Productivity and Misallocation in General Equilibrium

David Rezza Baqaee & Emmanuel Farhi

Discussion by Franck Portier
University College London

Monetary Policy Challenges Conference
Banque de France & Deutsche Bundesbank
June 21, 2018, Paris

Baqaee & Farhi

- Fascinating set of papers by David & Emmanuel
- Exploration of aggregation results in economies with non-trivial I-O stucture
- A set of non-intuitive (at first pass) results, that they are able to communicate and explain very well
- One does learn from reading their work (although it is not simple)

Short Recent History of I-O Structure in Macro

- The Long & Plosser (1983) model
  - × Cobb-Douglas multi-sector economy with analytical solution
  - × *iid* sectoral productivity shocks create BC-like fluctuations
  - × $N = 6$ sectors
- What about the law of large numbers if $N \to \infty$?
- Horvath (1998) :
  - × the rate at which the law of large numbers applies is controlled by the rate of increase in the number of full rows in the input-use matrix
  - × rather than by the rate of increase in the total number of sectors
- Dupor (1998) "Aggregation and irrelevance in multi-sector models"
  - × Observational equivalence between single and multi-sector Brock-Mirman models.
  - × Irrelevance proposition: Different input-output matrices generate exactly the same spectrum for aggregate variables
  - × $\rightsquigarrow$ end of the story (?)

Short Recent History of I-O Structure in Macro

- Gabaix (2011): some very large (granular) firms $\rightsquigarrow$ aggregate volatility.
- Acemoglu et al. (2012): with I-O linkages, the equilibrium size of firms will depend on the shape of the input-output matrix
- Here, David & Emmanuel address the aggregation problem in an inefficient economy

Hulten Theorem

- Hulten Theorem

$$\frac{\Delta Y}{Y} - \sum_f \Lambda_f \frac{\Delta L_f}{L_f} \approx \sum_i \lambda_i \frac{\Delta TFP_i}{TFP_i},$$

- λ_i : share of sector i sales in GDP
- David & Emmanuel :

$$\mathrm{d}\log Y = \underbrace{\frac{\partial \log \mathcal{Y}}{\partial \log A}\,\mathrm{d}\log A}_{\Delta\text{Technology}} + \underbrace{\frac{\partial \log \mathcal{Y}}{\partial \mathcal{X}}\,\mathrm{d}\mathcal{X}}_{\Delta\text{Allocative Efficiency}} .$$

- Second term is zero in undistorted economies, but not in distorted ones
- Therefore, the very details of the I-O matrix matter, and not only the Domar weight (sales share as a fraction of GDP)

Growth Accounting in an Inefficient Economy with an I-O Structure

- Spectacular result :
  - × US 1997-2015,
  - × Allocative efficiency has improved, and accounts for about 50% of TFP growth,
  - × Even though (if fact *because*) markups have increased
  - × Explanation : markups on average have increased because firms that charge large markups have gotten larger.
  - × Firms that had large markups were too small from an allocative efficiency point of view
  - × $\rightsquigarrow$ allocative efficiency has increases if their size has increase.
- But of course, at the same time, the gains from reducing markups have increased (equivalent to a 20% increase in TFP)

Focusing on Business Cycles

- I have one interrogation that I am not sure I can clearly formulate (but it sometimes wakes me up at night)
- Business cycles are not the focus of that paper
- I miserably failed trying to get some results, even in super simple two-firms economies
- Let's agree (?) that Business cycles are ultimately about the fluctuations in the intensity of factors usage
- For short, it is about fluctuations in hours worked
- I-O linkages are essentially rounds of production of goods with other goods
- The literature has focussed on quantities (Value-added, firms size, etc...)
- How important is the I-O structure for fluctuations in hours worked?
- Am I wrong to think that it does not matter much?