

**No Credit For Transition:
Efficiency Wages, the Maastricht Treaty and German
Unemployment**

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Abstract

Germany is generally regarded as the nominal anchor for Europe. Its participation is the *sine qua non* of EMU. It has been the largest net contributor to EU finances, the leading proponent of greater economic and political union, and the leading example of the virtues of fiscal and monetary rectitude as enshrined in the Maastricht treaty. However, reunified Germany combines the prosperous western state with the transitional eastern economy, and the burdens of combining the two roles, that of being an example of fiscal and monetary prudence for the EU on the one hand, and that of financing the transition of the former East Germany on the other, are leading to high unemployment, are slowing the transition process, and may become insupportable. We argue here that Germany should be viewed as part of the problem rather than its treatment.

Keywords: Transition, Germany, Maastricht, EMU, instability

JEL numbers: E62, J41, O52, R12

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Introduction

"Germany has become caught in a vicious circle. Rising unemployment has undermined the finances of a generous social security system, forcing up non-wage labour costs in the form of employers' contributions. In response companies have rationalised by investing abroad and cutting staff at home, increasing unemployment still further, and putting the social security system under still more strain." (Peter Norman, Financial Times, 27th February 1998.)

In the United States, the trade-off between unemployment and inflation seems to have improved and the combination of below 5% unemployment and below 3% inflation (with little sign of increases in the pipeline) has led some observers to conclude that the US NAIRU may have fallen by one percentage point - in part because of the competitive pressures exerted by globalization (Posen, 1997). In the European Union, however, things look very different. While it is true that inflation is currently lower in France and Germany than in the USA, this is associated with very high levels of unemployment, above 11% in both countries. Europe has surely been exposed to much the same forces of globalization as the US, and the creation of the Single Market in 1992 has if anything meant that the changes in competitive pressure may have been greater. Why the difference?

One possibility is that the effects of increased competition have different effects depending on the initial state of competition. Calmfors and Driffill (1988) have argued that both highly corporatist and highly competitive economies are better at handling supply side shocks than are mixed economies. Danthine and Hunt (1994), following similar lines, showed that the integration of two economies could lead to either a higher or a lower equilibrium rate of unemployment depending on the initial degree of centralization of bargaining and the arrangements put in place thereafter. Perhaps, under pressure of globalization, the US is becoming more purely competitive but Europe is becoming more mixed -- with some decline in corporatism but no radical shift in the institutional structure. (If so, the message for Europe would be: don't stop now!) In his study, Posen (1997) is examining the possibly differential effects of globalization on the NAIRU in the US and Europe.

By focusing on Germany we examine an institutional change peculiar to Europe that is having a dramatic effect on unemployment and inflation -- the economic transition from Communist planning to the market economy. In Central Europe transition has been marked by a U-shaped drop in output which has pushed unemployment rates above 10% (and even higher). Aghion and Blanchard (1994) have analysed the economic forces that may be responsible for the increased unemployment. While the aim of these authors has been to explain events in Poland, Hungary and other Central European states, we contend that they are also relevant for Germany where handling the transition has been the major domestic problem since Unification.

Since that date Germany has been responsible for handling 8 million workers in transition. But at the same time Germany has been in the lead in pursuit of closer economic integration in Western Europe, with Chancellor Kohl's objective of keeping EMU on target as the clearest illustration. (These two are, of course, not independent: Chancellor Kohl feels that a more closely integrated Europe offers a more secure environment for the Germany he helped to unify.) Pursuing both objectives at the same time has, we argue, imposed peculiar strains on the German economy, of which rising unemployment is the outward manifestation.

A key factor is that the Maastricht criteria governing debt and deficits (which were designed to prevent profligate spending by fiscally irresponsible governments) and their successor the Stability and Growth Pact effectively block the use of capital markets to finance the costs of transition, forcing the costs onto current taxpayers, and destroying new jobs in the process, as described by Peter Norman in the Financial Times, above. Instead of treating her as a special case to be exempted from the Maastricht criteria, however, Germany's neighbours are looking to her to set the pace in fiscal rectitude. Like the wronged heroine of some Victorian novel, Germany is destined to bring her offspring into the world without any relaxation in the strict straight-jacket of utter respectability!

To analyse the supply side in a consistent fashion with and without transition, we adopt the efficiency wage framework of Shapiro and Stiglitz (1984). Before transition, unemployment is in equilibrium when wages are high enough to prevent shirking and when new hiring at these wages just matches the rate of job break-up. During transition the rise of inflows increases the

pool (and duration) of unemployment which reduces the efficiency wage; but the taxes required to pay for the extra unemployed act as a deterrent to job creation.(It is because of the terms of the Maastricht Treaty that we feel justified in applying to Germany the fiscal constraints used by Aghion and Blanchard for countries with no access to capital markets.)

To see whether or not hiring will tend to catch up with inflows to unemployment during transition, we conduct some numerical exercises. We first illustrate a relatively benign scenario where unemployment rises during transition, but its rise is bounded (to about 4 percentage points). We also find that with higher rates of unemployment benefit there could be a “vicious circle” in which rising unemployment increases taxes more than it reduces the efficiency wage, so unemployment will keep on rising until the transition is over. (“Hysteresis” effects make this scenario more likely.) We show that this will not happen if there is “tax smoothing”, ie, where there are deficits during transition and fiscal sustainability is achieved by a small rise in the permanent rate of tax. Before concluding we consider the argument that tax smoothing removes incentives to reform labour markets. Before that we first present some evidence of the fiscal burden imposed by the process of transition.

Unemployment and the fiscal burden in Germany

By 1996, wages in East Germany had risen to around 73% of those in the west, but productivity had risen to only 52% or thereabouts, and production costs are consequently much higher in the East than in the west. (OECD, 1997.) Employment fell very fast in the East after unification, from 8 million in 1991 to 6.25 million in 1992, and it has stayed in the range 6 to 6.5 million from then onwards. Unemployment in the East shot up, to over 15% by 1992q2 and has remained in the 15-18% range since then. In the West employment has fallen steadily since 1992, right until 1997, and unemployment has risen steadily. Table 1 gives some recent figures and Figure 0 shows a longer time series for the Federal Republic.

Table 1. Unemployment rates in Germany

	1993	1994	1995	1996
West	8.2	9.2	9.3	10.1
East	15.8	16.0	14.9	16.7

Sources: Federal Statistical Office of Germany. Figures for April of each year. Unemployment is as a percentage of the active population (dependent civilian employment). West is former

territory of the Federal Republic. East is New Länder and Berlin-East.

	Jan 97	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98
Germany	13.5	13.5	13.0	12.6	12.3	12.2	12.6	12.7	12.5	12.4	12.5	13.1	14.0
West	11.8	11.8	11.3	11.0	10.7	10.6	10.9	10.9	10.7	10.6	10.7	11.1	11.5
East	20.2	20.5	19.6	19.0	18.7	18.7	19.4	19.7	19.6	19.5	19.7	20.8	22.6

Sources: German Federal Statistics Office. Unemployment as a percentage of the active population (dependent civilian employment). West is former territory of the Federal Republic. East is New Länder and Berlin-East.

The transfers to the East have been huge, and are likely to continue on a vast scale for a long time to come¹ -- see table 2. Meanwhile, public debt has risen to the limit, as table 3 shows.

Table 2. Transfers to East Germany

	1991	1992	1993	1994	1995	1996	1997
DM bn	106	115	129	125	140	140	133
% of GDP of all Germany	3.7	3.7	4.1	3.8	4.0	4.0	3.6
% of GDP of East Germany	51.5	43.8	41.1	35.8	36.8	35.2	32.4

Source: OECD country report on Germany, July 1997, table 8, page 43.

Table 3. German government debt and deficits

	91	92	93	94	95	96	97	98
public debt, % GDP, Maastricht definition	41.5	44.1	48.2	50.4	58.1	60.7	61.3	61.3
net general government lending				-2.4	-3.6	-3.8	-2.7	-2.5

Source: OECD country report, Germany, July 1997; Financial Times, 28.2.98. The 1997 and 1998 deficit figures and the 1998 debt are from OECD and member states sources, as reported in the FT 28.2.98

¹High subsidies to East Germany are expected to continue into the next decade at least "The programme maintains high support levels for 6 years, declining from 2002 on." (OECD, page 14) The problems of ensuring that growth and prosperity in East Germany become self-sustaining have been discussed by Hughes-Hallett and Ma (1993), Boltho *et al* (1997), and others.

Rising rates of social security contributions, partly the result of rising unemployment, present serious problems. In a recent survey, East German firms listed as their two foremost problems excessively high personnel costs and social security contributions that are rising too rapidly (OECD, 1997). This theme has been taken up by other commentators. Carlin and Soskice (1997) report that unemployment benefits exceeding 60% of former net earnings are available for 32 months, and subsequently unemployment assistance of over 50% of former net earnings is available indefinitely. The effective net replacement rate for people on unemployment-related benefits is between 70% and 80%, and, for people receiving social assistance, between 50% and 60%.

The natural rate of unemployment in Germany

To analyse the German natural rate of unemployment and the process of transition in a unified framework, we adopt Shapiro and Stiglitz's model of efficiency wages. This framework generates an equilibrium level of involuntary unemployment, and can easily be extended to incorporate the Aghion-Blanchard model of transition.

In efficiency wage models there is asymmetric information in the firm, which observes aggregate productivity without error, but the individual worker's productivity with error. Monitoring is costly and carried out imperfectly, leaving an incentive to shirk. To counter this the firm can raise the wage above that available elsewhere so that those caught shirking (and fired) suffer a loss of income. If all firms do the same there must be unemployment spells to provide a deterrent to shirking, and thus the informational asymmetry generates equilibrium unemployment.

The existence of unions may provide a cheaper way of resolving the firm's informational problem, as Vroman (1990, p405), points out: "If the union is held accountable for the aggregate effort in the sense that negotiated wages depend on aggregate productivity, the firm is able to pass the shirking problem on to the union. In this situation the firm can reduce or eliminate its monitoring. The union-nonunion wage differential then reflects the extraction by the union of some fraction of the firm's savings in monitoring costs in return for a guaranteed effort level". Unions can help to cut monitoring costs but evidently wages will still be higher because of the asymmetric information: and this can lead to unemployment.

With these preliminaries, we proceed with the efficiency wage formulation of Shapiro and Stiglitz (1984) where: $w = b + e + c(r + h + \delta)$. Here w denotes the after tax wage, b the unemployment benefits rate, and e the level of effort required of (non-shirking) workers. c is a constant reflecting incentive compatibility (the required excess of utility from being employed and not shirking over the utility from being unemployed, equal to e/q where q is the discovery rate per unit time of shirking workers²), r is the discount rate, h is the rate of hirings, and δ is the rate at which existing jobs come to an end, independently of shirking. $h = H/U$, where H is the number of workers hired per unit time, and thus H/U is each unemployed worker's probability of getting hired per period.

The rate of hiring is assumed to depend on the profitability of new jobs, viz., $H = a(y-z-w)$, where y is the output produced from a new job, and z is the tax on employment. Taxes are used to finance unemployment benefits: there is no borrowing allowed. Thus $bU = z(1-U)$. This both reflects the constraints imposed by the Maastricht treaty (or its successor the Stability and Growth Pact) and ensures long run fiscal sustainability. It is of course stronger than necessary to achieve sustainability which requires only equality of present values of taxes and spending less initial debt, an issue we return to when we consider tax smoothing. The growth of unemployment reflects the difference between inflows, due to jobs breaking up randomly at a rate δ , and outflows, which are due to hirings, H .

The equations of this model are thus

- (1) $w = b + e + c(r + \delta + H/U)$
- (2) $bU = z(1-U)$
- (3) $dU/dt = \delta(1-U) - H$
- (4) $H = a(y - z - w)$ for $(y - z - w) > 0$, zero otherwise.

Hirings H can be expressed as a function of unemployment U and the parameters of the model, by substituting (2) into (4) to give:

$$(5) \quad \frac{H}{a} = \left(y - \frac{b}{1-U} - e - c(r+\delta) \right) \left(\frac{U}{U+ac} \right)$$

²In a small time interval dt , $q \cdot dt$ is the probability of a shirker being caught.

This describes the curve OF in figure 1, which passes through (0,0), reaches a peak for some positive level of unemployment, and falls back to zero for some higher level (<1). The locus for $dU/dt = 0$, labelled PP in the figure, intersects the vertical axis at $H=\delta$, and the hiring locus at points A and B.

The stable equilibrium at A defines the natural rate of unemployment for the German economy. There is another, unstable, stationary state at B, discussed below. In this model unemployment is involuntary in the sense that each worker would strictly prefer to be employed rather than to be unemployed, and because of externalities, the natural rate is suboptimal. "Each firm fails to take into account the consequences of its actions on the level of monitoring and wages that other firms must undertake in order to avoid shirking by workers.....as a result there is scope for government interventions, both with respect to unemployment and taxes or subsidies on monitoring and labour turnover, which can (if appropriately designed) lead to Pareto improvements." (Shapiro and Stiglitz 1984, reprinted in Mankiw and Romer (1991), page 139.) The efficiency wage model implies that the equilibrium rate of unemployment is very sensitive to the ratio of benefits to net wages, i.e., the replacement rate, as our numerical simulations will show.

The existence of the unstable equilibrium at B is an artefact of imposing too tight a condition for fiscal sustainability (in the shape of period by period budget balance). Suppose the economy starts from the bad equilibrium at B. The government could achieve fiscal sustainability by imposing a constant tax rate \bar{z} which would yield enough revenue in present value to cover benefits along the adjustment path and in the eventual steady state. The hiring curve, equation (5), then becomes

$$(5') \quad H/a = [U/(U+ac)][y - \bar{z} - b - e - c(r + \delta)]$$

shown as OL in figure 2. It is clear that \bar{z} will be much less than the tax rate needed to cover benefits at the bad equilibrium but somewhat greater than that needed to cover benefits at the natural rate U_N , viz., $bU_B/(1-U_B) \gg \bar{z} > bU_N/(1-U_N)$. The hiring curve (5') now rises from the origin to an asymptotic level \bar{H} where

$$\bar{H} = a[y - \bar{z} - b - e - c(r + \delta)].$$

It is clear that there is now only one equilibrium, the stable equilibrium at $U_N' (> U_N)$. There

been a slight increase in the natural rate since taxes are higher than needed simply to cover current benefits because of accumulated deficits. (This induces a form of hysteresis in the natural rate.)

Transitional problems

Consider how the preceding analysis needs to be modified to take account of transition, i.e., to incorporate the supply side effects of German unification. Following Aghion and Blanchard, we now take N to be employment in old unreconstructed East German enterprises, E to be employment in West German or new enterprises in East Germany, and U to be unemployment in Germany as a whole, such that $U + E + N = 1$. We assume that the rise of wages in East Germany towards levels in West Germany, ahead of the rise in productivity in East Germany, has been causing old East German firms to shed jobs and make people unemployed at some constant rate, at least until wages have equalised and the process has come to an end.² Suppose this process causes a flow of workers into unemployment at a rate S in addition to the normal break-up of jobs at the rate δ . (It would clearly be possible to make other assumptions, such as that the rate of job shedding in the East was proportional to the number of jobs remaining. See Blanchard 1997 pages 122-4.)

The change in the unemployment rate is the inflow due to job shedding in the East plus the inflow generated by the breakup of existing jobs in both East and West, less the hirings into new jobs (in either East or West), and thus (3) above is now replaced by

$$(3') \quad dU/dt = S + \delta(1-U) - H$$

How does this modification affect the analysis? Equation (5) is unchanged, but the additional inflows into unemployment S causes the $dU/dt=0$ locus to shift upwards from PP to TT in figure 1. As in Aghion and Blanchard, there may be two stationary states of the system, providing that the inflow into unemployment (S) is not too high. These are at A' and B' . The increased flows into unemployment imply that, during the transition, the stable equilibrium rate of unemployment rises from U_N to U_T . Consider for example transition beginning with

²Of course, this would mean that the developments in wages, determined by other aspects of the model, affected the flow of workers into the pool of unemployed, and this is a link we have not introduced into our formal analysis.

unemployment at the pre-existing natural rate. Given the dynamics of the system, unemployment would rise towards U_T as long as labour shedding was taking place. After the end of the process of transition, the $dU/dt=0$ locus shifts back to its original position and unemployment returns gradually to U_N -- i.e., there is no hysteresis in unemployment as taxes cover benefits all times and no debt is accumulated.

What policies have been followed in Germany since unification? The data in tables 2 and 3 suggest that the German government in the period up to 1996 was in fact willing to fund transition by borrowing, as transfers to the east were on average 4% of GDP, which -- if funded by borrowing, and allowing for nominal GDP growth -- would have raised debt by less than 4% per annum. As we see from table 3, the debt to GDP ratio actually grew by 4 percentage points per year on average between 1991 and 1996, more than accommodating the costs of funding transition. Since then, however, the deficit has been cut and the debt to GDP ratio stabilised to satisfy the Maastricht criteria.

Financing economic transition, with a temporary rise in spending, is a particularly strong case for 'tax smoothing', i.e., moving away from period-by-period budget balance while still ensuring sustainability by (for example) choosing a constant tax rate to satisfy the government's intertemporal budget constraint. The implications of this for unemployment are examined in figure 2, where the locus OF gives hiring with a continuously balanced budget, while OL shows the effects of tax smoothing on private hiring. The steady states under transition are given as points C' and A', where $U_{A'}$ is greater than $U_{C'}$. (The hiring function OL crosses OF between A and A' because the tax rate at the stationary point C' in transition with the constant tax rate is inevitably lower than the tax rate at the stationary point A' when taxes match current benefits, and thus, profits are higher at C'.)

In terms figure 2 we can see that the response of hiring by firms to the recent switch in German fiscal policy will be to switch from OL to OF. Consider how unemployment will respond, starting at the level U_S , where the OL and OF intersect below TT. Unemployment will continue to increase, but faster and further under the balanced budget than otherwise. The data in table 1, which show unemployment rising at this time, are not inconsistent with this interpretation.

Peter Norman in the Financial Times spoke of a vicious circle in which rising unemployment forces up non-wage labour costs and companies invest abroad, increasing unemployment still further, and putting the social security system under still more strain. Here the case for tax smoothing is even stronger, as we show in figure 3, where the TT locus fails to intersect the hiring locus OF. So, without tax smoothing, unemployment would rise with no natural upper limit throughout the transition process³ -- i.e., $dU/dt > 0$ so long as $S > 0$. With tax smoothing, however, there is an upper bound C' to the level of unemployment during the transition process, no matter how large the rate of shedding S.

Calibrating the Model

Assuming that the equilibrium rate of unemployment in Germany before unification was about 7%, we calibrate the model using the following parameter values. The real interest rate r is set at 5%. δ , the rate at which jobs break up is set at 10%, implying that jobs last an average ten years. Output per head, y , is normalised to 1. The unemployment benefit rate b is set so as to give a replacement rate (b/w) of roughly 60%, a conservative average figure for Germany, and $b=0.55$ has this effect. Since $y > w > b + e + c(r+\delta)$, effort is set at 0.15, and c has been set at 0.15, implying that, since $c = e/q$, $q=1$, i.e., the chance of a shirker surviving undetected for a year is $1/2.72$, or about one third. Given the values of the other parameters, a has been set equal to 2.25 and this generates equilibrium unemployment of 7.2%, which approximately equals the average level of unemployment in Germany over the decade before unification.

In terms of figure 1 the intercept of the PP schedule has been set at 0.10 and it crosses the OF schedule at $U=7.2\%$ giving an equilibrium hiring rate of 9.3% of the labour force. (These flows arise entirely out of the break-up of jobs, reflecting the well known feature of the Shapiro-Stiglitz model that there is no shirking in equilibrium!) The wage in equilibrium is 0.92, and the tax rate needed to cover unemployment benefits is only 4.3%.

³For a prolonged transition, this could in principle lead to an irreversibility. Consider for example the case in which unemployment in the transition has risen above U_B . At the end of the transition, unemployment would then continue to rise as the system collapsed under the weight of growing taxes. While this is unlikely to occur in the German case, it does illustrate in extreme form the risks of balancing the budget in each period in a model with multiple equilibria.

What happens in the transition process? If labour shedding adds an inflow into unemployment (S) of 3% of the labour force per annum, the equilibrium unemployment rate rises from 7.2 to roughly 12% as indicated by point A' in figure 1. So unemployment will rise towards that rate as long as the shedding continues. But note that if unemployment goes up to 12%, the tax rate needed to finance benefits goes up by about 80% as the elasticity of z with respect to U is $1/(1-U) > 1$. (What happens if taxes are smoothed is indicated in the next Figure.) If however the rate of shedding was half as fast again, i.e., 4.5% of the labour force, there would be no equilibrium rate during the transition process, a scenario corresponding to figure 3.

Figure 2, assuming the slower rate of shedding ($S=0.03$), compares the tax smoothing with the balanced budget policy. The constant tax rate which would cover the present value of benefits would be slightly above the balanced-budget tax rate in the absence of transition (that at A), but less than the steady-state tax rate in a permanent transition process, i.e., that at A'. With tax smoothing, the hiring function becomes OL.⁴ Unemployment rate rises towards C' during the transition process, so the upper bound on unemployment in transition with tax smoothing is around 10%: and it falls to C thereafter. (Note the post transition steady state unemployment at C has increased towards 8%.)

In the case of the vicious circle set out by Peter Norman, illustrated in figure 3, there is no upper bound to the rise in unemployment during the period of rapid job-shedding. The hiring rate along OF at no point matches the inflow into unemployment (TT). Here the case for tax smoothing seems particularly strong. With a constant tax rate and the hiring function OL, unemployment in the transition phase rises towards the level at C'. (In the scenario described in figure 3, and assuming that taxes are set to cover the present value of benefits, the steady-state level of unemployment in the transition phase is around 12 per cent.)

While the no-borrowing condition makes the short-run cost of transition greater, it may be argued that it also reinforces pressure to carry out labour market reform, and that in the long run this is

⁴To be broadly consistent with the 3 point rise in the equilibrium rate during transition shown in the figure, the tax rate used to generate OL is increased so as to cover cumulated benefit expenditures on an extra 3 points of unemployment for a period of 7 years.

advantageous. However, if the consequence of no-borrowing is to increase unemployment during transition, and if there is an element of hysteresis in unemployment, through the long-term unemployed losing skills, for example, then the no-borrowing constraint may actually make the problem worse rather than better. How can this be shown in the model? If the loss of skills of long-term unemployed is crudely represented as a lowering of the hiring function, i.e., a drop in the value of a from 2.25 to 1.5, then the outcome may be as in figure 4, where the fall in a pulls the hiring function OF' below TT . This means that there is no upper bound during transition and that natural rate post transition rises from U_N to U'_N , a increase of roughly 1 percentage point.

Incentives to reform labour markets

What do these simulations suggest is the appropriate supply-side policy for transition? The table below sets out two different scenarios: with a low and constant natural rate (first column) and with a higher natural rate- and possible hysteresis (second column). The first column spells out what we have seen in figure 2, namely that tax smoothing will check the bulge in unemployment during transition. If the pre and post transition equilibrium unemployment is low, then there is no need for any substantial labour market reform, and the argument that a crisis in unemployment is needed to enforce the necessary change does not apply. Tax smoothing seems a sensible policy in this case.

But what if there is a need for supply side reforms? Then incentives to get the government to act are of course important and, if the natural rate was high ex ante, a hair-shirt fiscal policy that threatened high unemployment during transition could be just the the trigger that enforces reform. This is a high risk strategy for a number of reasons. First because cutting benefits in the face of high unemployment is not politically attractive; and second because it may encourage the wrong kinds of reform. (See recent French experience, where high unemployment is leading to pressure to increase benefits and to reduce the work week.) In any case, as we have seen, the incentives do not seem to have worked to promote supply-side friendly reform in Germany either. There is then the added risk of “shooting oneself in the foot” if failure to respond to high unemployment makes the problem worse. (Through hysteresis, prolonged unemployment could be adding more to the problem than to its cure - this is risk illustrated in Figure 4.)

After EMU begins the Maastricht treaty will be superceded by the Stability and Growth Pact that strengthens the excessive deficit procedure by imposing sanctions. Philippe Trainar, of the French Ministry of Finance, in a paper largely devoted to praising the merits of the Pact (in von Hagen, 1997), adds, almost as an afterthought "don't forget that its success, not only political but also technical, depends on the ability of member states to implement efficient employment policies". The signalling incentives the Pact generates for fiscal policy in an equilibrium political fiscal cycle model have been studied in Le Borgne (1998) who finds, broadly speaking, that they encourage "competent" governments to undertake more reform and "incompetent" governments to do less. So it is not clear that the pact will provide the right incentives either.

Table 4. Fiscal Policy and Reforms

	low natural rate	high natural rate (say 9%)
no tax smoothing	temporarily high but bounded unemployment	danger of instability -- the vicious circle
tax smoothing	lowers upper bound to unemployment	no instability, but some rise in the long run natural rate

Extensions

Benefits related to wages

Our analysis, which has taken a fixed benefit level, has already illustrated how sensitive outcomes are to benefit levels. If it is modified so that the unemployment benefit rate b is made proportional to the wage, with $b = kw$, for $k < 1$, where k is the net replacement rate, then the sensitivity of outcomes to benefit levels is greatly magnified. The wage equation implied by the efficiency wage model, in equation (1) above, simply becomes

$$w = [e + c(r + \delta + H/U)]/(1-k)$$

so it makes the wage rate much more sensitive to the hiring rate and the level of unemployment. The wage affects the rate of hiring H both directly and through the level of taxes. When benefits are proportional to wages, we have the tax rate z given by $kwU = z(1-U)$. The hiring rate H depends on productivity (y), taxes, and wages, as given in (4), and thus solving for H ,

$$(5') \quad H = \frac{a \left(y - \left(1 + \frac{kU}{1-U} \right) \left(\frac{1}{1-k} \right) (e + c(r + \delta)) \right)}{1 + \frac{ac}{1-k} \left(1 + \frac{kU}{1-U} \right) \frac{1}{U}}$$

This relationship between the hiring rate and the unemployment rate is similar in form to (5). At zero unemployment there is no hiring. Hiring rises at first and then becomes zero again at some higher level of unemployment where the numerator becomes zero. However, the hiring function is now much more sensitive to the replacement rate.

Forward-looking hiring decisions

An obvious extension to the basic efficiency wage model used in the paper would be to allow for forward looking behaviour in the hiring decision. Aghion and Blanchard do this on the grounds that "even if current profits are high, many private firms, and especially foreign direct investors, will not invest if they expect conditions to deteriorate and profits to shrink in the future.....", and *mutatis mutandis*. At first sight it may appear that this would undermine the argument that tax smoothing would aid transition, since both the government and the firm would be concerned about the same present value of taxes, whatever their timing. However, it is clear that firms will discount the future at a higher rate, because of idiosyncratic (but nevertheless undiversifiable) risks, such as those posed by labour turnover, combined with training, hiring and firing costs. We have assumed a rate of normal turnover δ (which at 10% far exceeds the real interest rate of 5%) which will set a lower limit to the additional discount rate applied by firms to future profits. Thus forward looking hiring will not undermine the dangers of transition or the benefits of tax smoothing.

Capital Accumulation and Growth

Our analysis has had to sacrifice explicit analysis of the role of capital accumulation in order to focus on other aspects of transition. Others, such as Canova and Ravn (1997), have given capital an important explicit role, but have abstracted from labour market imperfections. Clearly a full analysis needs to embrace both aspects.

Conclusions

Our account of the impact of the Maastricht treaty on Germany-in-transition may remind some readers of the poignant episode in Evelyn Waugh's Decline and Fall when the formidable Lady Circumference goes to see her small son run in the School Sports. After the local band has finished playing Men of Harlech and the runners are in line, there is a hush of expectancy as Mr

Prendergast, the starter, waves his old service revolver and starts the countdown. It ends with a terrific explosion. As the smoke clears, it reveals Lord Tangent, her son, whimpering on the starting line wounded by a bullet in the foot. "A most unfortunate beginning," said the Headmaster.

In our view, the fiscal criteria in the Maastricht Treaty (and the budget balancing rules of the SGP) are one-size-fits-all hair-shirts designed to ensure that fiscal profligacy will not threaten the Euro. They leave very little room for tax smoothing. As a key player in the move to EMU, Germany has so far assiduously followed the rules, even though its own circumstances are special. So far, the outcome has been a relentless rise in unemployment.

The key issue is whether rising unemployment will act as the spur to labour market reforms. If so, things can fall neatly into place. If not, history suggests a parallel. The ERM collapsed because it was too inflexible to cope with the asymmetric demand effects of German unification. Will the inflexibility of fiscal rules in handling the asymmetric supply side effects be the Achilles heel of EMU?

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Figure 0. Unemployment rates in Germany (Federal Republic), quarterly, seasonally adjusted, 1970q1 - 1997q4.

Source: Bundesbank, from Datastream (Series BDUA0106E and BDUA0299E).

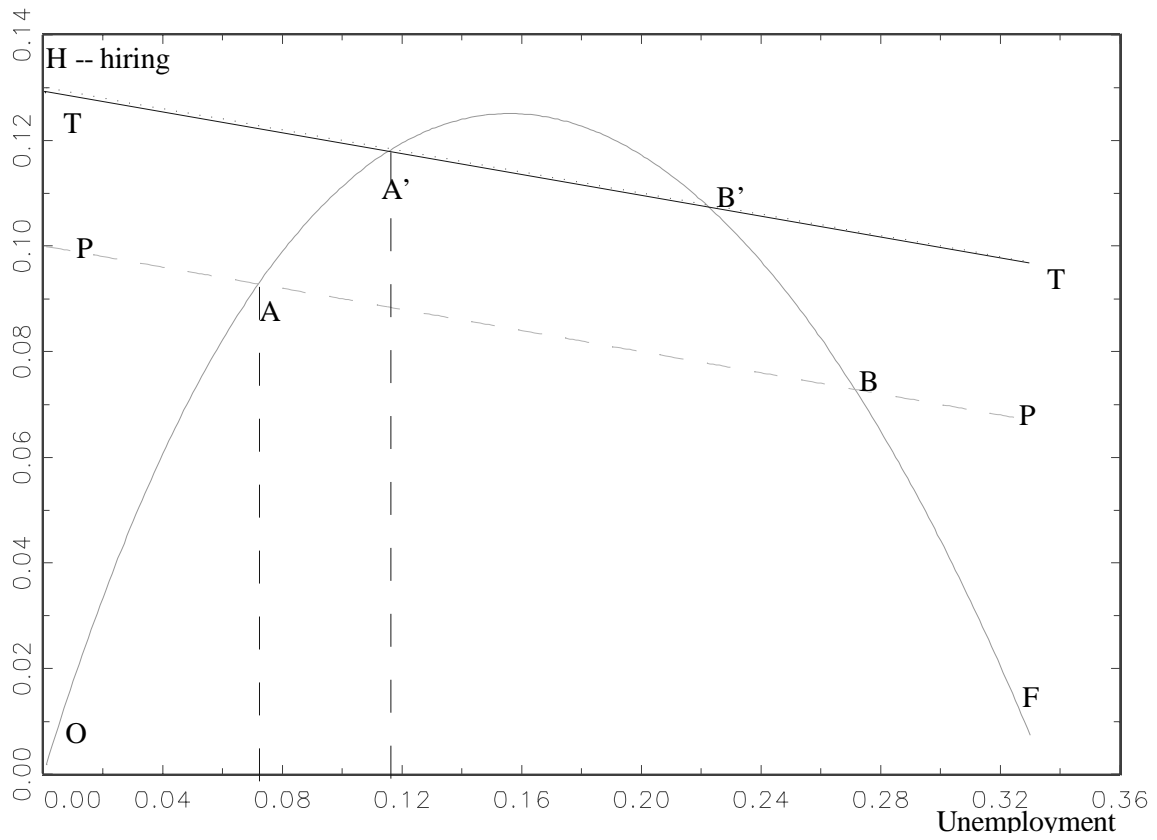


Figure 1. The Natural Rate and the Process of Transition
 Parameter values: $a=2.25$; $y=1$; $c=0.15$; $r=0.05$; $\delta=0.10$; $b=0.55$.

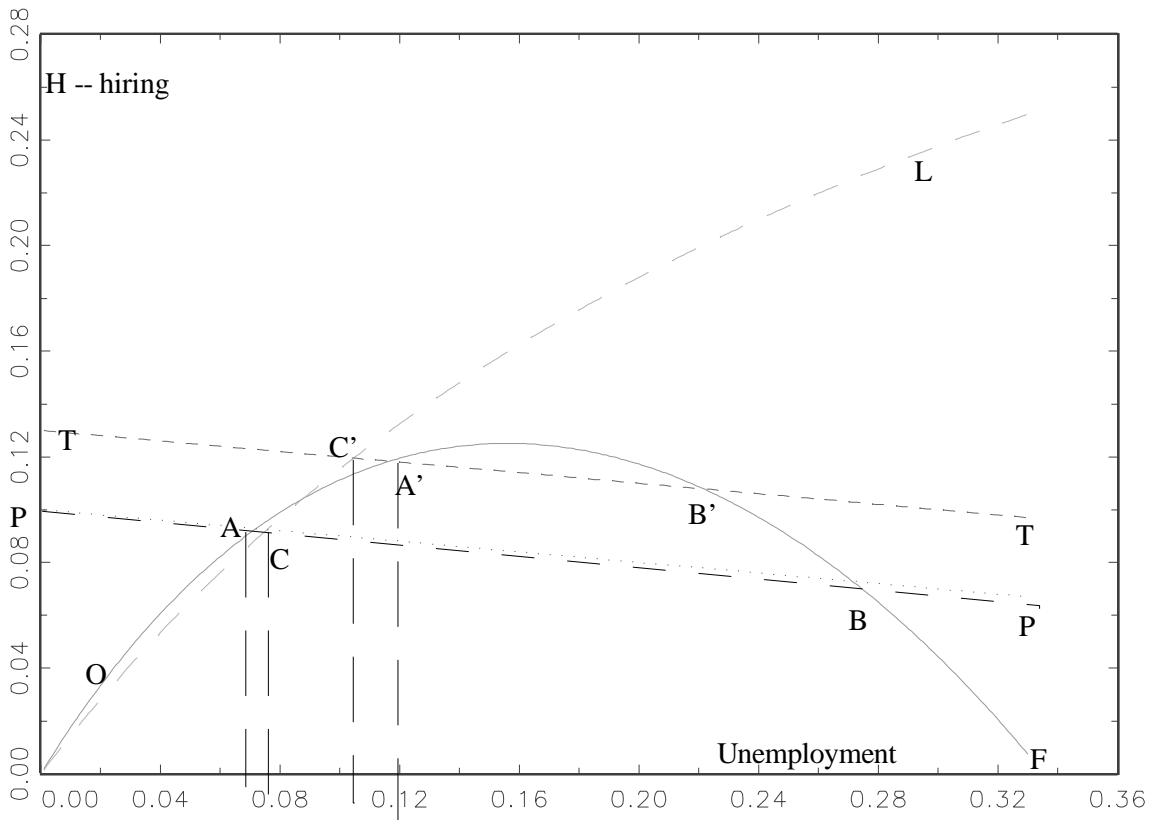


Figure 2. Transition and tax smoothing.
 Parameter values: Same as figure 1. Plus $z = 0.53$

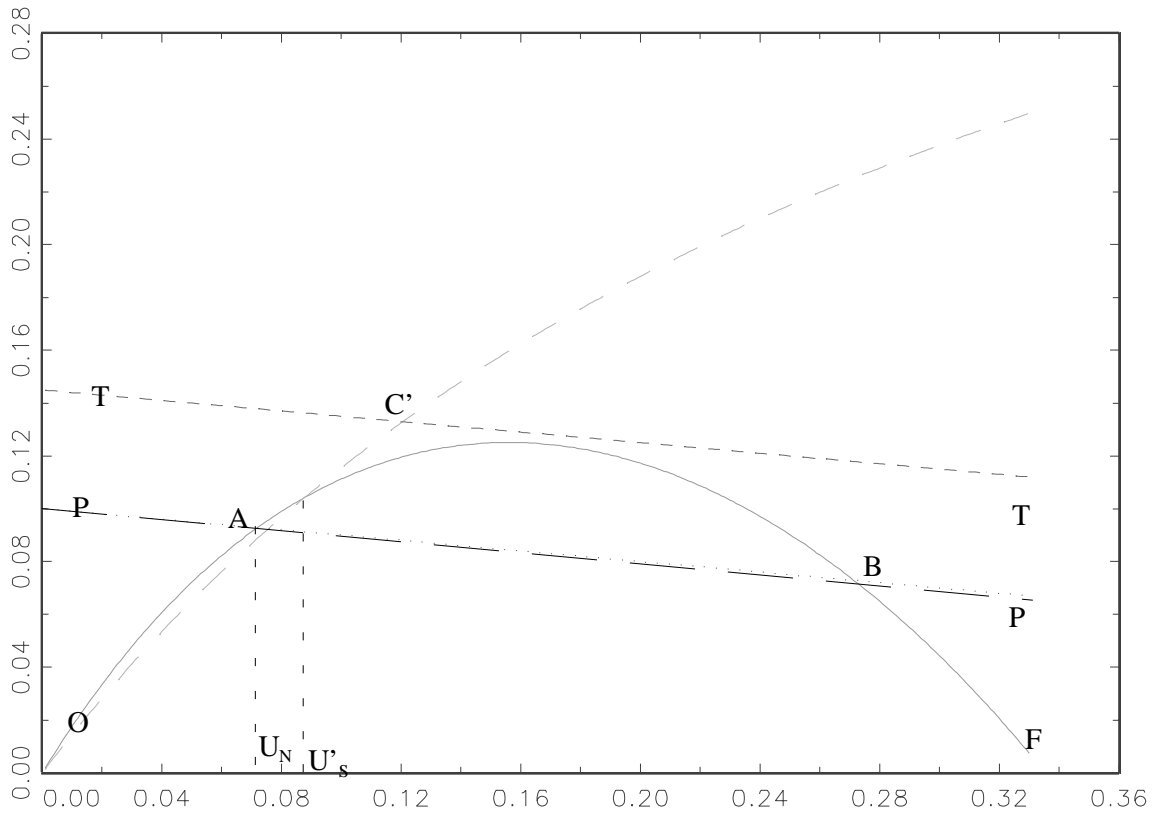


Figure 3. The Vicious Circle. Unstable transition with rapid job shedding, and possible tax smoothing. Parameter values: as in figure 1, except $S = 0.045$, $z = 0.053$.

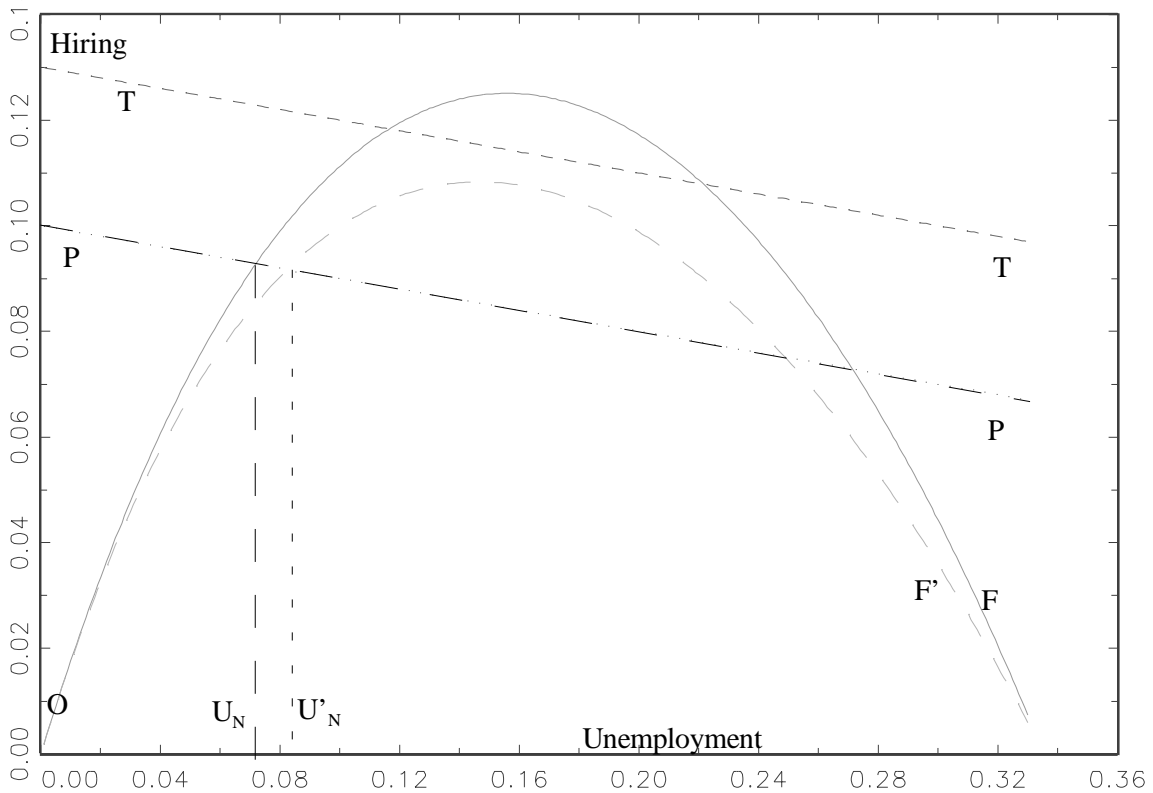


Figure 4. Hysteresis. A period of high unemployment which caused a fall in the subsequent hiring rate (a) would lead to a rise in the equilibrium unemployment rate. A fall in a from 2.25 to 1.5 causes the hiring function OF to shift to OF' and the equilibrium unemployment rate to rise to U'_N from U_N .