Centre for
Economic and
Business Research

CEBR

Discussion Paper 2003-21

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September 2, 2003

Abstract

Using a large-scale estimated multicountry model, this paper provides empirical evidence on the incentives to reform labour markets within the Economic and Monetary Union (EMU) in Europe. We also investigate under which conditions there are incentives to join or admit new members to the EMU. The study has two main results: First, countries with flexible labour markets may only want to join the EMU *after* the current members have undertaken sufficient labour market reforms and where labour markets are more flexible than their own. Second, we show that the application of fiscal restraints, such as those implied by the Stability and Growth Pact, could prevent countries from undertaking the required reforms.

Keywords: EMU, Enlargement, Structural Flexibility, Fiscal Policy

JEL Classification: F02, F15, F33, F42

*A previous version of this paper has been presented at EUI, Florence (April 2003), CEPII, Paris (June 2003), and IES, Reykjavik (August 2003). We thank for several useful comments given on those occasions. Financial support from the EPRU Network and the Danish Ministry of Economic and Business Affairs (Hughes Hallett and Jensen) and the Jubilaeumsfond of the Austrian National Bank (Richter) is gratefully acknowledged. Any views expressed are strictly our own.

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1 The issues

While many countries in Central and Eastern Europe have expressed strong interests in joining the European Union (EU), including its Economic and Monetary Union (EMU), several existing EU members have been reluctant to introduce the single currency, even if they satisfy the criteria for doing so. Moreover, the current members of the monetary union are not necessarily interested in allowing *any* candidate to join. It seems as if the countries who want to join the EMU are those whom the existing members may not want to have admitted; and those countries who the existing members would like to have join are exactly those who are unwilling to join. That clearly complicates the process of enlargement.

Several factors, including non-economic ones, may be critical for the decision to join or enlarge the EMU. In this paper we discuss the role of labour market flexibility, focussing on whether a candidate country is sufficiently reformed to join an existing union, and whether the existing members are reformed to an extent that an outsider would want to join.[1] We also discuss whether the fiscal restrictions implied by the Stability and Growth Pact (SGP) are likely to facilitate or hinder the introduction of more market flexibility.

To pursue this analysis, we distinguish between three different categories of European countries. First, there are the current members of the EMU, referred to as the Eurozone. Second, there are the countries which are able but possibly unwilling to join the EMU (typically the UK, Denmark and Sweden), referred to as the "N-countries". Third, there are the countries willing but possibly unable to join (like Poland, Hungary and the Czech Republic), referred to as the "E-countries". This distinction seems to be relevant not only with respect to recent labour market performance, but also in relation to the magnitude and speed of initiatives designed to improve the functioning of the labour market.

In fact, recent work by the OECD (see, e.g., Turner et al., 2001) gives some evidence to support our claim that N-countries and the Eurozone differ. For example, when looking at estimates of the *level* of the NAIRU there certainly is a difference between the Eurozone and N-countries: While the NAIRUs in 1999 in Denmark, Sweden, Norway and the UK were estimated to, respectively,

[1] The role of structural reform has already received a lot of academic attention (see, e.g., Calmfors, 2001), and has generally been seen as a question of whether, or at what pace, a less reformed candidate country would be able to meet a certain set of entrance criteria before being let into a better reformed union (see, e.g., Ozkan et al., 1997).

6.3, 5.8, 3.7 and 7.0%, the corresponding numbers for France, Germany, Italy and the Euro area were, respectively, 9.5, 6.9, 10.4 and 9.0. Similarly, when comparing the *changes* in the NAIRU during the 1990s, it is remarkable that it has been falling in all N-countries except for Sweden, whereas it has been rising in all the major Eurozone countries.[2]

Some initial attempts to estimate the impact of labour market policies and institutions on the performance of labour markets in E-countries have been made. For example, using a similar methodology as the one used by the OECD, Riboud et al. (2002) suggest that most of the E-countries have adopted labour market institutions similar to those in the EU and are, therefore, likely to have introduced rigidities similar to those existing in the EU. Overall, E-countries are found to be in the middle of the labour market flexibility scale when compared to current members of the EU.[3] Therefore, it may not be lack of labour market flexibility that explains the reservations by the Eurozone to admit E-countries. The Eurozone seems to be most concerned about factors such as monetary instability and inflation, fiscal irresponsibility, competition for structural funds, large unemployment and poverty, mass migration, social dumping and delocalization. In fact, it could be argued that "mass migration and social dumping" are signals of labour market flexibility in some places and rigidities elsewhere, not of rigidity itself. Therefore, the perceived problem behind E-countries' admission is not merely one of wage rigidity; but rather of low productivity and competitiveness in the official sector and more widely.[4]

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[2]The *initiatives* taken to improve the labour market performance in Europe have also been monitored closely by the OECD (see, e.g., Elmeskov and Kohl, 1998, and Elmeskov et al., 1998). A comparison between the UK and Germany may serve to illustrate the point that the N-countries and the Eurozone differ in that respect. For Germany the OECD listed 24 recommendations for changes in the area of labour market reforms, wheras for the UK only 6 recommendations were made. When assessing to what extent, and how, the two countries have reacted to those recommendations, it turns out that Germany in 3 cases took *no* action and in 2 cases took an *opposite* action. And among the 19 actions taken, only in 3 cases was this done sufficiently. On the other hand, the UK acted on *all* the recommendations, and in half of the cases to an extent which, in the judgement of the OECD, was seen as sufficient.

[3]This is clearly a very broad picture. Indeed, as well as different labour market structures are found within the EU, diversity in terms of employment protection legislation, support to the unemployed, taxation on labour, strength of unions etc. are found within the E-countries.

[4]Burda (1998) argues that the transition from command to market economies in East and Central Europe has created an official sector with low competitiveness and an underground sector with low taxation, low social protection, tax evasion, wage flexibility and free

In order to establish how a labour market reform could affect a country's decision to join a monetary union, as well as a decision by the existing members whether to admit a new member, we need a formal model of the incentives (for either side) to adopt a common currency. In previous research on this topic, our methodological approach has been to perform a cost-benefit analysis of whether the adopting of a common currency is *net* beneficial, by calculating for both parties the changes in welfare if the candidate country does join, compared to the *status quo* if it does not (Hughes Hallett and Jensen, 2001, 2002, 2003a,b). In these papers we have focussed on aspects such as the size of countries; the size of the underlying disturbances; the correlation between the disturbances in different countries; the costs of transactions between different currencies; the degree of rigidity in the adjustment of nominal wages; and the level of factor mobility across countries.

Our results suggest that the N-countries are unlikely to benefit from joining a Eurozone, with either limited market flexibility or lacking a stronger degree of labour market reform. Interestingly, introducing greater labour market flexibility does make joining the Eurozone more attractive in each case. But it does not do so by very much. The existing degree of rigidity is simply too large. In fact, the degree of flexibility needed to reduce these welfare/utility losses to zero, if shared equally between the candidate country and the rest of the EU, runs from about 70% for Denmark, to 90% for the UK. This clearly indicates that substantial labour market reforms would need to be undertaken before it would become worthwhile for these countries to join on *economic* grounds. We have also found that the Eurozone would be more willing to have the N-countries join than the N-countries would be to join.

If the same steps are repeated with the data for the E-countries, we find that their losses, due to insufficient flexibility or reform, are indeed much smaller: typically one third to one tenth the size of the corresponding figure for the N-countries at the same level of market inflexibility. In fact, some net gains start to appear when the degree of flexibility reaches the level where wage (or migration) adjustments can be relied on to eliminate half the E-countries' unemployment. On the other hand, the existing EU would find accession by the E-countries two to four times less attractive (at any level of market flexibility) than the E-countries would find it to join.[5]

entry and exit (migration). Unlike the former sector, the latter sector might pose a serious challenge to existing EMU countries.

[5]The benchmark solution has an independent monetary policy in the joining countries,

In this paper we offer an empirical investigation of the role of structural rigidities for the incentives to either join the EMU, or be joined. For that purpose we use a large-scale multicountry model with econometrically estimated models for both N- and E-countries, and for the Eurozone. We find, again, that structural reforms are important in making the Eurozone into a currency union worth joining; and the accession countries into suitable candidates for joining. In addition, we find that those countries which the Eurozone would like join are reluctant to join unless labour market reforms have taken place. On the other hand, we can show that those countries which are keen to join will benefit from joining EMU, but joining will not make the existing members better off. Thus, we find that there is an incentive and a need within the Eurozone countries to undertake structural reforms to boost output and employment. Structural reforms would therefore make everybody better off: those who want to join and those who are already members.

The issue then is whether those reforms are likely to take place. We demonstrate that fiscal restrictions, like those in the SGP, may have severe spillover effects, especially when market rigidities are in place. Too tight a fiscal policy combined with market rigidities will slow down economic growth in the Eurozone. That in itself restricts the scope for structural reforms, and the resources to undertake them. Hence, if those reforms are important, there is little incentive to closely obey to the SGP, or demand that others obey it.

From here the paper proceeds as follows. In Section 2 we first outline the empirical model and Section 3 then reports some macroeconomic outcomes from simulations of that model to illustrate the role of structural reform for the enlargement decision. In Section 4 we use the same model, now focussing on the interplay between structural reform and fiscal policy. Finally, Section 5 concludes.

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and hence the possibility that the EU or the candidate would devalue their currency to help reduce any unemployment caused by 'excessive' rigidities in their labour markets. Thus, with imperfect flexibility in a currency union, there are always costs to joining or being joined because one degree of freedom (or flexibility) has been closed down. But if the joining country is more flexible than the rest of the union, then the average adjustment cost to the existing members will go down – although not to zero.

2 The model

We carry out the empirical evaluation using the Oxford Economic Forecasting (OEF) model, which is a traditional multi-country econometrically estimated model. There are two main reasons why we have chosen to use the OEF model. First, as far as we know, it is the only model which contains a full specification of all the regions we are interested in, that is, the N-, E- and Eurozone countries. Second, unlike the OECD's Interlink and the IMF's Multimod, the OEF model has a clear specification of the structural (supply-side) asymmetries that are a key part of the real world and which motivate this paper.

The OEF model contains a sequence of theory based empirical models covering all the OECD economies, 14 of the largest emerging markets economies, and six trading blocs covering the rest of the world economy. These country models are then linked by trade (import and export) relations, world prices for tradables, intercountry capital flows, and hence interest rate and exchange rate links under different possible exchange rate regimes.

The countries covered specifically, which are important for his paper, include the US, Canada and Japan, plus China and Russia outside the EU; plus each of the Eurozone countries, and the UK, Denmark and Sweden in the EU; and Poland, Hungary and the Czech Republic among the new accession countries. Each of these country models is based on a traditional income-expenditure specification, plus a somewhat more detailed supply side specification to determine wages, prices and employment, and unit labour costs. Although the specification of each country is broadly similar, there are important differences both in the level of aggregation (larger countries contain more disaggregation, and more detailed financial sectors), and in terms of different responses to various shocks.

Since we are concerned about wage rigidities in general and the supply side in particular, we note here the way in which wages and salaries are set.[6] The

[6]There is also a monetary sector in the model. The exchange rate regimes are floating for the dollar, euro, pound, yen and other major currencies; but a single currency within the Eurozone, and a strict exchange rate targeting arrangement for Denmark (ERM-II), and for the accession countries in Eastern Europe. The model also has a government sector to conduct fiscal policy. Total government revenues are collected from a variety of sources, and the goverment has a number of different outlays. It is important to note that the model also determines some world market variables (such as oil and commodity prices) and world aggregates (world GDP, industrial production) endogenously. A more detailed specification of each model's expenditure blocs is given in Appendix 1.

OEF model incorporates short run nominal and real wage rigidities, which ensure the existence of "involuntary" unemployment and monetary effects on the real economy. In the long run the employment equation solves for the constant level of real unit labour costs, given by labour's share in the production function, while the wage and price equations solve for the level of unemployment consistent with this labour share. With long run vertical Phillips and aggregate supply curves, monetary policy then determines the inflation rate, while structural, or supply side policy determines the unemployment rate. The NAIRU is related to the gap between the total real cost of labour to employers, and the real value of post-tax wages received by employees.

Real wage rigidities are higher in some countries than others. In general, each country is modelled in terms of an "error correction model" (ECM), so that each equation contains short run deviations from the long run equilibrium. The smaller the adjustment parameter, the longer it will take to return to equilibrium after a shock occurs. Here we are interested in the difference between the labour market rigidities in the Eurozone, and those prevailing in the relevant countries outside. Within the Eurozone, each country is expected to have relatively similar structures, as captured the average earnings equation (AEE). By contrast, the asymmetry between the Eurozone countries and N-countries may be substantial. A comparison of the AEE in Britain and Germany, respectively, may serve to illustrate the point. Specifically, the British AEE reads as follows

$$\begin{aligned} D\ln E &= 0.17 + D\ln P + 0.37978 \cdot D\ln Q - 0.01162 \cdot D\ln U_{-1} \\ &\quad +0.13844 \cdot D\ln(P^c/P) - 0.54447 \cdot D\ln(P/P_{-1}) \\ &\quad -0.11192 \cdot D\ln(P_{-1}/P_{-2}) - 0.067024 \cdot D\ln(P_{-2}/P_{-3}) \\ &\quad +0.4553 \cdot D\ln(E/P)_{-1} \\ &\quad -0.098497 \cdot [\ln((E/P)_{-1} \cdot Q_{-1}) + 0.07 \cdot \ln(U/\bar{U})_{-1}] \qquad (1) \end{aligned}$$

where E is average earnings (in nominal terms), P is the deflator for GDP, P^c is the consumer price index, U is the unemployment rate, $\bar{U}$ is the NAIRU, Q is productivity, and D is the difference operator. The German AEE, meanwhile, has the following structure:

$$\begin{aligned} D\ln E &= 0.5 \cdot D\ln E_{-1} + \bar{U}^2_{-1}[0.050 \cdot D\ln P^c + 0.10 \cdot D\ln P^c_{-1} \\ &\quad +0.10 \cdot D\ln P^c_{-2} + 0.15 \cdot D\ln P^c_{-3} + 0.10 \cdot D\ln P^c_{-4} \\ &\quad +0.300 \cdot D\ln Q_{-1}] - 0.0025 \cdot D\ln U_{-1} \\ &\quad -0.10[\ln E_{-1} - \ln Q_{-1} - \ln P_{-1} + 0.015 \cdot \ln(U/\bar{U})_{-1}] \qquad (2) \end{aligned}$$

While exactly the same variables appear in the two AEEs, there are some remarkable differences between the short term behaviour of labour markets in the two countries. First, average earnings in the UK depend relatively more on the previous unemployment rate and the ratio of the current unemployment rate to the natural rate. So UK wages are more sensitive to market conditions. Second, once a disturbance has set in, the German equation has more persistence in it, as reflected in a higher coefficient on the previous period's rate of change in average earnings. Third, the UK has more supply side sensitivity if, for example, there is a negative productivity shock. Fourth, Germany has more persistent accommodation of price rises, out to P^c_{-4} instead of P_{-2}. Note also that P^c, unlike P, has import prices in it, and hence an additional source of inflationary stickiness, while P is influenced by capacity utilisation which implies extra market sensitivity in the British equation.

3 EMU and structural reform

3.1 The default or baseline solution

To make an assessment of the importance of market inflexibilities in extending EMU, and their role in creating incentives for countries to join or be joined, we have to create a baseline (counterfactual) simulation where there are no enlargements, no new inflexibilities or flexibilities, and no additional fiscal constraints. This baseline solution would therefore not have the UK or Poland (as the representative N- or E-countries) joining EMU; it will not have the SGP's 3% deficit limit imposed on those countries; and will not have the current degree of labour market (wage) flexibility in Germany and France increased.

It is important to stress that the projections from such a scenario are not of great interest in themselves. But they are necessary, as a benchmark against which the benefits of an alternative scenario - Britain joins the euro, say; or national fiscal policies are restrained; or Germany succeeds in making her labour market more sensitive to market conditions - can be measured. Consequently, it is not the baseline values themselves which matter in any of the subsequent comparisons, but whether the deviations from those baseline values can be said to favourable or unfavourable.

In that case, as for any linear comparisons, the baseline values do not influence the results and conclusions we discuss. Since they are common to both

sides of each comparison, they cancel out. However, this aspect of the problem also means that if we were, for example, to increase the degree of market flexibility in one country (or decrease it in another) on enlargement, we need to assess the results as favourable or unfavourable depending on whether the deviations from the baseline are now *more* favourable or *more* unfavourable than their counterparts in a previous simulation when those additional flexibilities or inflexibities were not present. It is not, therefore, a question of whether the new simulation produces results which are better than the previous one without the change. In that sense the results, as we discuss them, are progressive.

When evaluating the economic outcomes under different scenarios (structural assumptions, exchange rate regimes, enlargements, fiscal restrictions etc.), we focus on deviations from the baseline of (i) output, (ii) unemployment and (iii) inflation.

– Table 1 about here –

Table 1 contains the baseline simulation values for those variables for the countries highlighted in the comparisons which follow, averaged over the period 2002-2007 inclusive. They assume the absence of any extensions of EMU or major changes in market behaviour. They show an uncontroversial future in which inflation and growth continue in the 1%-2% and 2%-3% ranges respectively; unemployment is falling but very slowly; and the euro appreciates against both the pound and the dollar very much as it has done during the 2002-3 period. The only exception to this is Poland whose inflation and growth has been a little higher in recent years.

Finally, it will be clear that our simulations are being conducted to obtain the medium term "steady state" consequences of joining or not joining under various degrees og market flexibility and reform. This will then imply the medium and long term incentives for membership. Of course, being dynamic simulations, our calculations also show some of the costs and benefits along the way. But, as is usually the case in these macro-models, we find that a horizon of 5 years or more is enough to reach the steady state position of our theoretical comparative statics analysis.

3.2 A Northern enlargement of the EMU

We first investigate the effects of a flexible country (Britain) joining a block of inflexible countries (the Eurozone). The framework for this simulation is that the government announces well in advance that Britain would join the euro. Specifically, we assume that Britain would join EMU in the first quarter of 2005, and that this fact was announced already in the third quarter of 2002. As a result, Britain adopts a "European" monetary policy from 2003 onwards; but the exchange rate is not completely fixed in the period 2002-5. The exchange rate is then fixed at an entry level of €1.4316/£1 at the first quarter of 2005 and does not change thereafter.[7] This assumption is consistent with the exchange rate criterion for joining EMU, and with membership of ERM-II.

As a result of joining, Britain enjoys a lower short term interest rate (Figure 1a) over the entire simulation period.[8] The lower interest rate is a result of the relatively low degree of capital utilisation in the Eurozone. One would expect this lower interest rate would increase real GDP, together with the implied depreciation of the pound from €1.59/£ in 2002 (2nd qtr) to €1.4316/£ in 2005 (1st qtr). But this expansionary effect does not take place (Figure 1b).

–Figure 1 about here–

It is true that lower interest rates and the depreciation of the pound have led to a small increase in output at the beginning of the simulation. However, by the time Britain joins the euro, the real GDP growth rate is well below the baseline: that is, from 2005 on. This reduction is driven by the economic state of the Eurozone. Since Germany and the other Eurozone countries are performing poorly (see below), and since Britain is now linked with the Eurozone via a fixed exchange rate, there is a stronger (negative) spillover effect onto Britain than before, which cannot be offset by monetary policy or exchange rate realignments.

[7] We have checked the sensitivity of the results of this assumption of the joining rate, and found our conclusions were not altered for a wide range of plausible joining rates from €1.60/£ down to €1.30/£. The particular value used here is the model's equilibrium rate for the pound, and also very close to the market rate at the time of writing (€1.42/£, August 2003).

[8] In Figure 1 - and all subsequent figures - the solid schedule refers to the baseline, and the dotted schedule refers to the simulation.

– Figure 2 about here –

The reason for the reduction of the GDP growth rate is indeed the peg of the pound exchange rate to the euro. Towards the end of the sample, the euro appreciates steadily against the dollar. Of course, the depreciation of the pound at the time Britain joins the euro has an expansionary effect. But then, given the British trade structure, the subsequent euro appreciation (with Britain as a member) makes Britain worse off again. So the current account worsens, and therefore GDP. That spills over into lower employment in the private sector and a rise in unemployment (Figure 2a). That lower employment then has the effect of lowering average earnings, which in turn reduces the GDP deflator, and that then reduces the demand for labour in the private sector somewhat further.

At this point one would expect increasing competitiveness to have an effect. Unfortunately, the time horizon in these diagrams is too short to show the full effect of these adjustments on economic performance after 2007. At that stage falling average earnings do start to increase competitiveness again. Output and employment therefore expand, and will continue to do so as long as the budget deficit is not forced to decline at the same time. However, continuing expenditure cuts (triggered by fiscal restraints imposed on the size of the budget deficit) could place this emerging recovery at risk. It appears that that is a real risk. The unemployment rate behaves as the analogue of GDP, and rises as GDP falls. This has a knock on effect on government debt which rises sharply (Figure 2b). At this point we would have to take into account that, if Britain were to join the euro, she would be subject to the SGPs 3% deficit criterion. That would trigger sharper cuts in public expenditures, and hence larger falls in GDP (and larger rises in unemployment) than we observe here. We examine that problem in more detail in section 4 below.[9]

We also had a look at inflation, which is very similar to what we observe in the baseline (and hence is not reported). The same holds for the impact, on Germany, of Britain joining the Eurozone. German GDP improves slightly, as does the unemployment rate. The bottom line is, therefore, that a more flexible Britain is made worse off by joining, and a less flexible Germany is made better off – exactly as our theoretical results had predicted.

The key to recovery therefore lies in market flexibility; not only in unem-

[9]In fact, we find that the larger British deficit is caused by lower revenues, rather than by higher expenditures.

ployment and its impact on relative wages (and prices), but also in the reactions of fiscal policy to absorb the downturn, and in the ability of the markets of one's partners to provide alternative sources of demand as these adjustments are taking place. Had domestic debt not risen, or had the domestic or partner economies not been able to react so well, then the unemployment numbers would have been even larger.

Would the story be modified if Germany adopts British flexibilities? To explore this question we specifically assume that Germany has the same average earnings equation as Britain. As before, Britain joins the EMU at an exchange rate of €1.4316/£ at the first quarter of 2005, but Britain adopts European monetary policies already from 2002 (3rd qtr). That immediately lowers British interest rates, which in turn benefits growth. Moreover, since German demand is now higher than before, there is a positive trade effect for Britain. However, when the exchange rate is ultimately fixed in 2005 (1st qtr), a negative current account effect kicks in. By fixing to the euro, Britain faces an appreciation against the dollar. This appreciation reduces British competitiveness in the US and elsewhere and, given that around 20% of British exports go to the US, that has a significant negative effect on the British current account. This, in turn, reduces British employment and British demand, much as in the previous case (figure 3a).

– Figure 3 about here –

Perhaps the most interesting question is what happens to Germany in this case. As figure 3b demonstrates, by making German wages as flexible as the British ones, Germany is made much better off than before. It should be mentioned that we are comparing two deterministic solutions here. There is no shock affecting Germany: everything else has stayed the same as far as Germany is concerned. So we can conclude that the results of this scenario are indeed driven by making the German labour market more flexible. This suggests that one condition for Britain joining the euro would be that Germany (and others) should undertake structural reforms in their labour markets. The issue is whether the increased competition in the Eurozone (the prospect of Britain joining) would increase the incentive to undertake such reforms. However, even if it did, joining the euro still carries the appreciating exchange rate problem. That problem can only be resolved if Britain reduces her export dependence on US-dollar markets so that she can avoid going into recession. Hence different market structures and different patterns of trade matter as

well.

Finally, we had to look at the Eurozone inflation rate and found that introducing British flexibilities into the German labour market has led to a lower inflation rate. Again, flexibility is what matters.

3.3 Pressure for structural reform inside the Eurozone?

We have so far assumed that the German AEE is representing average earnings for all Eurozone countries. Implicitly, we thereby assume that structural asymmetries within the Eurozone are negligible. If this is true, a pressure on, say, Germany from other Eurozone countries to undertake structural reforms cannot be expected.

To study this aspect of the reform process, we have introduced German rigidities into France and Belgium. We changed the average earnings equations in order to build in some asymmetric behaviour. In France there is a distinction between average earnings in the private sector, and average earnings in the public sector. So, in the case of France and Belgium, we add an extra term into the the average earnings equation of the private sector, E^p, as follows:

$$D \ln E^p = f(U/\bar{U}, P^c, Q) + .015 \cdot (\max(1, (\ln(\bar{U}_{-1}/U_{-1}) - 1))). \qquad (3)$$

By introducing the last term, we have introduced a wage asymmetry into the earnings of France and Belgium that makes wages increase faster when the unemployment rate is less than NAIRU, but leaves them unaffected when unemployment is at or above the NAIRU.

We are now able to investigate what would be the effects in France and Belgium if wage bargaining were to follow the German pattern. Figure 4a shows that by introducing German rigidities (starting in 2002 (3rd qtr)) into the French labour market would reduce French GDP significantly. The effects on unemployment rates are probably more severe. In fact, the unemployment rate rises by more than 1 percentage point at the end of 2007 (figure 4a). The point to make, however, is that the German rigidity kicks in immediately. This happens because the new asymmetric wage response term prevents wages from falling when the slowdown sets in in 2002. Since this is quite a powerful *addition* to the already somewhat unresponsive French and Belgian earnings, it produces a sharp upturn in French and Belgian unemployment (figures 4b and 5b). But, as unemployment increases, there are now no counterpart reductions in wages and increases in competitiveness as there were in the British case.

– Figure 4 about here –

Moreover, this higher unemployment rate does not imply a lower inflation rate. In fact the French inflation rate is slightly higher than in the baseline solution towards the end of the simulation.

The structural rigidity effects are, however, rather more severe in Belgium - a small country. Belgian GDP drops about 6% by the end of the simulation period (Figure 5a) and, consequently, the unemployment rate rises by 5 percentage points towards the end of the sample (Figure 5b). And, in contrast to France, Belgium does have to suffer higher inflation.

– Figure 5 about here –

Finally, we find that towards the end of the sample the consumer prices are almost 20 points higher than the baseline. So if Belgium and France were to possess German rigidities, they would both be made worse off. On the other hand, we have shown that if Germany were to implement structural reforms, then the Eurozone as a whole would benefit. These results therefore suggest that France and Belgium do have damaging structural rigidities, but they are not as severe as those in Germany. We might therefore expect political pressures to emerge from within the EU to "persuade" Germany to undertake some structural reform on her own account.

3.4 Eastern enlargement of the EMU

We now turn to analyse the effects of another kind of expansion: one in which one of the E-countries, Poland, joins EMU. We also looked at the effect of this on the Eurozone countries, but it turned out - unsurprisingly, as we note below - that there was no appreciable impact on any of the EU countries modelled in the OEF model. So we do not report any of those results.

For the effects on Poland, we have assumed that Poland would enter the EU and also the Eurozone in 2005. As with the British simulation, the exchange rate is fixed at that point in time, but European monetary policy is adopted before hand (from 2002). The result is that, in terms of national incomes, Poland gaining from a GDP level which is 5% higher after joining the euro (Figure 6a). This is very robust to the exchange rate value at the time of joining. We tried several entry rates and there has always been an

improvement of the Polish GDP.[10] Instead the higher growth rate of Polish GDP is driven by the much lower European interest rate. And as a result, the Polish unemployment rate decreases (Figure 6b).

– Figure 6 about here –

Therefore, there is a clear incentive for Poland to join EMU. In order to make sure that we are not producing a negative (inflationary) output gap here, we need to check on the Polish inflation rate. It turns out that Polish inflation rate is slightly increasing, but the changes are very small. In summary, we can say that Poland gains from joining the EU.

We next look at the Czech results. They are rather similar. We assumed that the Czech Republic would join EMU at the same time as Poland (2005Q1), and at an exchange rate of CKR38/€1. The result is that the Czech GDP is only slightly increasing. At the same time, the Czech inflation rate is almost unchanged. So, when the Czech Republic joins EMU, it will gain in terms of GDP growth. Unemployment is temporarily reduced, but inflation is unchanged. So although the changes are small in terms of the growth rate, there is an incentive for the Czech Republic to join EMU. Nevertheless, of all the new members, the Czech Republic gains least from joining the euro. This may be because the Czech Republic is already working at near its full employment level. This suggestion is supported by the fact that its unemployment rate has converged on its baseline value by the end of the reported simulation period.

Finally, we examine the case for Hungary. As for Poland, we assumed that European monetary policy is adopted in 2002Q3. The exchange rate is ultimately fixed at F280/€1 in 2005Q1. That exchange rate is in line with the calculated equilibrium exchange of the OEF model. Hungarian GDP is increasing in comparison to her baseline. Accordingly the unemplyment rate falls to 4.3% of the labour force. The increase in Hungarian GDP is essentially driven by a lower European interest rate. However, those gains imply that inflation is only slightly increasing. Therefore, Hungary also has an incentive to join EMU: she would also enjoy an expansion in output without inflationary pressure.

Now we come to the effect on the existing Eurozone members of an eastward expansion. As the OEF model treats German exports as chiefly dependent on the growth of world GDP, there is very little impact of Poland, the Czech

[10]The results reported here assume that Poland joins at an exchange rate of Zl5/€1.

Republic or Hungary on German exports. Although the Polish, Czech, and Hungarian GDP increase significantly, these increases not big enough to change the world GDP or the German current account very much (or the current accounts of the other euro countries for that matter).

The other way the E-countries could affect the existing union is through inflationary pressures. However, there is also no visible impact on Eurozone inflation in these simulations. This comes from the fact that all three countries are small, so that the Eurozone interest rates do not have to change when these countries join. Hence there is no appreciable impact on the monetary conditions in the Eurozone countries. However, this is not to say that there is no impact at all. If German trade could have been broken down to specific countries then a change in her current account would have no doubt been visible, but to examine the changes at that level of detail is a task for future research.

4 Structural reform and fiscal policy

4.1 Is there a link?

How do fiscal constraints affect the incentive, and a country's capacity, to carry out structural reform?[11] One could imagine that any programme of structural reform would entail additional public expenditures, and possibly lower revenues or lower output (or larger output gaps) while they are being carried out. This is because the process of reform will cause more people to be thrown out of work while the reforms are being carried out, and it will take some time before those people are redeployed in new jobs in new industries. Indeed, many of them may need retraining or new skills. There will therefore be additional unemployment and other social benefits to be paid in the interim, and extra retraining programmes to be paid for. At the same time, there may well be new infrastructure projects, development grants, support for new technologies or firms that have to adapt. In each case, public expenditures will rise.

With unemployment temporarily higher and profits lower, tax revenues will be lower; and output lower too. Consequently, the fiscal deficit will be larger, and the deficit ratio significantly larger than the trend position of either. These changes will lead to Figure 7 (see also European Commission, 2002),

[11] Little theoretical work has been initiated in this area. An exception is Beetsma and Debrun (2003).

which shows how the fiscal deficit ratio would vary with different sizes of the output gap. The bold line AA' shows the position before structural reforms are undertaken. Point D is the structural deficit for this economy, the deficit being positive even though the output gap is zero (internal equilibrium).[12]

– Figure 7 about here –

Structural reform would, presumably, be designed to eliminate that structural deficit. That would get us to line BB'. But the argument above suggests that we would have to reach that position via the line CC', which represents a short term adjustment phase. In fact, it is not clear exactly where CC' should lie, other than it must be above AA' and with a slope no less than AA'. Consequently, it could be a simple rightward shift from AA'; or a rightward shift with steeper slope as drawn; or a rightward shift for negative output gaps only. Experience suggests that it is probably one of the latter two possibilities, since standard reforms during boom periods are going to be easier and cheaper to finance; and hence the unemployment cost/retraining costs lower per unit output gap. Since people find jobs quicker, possibly without retraining, and held fewer benefits. Similarly, the technology and development costs might be lower, and the revenue shortfall less. In that case the CC' line will be as we show it.

Now we can impose some fiscal constraints to see the consequences. In Figure 7 this is represented by the SGP's 3% limit on the deficit ratio. It is immediately obvious that any such restriction would interfere with the process of structural reform. Although the probability of exceeding that limit (or more precisely of getting an output gap that forces us to do so) is much lower after the reforms are completed - that was the motivation for conducting the reforms in the first place - the probability of exceeding them in the interim (and getting fined for it) will have increased significantly. That would be a considerable barrier to ever undertaking such reforms; and make them much more expensive, either in fines or in cancelling other expenditures to make room for the reforms. In that case, the reforms would either be postponed or switched off each time the 3% limit came close; or countries would never undertake them for fear of breaching that limit.

[12]The European Commission has estimated the slope of this line to be approximately -0.5 for the Eurozone as a whole, a bit steeper for countries with extensive social welfare programmes and a bit less steep elsewhere.

4.2 Empirical evidence on the link between fiscal constraints and structural reform

Option 1: Fiscal constraints through tax increases. We now investigate empirically the impact of fiscal policy on the incentives for structural reform and the incentive to join. We assume that the British government decides it needs to reduce government debt further. As a unilateral action the British government limits its fiscal deficit to 0.3% of GDP. Although this is not strictly a representation of the SGP, it is in line with the SGPs requirement that countries should remain "close to balance or in surplus", and it also corresponds to Britain's official target for her cyclically adjusted budget. However, public expenditures are to be kept at the same level as before, so that the government has to increase taxes.

As Figure 8 shows, a much clearer business cycle now emerges. In the short run, Britain is better off joining EMU. But towards the end of the sample she is worse off. These are standard results for an expansionary fiscal contraction: in the short term the economy appears to improve, but performance begins to deteriorate again in the longer term as unemployment increases (Barry and Devereux, 1995). Indeed, figure 8 shows that unemployment is behaving as an analogue of GDP, without discernable effects on the inflation rate.

– Figure 8 about here –

Interestingly, the effects on Germany are also much stronger in this simulation. Fiscal prudence in Britain evidently has a significant impact on Germany. In particular, Germany is now much better off in the short run than she is worse off in the long run. That shows the incentive effect of wanting a more flexible partner. Evidently, fiscal restrictions throw more of the burden of adjustment onto the more flexible partner - the UK in this case. So overall, Germany is rather better off if Britain restricts fiscal policy to reduce her deficit, but keeps her expenditures at a constant level. That however, comes at considerable extra (long term) cost to Britain.

Option 2: Fiscal consolidation through expenditure cuts. Next, we investigate the impact of expenditure cuts in Britain on Britain and Germany. We assume that the British government reduces the deficit to 0.3% of GDP and reduces expenditure accordingly. We assume the same exchange rate at entry as before in order to make this simulation comparable to the previous one. The

results, reported in Figure 9,[13] shows that Britain is now considerably worse off, at least in comparison to the baseline (Figure 9a) However, towards the end of the simulation, fiscal prudence generates bigger gains in growth than financing the joining of EMU by deficit. Nevertheless, the growth rate here is still less than in the default solution where Britain does not join EMU.

– Figure 9 about here –

The first fiscal restraint scenario showed that the unemployment rate improved in comparison to the baseline. In this scenario (schedule "C"), the unemployment rate is higher than in the baseline (schedule "A") or the first simulation (schedule "B"). But the unemployment rate does converge towards the baseline at the end of the simulation period, whilst the unemployment rate in the first scenario is moving away from the baseline at that point. So fiscal restraint has ambiguous effects in Britain. Unemployment is unambiguously worse in the short term, but may become better again if expenditures can be gradually cut so that higher taxation does not become an additional burden.

– Figure 10 about here –

However, this kind of fiscal restraint in Britain clearly has a damaging impact on Germany (Figure 10). In the first scenario (schedules "A" and "B"), Germany was definitely helped by Britain joining the euro, especially in the early years. In this second scenario (schedule "C"), Germany is worse off over the entire period. So Germany would not want Britain to cut her public expenditures. That in turn means that Germany would not want Britain to apply the SGP rules, or have them enforced by others through the excessive deficit mechanism. Especially, if that should lead to significant cuts in expenditure. Germany could live with a British slowdown if that comes from higher taxes, but Germany is sensitive to expenditure cuts. It is unlikely that the SGP would survive if no-one has an incentive to demand that it be honoured by others, let alone apply it to oneself.

[13] Schedule "A" shows the baseline, schedule "B" shows option 1 and schedule "C" shows option 2.

4.3 Further evidence on the difficulties caused by different degrees of flexibility

In order to emphasize the disincentive effects of joining a monetary union of partners less flexible than oneself, we experimented with giving Britain German-style inflexibilities in the labour markets. In practice this involved giving Britain the German AEE, as stated by equation (2). We then reran the "Britains joins in 2005 at £1=€1.43" scenario.

No fiscal constraints on anyone. The results of this simulation appear as the "Britain in EMU, and inflexible" path in Figure 11. These results are compared to the results of Figure 1b – "Britain joining EMU, and flexible"; and also to the baseline path. The results presented in Figure 1 had, of course, shown that Britain was worse off entering EMU with an inflexible Germany, although Germany was better off. That confirmed the "Groucho Marx" result: it would not be advantageous for the more flexible to join, although they would be welcomed by the less flexible.

– Figure 11 about here –

Adding to Britain's inflexibility does not change that result. To join becomes even less advantageous for Britain (a 20% loss) because adjustment is now more difficult, although the need to adjust is the same as before. By contrast, the *extra* loss to Germany is rather smaller (5% instead of 20%), the EMU's adjustment burden having been transferred to Britain. Thus, Germany would prefer the joiner to be flexible; but even if she is only relatively so, much of the burden of adjustment can be shifted to the more flexible.

Britain would prefer the flexible rather than inflexible if she has to be within the EMU, of course; but it is the average level of inflexibility which causes the losses here, and the imbalance between the degrees of inflexibility, not other factors such as the exchange rate value at joining.[14] Nevertheless, Britain would still have been better off outside.

Britain and Germany are both subject to expenditure constraints. Figure 12 now shows the results when we rerun the exercise of section 4.2, but with both subject to a budget deficit of 0.3% and with both obliged to

[14] As we pointed out earlier, the results are robust to variations in that value in the range £1=€1.30 to €1.60.

cut expenditures to reach that target. The new results are marked "Germany constrained as well", and are compared to the results already obtained in figures 8 and 9 for British and German GDPs respectively.

– Figure 12 about here –

In these diagrams, Britain remains flexible (with her original wage bargaing equation), but Germany inflexible. Again, we see that the additional expenditure constraints in Germany have worsened the situation for both countries, but interestingly almost as much for Britain (4%), where there are no additonal restrictions (compare Figure 8a), as for Germany (5%) where these restrictions are new.

Thus, there is a strong interaction (link) between market inflexibilities and fiscal restraint; and, given the asymmetric incidence of those inflexibilities, there is as strong a spillover/disincentive effect on the flexible economy as there is on the inflexible. Once again, market inflexibilities are what cause the transfer of the adjustment burden, exaggerated here by the fiscal restrictions.

Germany adopts British wage flexibility. Can we confirm these disincentive effects by making them disappear when Germany becomes flexible in the same sense as Britain? This involves giving Germany, Britain's wage bargaining equation. The results appear in Figure 13. It is clear that the previous losses, and the German deficit problem, both vanish. Again, it is market flexibility problems which have underlain the losses in the earlier simulations.

– Figure 13 about here –

5 Concluding remarks

In this paper, we investigated a "Groucho-Marx theorem" from our earlier work which showed the vital role played by structural reforms in making the Eurozone into a currency union worth joining; and the accession countries into suitable candidates for joining. We used a large multi-country model to evaluate the effect of joining under different circumstances. By doing so, we could provide empirical evidence of what would happen if these countries were to join.

Although not all current "outs" will be the same - and in previous work we found that Denmark for example is significantly closer to wanting to join

than the UK[15] - we find that those countries which the Eurozone would like to join are reluctant to do, unless labour market reforms have taken place. On the other hand, we have shown that those countries which are keen to join will benefit from joining EMU, but the existing members will not be better off if they do so. We also found that there is an incentive and a need within the Eurozone countries to undertake structural reforms if economic growth is to be stimulated. Structural reforms would therefore make everybody better off.

Finally, we have shown that too strict an application of the SGP has severe spillover effects, especially when market rigidities are in place. Too tight a fiscal policy combined with market rigidities will slow down economic growth in the Eurozone and make structural reform unlikely. if not impossible to carry out. Therefore, if structural reform is seen as important, there is little incentive to obey to the SGP.

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A Appendix: Details of the Oxford Economic Forecating (OEF) model

The structure of each country model is based on the income-expenditure national accounting framework. However, the model also have a coherent treatment of supply. In the long run, each economy has a one sector Cobb-Douglas production technology. In addition countries have a natural growth rate beyond the power of governments to alter, which is driven by population and productivity growth. Output cycles around a deterministic trend, which defines potential output corresponding to the natural rate of unemployment. Firms are assumed to set prices given output and the capital stock, but – crucially to the paper – the labour market is imperfectly competitive. Firms bargain with workers over wages, but are able to choose the level of unemployment. Countries with high real wages therefore get high unemployment relative to the natural rate.

Inflation is a monetary phenomenon in the long run. All the models have vertical long run Phillips curves, so expansionary demand policies put upward pressure on inflation. Unchecked, these pressures would cause the price level to accelerate away without bound. In order to prevent this, the model has an endogenised monetary policy. For some (such as the US and UK), monetary policy is summarised in an inflation targeting rule, and interest rates are assumed to move up whenever inflation is above target rate, and/or output is above potential (a so-called "Taylor rule"). In others (e.g. in the Eurozone) the authorities are assumed to act as though they target a monetary aggregate. The coefficients in the interest rate reaction function, as well as inflation target itself allow for different levels of hawkishness.

On the demand side, consumption is a function of real incomes, real financial wealth, real interest rates and inflation. Investment expenditures are determined by Tobin's q (current and future expected revenues), and by its opportunity cost, after taking taxes and allowances into account. Countries are assumed to be "small", in the sense that exports are determined by demand (import demands elsewhere) and a country cannot ultimately determine its own terms of trade. Consequently, exports are a function of world demand and the real exchange rate, and the world trade matrix ensures adding-up consistency across countries. Imports are determined by real domestic demand and competitiveness.

Each model also contains a financial sector, which includes variables of di-

rect relevance to financial market participants. This block forecasts total rates of return on cash, stocks and, bonds. Private sector asset holdings have been broken down to personal and corporate components. In the public sector, general government debt is now identified for all countries, and both net overseas assets and net investment flows are derived by residual.

Model variables are divided into demand and supply, core and non-core. Coverage of core variables is standard across all country models; non-core coverage varies across countries depending on data availability and country-specific requirements. Core demand variables include all the aggregate expenditure components, at constant and current prices, monetary policy variables and the financial variables. The non-core element disaggregates consumption and investment, as well as important indicator variables such as retail sales and car sales. Core supply consists of variables determining the natural levels of output, unemployment and real wages. Prices are also disaggregated in the core supply block. Non-core supply disaggregates employment and nominal earnings. Separate blocks build up the government, personal and corporate sector flow accounts.

A.1 Consumption

The equations take the form:

$$\Delta c = a_1 a_2 \Delta u - a_3 c_{-1} - a_4 y_{-1} - (1 - a_4) W_{-1} + a_5 R_{-1} \qquad \text{(A1)}$$

where c, y and u are consumption, real income and unemployment respectively, while W and R refer to the financial wealth-income ratio and real interest rates. These error-correction formulations appear to mimic consumption smoothing in a number of countries very well.

A.2 Investment

The equations for business investment are based on Tobin's q. Capital is time-consuming to install and adjustment costs drive a wedge between the post-tax marginal product of capital and its marginal costs. Profit maximising firms invest when the marginal return is greater than the replacement cost ($q > 1$), and reduce investment when the reverse holds. In the long run, the capital stocks reaches its desired level, $q = 1$ and he familiar marginal productivity relationship holds. The equations take the following form:

$$\Delta i = a_1 q - a_2 i_{-1} - k_{-1} + a_3 \Delta y \qquad \text{(A2)}$$

where i is private sector business fixed investment, k is the equivalent capital stock and y is GDP. Finally, q is defined as the post tax marginal product of capital relative to the real interest rate. There are also short term accelerator effects from changes in output, reflecting the possibility that some companies are credit-constrained.

Personal sector housing investment is determined analogously to consumption, by real income, wealth and interest rates, since it is considered part of a portfolio of spending decisions taken by households. Government investment is exogenous.

A.3 International trade

Exports and imports are demand determined:

$$\Delta x = \Delta wt - a_1 cu - a_2 \Delta wcr - a_3 x_{-1} - w_{-1} - a_4 trx \qquad \text{(A3)}$$

$$\Delta m = b_1 \Delta tfe + b_2 \Delta wcr - b_3 \Delta m_{-1} - tfe_{-1} - b_4 wcr_{-1} - b_5 cu_{-1} \qquad \text{(A4)}$$

where x refers to exports of non-fuel goods; m to equivalent imports, wt is world trade; tfe total final expenditure; wcr, relative unit labour costs; and cu, capacity utilisation as measured by the output gap. Trade competitiveness elasticities are typically between 0.3 and 0.6; and most country models satisfy the Marshall-Lerner conditions, so that an improvement in competitiveness will lead to an improvement in the trade balance in the long-run. The equations for trade in services are analogous to those for non-fuel goods, while imports of fuel meet the gap between domestic and export demand, and domestic production. All trade prices are a weighted average of domestic and world prices.

A.4 The supply side

The key relationship here is a production function for each country relating output to employment. From that production function we can derive the marginal product of labour, which in equilibrium equals real wage. That relationship would then imply a demand for labour (nd) at each real wage level. Given a predetermined labour supply (ns), the intersection of ns and nd generates an equilibrium real wage consistent with no involuntary unemployment at full capacity output. The latter is the long run aggregate supply level.

In the short run, however, relatively rigid real wages generate involuntary unemployment (nd$\neq$ns), while nominal inertia means that that is a short run

relationship between real wages and the price level. Short run changes in labour demand then trace out a positively sloped short run aggregated supply curve (AS), ensuring that any changes in aggregate demand (AD) translate into short run changes in prices and output, although the long-run effects are felt on prices alone. Thus the employment equation defines a level of real unit labour costs (real wages/productivity) which is constant in the long run. Consistent with this level of real unit labour costs are natural levels of output and employment. When the economy is away from these natural levels, inflation and interest rates move to bring the economy back towards equilibrium. The larger are nominal and real rigidities, the larger and longer-lived are real disequilibria.

In the long run, the employment equation solves for real unit labour costs, given labour's share of national income implied by the level of national output; while the wage and price equations solve for the level of unemployment consistent with this labour share. In the short run, both wage and price equations incorporate nominal and real wage rigidity, which ensure the existence of "involuntary" unemployment and monetary effects on the real economy. Thus, with vertical Phillips and aggregate supply curves in the long run, monetary policy determines the inflation rate, while short term structural rigidities determine the unemployment rate and hence the short run variations in wages. The NAIRU (non-accelerating inflation rate of unemployment) is related to the so-called "tax wedge" (the gap between the total real cost of labour to employers, including social security contributions, and the real value of post-tax wages received by employees), and to real prices.

B Appendix: Tables and Figures

Table 1: Baseline Statistics: Economic Development in the Absence of Any New Enlargements, 2002-2007

	Britain	Germany	France	Belgium	Poland
Inflation (%)	1.5	2.0	2.0	2.0	5.0
GDP growth (%)	2.5	1.8	3.0	2.8	4.4
Unemployment (%)	3.0-3.5	10.4-8.1	9.0-7.2	11-10	16-14

Additional Figures: UK interest rates fall from 5% to 4%; UK debt increases 8% over 4.5 years (the debt ration therefore falls 7% points over the same period); the Pound depreciates from £1.59 to £1.43, and the Dollar depreciates from $0.85 to $1.12 per euro

Source: own calculations

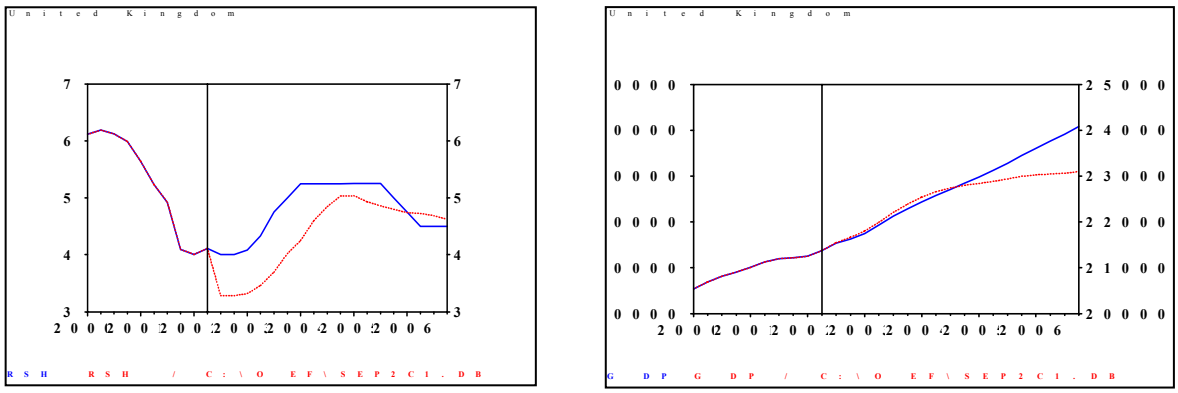

Figure 1: Britain in EMU and Flexible: Short-Term Interest Rate (Left) and Real GDP (Right); 3% Deficit Criterion

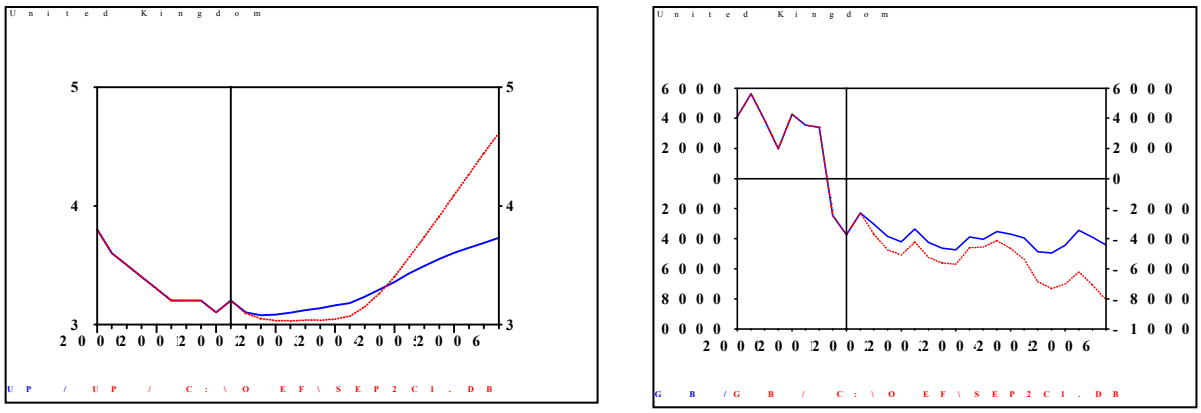

Figure 2: Britain joining EMU, Unemployment Rate (Left) Government Debt (Right)

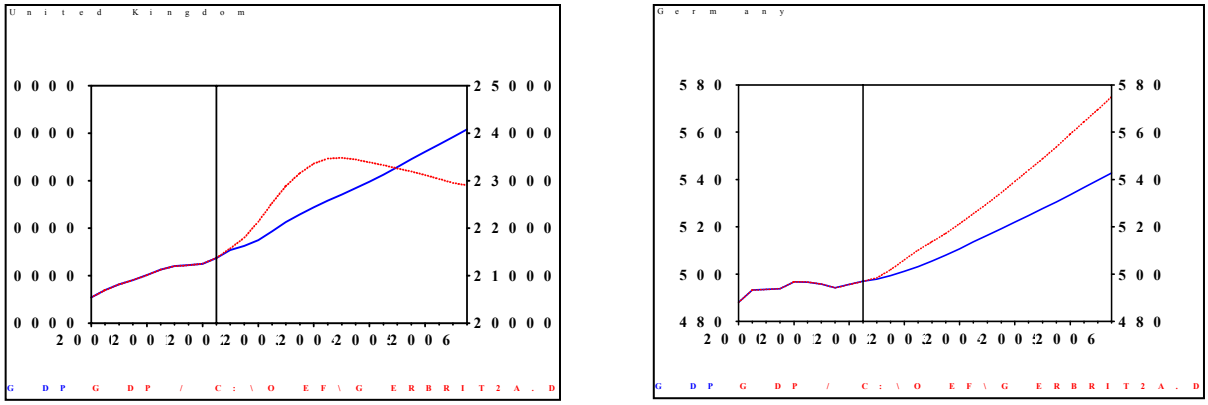

Figure 3: Britain Joins EMU, but Germany Adopts British Labour Market Flexibility: British GDP (Left), German GDP (Right)

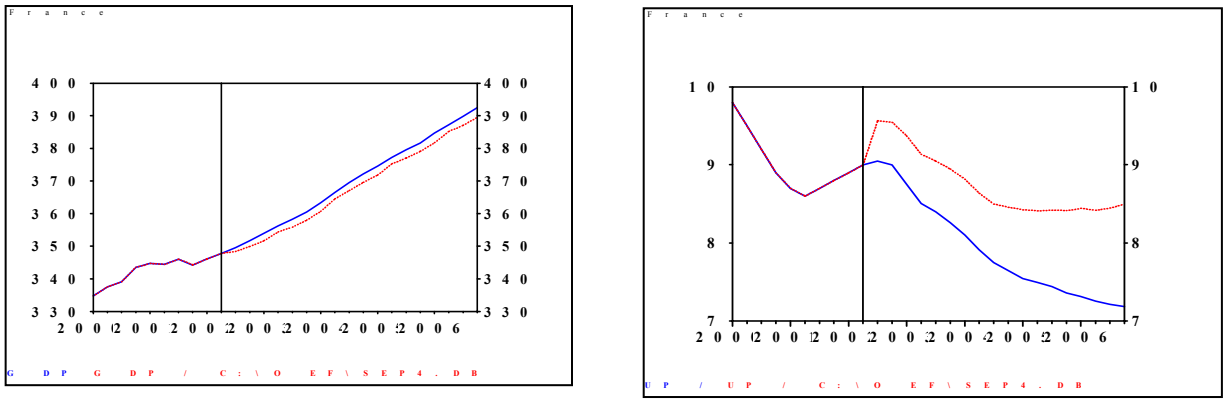

Figure 4: France and Belgium have German Rigidities: Real French GDP (Left) and Unemployment Rate (Right)

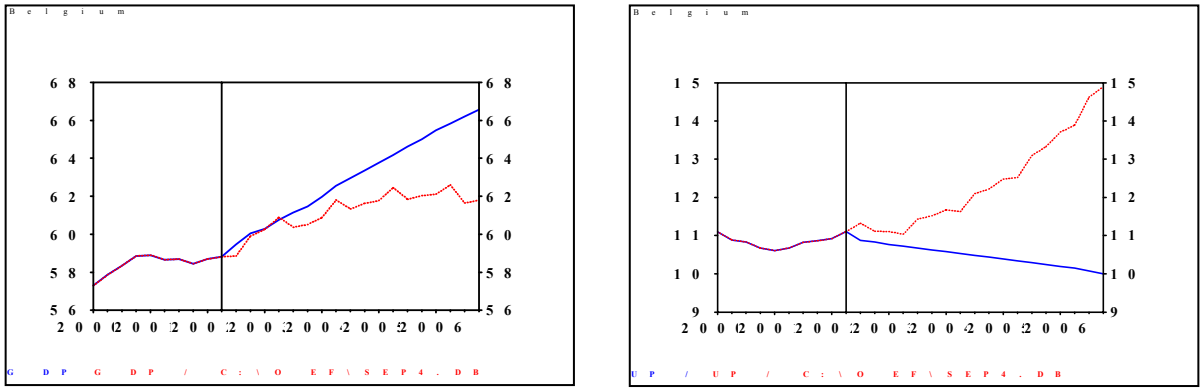

Figure 5: France and Belgium have German Rigidities: Real Belgian GDP (Left) and Unemployment Rate (Right)

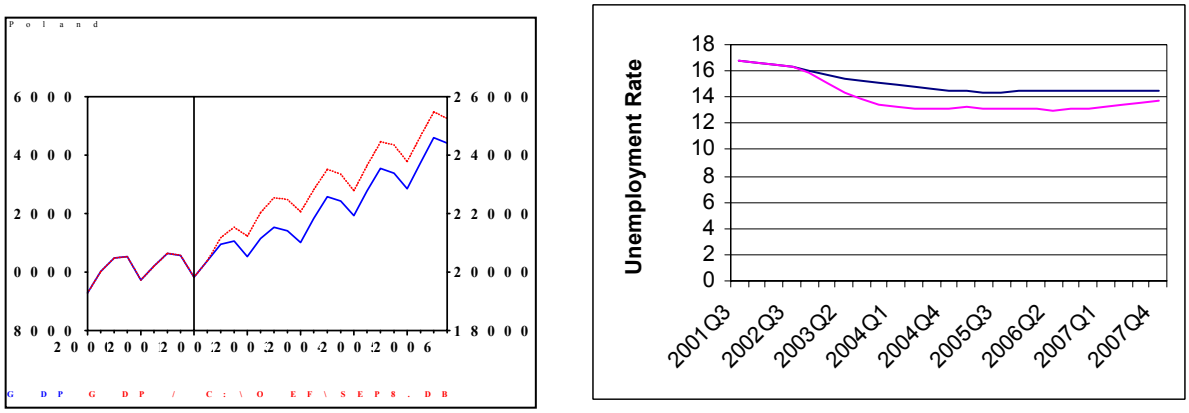

Figure 6: Poland is joining the EU at Zl5/€1: Real GDP (Left), Unemployment Rate (Right)

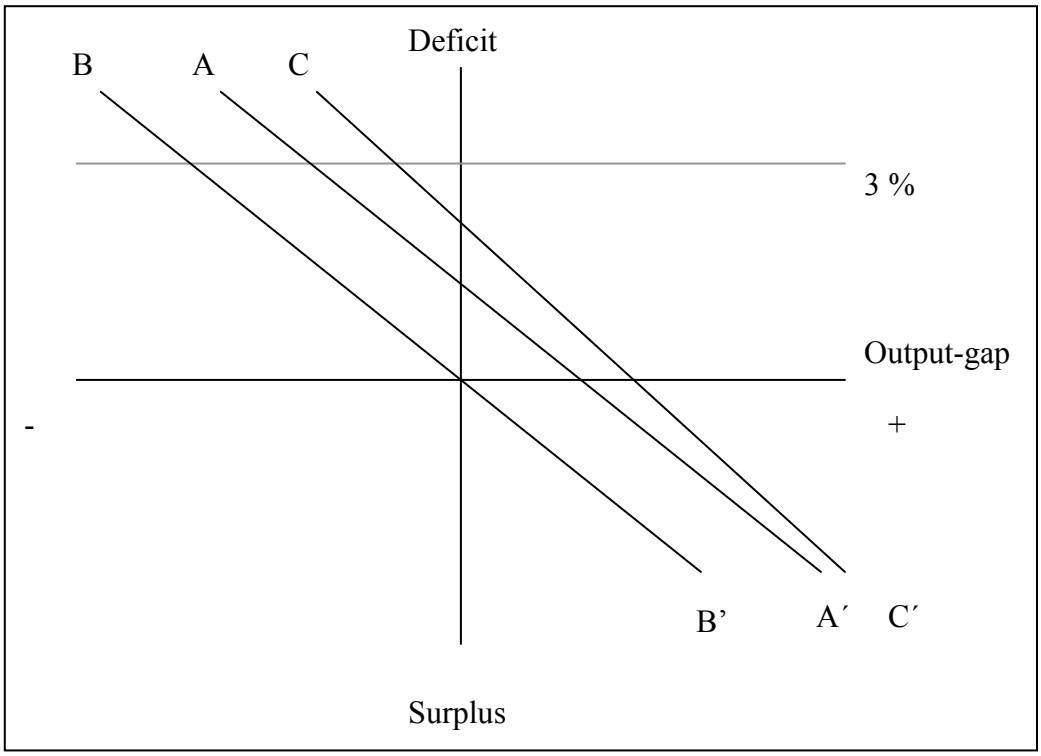

Figure 7: Link between Fiscal Policy and Structural Reform

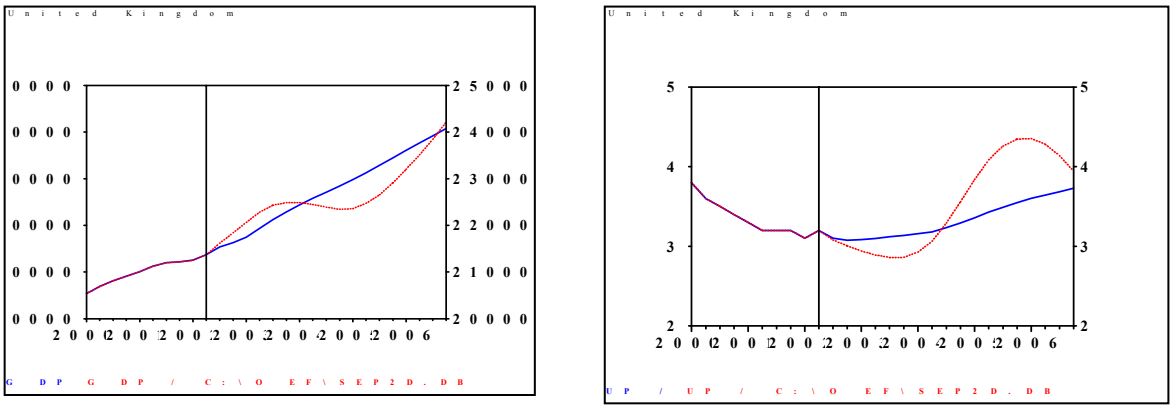

Figure 8: Britain joining EMU: GDP (constant prices) in Britain (Left), British Unemployment Rate (Right), 0.3% Deficit Criterion

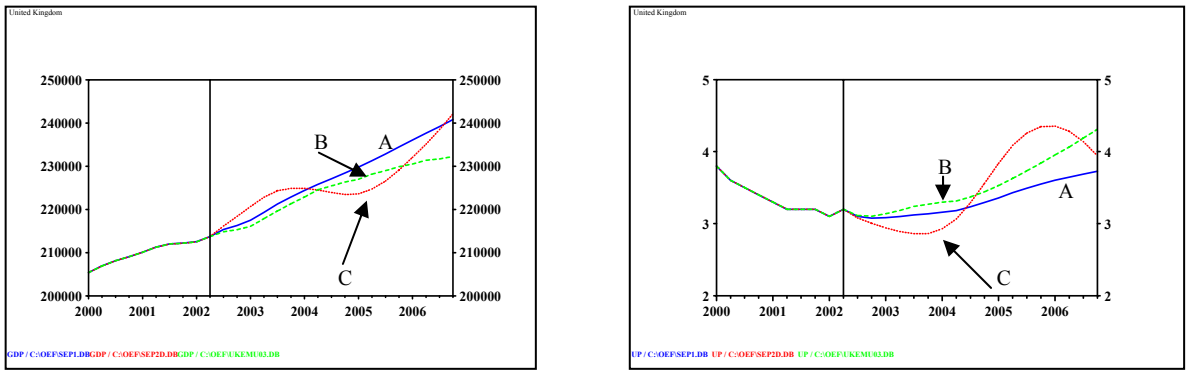

Figure 9: Britain joining EMU: GDP (constant prices) in Britain (Left), Unemployment Rate (Right) 0.3% Deficit Criterion

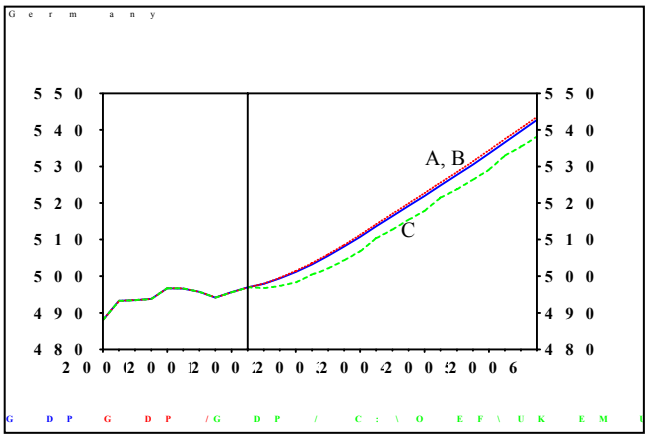

Figure 10: Britain in EMU, Real GDP in Germany, 0.3% Deficit Criterion

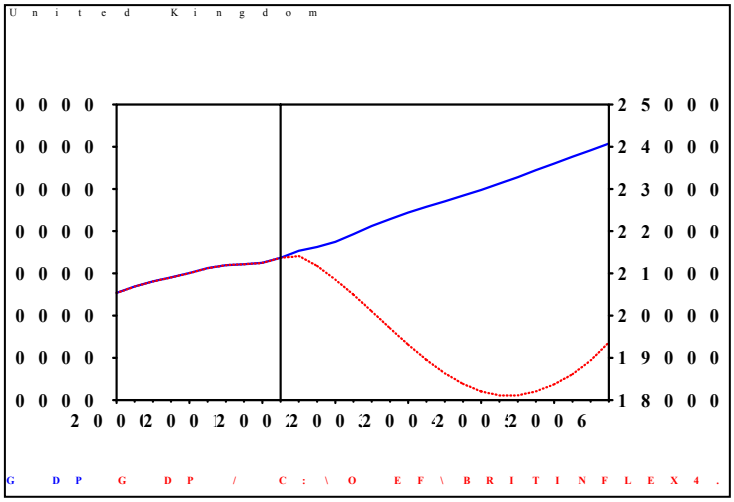

Figure 11: Britain in EMU, and Inflexible

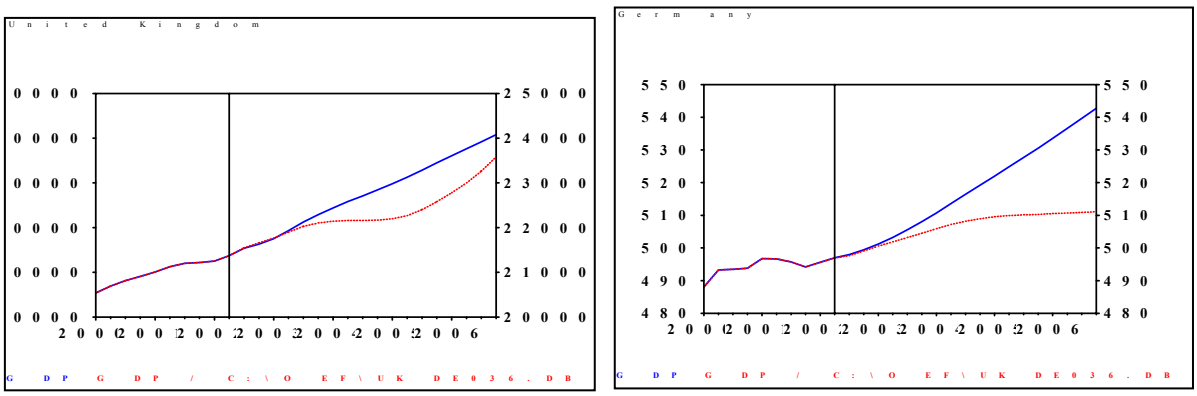

Figure 12: Britain (left) and Germany (right) Cut Expenditure: Real GDP

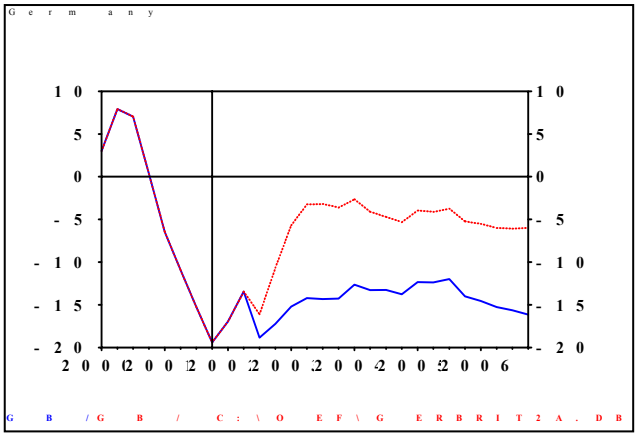

Figure 13: Development of German Government Debt: Germany Adopts British Labour Market Flexibility