UNR above.
b	Real average net benefits, including Sozialhilfe. Net benefits from Ramb (1985, p. 19 - benefits per recipient, adjusted for the composition of unemployment in 1982 and 1983). Sozialhilfe data from various issues of Landesamt für Datenverarbeitung und statistik Nordrhein - Westfalen, Statistische Berichte, Die Sozialhilfe in Nordrhein-Westfalen: Teil 1 Ausgaben und Einnahmen, seite 6, und Teil 2, Empfänger von Sozialhilfe, seite 4.
T_L	Employees' national insurance and tax deductions - fraction of employee gross wages and salaries. Volkswirtschaftlichen Gesamtrechnungen (Statistisches Bundesamt), Fachserie 18, Reihe 1, Konten und standardtabellen 1983, 2.12 Einkommen aus unselbständiger Arbeit.
INFL	Rate of inflation. INFL = Δ logP. P from: Preise, Fachserie 17, Reihe 7, Preise und Preisindizes für die Lebenshaltung, März 1984, seite 3, Gesamtlebenshaltung Eilbericht.

y	Real gross national product. Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe 5.5, Revidierte Ergebnisse 1960 bis 1981, 2.5 Verwendung des sozialprodukts. Updated by the Deutsche Bundesbank.
T_F	Employers' costs other than wage costs, indirect costs expressed as a fraction of gross wages. From: Argumente zu Unternehmenfragen, Institut der Deutschen Wirtschaft (material supplied by Professor Fels).
VAT	Value added tax. Net indirect taxes (supplied by the Deutsche Bundesbank) expressed as a fraction of nominal income.
POP	Working population. As in 2. for UNR above.
XVOL	Real trade balance (excluding terms of trade effects). As in y above.
WT	Index of world trade. National Institute of Economic and Social Research (Quarterly Bulletin) and OECD (Main Economic Indicators).
e	Real exchange rate. $e = \log S + \log P - \log P_F$, where S = nominal exchange rate of the DM, P is as above (INFL) and P_F is foreign price level. S and P_F constructed from International Financial Statistics, using series amx, MERM, and 64 (a weighted average for Germany's principle trading partners).

Notes

1. Paper presented at the Conference "Unemployment in Europe", The European Production Study Group, Maastricht, April 1986. Useful comments were received from participants in this Conference and in a seminar at International Finance Division, Federal Reserve Board; thanks are due especially to Victoria Chick, Neil Ericsson, Michael Gavin, David Germany and Karen Johnson. We are grateful to Simon Blackman and John Riley for computational assistance with the German model, and for production of the graphs. We also thank the ESRC for their financial support of this research.

2. For work on the United Kingdom see Minford (1983), Minford et al (1985). The latter also contains preliminary work on some other European countries. See also section IV below.

3. The analytical approach and the empirical work on the UK is set out in detail in Minford (1983).

4. (3) is derived from a production function of the form $y_i(1-u) = f(k_i, L_i, \bar{T}_i)$ where u is the (assumed inflexible) share of imports in production and $\bar{T}$ is the stock of the exogenous factor ('entrepreneurship') which is assumed to be growing steadily over time. To obtain (3) we substitute for capital (from the marginal productivity condition for capital) in terms of the cost of capital, labour, and the fixed factor.

5. For example Franz (1982) concludes that there is a positive effect (although small) of the entitlement to unemployment compensation on the reservation wage and hence on the duration of unemployment.

6. Given that he/she has contributed to the social insurance scheme for six months sometime within the last three years. This figure was increased from 62.5% to 68% in 1975 and then reduced to its present level in 1983.

7. This is in 1986, from table supplied by the Bundesanstalt für Arbeit.

8. In 1983 33% of the registered unemployed were supported by Sozialhilfe, 45% by Arbeitslosengeld and 22% by Arbeitslosenhilfe (Hallett, 1985).

9. This is consistent with comments made in Hallett (1985).

10. This is similar to findings in the United Kingdom (see Minford (1983), Minford et al (1985)) and Belgium (work in progress at Liverpool).

11. The figures from France and Italy are from Minford et al (1985).

12. In Italy this is often blamed on full indexation, the Scala Mobile; yet indexation as such implies nothing for the real wage.

13. Up to 1983 Government expenditure had grown at 5.8% per annum in real terms since 1970, 2.6% faster than GDP. Its share of GDP rose from 27% to 41%.

14. A fuller description, including a stylised version, of the model is available from the authors.

15. This is equal to total public sector debt minus interest payments on outstanding debt.

16. We should also note that the effect on unemployment of the 75 recession was to some extent reduced by the expulsion of foreign workers - 726,000 between 1973-8 (see Valli, 1983).

17. Unemployment growth in 1984 and 1985 was basically zero.

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