

“The Economics of Technical Progress”: A Comment

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The first half of this paper begins with a lovely overview of technical change, being clear and well presented. For someone well versed in the subject, it was necessary to begin to concentrate more on the paper when the discussion of factor or price augmentation began, particularly with regard to the possible confusion between technical change and economics of scale in empirical work. In terms of solving identification problems in economic models, I wonder how common holotheticity, or simple relabelling of isoquants with technical change, is. I suspect that holotheticity is a curiosity more than a real issue.

The technical change formulation suggested for estimation seems quite flexible, as it allows for different forms of technical change and apparently only requires current dollar data. I assume that determination of the actual form used, i.e. price augmenting, additive or no technical change etc., is done by experimentation. I would be interested to hear how difficult this turns out to be in practice.

In the second part of the paper at least initially a more restrictive assumption is made about technical change, specifically that it is Hicks neutral in form. To integrate the two parts of the paper it might be advisable to estimate a form for technical change in the first half of the paper and assume that form in the second half. In addition, if the technical change survey included a brief survey on R&D the paper would be more cohesive.

Being a tireless capital stock generator, I enjoyed the comment that their model essentially went back to the Middle Ages and assumed a benchmark of zero for basic knowledge. I wish I could do the same for capital stock.

I am not comfortable with the assumption that commodity prices increase at the same rate as prices of inputs in the R&D sector. R&D inputs produce and intermediate output, an output that is very different from the output of the sector as a whole. If this was done for mathematical convenience, it should be indicated as such.

To rationalize why basic knowledge is worth more the higher the stock of technical knowledge, I thought of an industry in which technology is vital. Is this the idea? The discussion of how the distinction between basic and applied research is important to public policy is a beneficial addition to the paper. It's intuitively obvious once described, but so often intuition is omitted in a mathematical paper. The idea that R&D can “save” an industry with slowly rising output prices (or sluggish demand) is a general point that applies to technical change in general.

Finally, onto the Cournot-Nash part of the paper. Does firm II have an advantage in a closed loop strategy because it does not have basic research costs? In the $N + 1$ firm model I was surprised that Koc was below Koo. Is it fair to draw an analogy with the von Stackelberg model in which the leader-follower situation is the best for the leader of all possible situations? It would be best if this result was motivated with some insight into what drives the model.

Overall, the Sato and Mitchell paper is an excellent paper, a pleasure to read and discuss.

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