Robert Schuman Centre

European Unemployment: Macroeconomic Aspects

High Unemployment and Stabilisation Policy

WINFRIED VOGT

RSC No. 97/48

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EUI Working Paper RSC No. 97/48

Vogt: *European Unemployment: Macroeconomic Aspects High Unemployment and Stabilisation Policy*

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EUROPEAN UNIVERSITY INSTITUTE, FLORENCE

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High Unemployment and Stabilisation Policy

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Paper presented at the Conference of the RSC on
European Unemployment: Macroeconomic Aspects
held at the EUI on 21-22 Nov. 1996, and organised by Michael Artis
(in collaboration with the Economics Department and the European Forum)
with financial support from the European Commission, DG V

EUI Working Paper **RSC** No. 97/48

BADIA FIESOLANA, SAN DOMENICO (FI)

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Printed in Italy in August 1997
European University Institute
Badia Fiesolana
I – 50016 San Domenico (FI)
Italy

1. High unemployment and stabilisation policy in Europe

1. US and European labour markets have one important feature in common: A significant part of the supply of labour is not occupied in the very productive primary sector of the economy. However, there is also a striking difference: In Europe, most of those who are not employed in the primary sector remain unemployed, whereas, in the United States, they work in a less productive secondary sector. This difference is usually explained by Europe's generous system of unemployment benefits. Individuals who cannot get a job in the primary sector prefer being unemployed to working in the secondary sector where incomes are low and uncertain. Moreover, it is claimed that the high costs of some European welfare states in general diminish profitable employment opportunities. From this point of view, the policy recommended to reduce Europe's high unemployment is to restructure the European economies according to the pattern of the US economy. Familiar proposals are to cut back the welfare state, and in particular, to diminish unemployment benefits in order to provide incentives for the unemployed to look for a job.

The basic structure of the European and the US labour market reveals, however, that both markets share the apparent inability to employ a higher proportion of their labour supply in the productive primary sector. Hence, it seems more relevant to ask the question why this should be so. The answer that most workers outside the primary sector are inherently unproductive is too simple and not supported by the empirical evidence. A closer inspection of the historical record shows that one of the reasons might be a fairly rigorous anti-inflationary policy which keeps the rate of productive employment down, in order to stabilise the price level. Empirical data indicate that the endeavour of central banks to keep inflation rates down has, indeed, been accompanied by a reduction in the rate of employment in the primary sector. If this observation is correct, the monetary authorities have apparently used some trade-off between inflation and the rate of unemployment in the primary sector of the economy. According to this view, the loss of employment in the primary sector is simply the price which has to be paid for a stable price level, both in Europe and in the United States. But then the unpleasant conclusion for the European economies is once more that they waste the human resources which cannot be used in the primary sector, whereas these resources are employed at least in the secondary sector in the United States.

2. Before jumping to this conclusion, it seems reasonable to ask whether one should really recommend a rigorous stabilisation policy at the price of a significantly reduced rate of employment in the primary sector of the economy. An alternative proposal would be to shift to a more moderate stabilisation policy

which does not immediately react to each inflationary pressure and which tolerates temporary inflation, if in this way a considerably. higher average proportion of a country's labour supply could be employed in the productive sector. This could also change the general attitude towards the welfare state. One can imagine that the optimal level of welfare expenditures depends essentially on the rate of employment of the primary sector, and that in a very productive economy the welfare state, and especially unemployment compensation, would not be considered such a heavy burden. According to this view, the demand for a cutback of the welfare state in European countries may be to some degree only a reflection of their low rate of employment, and hence, of a rigorous stabilisation policy.

This is not to deny the importance of a well conceived stabilisation policy aimed at keeping inflation within limits. Without such a policy, one would have to expect a strong inherent tendency towards a high rate of employment or even full employment in the primary sector. The employees of this sector would have a very strong position in the labour market, because there would be no competition from outside this sector. They would use this position to demand and enforce higher wages. The firms, in which they are employed, would attempt to keep real wages down by raising their prices. The result would be an inflationary process characterised by some unexpected inflation. This is a very undesirable state of affairs for several reasons, but especially because it usually hurts creditors who have to expect losses because the repayment of a loan will be worth less than they had anticipated. The likely consequence will be that the growth of the country's capital stock is retarded, because savings go down and capital is invested in countries with no or with less unanticipated inflation . It is obvious that the welfare losses of such a development could be intolerably high.

Therefore, the implementation of a stabilisation policy which controls unexpected inflation is necessary. It is widely acknowledged that there exists a rate of employment at which this target can be achieved. The corresponding unemployment rate is known as "non accelerating inflation rate of unemployment" (NAIRU). Although the usual definition refers to the overall unemployment rate of an economy, it should here be understood as the share of the labour supply which is not employed in the primary sector. The crucial condition for an inflation-free economy is that the demand for higher wages in the primary sector is sufficiently constrained by a competitive pressure from outside. It doesn't matter whether this pressure comes from those employed in the secondary sector or from the unemployed.

It is also acknowledged, however, that it is impossible to keep the economy continuously at some target rate of employment. Not even the most

effective stabilisation policy can avoid fluctuations around such a position. Hence, if the target is NAIRU, the economy will still occasionally move into the inflationary domain. A rigorous stabilisation policy, which aims at preventing an unexpected inflation altogether, would have to choose a target rate of employment so far to the left of NAIRU that even large positive deviations would not bring the economy into the inflationary regime. Such a policy would be dangerous if it merely substituted an unexpected inflation by an unexpected deflation, because the latter is hardly less expensive (in terms of welfare losses) than the former. However, in most industrialised countries a deflation is prevented by downward rigid money wages. This fact indeed offers an opportunity to choose a target rate of employment which prevents an unexpected inflation without at the same provoking an unanticipated deflation.

Monetary authorities frequently opt for such a rigorous stabilisation policy because they are convinced that this is in the best interest of the economy. Even if they are not convinced per se, they may be forced to imitate such a policy if it is used in other countries. A country risks losing capital to inflation-free countries, if it permits unexpected inflation, even if this is only moderate and temporary. For analogous reasons, competition for capital between countries may lead to a race for more stability ending in the rigorous stabilisation policy defined above.

3. The problem of such a policy is that it may require a fairly low average rate of employment in the primary sector. If the consequence of this is persistent unemployment, a certain proportion of the unemployed would become long-term unemployed. But long-term unemployed individuals tend to lose their productive capacity, and sooner or later they drop out of the labour force. Hence, the effective labour supply would tend to decline. As the target rate of employment refers to this effective supply of labour, the total rate of unemployment which refers to the total labour force would rise. The final result could be an intolerably high rate of unemployment.

In this case, it might indeed be preferable to cut unemployment benefits in order to induce people to search a job. This would not only reduce the high rate of unemployment, but - more importantly - it would help to preserve the productive capacity of the individuals and hence stabilise the effective supply of labour. A rigorous stabilisation policy might therefore create some strong political pressure to reduce or even remove the support of the unemployed. Furthermore, it is easier for a country to stick to a rigorous stabilisation policy, if it has a low value of NAIRU, because then the loss of employment in the primary sector is less severe. One of the most promising ways of reducing NAIRU is a contraction of public spending and especially of the welfare state. When the tax burden of employees is relieved, wage claims will be more moderate so that an inflationary

pressure would arise only at higher rates of employment. Moreover, lower taxes can stimulate savings and in that way increase employment opportunities through a higher stock of capital. In this respect, a particularly promising policy seems to be a reduction of taxes on capital income. By this measure, countries sometimes even endeavour to attract foreign capital, although it is obvious that such a policy is futile if all countries tried to pursue it.

Yet, this outcome of a rigorous stabilisation policy could be far from optimal, because it is compatible with a reasonable unemployment rate only at a rather high price. Those who are not employed in the primary sector are forced to accept a badly paid and uncertain job in the secondary sector. The overall level of welfare is reduced, and the promotion of capital formation is likely to benefit capital at the expense of labour.

4. From this perspective, a moderate stabilisation policy, which stabilises the economy around NAIRU, should be taken more seriously.First of all, it would allow a higher rate of employment in the primary sector. Second, in this case, a radical reduction of welfare expenditures, especially of unemployment benefits, would probably turn out to be unnecessary and even undesirable. Certainly, this kind of stabilisation policy would occasionally tolerate some unexpected inflation, which could negatively affect the capital stock of the economy. But the impact could be small, because any unanticipated inflation would be temporary and moderate.

However, the transition from a rigorous to a moderate stabilisation policy could be a difficult task. Once a rigorous stabilisation policy and its supporting measures have been established world-wide, it is almost impossible for a single country to abandon them. A moderate stabilisation policy and a more generous welfare state would probably provoke an outflow of capital which would jeopardise the attempt to raise the rate of employment. Hence, the shift to a moderate stabilisation policy could only be inaugurated in a co-ordinated way. All countries involved would have to commit to this kind of policy.

The following sections analyse these claims and conclusions within the framework of a simple macroeconomic model. The model is of the NAIRU type, where NAIRU is determined by the consistency of wage claims and prices (see, for example, Carlin and Soskice, 1990, Manning, 1995, some of the articles in Dixon and Rankin, 1995, and Vogt, 1996). The analysis is intended to show that there is indeed a sound theoretical basis for proposing a moderate instead of a rigorous stabilisation policy.

2. A macroeconomic model

2.1 The basic structure of the model

1. The purpose of this section is to describe the model of an economy with two sectors of production, a "primary" and a "secondary" sector. Labour productivity is very high in the primary sector, but rather low and uncertain in the secondary sector.

In the primary sector, a given number of commodities is produced. Each commodity is produced by a different firm which has some advantage in its production due to some specific initial endowment (e.g. some special knowledge). Apart from this difference, firms are identical, i.e. they have the same technologies and costs. Also, demand for these commodities is symmetrical so that all commodities are produced and sold in equal amounts. Hence, one can say that there is a composite commodity consisting of equal amounts of all single goods. This composite commodity can be used for (private and public) consumption and for the formation of capital.

The inputs of production are capital and homogeneous labour. The production function of a representative firm is

$$(1) \qquad Y = Kf(Ne^{gt}/K) = kf(n/k)Le^{gt}, \quad k:=K/Le^{gt}, \; n:=N/L .$$

Here, Y is production, K is capital and N is the number of employees. There are constant returns to scale with respect to capital and labour, and diminishing returns to each separate factor of production, i.e. $f'>0$, $f''<0$. $g>0$ indicates a labour saving technical progress. One could think of treating the rate of technical progress as an endogenous variable as in the new growth theory. It seems, however, that not much would be gained for the purpose of the intended analysis and that it is preferable to keep the analysis as simple as possible. k is the level at which the stock of capital grows at the rate g. L indicates a constant labour supply, and n is the rate of employment in the primary sector. Correspondingly, 1-n is the proportion of the labour supply which is not employed in this sector.

The macroeconomic background of the analysis can be emphasised if one assumes that there is a continuum of commodities and firms on the closed interval [0,1], because then the variables are identical to macroeconomic aggregates, i.e. Y is total production of the primary sector, K is the capital stock and N is the number of employees in this sector.

Firms minimise their production costs according to the condition

(2) $$\frac{r}{\bar{w}} = \frac{f(n/k) - f'(n/k)n/k}{f'(n/k)}.$$

Here, r is the rate of interest, w is the real wage, and $w = \bar{w}e^{gt}$, so that $\bar{w}$ is the level at which the real wage grows at the rate g.

2. In a small open economy, the rate of interest is determined by the conditions of the global capital market. In this case

(3a) $$r = \bar{r},$$

where $\bar{r}$ is the world rate of interest. Together with the real wage it determines the equilibrium value of the labour intensity of production, n/k. For all countries together, or in a closed economy, this intensity is determined by the accumulation of capital which in turn implies a certain equilibrium rate of interest. The accumulation of capital can be explained by the assumption that a constant proportion s ($0<s<1$) of the primary sector's production is saved and invested in the capital good. The rate of change of capital is then given by $\dot{K} = sfK$, and hence the level of the capital stock of the economy develops according to

$$\dot{k}/k = sf(n/k) - g$$

A steady state is reached when the level of capital and the rate of employment obey the condition

(3b) $$f(n/k) = g/s.$$

In this case, n/k is determined by the parameters g and s, which are (for analytical convenience) assumed here as given. When n/k exceeds its steady state value, the level of capital rises, and when n/k is below its steady state value, k falls.

3. In the secondary sector, a consumption good can be produced which is a perfect substitute for the composite commodity. The only factor of production is labour. Labour productivity is a random variable x with a distribution function $\Phi(x)$ and an expected value $Ex = \bar{x}$. Total production of the secondary sector is

(4) $$X = (L-N)e^{gt}\bar{x}.$$

Productivity in this sector is distinctly lower than in the primary sector, i.e. $\bar{x} << f'(n/k)$.

4. The total labour force of the economy is $\bar{L}$. $L \leq \bar{L}$ is the (inelastic) supply of labour. The greatest part of this supply is employed in the primary sector, but

some part of it may go to the secondary sector, and there may also be some unemployment.

5. Commodity markets and the secondary labour market are competitive. Employees of the primary sector have some bargaining power, because there are positive real entry costs ω_E for individuals who want to move from the secondary sector or from unemployment to the primary sector. It is assumed that these costs rise with an increasing rate of employment in the primary sector, i.e. $\omega_E = \omega_E(n)$, $\omega_E'(n) > 0$.

6. It is assumed that money is in some way essential for production and exchange. The money price of the composite commodity is P. At this price, the demand for the good of the secondary sector (which is a perfect substitute) is completely elastic, so that P is also the equilibrium price of this good. The money wage is $W = \overline{W}e^{gt}$, where $\overline{W}$ is the level at which W grows at the rate g. A supply of money, M, is provided by the state and determined by the monetary authorities. Total demand for all commodities depends positively on the real balances M/P. The familiar equilibrium condition is

$$\overline{Y} + \overline{X} = D(M/P),\ D' > 0, \tag{5}$$

where D is a macroeconomic demand function and $Y = \overline{Y}g^{et}$, $X = \overline{X}g^{et}$.

7. Readers will perhaps miss the microeconomic foundations of labour supply, consumption demand, capital accumulation, and the role of money. There are two reasons for this omission. First, it seems preferable to keep the analysis as clear and simple as possible. It would be rather straightforward to derive labour supply, consumption demand, and also capital formation in the usual way from first principles (as, for example, in Phelps 1994). Second, however, there is still no reliable bridge from an intertemporal microeconomic analysis with uncertainty on one hand, to capital and money in macroeconomic models on the other. Hence, ad hoc assumptions, as in equations (3b) and (5), seem still preferable to sophisticated, but doubtful microeconomic explanations.

The only explicit assumption about utility functions is that the utility of an individual who supplies labour can be expressed by u-e . Here, e>0 indicates the costs of being employed, i.e. e=0 for unemployed individuals. u is a (concave) utility function , which increases with the real disposable income of an individual, and with the size of the welfare state. The real disposable income of an employee of the primary sector is his/her real wage, minus his/her contributions to the welfare state. The disposable income is x for individuals employed in the

secondary sector, and b for unemployed individuals, where b is the level at which unemployment benefits grow at the rate g.

2.2 Competitive prices, wage bargaining, and the real wage

1. The following considerations concern the primary sector of the economy. Under perfect competition, the price of each commodity would equal the average costs of production. However, the specific initial endowment of each firm permits a somewhat higher price and a corresponding rent (profit) of the firm. Under this condition, competitive prices are determined by a mark up m on average costs, where m is a given positive parameter. Furthermore it is assumed that the price of each commodity is set before the prices of the factors of production are known with certainty. Thus the price P of a commodity which is identical to the general price level is determined by the expected average costs C^E , which are given by

$$C^E = [W^E N + rP^E K]/Y = [\overline{W}^E n/k + rP^E]/f \, .$$

The superscript E indicates expected values. W is the money wage, and $\overline{W} = We^{gt}$ is the level at which the money wage grows at the rate g. P^E is the expected price of the composite commodity.

It is shown below {see equation (8d)} that $\overline{W}^E/P^E = \overline{W}/P$. Together with equation (2), it follows that expected average costs are equal to expected marginal costs (this is simply implied by constant returns to scale):

$$C^E = \overline{W}^E/f'(n/k),$$

i.e. C^E equals the ratio of the expected money wage to the marginal productivity of labour.

The competitive price is then given by

$$P = (1+m)\, \overline{W}^E/f'(n/k). \tag{6}$$

At this price, the market of each firm is contestable. It is assumed that the monopoly price of the market would be higher. Hence, each firm takes the competitive price as a given parameter. As this price exceeds the average costs, each firm would like to produce and supply as much of its product as possible.

2. The money wage of the primary sector is determined by bargaining. Under perfect competition, it would correspond to a reservation wage ω_R , which is determined either by the expected income of the secondary sector or by

unemployment benefits. However, competition is constrained by costs of entry to the primary sector, ω_E. This gives those who are employed in this sector some bargaining power. An employer can replace one of his employees by an outsider only if he adds the outsider's entry cost to the reservations wage ω_R . Hence, $\omega_R + \omega_E$ is the maximum real wage which he is willing to concede. The minimum demand of an employee is equal to his/her outside option ω_R . Depending on the respective bargaining power, the bargained real wage will therefore lie somewhere in the interval between ω_R and $\omega_R + \omega_E$. This shows that the entry costs ω_R provide some rent which can be shared by employers and employees. For the sake of simplicity, and without loss of generality, it can be assumed that employees are able to obtain the whole rent, so that the bargained money wage is determined by

(7) $\qquad \overline{W} = \omega P^E, \qquad \omega := \omega_R + \omega_E.$

In accordance with the determination of the price level, it is likewise assumed here that the money wage depends on the expected price level, because it has to be fixed before the true price level is revealed.

The bargained real wage ω will depend on the rate of employment n. It is assumed that entry costs are positively related to the rate of employment, $\omega_E = \omega_E(n)$ and $\omega_E'>0$. On the other hand, it is shown below that ω_R may be a decreasing function of the same variable, $\omega_R = \omega_R(n)$ and $\omega_R'(n)<0$. It seems reasonable to assume that, for all relevant values of n, the positive effect of the entry costs dominates the perhaps negative effect of the reservation wage, so that $\omega'(n) > 0$. Furthermore, it is assumed that the bargained real wage is always less then the marginal productivity of labour, because otherwise a firm would be expected to accept losses. It is possible, however, that the bargained real wage exceeds the real wage compatible with price setting in the commodity market. These assumptions on ω can be summarised in the following way:

(8) $\qquad \omega = \omega(n), \quad \omega'(n) > 0, \quad \text{and} \quad f'(n/k)/(1+m) < \omega(1) < f'(n/k),$

where n/k is determined by either (3a) or (3b).

3. The level of the real wage is $\overline{w} = \overline{W}/P$. If the money wage is correctly expected, it follows from equation (6) that

(9a) $\qquad \overline{w} = f'(n/k)/(1+m).$

This is a constant value, if (n/k) is determined by (3a) or (3b). If the price level is correctly expected, it follows from equation (7) that

(9b) $\overline{w} = \omega(n)$,

i.e. according to (9), $\overline{w}$ is an increasing function of the rate of employment. Figure 1 shows the graphs of (9a) and (9b).

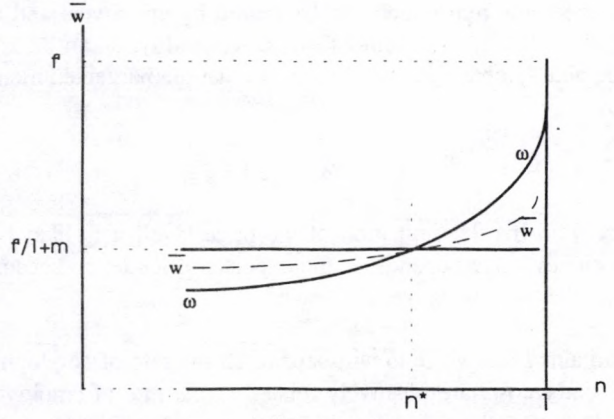

figure 1

For given wage and price expectations, the equations (6) and (7) show that the real wage is given by

(9c) $\overline{w} = \omega(n) f P^E/(1+m)\overline{W}^E$.

Which wage level will be expected when competitive prices are set? An apparent answer is that it must be the wage level which results from expected prices, so that
$\overline{W}^E = \omega(n)P^E$. In this case, the competitive price level will be given by

(6a) $P = \omega(n)(1+m)\, P^E/f$.

In an analogous way, one can argue that the expected price level which determines the wage rate must be equal to the price level which is actually established, $P^E = (1+m)\overline{W}^E/f$. Then the bargained wage level would be set at

(7a) $\overline{W} = \omega(n)(1+m)\overline{W}^E/f$.

The price and wage equations gained in this way imply that the real wage $\overline{w}=\overline{W}/P$ must equal its expected value:

(9d) $$\overline{w}=\overline{W}/P=\overline{W}^E/P^E .$$

Replacing $\overline{W}^E/P^E$ in equation (9c) by $\overline{w}$ yields the solution

(9) $$\overline{w} = \sqrt{\omega(n)f'(n/k)/(1+m)} .$$

Hence, the real wage is an average value of ω and $f'/(1+m)$. At a given value of n/k it rises with the rate of employment, but less than ω does. The condition (8) implies

(8a) $$f'(n/k)/(1+m) < \overline{w}\ (1) < \omega(1) < f'(n/k).$$

At full employment, the real wage is less than the marginal productivity of labour so that there are still some profits, but it exceeds the real wage which would be consistent with the price level. This behaviour of the real wage is shown in figure 1 by the dotted line.

2.3 The equilibrium rate of employment

1. In the primary sector of the economy, the price of each firm exceeds its average costs and hence also its marginal costs. This is certainly true for expected costs because the competitive price is set by a mark up on expected costs. The rather weak condition (8a) ensures that the price is also higher than the ex post value of marginal costs, $P > \overline{W}/f'$. As each firm acts as a price taker, it wants to produce as much as possible. The maximum amount of production is obtained when all resources are employed. Hence, there is an inherent tendency to full employment. The fact that the real wage rises when the rate of employment goes up does not obstruct this tendency, because it is due to an external effect. When a single firm employs more workers, it does not improve their bargaining power. The position of employees is improved only when all firms together expand their labour force. Even if this resulted in a reduction of profits, a single firm would have no incentive to behave in a different way. It would be in a typical prisoners' dilemma.

However, full employment is a precarious state because it implies inconsistent expectations. At full employment, employees are in a particularly strong bargaining position. The desired real wage $\omega(n)$ reaches its maximum value. Equations (6a) and (7a) together with (8a) imply $P/P^E = W/W^E > 1$. As the ex post values of prices and wages exceed their expected values, there is

unexpected inflation. There is a vast and still growing literature on the social costs of unexpected inflation (see, for example, Howitt 1990). For the present purpose it seems reasonable to focus on the potential losses of creditors whose ex post real return is less than they expected. A country with unanticipated inflation must fear an outflow of capital, because capital owners will look for more profitable investment opportunities in other countries, unless domestic firms offer a higher real rate of interest. For all countries together (or in a closed economy), an unanticipated inflation will reduce the rate of savings. In both cases, a country's capital stock will decline {see (3a) and (3b)}. (It is obvious that for a precise explanation of these statements, the inflationary process and its implications for individuals and firms would have to be specified).

2. This shows that full employment in the productive (primary) sector is no equilibrium, even if it were the outcome of unguided market forces. Consistent expectations require a rate of employment n*, at which

$$\omega(n^*) = f'(n/k)/(1+m), \tag{10}$$

with n/k determined by (3a) or (3b). The corresponding value of n* (and also the conditions of its existence) can be seen in figure 1. This is the familiar "non accelerating inflation rate of unemployment", NAIRU. It is frequently claimed that NAIRU, not full employment, would come about by unguided market forces, if the individual agents have rational (correct) expectations. However, in a monetary economy this view presumes an exogenous supply of money. The usual approach is to assume a macroeconomic demand function D(M/P), where M is the exogenous supply of money, and a macroeconomic supply function $S(P^E/P)$. Then NAIRU is obtained when the following three conditions are satisfied: First, equilibrium in the commodity market, S=D. Second, rational (or correct) expectations, $P^E = P$. Third, the supply of money is exogenous, $M = \overline{M}$. It follows that $S^* = S(1) = D(\overline{M}/P^*)$. Here, S^* corresponds to NAIRU. This line of reasoning can be applied to the present model, if it is supplemented by the corresponding aggregate demand function (5) . The level of supply is given by $\overline{Y} + \overline{X} = nLf(n/k)/(n/k) + nL(1-\overline{x})$. When expectations are rational (correct), the price equation (6) and the wage equation (7) are consistent at n*, i.e. NAIRU. When the supply of money is exogenously given, the price level results from the equilibrium in the commodity market, $n^*L\{f(n/k)/(n/k)-\overline{x}\} = D(\overline{M}/P^*)-\overline{x}L$.

It is important to realise that rational or correct expectations are sufficient to establish NAIRU only under the additional condition that the supply of money is exogenous (given the equilibrium in the commodity market). Thus, a state of full employment could prevail as long as the resulting inflation is financed by a corresponding endogenous expansion of the supply of money. In this case, the

price level is determined by the price equation (6), given the expected wage level. Equilibrium in the commodity market determines the equilibrium value of real balances, M/P which is obtained by a continuous endogenous adjustment of M to P.

Viewed in this way, NAIRU is not established merely by market forces as such, but by some deliberate monetary policy which determines the price level. Sacrificing some employment in the primary sector in order to stabilise the price level at NAIRU is a reasonable policy, whenever the costs of an unexpected inflation are higher than the opportunity costs of a reduced production in this sector of the economy.

3. Stabilising the economy at NAIRU does not mean that the monetary authorities are able to keep the economy continuously at this position. There will be fluctuations around NAIRU, which can be explained by movements of the parameters of the economy, especially by oscillations of overall demand. It is commonly accepted that a monetary policy of "fine tuning" which tries to dampen or even eliminate these fluctuations is doomed to failure, because there are unavoidable lags of recognition, implementation, and of the impact of a policy action. What stabilisation policy can do is to bring about the conditions under which NAIRU becomes a centre of gravitation, around which the economy can fluctuate. There are positive of negative deviations of the rate of employment n from its equilibrium value n*. Every deviation induces inconsistent expectations according to

(11) $\omega(n) \neq f'(n/k)/(1+m)$ for $n \neq n^*$ and n/k determined by (3a) or (3b).

Equation (6a) shows that there will be unexpected inflation ($P>P^E$) if $n>n^*$, and unexpected deflation ($P<P^E$) if $n<n^*$, but one could perhaps expect that in the long run inflation and deflation compensate so that the price level is stable on average. Nevertheless, there would still be some costs of unexpected movements of the price level, especially because there are also costs of unexpected deflation (comparable to those of unexpected inflation).

This description is not in accordance, however, with the empirical observation that there is hardly any deflation at all, and certainly no unexpected deflation. The reason for this is apparently that money wages are downward rigid. There is a lot of empirical evidence that this is in fact the case. Furthermore, there are some more or less convincing explanations for this phenomenon, for example the importance of relative wages in wage bargaining, or the real debt resistance hypothesis. (Much of the theoretical and empirical evidence is presented in Akerlof, Dickens and Perry, 1996, pp.4-17. The real debt resistance hypothesis is

discussed in Taheri, 1995). Whatever the reason may be, the present analysis suggests that a downward rigidity of money wages is to be welcomed rather than criticised. Usually, the downward rigidity of money wages is blamed for the existence and persistence of high unemployment. But the analysis shows that downward flexible money wages would not reduce the equilibrium rate of unemployment. On the contrary, the downward rigidity of money wages is helpful, because it prevents unanticipated deflation and its costs. Hence, it rather supplements a stabilisation policy, which keeps the economy on a path around the gravitation centre n*, because the price level is stabilised, except for periods in which the rate of employment exceeds its value at n*, and the economic costs of deviations are limited to those produced by unanticipated inflation during boom periods.

2.4 A rigorous versus a moderate stabilisation policy

1. Without unexpected deflation, all rates of unemployment 1-n with $(1+m)\omega(n) \leq f'$ are NAIRU. When the money wage cannot fall, its ex post value can be correctly anticipated so that $\overline{w}^E = \overline{w}$. Hence, the real wage follows immediately from the determination of competitive prices, i.e. equation (9a), $\overline{w} = f'/(1+m)$, is valid for all values $n \leq n^*$. It is true that employees would accept a reduction of the real wage because $\omega(n) < \overline{w}$ for $n \leq n^*$, but this is prevented by the downward rigidity of money wages.

A lot of empirical evidence shows that monetary authorities are apparently inclined to use the existence of multiple NAIRU for a more rigorous stabilisation of the price level. It is debatable whether they would accept movements around n* if each temporary inflation was balanced by a corresponding deflation in such a way that the price level remained stable on average. But very often their preferred objective seems to be to avoid inflation altogether. This ambitious target can only be achieved when the rate of employment, around which the economy oscillates, is below n*. In an economy with downward flexible money wages, such a policy would be irrational, because it would simply replace unexpected inflation by unexpected deflation. However, with downward rigid money wages, the monetary authorities can choose a centre of gravitation $n^\circ < n^*$ from the multiplicity of rates of employment which are NAIRU. This can be done in such a way that positive deviations from this centre will not propel the rate of employment into the inflationary domain. One might call this a "rigorous" stabilisation policy, and n° a "rigorous" NAIRU, as compared to a "moderate" stabilisation policy with the focus on a "moderate" NAIRU n*. (The paper by Akerlof, Dickens and Perry, 1996, is also based on this idea).

The principal idea behind such a policy seems to be that the total elimination of unexpected inflation would maximise the rate of savings. The corresponding increase of the capital stock should then allow a rate of non-inflationary unemployment n° which is higher than n^* under a moderate stabilisation policy . This idea can be formalised in the following way. If $(1+\nu)n^\circ$ ($\nu>0$) is the highest positive deviation from n° , the target rate of employment which completely prevents inflationary pressure must be chosen according to

$$f'\{(n/k)^\circ\}/(1+m) = \omega\{(1+\nu)n^\circ\} \tag{12}$$

In this way, all rates of employment are confined to an interval in which the condition $(1+m)\omega \leq f$ holds, and every rate of unemployment is NAIRU. Now assume that s° is the rate of savings induced by a rigorous stabilisation policy. It determines the labour intensity $(n/k)^\circ$ according to equation (3b) in the following way:

$$f\{(n/k)^\circ\} = g/s^\circ. \tag{3b)'}$$

Equations (3b)' and (12) together determine k° and n°.

These values must be compared with the values k^* and n^* which correspond to a moderate stabilisation policy. They are determined by equation (10) and equation (3b) for $s = s^*$, where s^* is the rate of savings induced by the centre of gravitation n^*. The basic idea of a rigorous stabilisation policy can now be expressed with the help of figure 2.

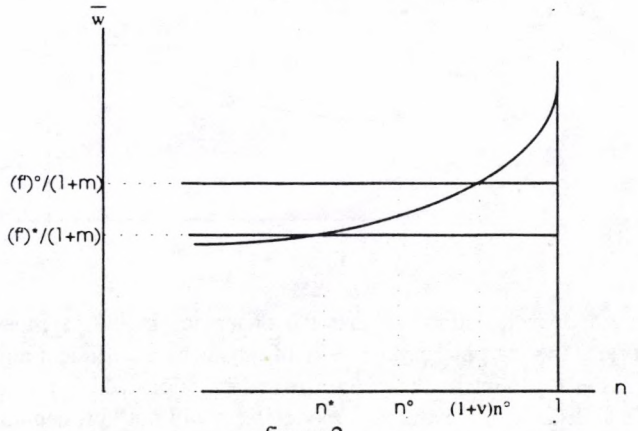

figure 2

As n° is a non-inflationary solution (whereas n^* admits temporary unexpected inflation), it provides an incentive for a higher rate of savings, $s^\circ > s^*$. As a result, the capital intensity of production is also higher in n°, $(n/k)^\circ < (n/k)^*$. Even for a positive value of ν , it is therefore possible that $(1+\nu)(n/k)^\circ < (n/k)^*$. A comparison of equations (10) and (12) shows that this implies $(1+\nu)n^\circ > n^*$, or $(1+\nu)k^\circ(n/k)^\circ > k^*(n/k)^*$. In this case, a rigorous stabilisation policy would be justified. It would raise the capital stock ($k^\circ > k^*$) and in this way create additional employment opportunities, so that the average rate of employment, $n^\circ > n^*$, would indeed be higher.

2. As the preceding analysis shows, the success of a rigorous stabilisation policy is guaranteed only if it induces a sufficient amount of additional savings. If the difference between s° and s^* is small, $(n/k)^\circ<(n/k)^*$ is still valid, but now $(1+\nu)(n/k)^\circ > (n/k)^*$ becomes possible. A comparison of equations (10) and (12) shows that this implies $(1+\nu)n^\circ < n^*$ so that $n^\circ < n^*$. Furthermore, $(1+\nu)k^\circ(n/k)^\circ < k^*(n/k)^*$. It immediately follows that $k^\circ < k^*$. Hence, a rigorous stabilisation policy would fail to increase the capital stock, and the target rate of employment n° would remain below the moderate value n^* of NAIRU. Figure 3 illustrates this result.

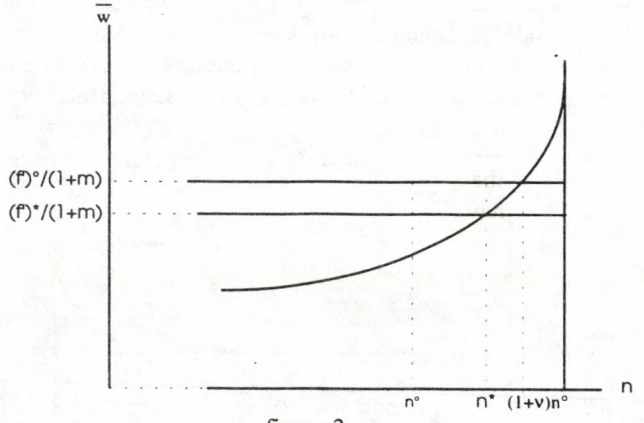

figure 3

It is an open question whether the difference in the savings rate is big enough to raise the marginal productivity of labour by a sufficient amount. There is some reason to doubt it. If the unexpected inflation, which is tolerated by a moderate stabilisation policy, is also moderate, it will not hurt capital investment very much, and there will be no substantial decline in savings. Arguments in favour of this view are, first, that an unexpected inflation is only temporary, and

second, that it remains limited because $P/P^E = \omega(n)(1+m)/f' < \omega(1)/\bar{w}$ {see equation (6a)}.

If a moderate stabilisation policy does not imply a significant decline in the capital stock, the difference between n^* and n° is determined mainly by the extent of positive deviations from n°. In the case in which savings don't differ at all, n^*-n° simply corresponds to the maximum positive deviation expected.

3. An important property of a rigorous stabilisation policy is the permanent exclusion from the primary sector of a certain proportion of the total labour supply. Its likely consequence will be that some individuals will never get a chance of becoming employed in this sector. If they remain unemployed, they also tend to lose the productive abilities required for working there, so that they eventually become really unable to compete for jobs in the primary sector. In this way, the competitive pressure from unemployed individuals, which determines the bargaining power of the insiders of the primary sector, is weakened. Consequently, a higher rate of unemployment is required in order to eliminate an inflationary pressure. (This problem has been examined in several studies. See, for example, Carlin and Soskice, 1990, ch.19.3)

In order to specify the potential outcome within the framework of the present model, one has to distinguish between the total labour force $\bar{L}$ and the effective amount of labour $L \leq \bar{L}$ supplied to the primary sector. Under a rigorous stabilisation policy, $[1-(1+\nu)n^\circ]L$ potential workers are never employed there. Assume that in each period $\gamma[1-(1+\nu)n^\circ]L$ of them, $(0<\gamma<1)$, lose the ability to compete for a job in the primary sector and drop out of the effective labour supply. Some of them may be leaving the labour force anyway, mainly because of old age. Assume that their number is $\delta\bar{L}$, and that they can be replaced by well-trained (young) persons, so that the total labour force $\bar{L}$ remains constant. If the number of those who drop out exceeds the number of those who retire, $\delta\bar{L} < \gamma[1-(1+\nu)n^\circ]L$, the effective labour supply declines, until a steady state solution is obtained at which

$$L/\bar{L} = \delta/\chi[1-(1+\nu)n^\circ] < 1.$$

The average total rate of employment in the primary sector, $nL/\bar{L}$, would then shrink correspondingly. Even if δ is only slightly less than $\chi[1-(1+\nu)n^\circ]$, the impact on the total rate of unemployment, $1-nL/\bar{L}$, could be considerable (for example, if $L/\bar{L} = 0{,}96$, the rate of employment is reduced by four percentage points).

A moderate stabilisation policy could avoid such an increase in total unemployment, because it occasionally allows high rates of employment or even full employment. When the rate of permanent unemployment is low, it is likely that those who drop out of the effective labour supply, because their productivity has fallen, belong to the group of people who are retiring anyway. In this case, the effective labour supply remains constant at its initial value $\bar{L}$.

2.5 Stabilisation policy and the welfare state

1. When the economy is stabilised at NAIRU, (1-n)L workers are excluded from the primary sector, because they cannot successfully compete with insiders. They can either move to the secondary sector, or they can remain unemployed. The secondary sector is a competitive sector, in which labour is the only factor of production. The average and marginal productivity of labour is x. As there is perfect competition, x is also the real income of a worker in this sector. The special feature of this income is that it is uncertain and that its expected value $\bar{x} = Ex$ is low compared to the productivity of the primary sector, Ex<<f'. The expected utility of an individual working in the secondary sector is E[u(x)]-e. It can be very low, if many jobs are badly paid, and if individuals are very risk averse. In this case, the individuals, who are forced to work in the secondary sector, must be regarded as the victims of the stabilisation policy. In order to improve their prospect, one could consider an insurance which guarantees a minimum income, for example the average income $\bar{x} = Ex$. However, this may give rise to the familiar moral hazard problem. Workers may reduce their effort, but claim that their income is low because their job is so bad. If it is too expensive to observe the true level of effort, the compensation must be paid in any case. A simple version of the formal argument can be presented in the following way. Assume that workers can reduce their effort level e to 0 without being observed. They will prefer to do this if $(\bar{x})\{1 - \Phi(\bar{x})\} > \int_{\bar{x}}^{\infty} u(x)d\Phi(x) - e$, where $\Phi(x)$ is the distribution function of x. For example, if $x=x^+$ with probability q and x=0 with probability 1-q, the corresponding condition would be $u(\bar{x}) > u(x^+)-e/q$.

In this case, the elimination of uncertainty would virtually amount to the provision of unemployment benefits. It is obvious that these benefits would have to be financed by the income recipients of the primary sector. In the simple setting of the present model, a regular scheme of unemployment compensations makes sense only if the unemployment benefit b is high enough to guarantee that u(b) > Eu(x)-e. In this case, unemployment is preferred to working in the secondary sector. If this insurance scheme is to be financed by those employed in the primary sector, each of them has to contribute the amount b(L-N)/N.

The decision, whether there is sufficient unemployment compensation or not, affects the reservation wage, and hence the rate of emmployment. With no unemployment, the reservation wage ω_R of the primary labour market is determined by $u(\omega_R) = Eu(x)$ or
$\omega_R = u^{-1}\{Eu(x)\}$. At NAIRU, the real wage of the primary sector is the sum of this reservation wage and entry costs, $\bar{w} = \omega_R + \omega_E(n)$. In a steady state equilibrium, $\bar{w} = f'(n/k)/(1+m)$, and n/k follows from (3a) or (3b). Hence, $\bar{w}$ can be regarded as given. The equilibrium rate of employment n* is then determined by the condition

(13a) $$\omega_E(n^*) = \bar{w} - u^{-1}\{Eu(x)\}.$$

If Eu(x) is very low compared to $\bar{w}$, entry costs must be correspondingly high. This is the case at a high rate of employment n*. Therefore, a low expected utility in the secondary sector is a favourable condition for stabilising the price level at a high rate of employment in the primary sector. With sufficient unemployment benefits, the reservation wage ω_R of the primary sector has to satisfy the equality $u\{\omega_R - b[(\bar{L}/nL)-1]\} - e = u(b)$. Once again, the equilibrium real wage $\bar{w} = \omega_R + \omega_E$ is determined by exogenous parameters, $\bar{w} = f'(n/k)/(1+m)$, and n/k from (3a) or (3b). Hence, the rate of employment is now given by

(13b) $$\omega_E(n^*) + b[(\bar{L}/nL)-1] = \bar{w} - u^{-1}\{u(b)+e\}.$$

A comparison with equation (13a) shows the obvious result that the rate of employment in the primary sector is lower than in an economy without unemployment benefits.

In spite of this disadvantage, individuals might opt for an unemployment compensation scheme, when they consider the risk of becoming unemployed. With no compensation system, the individual utility level will be either $u(\bar{w})-e$, or $Eu(x)-e$. With unemployment compensation, the corresponding utility levels are either $u\{\bar{w}-b[(\bar{L}/nL)-1]\}-e < u(\bar{w})-e$, or $u(b) > Eu(x)-e$. Even employed individuals might then prefer the solution with unemployment compensation, if they are sufficiently risk averse. They can also enforce such a solution, because they have the majority of votes in the political decision-making process.

However, under a rigorous stabilisation policy, unemployment may be very high. In this case, the contribution to unemployment compensation, $b[(\bar{L}/nL)-1]$, can also be rather high, because it goes up with a falling value of n, which also increases $\bar{L}/L$. As unemployment benefits become more expensive, one should expect that there would be less demand for them, and the employees of the

primary sector, who decide the political outcome, might opt for a reduction. It is conceivable that this reduction is so substantial that people would prefer working in the secondary sector to being unemployed. In this way, a high rate of employment in the secondary sector together with a low rate of unemployment may simply indicate an optimal reaction to a rigorous stabilisation policy.

2. Furthermore, a policy which implies high unemployment raises the general tax burden. This might lead to a decline of the optimal size of the welfare state. Assume that $t\bar{L}$ is the quantity of a public good (the size of the welfare state) which is financed by the employees of the primary sector. Then each of them has to contribute $t\bar{L}/nL$. Again, the burden of the contribution rises with a falling rate of employment. (The basic argument of the analysis remains valid, if the recipients of capital income and profits are also taken into account).

Hence, a rising rate of unemployment reduces the disposable income $\bar{w}-t\bar{L}/nL$. A lower disposable income would probably reduce the savings rate s. This would aggravate the negative impact, because it would also reduce the real wage $\bar{w}$ {see equations (9a) and (3b)}. A usual utility function, which considers the public good (or the size of the welfare state), is $u(\bar{w}-t\bar{L}/nL, t)$. It shows the possible trade-off between the public good and its costs. It is easy to see that the optimal value of t , which maximises u, declines with a falling value of n , for two reasons. First, there is a negative substitution effect due to the higher price of the public good. Second, there is also a negative income effect due to the contraction of the disposable income.Therefore, the employees of the primary sector will prefer a lower value of t , i.e. a reduced size of the welfare state. They can probably accomplish this result, because they have the majority of votes in the political decision-making process.

A reduction of the size of the welfare state shifts the curve of the bargained wage downward, because it lowers the reservation wage. It may also shift the curve $\bar{w}=f'/(1+m)$ upward, if it raises the rate of savings. Hence, such a reduction would to some extent reverse the negative impact on the employment rate (see figures).

A reduction of the high rate of unemployment will be even more important, if there are additional costs of a low rate of employment in the primary sector. It is well known, for example, that the crime rate of a society is positively related to the unemployment rate (and also to the rate of employment in the secondary sector of the economy). Hence, the costs of criminality will go up with a declining rate of employment. Their existence provides an additional incentive to raise the employment rate by cutting back the public sector.

3. Some conclusions for unemployment and stabilisation policy in Europe

1. The purpose of this analysis has been to shed some light on the likely causes and also on possible cures of high unemployment in European countries. Nobody can deny that the persistence of high unemployment has substantially contributed to the complete elimination of unexpected inflation. This indicates convincingly that European employment has, indeed, been determined by some NAIRU. Furthermore, there is some clear evidence that this state of NAIRU has mainly been achieved by a more or less rigorous stabilisation policy (see, for example, L. Ball, 1996). As a matter of fact, there were only two periods of unexpected inflation in Europe after the Second World War. Each of them was triggered by an oil price shock, and both were successfully removed after some time by a restrictive monetary policy. This view is confirmed by the way in which the monetary authorities themselves have usually assessed their own policy and its consequences (see, for example, the study of Beißinger, 1996, for Germany).

2. Most supporters of a determined stabilisation policy would deny, however, that this poliy is responsible for the high rate of unemployment. According to conventional wisdom, this phenomenon is due to an unusually high value of NAIRU, caused by some structural reasons,such as high wages and a shortage of capital in relation to the supply of labour. In the context of the model presented above, the argument is that even the moderate value of NAIRU, i.e. 1-n*, is too high to permit price stability without a lot of unemployment. According to the model, n* is determined by the intersection of $f'(n/k)/(1+m)$ and $\omega(n)$ {see equation (10)}, where the steady state value of n/k follows from either $r=\bar{r}$ {see equation (3a)}, or $f(n/k)=g/s$ {see equation (3b)}. Hence, n* could, indeed, be low for the reasons mentioned above. First, the wage demand, expressed by $\omega(n)$, could be comparatively high, and second, the marginal productivity of labour, f', could be comparatively low. There is some evidence that f' has recently come under some pressure by an increased rate of technical progress. However, the main explanation could be a relative shortage of capital caused by the intensified global competition for capital (given an abundant supply of labour), which increases the real rate of interest, but basically by an insufficient rate of savings.

The obvious proposals for raising employment, which follow from this diagnosis, are a reduction of the wage pressure and a promotion of savings. Among several measures suggested (and partly implemented), a relief of the tax burden and of unemployment benefits has received the greatest attention. This is plausible. Lower taxes on wage income and reduced contributions to unemployment insurance decrease the reservation wage and hence the wage demand as expressed by $\omega(n)$. Lower taxes in general, but especially on capital

income, are likely to generate more savings which raise the capital stock and in this way the marginal productivity of labour.

It is conceivable that this policy can indeed reduce the rate of unemployment, without at the same time sacrificing the target of a stable price level. The experience of the US economy with its low rate of both unemployment and inflation seems to confirm this hope. On the other hand, it is exactly this same experience which casts some doubt on the desirability of the ensuing structure, especially with respect to the rate of employment in the primary sector, and the eventual size of the welfare state. A low rate of unemployment, which is coupled with a fairly high rate of employment in the less productive secondary sector, and with a trimmed welfare state, may arouse the suspicion that it could be simply the result of a rigorous stabilisation policy.

3. With this perception in mind, an alternative explanation of the European experience would suggest that, besides some structural causes, a rigorous stabilisation policy also has been an important source of high unemployment. This view seems to be confirmed by empirical research on the reasons of European unemplyoment (see, for example, the survey by Bean, 1994). There is apparently no convincing evidence that a significant part of the unemplyoment could be explained by structural changes, whereas the role of monetary constraints for the rise in unemployment is confirmed. Recessions, which caused the rise in unemployment rates, were regularly initiated by restrictive monetary measures (there is a vast literature, which tends to confirm this view. See, for example, Romer and Romer 1994a and 1994b).

This explanation suggests a transition to a moderate stabilisation policy, which tries to establish n^* instead of n° as a long run centre of gravitation, and which tolerates economic upswings even if they provoke some unexpected inflation. A clear advantage of this step would be a higher average rate of employment in the primary sector. Furhtermore, it would probably obstruct the excessive cutback of the welfare state, and especially of unemployment compensations, which has been proposed and already partly implemented. Those, who cannot find a job in the primary sector, would then still have a fair chance of choosing between taking a job in the secondary sector or being unemployed. This is not to deny that there is also sound reason for a reduction of high budget deficits and taxes, which could contribute to an increase of capital formation and employment. However, these reductions could be limited, if it is really the case that the optimal size of the welfare state is greater under a moderate rather than a rigorous stabilisation policy. Finally, stabilising the economy around the moderate NAIRU would be advantageous for the employees of the primary sector, because in boom periods their real wage would rise {see equation (9) and figure 1}.

4. The shift to a moderate stabilisation policy would probably not require any spectacular expansionary measures, but just a credible commitment from the monetary authorities that they would be prepared to accept n^* instead of n° as a centre of gravitation, and that they would tolerate some temporary inflation caused by positive deviations from this centre. Such a commitment would presumably induce the economic agents to regard n^* as the long run equilibrium position of the economy and to adjust their plans accordingly. Still, one should not expect an immediate success of this transition. The reduction of the rate of unemployment would be retarded, because the accumulation of capital necessary to support n^* instead of n° takes some time (remember, that n^* and n° are steady state values. A similar point is made in Rowthorn, 1995).

A single country might find it difficult, if not impossible, to shift to a moderate stabilisation policy, because the tolerance of an unexpected inflation might provoke an outflow of capital. The same problem arises with respect to the adequate choice of welfare expenditures, because higher taxes, especially on capital income, may also induce a corresponding loss of capital. Presently, the general impression is rather that countries are in a race for more stabilisation and less welfare, in order to attract capital from each other. It is obvious that this competition is simply the futile result of a prisoners' dilemma. But this kind of behaviour demonstrates that the suggested transition is only possible if an extremely important condition is satisfied: The move would have to be supported by all, or at least by the most influential, monetary institutions. A serious attempt to shift to a moderate stabilisation policy generally requires credible commitments from all parties involved.

The most serious obstacle to this transition is probably the widespread belief that the high unemployment is due to the structural factors mentioned above, and not the anti-inflationary policy. It is obvious that the present analysis cannot simply reject this conventional wisdom on theoretical or even empirical grounds. Rather, the purpose of this analysis has been to demonstrate that the persistence of high unemployment might also be due to a rigorous stabilisation policy, and that in this case, the attempt to reduce unemployment by a rigorous reduction of the welfare state could be misguided. The analysis intends to show that these conclusions cannot be rejected on purely theoretical grounds, so that a final judgement has to rely on empirical considerations. As there is also some empirical evidence in support of the view presented here, this view should perhaps be taken more seriously than it has been up to now.

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