

## Technology Shocks and Employment in Open Economies

### Reply to John Fender's comments

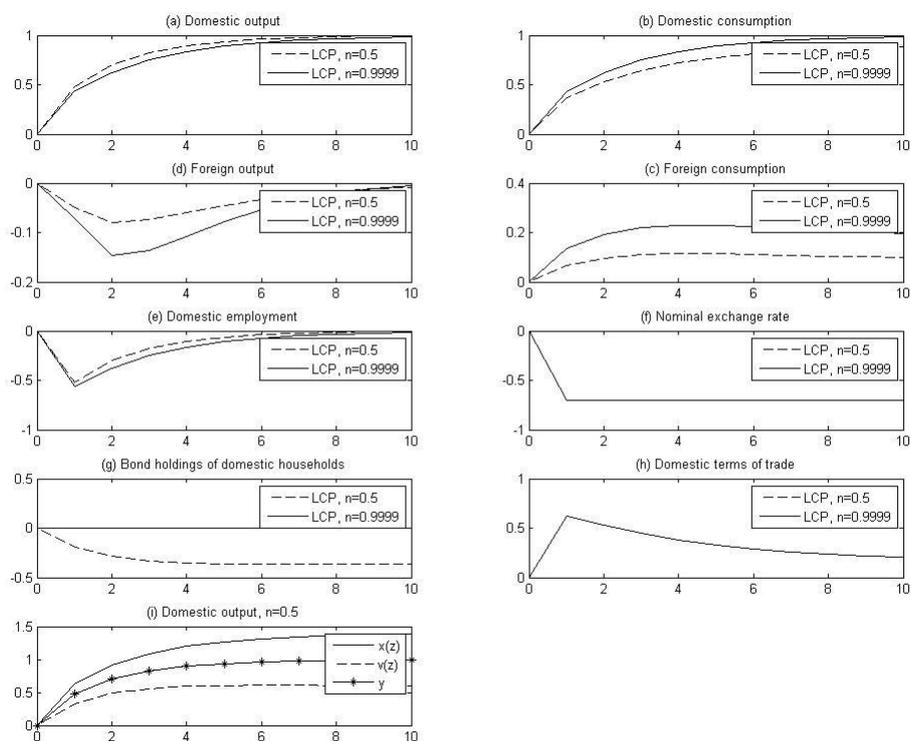
by Juha Tervala

John Fender's comments are very good and some of them deserve to be carefully explored.

- John Fender wrote: "It might be thought that in an open economy, a positive technology shock is less likely to result in a fall in employment as the openness of the economy provides another channel whereby increased output can be disposed of (i.e., to foreigners). After an improvement in technology producers might be expected to cut prices, boosting sales to foreigners."

This hypothesis can be somehow tested in the LCP version of the model where it is possible to distinguish between the output sold in the domestic market ( $x$ ) and the output sold in the foreign market ( $v$ ). The figure below shows the effect of a productivity shock on some key variables (including the composition of domestic output) in two cases. The solid line shows the basic (LCP) case and the dashed lines depict the (LCP) case where the model is virtually closed (the relative size of the domestic economy is 0.999).

Domestic firms cut prices when technology improves as soon as they have an opportunity to do it (see section 2.3 of the paper). Panel (i) shows that a domestic technology shock boosts sales to foreigners. The openness of the economy indeed provides "another channel whereby increased output can be disposed of (i.e., to foreigners)"! Thus, this channel is one reason why in an open economy a technology shock causes a decline in employment that is smaller than in the case of a closed economy.



- Why does the exchange rate appreciate in response to the shock?

The relative consumption change increases the relative demand for domestic money permanently. This requires an appreciation of the domestic currency.

- In the paper it is shown that ‘The home country runs a current account deficit’. John Fender wrote “This is quite surprising. The technology improvement should result in increased export sales of those firms that do reduce their prices, which should tend to improve the current account.”

This is a good point. In this model, only a permanent technology shock generates a current account deficit in the short run. If a technology shock was temporary, it would cause a current account surplus in the short run.

On the one hand, a technology shock results in increased export sales, which tends to improve the current account. On the other hand, households have ability to smooth consumption via the current account. If a technology shock is permanent, households are temporarily poor, relative to their long-run income. To smooth consumption, domestic households are willing to run a current account deficit in the short run. If a technology shock is temporary, however, households’ short-run income is higher than their long-run income. To smooth consumption, domestic households save part of this income by running a current account surplus in the short-run.

The figure below shows the effects of a temporary technology shock in a case where the persistence of a technology shock is 0.9. It illustrates that a temporary technology shock causes a current account surplus in the short run. In addition, the figure shows

that the effects of technology shocks on some other key variables are sensitive to changes in the persistence of technology shocks. The change in the persistence of technology shocks however does not change in the main result of my paper: the expenditure switching effect of a nominal exchange rate change is still one reason why employment declines after a technology shock.

*The figure below illustrates that the model can easily be used to analyse a number of questions related to the international transmission of technology shock (once the Matlab file that solves the model is available to all readers of Economics).*

