Discussion of "From Micro to Macro in an Equilibrium Diffusion Model" Brooks, Donovan, Johnson (2022)

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Overview

- Main question:
  - Importance of knowledge diffusion for aggregate economic outcomes
  - Growing body of empirical papers use matching interventions to quantify effects
- This paper:
  - Standard empirical moments (ATE) can be misleading!
  - In a (very) large class of models, an adjusted covariance moment predicts aggregate effects better

Economies

- Consider a set of economies $\mathcal{E}_i \equiv \mathcal{E}(\theta_i, \beta_i; \gamma)$
- Tomorrow's ability is

$$z'(z, \epsilon, \hat{z}) = e^{c+\epsilon} z^{\rho} \max\left\{1, \frac{\hat{z}}{z}\right\}^{\beta_i}$$

with imitation opportunities distributed according to $\hat{M}(\hat{z}, z, \theta_i)$.

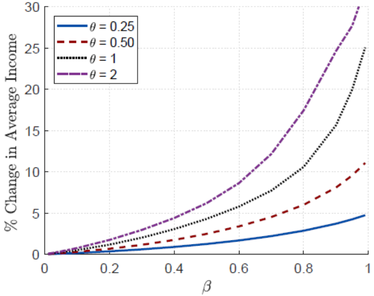
  - θ_i: how likely is it to meet a good match (if low, matching is difficult)?
  - β_i: how effective is the match?

From micro to macro

- Macro/at-scale/aggregate
  - Consider an at-scale policy $\Delta\theta_i$
  - Implies aggregate gain:
    $\Delta y_{\Delta\theta_i}(\theta_i, \beta_i; \gamma) \equiv y(\mathcal{E}(\theta_i + \Delta\theta_i, \beta_i; \gamma)) - y(\mathcal{E}(\theta_i, \beta_i; \gamma))$
- Micro
  - Consider a "matching intervention"
  - Delivers $ATE(\mathcal{E}_i)$ & $Adjcov(\mathcal{E}_i)$ using two linear regressions.

From micro to macro

- Aggregate gains depend differently on diffusion parameters: $\Delta y_{\Delta\theta_i}(\underset{+}{\theta_i}, \underset{+}{\beta_i}; \gamma)$



- 1-to-1 mapping $g_i : ATE(\mathcal{E}_i), Adjcov(\mathcal{E}_i) \rightarrow \beta_i, \theta_i$, but $ATE(\mathcal{E}_i)$ itself misleading!

Application: Kenyan firms

- RCT from Brooks et al. (2018) to estimate diffusion parametes.
- At-scale policy in Kenya using GE model $\gamma = \gamma_{Kenya}$
  - Overall income rises by 11 percent:
    - new maching technology directly improves ability distribution
    - amplification effect through prices
  - Counterfactuals: For the same ATE, aggregate gains differ from 0.6 to 38 percent.

Thoughts

- How important is "the rest of the model" (γ) for aggregate gains (11%)
- The paper suggests that β drives aggregate gains
  - What does this mean for policy, i.e. should we try to increase β?
- Validity of diffusion parameters as estimated from micro-data for at-scale policy changes?
  - e.g. firms are willing to share knowledge as long as they know that they only take part in a local intervention

Summary

- Very important paper that links micro-evidence to general equilibrium models.
- Extremely revelant for policy-makers and the cost-effective scale-up of interventions.

Thank you!

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