Market Distortions, Structural Reforms and Employment:
A Dynamic Analysis

I.   Project participants

1. Andrew Hughes Hallett, School of Public Policy, George Mason University and CEBR
2. Svend E. Hougaard Jensen, CEBR (project coordinator)
3. Nikola Bokan, CEBR and University of St. Andrews

II.   Project description

1. *Background/motivation*

Tax reform, product market liberalisation and deregulation in the labour markets are widely seen as the keys to an improved economic performance – particularly in Europe. Yet, the academic literature has seen very little formal analysis of the reform process, or of how far structural reforms could be expected to improve economic performance in practice. Similarly, many countries have proved reluctant to actually embrace such reforms, despite being happy enough to extol their virtues in public debate. These inconsistencies need explanation.

Starting from work by Blanchard and Giavazzi (2003) and Spector (2004), we have in recent work developed a model of an economy with imperfect competition, wage bargaining and tax distortions to show the conflict between the long run gains from tax/market reforms and their short run costs, including the costs of financing those reforms (Bokan and Hughes Hallett, 2006a,b). On a comparative statics basis, we were able to confirm the existence of short run costs as the main stumbling block, and also the

existence of long run gains. But, in the absence of a fully dynamic analysis, we were unable to answer the key question: when will the expected discounted value of the gains outweigh the current short run costs?

We were similarly unable to trace out how the trade-offs between the real and nominal performance of the economy, as represented in the inflation-unemployment trade-off, are affected by these distortions and how far they might be eased by the different reform measures available. Lastly, we were unable to show explicitly how these different distortions affect the natural rate of unemployment and hence which structural reform measures would be the most important to undertake. Thus, the purpose of this project is to find answers to those important questions.

2. A pilot project

As a first step (the pilot project), we intend to construct an explicit dynamic analysis to answer those questions. We will do that by formulating a dynamic general equilibrium model, comprising a search and matching model of the labour market, including wage bargaining as a wage determination mechanism, and combining that with an imperfect competition model of the product market. Initially, our plan is to model wage bargaining as a simple sharing rule, but other types of bargaining mechanism might also be considered, such as the "right to manage" and possibly individual bargaining.

On the worker-consumer side, preferences over consumption bundles will be modeled using Dixit and Stiglitz type of aggregator. Since firms are monopolistic competitors, and they all have some monopoly power, we can think of the firm as representing one industry in the economy. But in order to make each industry different, to capture the monopolistic competition feature that characterizes advanced economies today, we will assume that each firm is hit by some idiosyncratic shock. So, when the firms maximize their profits they take into account both the demand from the worker-consumers (the outcome of the standard utility maximization problems) and the shocks they can expect to be hit with.

This yields a dynamic general equilibrium framework that allows us to analyse the adjustment process, from short run costs to long run gains in improved performance. In addition, we can establish a set of conditions under which the expected long run gains will exceed their short run costs. We will also examine the traditional real vs. nominal trade-offs to see which of the reforms relax the severity of those trade-offs most effectively, and which of them affect the natural rate of unemployment most favourably.

3. Expected Results from the Pilot Project

That provides a guide to which reform measures would be most effective in practice. All these results will be obtained by manipulating the model's reform (or regulatory) parameters – the degree of substitutability (or competition) in the product markets; the degree of wage bargaining power in the labour markets; the burden of business taxes, wage taxes, payroll taxes; parameters reflecting hiring and firing costs or minimum wage legislation, skill levels and unemployment benefits – which in turn affect the probability of job matching and acceptance and the separation parameter in the search model. An important by-product is that we will have created a model that can discriminate between reform measures for reducing the natural rate, and those appropriate for improving the short run inflation-unemployment trade-off. Perhaps most importantly, this approach is capable of showing whether sudden reforms ("cold turkey") or gradualism is the better reform strategy overall.

III. Possible Extensions in the Future

We recognise that the programme of research outlined above involves a great deal of detailed work, both on the model building side, and in terms of the numerical algorithms needed to solve the models once created. Nevertheless we have a significant amount of experience from our earlier papers in the model building issues that we can expect to meet. Similarly, the literature contains a number of search model applications, so again the cumulated experience of solving these models numerically can be brought to bear. In addition, it is a feature of this kind of analysis that it takes sometime to get the models set up and solved, but then it is very easy to generate a large number of alternative

simulations, which can be used to study different scenarios of interest. We therefore estimate that this project can be concluded successfully in a year.

That said, it is equally obvious that once we have a working model of this form, there are many extensions to the analysis that we have outlined that could and should be made. We therefore regard the work outlined above to be a first phase of a wider project, to get the right kind of model set up and working. The model itself, and the experience gained, would then form a useful platform for conducting the extensions needed in the context of a wider research project which might have more immediate policy problems and a model of a specific economy (Denmark, the European Union?) as its specific focus. We intend to apply for such a larger and more comprehensive follow-up project, stressing the applications of our methodology. That project might also be used as a vehicle for training two PhD students in the relevant analytical and model building techniques, on the back of the experience gained in this one.

One important extension would be to model the monetary side of the economy to capture the interactions between a disciplined monetary policy and the various regulatory parameters which lead to market rigidities. This could be done by providing a nominal (monetary) side to the model of the economy and then taken further by introducing money via a money-in-the-utility-function approach. To make this extension more realistic we might also consider the price adjustment mechanism by assuming quadratic costs adjustment process on behalf of the optimising firms. This will result in an explicit formulation of the Phillips curve which will allow us to analyze inflationary pressures on the economy. We will analyse various monetary policy rules, ranging from a simple money growth rule to various interest rate rules to obtain *joint* effect of those monetary policy decisions and the ones resulting from structural reforms.

Second, some of these issues have been previously approached in the literature, but the analysis has always been done using linearization techniques. Taking into account the highly non-linear nature of this type of model, a natural question is: what has been lost by applying linearization techniques? We could aim to address this question by solving

models using non-linear numerical methods, more specifically using the deterministic parameterized expectation algorithm proposed by Judd (1998).

Third, we would also want to consider the effect of the stochastic entry costs. The introduction of the stochastic entry costs will allow us to analyse an additional dimension of structural reform. Stochastic entry costs can be justified on the grounds of greater realism: that, although most of barriers to entry could be thought as being fixed and non stochastic, certain individual characteristics of the entry process – such as the speed with which clerks process the applications ("red tape"), the state of the economy when entry is actually undertaken, or the frequent changes of policy, standards or in the requirements for entry will inevitably play an important role that needs to be investigated.

Finally, it is our hope that this project would pave the way for more realistic country studies, but this will unavoidably depend on the success of the earlier steps in the present project.

IV.   References

- Blanchard, O. and F. Giavazzi (2003) "Macroeconomic Effects of Regulation and Deregulation in Goods and Labour Markets", *Quarterly Journal of Economics*, 118, 897-907

- Bokan, N. and A. Hughes Hallett (2006a) "Labour and Product Market Reforms in the Economy with Distortionary Taxation", Discussion Paper 5431, Centre for Economic Policy Research, London.

- Bokan, N and A. Hughes Hallett (2006b) "How Much Do Tax Distortions Restrict Employment and Output?", Working Paper, CEBR.

- Hughes Hallett, A., S. H. Jensen and C. Richter (2005) "The European Economy at the Cross Roads: Structural Reforms, Fiscal Constraints, and the Lisbon Agenda", *Research in International Business and Finance*, vol. 19, 2005, pp. 229-250.

- Judd, K. (1998) *Numerical Methods in Economics,* MIT Press.

- Spector, D. (2004) "Competition and the Capital-Labour Conflict", *European Economic Review*, 48, 25-32.

V.   Visibility/dissemination

The expected research output from this pilot project would be a discussion paper which after some revisions would be aimed at a high-ranked international journal. That is the immediate objective. Extensions to our work would naturally give rise to further academic papers based on the results of the pilot project. These papers will be published at a later stage.

Also, before submitting any papers, we plan to present our work at various workshops and conferences. In the event that we are able to establish a wider project, we will want to organize a CEBR workshop with a strong international orientation. For example, we would explore the possibility of hosting a conference organized jointly with a leading international research institute, such as the London-based CEPR or the Munich-based CESifo. Finally, but not least, we would want to derive more popular writings from the project meant for a wider audience, with a Danish/Nordic readership in mind. However, we realize that the pilot project is unlikely to give rise to more than a limited output of that kind.

VI.   Time Schedule

The project would mainly be conducted during the period July 2007 - June 2008. For some of that period, Andrew Hughes Hallett and Nikola Bokan plan to be based at CEBR. However, in order to bring the work into publishable form, the intention is to spread the project over the year.

VII. Budget

- Løn til videnskabelige medarbejdere (SHJ, professor)

  i. Forventet forbrug af forskningstid   1 md.
  ii. Månedlig lønsats   55.800 kr.
  iii. I alt   55.800 kr.

- Udgifter til udenlandsk gæsteforsker (AHH, professor)

  i. Forventet forbrug af forskningstid   2 mdr.
  ii. Månedlig lønsats   55.800 kr.
  iii. Rejser/ophold   25.000 kr.
  iv. I alt   136.600 kr.

- Udgifter til udenlandsk gæsteforsker (NB, adjunkt)

  i. Forventet forbrug af forskningstid   3 mdr.
  ii. Månedlig lønsats   35.367 kr.
  iii. Rejser/ophold   25.000 kr.
  iv. I alt   131.101 kr.

- Overhead (20 % af udgifter)   64.700 kr.

TOTAL   **388.201 kr.**