

Reply to the Referees; reports on Discussion paper 2007-42:

We are very grateful for all the referees' comments on this paper. Although this paper has been presented at a number of seminars and conferences in Europe and the US, it is very useful to get a formal response as others see it. As a result we have made a number of revisions to the text, and have extensively rewritten sections 3 and 4 to close some gaps and make the model more specific. Details of the revisions, and responses to the referees' points by his numbering, are given below.

Referee #1:

1. We agree. We have revised the text in the introduction and conclusion to play up tax reform as the new contribution made by this paper.
2. Here we differ. The discussion of the determination of the natural and actual rates of unemployment (section 2.2) is necessary to pin down how unemployment reacts with the reservation wage: see section 3.2. That is a key component of the short vs. long run costs example at the end of section 3, and hence of the discussion of the different types of reform measure which lies at the core of the paper. To remove this would leave the paper extremely vague and open to criticism for that reason. We are sorry if the referee feels that this development is "ad hoc". It is an inevitable consequence of imposing limited budget deficits on a model in which employment develops according to a standard search model of the labour market, as is shown. One could call those models ad hoc, but I don't think it would be a widely held view. However the wording at the start of that subsection was not well chosen. We have revised those paragraphs according to the referee's wishes in his point 3. I think the referee's confusion here actually stems from the fact that he thinks the relation between w_r and u is positive, whereas it is shown to be negative in section 3.2.
3. We have adopted the rewording as suggested by the referee. However, the relationship between w_r and u is negative rather than positive so the second part of the referee's comment falls away. But we have included a comment on the outside income sources for the unemployed as requested.
4. We agree with this point, but think that to answer it fully would require another paper. Unemployment benefits are however considered explicitly among the institutional reforms in section 4 which the referee has asked us to cut out (point 9). We cannot satisfy the referee both ways. We have taken the view, along with the referee, that reforms of this kind could be important. The revised section 4 now covers them, and shows how a fuller analysis of unemployment benefits would have to be done.
5. This comment is more challenging:
 - a) There is no obligation to change $\bar{\theta}$; and all our results go through without it. It is simply a policy option for a government. However altering $\bar{\theta}$ just says that consumers prefer (and are able to buy) more varieties to less. That does not seem very controversial,

particularly as there is already a great deal of literature which uses that argument. It seems to me that nearly all governments in the past 20 years have argued that that has been their major achievement.

- b) I assume the fixed costs proposition refers to “c”. It seems reasonable that the entry costs you are prepared to pay should be dependent on the size of the market you expect to get – not least because we are dealing with incompletely competitive markets. So this assumption is actually a reflection of the scale economies or monopoly power that underlies our model. And it is easy to think of real world examples. Conversely, if entry costs were really independent of output and number of firms as the referee suggests, there would be no entry at all because, as the parameters that currently control output or the number of firms change, there would be nothing to change the original decision to have entered or not to have entered. Those who chose to stay out will remain out, and those who are in will stay in. Given that output is differentiated by firms, and is strictly related to the number of firms, this means there would be no distinction between short and long term, and hence no possibility for growth or welfare improvements. And hence no reason for undertaking reforms. As a result, we do not think it would be helpful to follow this strategy in a paper which is focused on structural reform.
- 6. a) We agree with this. We have adjusted the wording and added a footnote on the mixed evidence on the efficient bargaining solution. And we also report that two sets of authors have already established that the results do not change if a right to manage model is used instead. But please note: this was only one of three arguments supporting a bargaining approach. We had already put the “stronger workers” point in as the first argument.
b) My guess is that this alternative objective would produce very similar results to changing β since any changes in the latter will also alter the relative weights on employment and wages. The danger in this alternative approach is that we might lose incentive compatibility, which means no wage agreements would take place (at present they are guaranteed). We have not pursued this option for that reason. Incentive compatibility is our third reason for adopting Nash bargains.
- 7. We have deleted the offending sentence. It referred to a case that could not occur anyway.
 - 8. Agreed. We have adjusted the wording to distinguish between the short term, and the first and second part of the longer term adjustments.
 - 9. We did not follow this suggestion for the reasons given in 4 above. It would take away the opportunity to show that the reforms that are good for employment are not the same as those which are good for welfare. That is one of the key conclusions of the paper.
 - 10. Yes, this is indeed possible. But it is still of interest to know which are the dominant reform strategies, and which instruments have comparative advantage. We did in fact have a section on the optimal combination of policies in an earlier version of this work, but it was rather complicated and took several pages to lay out the intuition. So we thought it better omitted. But we have noted that determining comparative advantage doesn't rule out using packages of instruments.

Referee #2:

The comments at the start of this report were very useful for setting the paper in context, and we have used them. However, I think it is a little harsh to say that the contributions beyond the Blanchard-Giavazzi paper are rather small. In our view, the contributions are:

- Bringing taxes into the analysis and an examination of the impact of tax reforms. There is nothing on this topic in BG, but it is one of the most discussed types of reform.
- We analyse extensively, and give examples of the intertemporal trade-offs implied by this model. The short and long run analysis is there in BG; but nothing that says the short run effects of reform may be ambiguous or negative, and the long run effects positive for example. The contribution here is not so much the extension of the model as such (though the addition of taxes and tax reforms is significant), but the new results that can be derived from it. Comments made elsewhere in this report seem to recognize that.
- Likewise, BG contains nothing on the impact on the Phillips curve (its slope or position) or the connection to why the Phillips curve seems to have become flatter.
- Nor on the composition of the mark-up term (size of tax distortions vs market distortions)
- Nor on the conclusion that the reforms which improve welfare may be different from those good for generating jobs.
- Nor on which types of reforms may be more effective (eg that tax reforms may be more powerful than deregulating the labour markets, and the circumstances in which that will be true).
- And there is nothing on the orders of magnitude of the impacts of reform, or on which countries suffer from what problem.

We think that this is a substantial list of pertinent contributions which are not, as far as we know, available elsewhere in the literature.

Nuisances:

- 1) Y reflects total income (wages and profits), as stated, since it is total output.
- 2) $P=1$ might be used since the symmetric equilibrium forces $P_i/P=1$ for all i (section 3.2). But since the choice of numeraire plays no role in the analysis, we have avoided making an arbitrary choice that would make no difference anyway.
- 3) w_r is stated as representing unemployment benefits, and *hence* the level of the reservation wage implied.
- 4) $\delta \geq 1$ is stated explicitly (in three places in section 3.1, and several places thereafter).
- 5) These inequality restrictions on “ c ” are already used in proposition 7.

Section 2.2 has been deleted, and an explicit derivation of that part of the model now appears in section 3.2. The old section 2.2 has been replaced by a discussion of how unemployment is modeled (in levels and changes), and how it affects the budgetary position. These are key components of what follows.

P7. The budget constraint typo has been corrected.

P7. Efficient bargaining vs. the right to manage. We have added a footnote to acknowledge that point, but also to say that alternative approaches do not appear to change any of the results.

P9. Maybe. It might be simpler mathematically, but our formulation is hardly more complicated and has the distinct advantage that it shows directly how the mark-up varies with taxation and the degree of imperfect competition in the markets. It therefore allows a more direct interpretation of the results, and allows us to provide an immediate intuition for those results (see, for example, after (17); or propositions 2, 4, 5 and 6). So we are faced with a trade-off: simpler formulae vs. more obscure and complicated explanations of the intuition behind the results. This is a judgment call. We prefer to err on the side of more insight into the behavior being analysed.

P10. a) It is not clear how much would actually be gained. It is very easy to see the effects of changes in β in our set up too, and you get to see the role of the mark-up (market power) as well. Our formulation means that you can see the mechanism by which β affects the mark-up and *hence* real wages etc. Using the referee's simplified notation produces the same result; but you don't see the operative mechanism, just the outcomes.

b) propositions 2 and 3 do discuss the effect of wage taxes on labour (see the paragraph and corollary that follows each). We added a comparison to the Spector paper on this point as well.

P11-13. I think this is a matter of language, not a question of inconsistency. In English English, "eventually" means "gradually and after a considerable period of time". Hence proposition 4 describes what has happened in the adjustments from the short run towards the long run, while (26) describes the equilibrium outcomes once firms have finished adjusting. Similarly what was corollary 3 (now corollary 2) describes the result of the transition from short run to long run, and (26) the final long run equilibrium after the transition effects have vanished. They are consistent therefore.

To prevent any confusion on this point, we have done two things. We have changed the language in proposition 4 and corollary 2 to replace "eventually" with "in transition from short to long run". And we inserted an extra paragraph to make the non-monotonic responses between the short run, and on the way between the short run and long run equilibrium, absolutely clear.

Section 3.5: using the restrictions on c to sign the comparative statics. We have done that although the restrictions have been represented in a different form to the referee's comment.

P14-15. We have used limited budget deficits from the constraint (9). This is stated in section 2 and then used explicitly in section 3.2. Mostly, but not always, this involves maintaining a balanced budget. This corrects a problem with previous papers on tax reform which imply no budget constraints and hence that the reforms can expand the deficit indefinitely without cost. In contrast, the example in 3.6 claims, as the referee says, that neutral tax reforms (in our framework) require balanced changes in taxes.

Section 4: this has been extensively rewritten. I can see that the institutional changes part may look independent of the rest of the paper, and that we might delete it. But the model, as it stands, determines changes in unemployment but not the level of unemployment. By adding (3), (4) in section 2.2 we are able to explain the level too, and we need to do that or we wouldn't be able to say what happens to u_N and the position (rather than the slope) of the Phillips curve. If that is done, then institutional changes are of interest because they correspond to the policy changes actually being proposed. I realize that this could be done parsimoniously (but only implicitly) via

changes in β . However, we think it would be more useful and informative for a general audience to keep policy relevance by discussing these policy changes in the form in which they are actually proposed.

Section 5: a) Real wages are shown to be proportional to welfare in this model (section 2). And since it is real wages, not (7), which are solved out in the short and long run, it is far simpler (in keeping with the referee's wish for a more straightforward analysis) to use what has already been derived rather than to start out on a new derivation.

b) Welfare is a long run measure since long run real wages have been used to calculate it.

c) Real wages and unemployment *are* affected by the value of δ , even in the long run. You can see this because both depend on c ; and c in the long run is a function of μ , and μ is a function of δ . So the level of δ matters. But, once we get to that final equilibrium, neither will change again since there are no further changes in δ . The threshold values of δ then follow from a comparison of which reform has a larger effect. Why does that not make sense, given that real wages and unemployment depend on the level of δ ?

d) Liberalisation *does* take the form of a fall in c since a rise in δ implies a fall in c ; proposition 4. We do it this way because legislation and policy cannot affect c directly since it is a market outcome. Comparisons with deregulating the labour market and tax reforms are made as follows: in corollary 4a); bullet points i) and ii) below that; on p20; and corollaries 5a) and c) and the text following, for example.

Literature: We have made extensive use of these points.

i) Comparisons with BG are made in many places. We note that our equations (26)-(28) are the same as BG but with extra terms reflecting our addition of wage and payroll taxes. Set the tax rates to zero and you get back to BG (this is not quite true for (27) since we solve for the reservation wage, but you can see it would be the same if the inverse relation to u were used). Finally we made comparisons to Spector's results, and where they differ, in several places.

ii) These references are noted, but since we are doing a comparative statics exercise based on proportional taxation and uniform tax bases it is not clear if our results are actually comparable to those that depend on the degree of progressive taxation, varying tax bases and varying growth rates. So we note these papers for the possible extensions that they suggest.

iii) Fiori et al was written after this paper. However, it proved very useful even though its focus on empirical tests of the BG predictions and the interactions between product market liberalization and labour market deregulation is quite different. We have included references to it at several points. The other paper is noted but with progressive taxation and fully competitive markets, it implies a different type of problem.

The additional reader:

a) The weakness of having an exogenous δ is only a short run device; in the long run it is endogenous and solved for (equation 26).

b) The budget constraint B is as the reader says it should be.

c) I should point out that we derive results for $\beta = 0$, and $\beta = 0.5$, as well as $\beta = 0.25$. This covers the full range from decentralized to centralized wage bargaining (section 6).