

Discussion of

Engines of Sectoral Labor Productivity Growth

by Zsófia Bárány and Christian Siegel

Sang Yoon (Tim) Lee
Queen Mary and CEPR

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Quick Summary

- **What is the source of labor productivity growth, by sector?**
- Nested CES production function by sector:
 1. 3 sectors (islands), 3 occupations, 2 types of capital
 2. Capital (2) and labor (3) augmenting productivities, for each sector
 3. So $5 \times 3 = 15$ “productivities”
- **Capital vs Labor:** labor-augmenting quantitatively more important
- **Traditional vs ICT Capital:** traditional capital more important
- **Occupation vs Sectors:** occupation-specific more important

Quick Comments

- + Transparent framework, easy to understand where the decompositions are coming from
- + Comprehensive empirical work to understand how different layers of the macroeconomy affect sectoral productivity
 - Not sure what LFP is (as opposed to TFP), or why we should care
 - What is “technology?”

What is Technology?

1. Accounting vs. counterfactuals (always) a problem in such calibration exercises *(c.f. I'm also a guilty of this...)*
 2. As a quantitative exercise, the framework is useful in identifying in which dimensions we should be looking if we want to understand sources of (sectoral) productivity growth:
 - Things that affect capital or labor?
 - Which types of capital and labor?
 3. The quantitative framework gives clean-cut answers
 4. But it does not mean α 's are actually technology, nor that it is biased toward particular inputs
- ⇒ α 's in this framework are essentially wedges, that we cannot account for from observable data

Primitives

$$Y_J^{\frac{\sigma-1}{\sigma}} = (\alpha_{kJ}k_J)^{\frac{\sigma-1}{\sigma}} + \left[(\alpha_{mJ}l_{mJ})^{\frac{\rho-1}{\rho}} + \left((\alpha_{rJ}l_{rJ})^{\frac{\sigma_c-1}{\sigma_c}} + (\alpha_{cJ}c_J)^{\frac{\sigma_c-1}{\sigma_c}} \right)^{\frac{\sigma_c(\rho-1)}{(\sigma_c-1)\rho}} + (\alpha_{mJ}l_{mJ})^{\frac{\rho-1}{\rho}} \right]^{\frac{\sigma-1}{\sigma}}$$

1. Changing α 's or inputs are symmetric
2. No need to analyze separately, can just compare α changes directly against input changes
3. For accounting, the actual values of the changes are more relevant (i.e., is it ir/relevant because the values (don't) change a lot, or despite (not) changing a lot?)

Biased Technology or Diff. Elast. of Substitution?

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1. Computer capital “replaces” routine labor
2. More precisely, replaces l_{rJ} more than (l_{mJ}, l_{aJ}) : implicitly **complements** both high- and low-skill labor
3. Sectoral differences in replacement may come from differential “biased technology growth”...

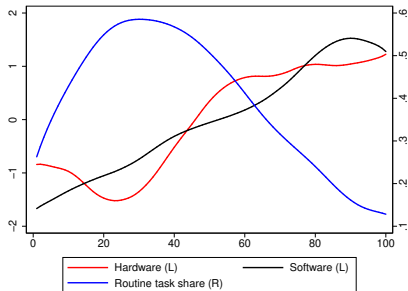
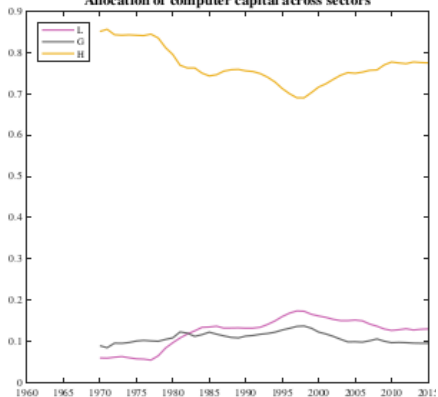
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4. but can also interpret as **differential elasticities of substitution**, among other observationally equivalent possibilities

Computer Capital and Sectors/Occupations

Allocation of computer capital across sectors

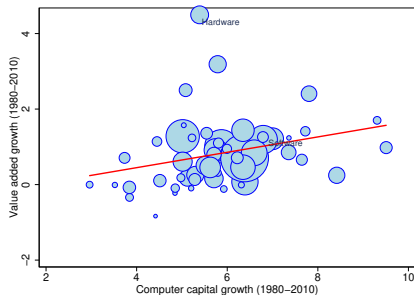
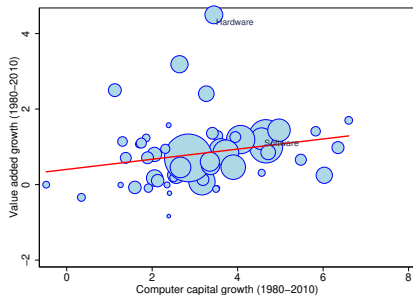


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- Reassuring the most action comes from between-occupations (for me)
- But to put a technological interpretation, need to dig into the α 's
- At least part of it must be supply (skills), not demand (technology)...
- **Where does technology come from if not embedded in capital?**
- How does (k_J, c_J) affect l_{xj} 's by $x \in \{m, r, a\}$?

Computer Capital and Value-added Growth



- Computer capital definitely related to differential sectoral growth
- If not direct and quantitative “bias” comes from occupational labor, there must be some channel s.t.

$$c_J \Rightarrow (\alpha_{mJ}/\alpha_{rJ}, \alpha_{aJ}/\alpha_{rJ}) \Rightarrow (l_{mJ}/l_{rJ}, l_{aJ}/l_{rJ})$$

differentially across J

Conclusion

- Very useful and intuitive decomposition exercise
- Interpretation of capital, labor and technology is a bit vague

THANK YOU!

Buera, Francisco J., Joseph P. Kaboski, and Richard Rogerson, “Skill Biased Structural Change,” NBER Working Papers 21165, National Bureau of Economic Research, Inc May 2015.

Nardi, Mariacristina De, Eric French, and John Bailey Jones, “Savings After Retirement: A Survey,” *Annual Review of Economics*, 2016, 8 (1), 177–204.