Discussion:
Total factor productivity and the terms of trade
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Research question: What is the effect of ToT shocks on TFP

How it address the question:
1. Test an SVAR with TFP and ToT on aggregate data
2. Test the effect of ΔToT on ΔTFP at the firm level using CompNet data
3. Build and calibrate a model with 4 sectors: M,X,N and R&D
   - Model follows closely Schmitt-Grohé and Uribe (2018) and adds the R&D sector

Findings:
1. SVAR: ToT shock has a negative effect on TFP
2. Regression:
   - Improvements in ToT reduce changes on TFP
   - The effect is driven by the effect on manufacturing sector. Within manufacturing, the effect is explained by the interaction of the share of exporters and the change in ToT
   - The effect is not present in non-manufacturing sector
   - The effect is not explained by new entrants
   - Negative effect of changes in ToT on changes in R&D expenditures
3. Model
   - Does a good job in matching targeted and non-targeted moments
   - Can replicate the decrease in TFP and increase in output observed in the data
   - ▼ TFP is explained by ▼ R&D coming from a ▼ in employment in R&D sector
Summary

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Comments I

Macroeconomic Evidence

- Identifying restriction of the VAR: TFP in the long-run is only affected by its own shocks
  - If there is a shift of resources away from R&D to physical goods, this would affect the LR level of TFP (unless in the future you compensate the decrease in R&D)

- It is true that TFP decrease the first period after the shock, but then increases in most cases (many cases not significant though)

- If one expect that the ToT shocks is long lasting, then one can expect that R&D investment increases to increase profits in the future.
  - Although according to Schmitt-Grohé and Uribe (2018) the ToT shocks have an average duration of around 2 years
Comments II

Microeconomic Evidence

- In the main regression, I would suggest constructing industry specific ToT.
- Changes in the mass of firms: only consider entrants. But the other term explaining the changes in TFP could be the mass of exiters.
  - Specially when $\downarrow$ ToT one can expect that less productive firms exit $\Rightarrow \uparrow$ TFP

R&D and ToT Evidence

- Not clear the effect. In the table 7/12 have negative relation but 5/12 have positive (and around the same magnitude in both directions)
- In terms of significance, there is one in the positive and one in the negative side
Comments III

Model

- Not very clear the modelling choice for the R&D sector:
  - Production function: Why the R&D sector do not use $K$?
  - Nobody pays for the research good (the government covers the cost), why not having a proper sector (like Atkenson and Burstein, 2010)
  - All sectors have CRS, while R&D seems a DRS, why?

- Calibration:
  - The non tradable sector is matched to the share of services. However, trade in services has been increasing (nowadays is 1/4 of total trade)
  - In the calibration the autocorrelations are stated as non-targeted, but I guess that most of the work is done by $\rho_z$
  - The standard deviations are reported in percentage terms, with respect to what?
Minor comments

- It would help to have in the appendix how the TFP index used in the SVAR is constructed.

- The claim that countries are homogenous in the SVAR analysis is risky. There are large countries like Germany, the UK or France and very small ones like Denmark or Belgium.

- **Main mechanism**

  \[
  \frac{U_3(c,l^m,l^x,l^n,h)}{(1-\tau)totAzF_2^x(k,l)} = \frac{U_5(c,l^m,l^x,l^n,h)}{BAz^{\gamma}h^{\gamma-1}}
  \]

  - If ↑ h → ↑ \(U_5(c,l^m,l^x,l^n,h)\) and ↑ \(BAz^{\gamma}h^{\gamma-1}\), we can not define the sign of this.

  - However, the author shows the sign using the implicit function theorem. I would just leave that prove.

  - The authors mention that TFP and R&D are counter cyclical in the model, but table 6 reports positive correlation for both variables. It should be negative since ToT increase output and decrease TFP and R&D in the model.

  - The authors mention that wages in R&D sector decreases, but actually they increase in the IRF.
Thank you!
Trade in Services

Trade in Merchandise and Services in Euro Area

Merchandise trade (% of GDP)  Trade in services (% of GDP)