Discussion: "Heterogeneous Agent Trade" by Mike Waugh

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Macro-Trade-Development Workshop

Summary

Questions:

- How does inequality within countries affect trade between countries?
- How are the gains from trade distributed across consumers?

Methodology:

- Multi-country Huggett (1993) environment
- Random utility (logit demand) for country-specific tradeable goods. Microfoundation for demand side of Armington trade model.
- Households choose (i) how much to save, and (ii) whether to buy imported or domestic

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What this paper ISN'T: a theory of how trade affects income inequality

- See, e.g., Lyon and Waugh (2019) for that
- Could say something about wealth inequality, but probably not the right framework

Overview of key results + mechanisms

Heterogeneous trade exposure

- Imports more expensive than domestic products
- Poor consumers less likely to choose imported goods

Heterogeneous trade elasticities

- Intensive margin (θ^I): Consumers near borrowing constraint spend more today when BC relaxes
- Extensive margin (θ^E): Poor consumers more price-sensitive

Heterogeneous gains

- Substitution (PE): heterogeneous changes in "home choice probabilities" (ACR at the micro level)
- Asset trade (GE): interest rate changes affect borrowers and savers in opposite way
- GE increases (decreases) gains heterogeneity when trade with small (large) market is liberalized

How important are dynamics?

"[O]utside of log preferences, the random utility model naturally introduces a form of non-homotheticity. And…this is shaping how aggregate trade is responding to changes in trade costs."

Paper compares dynamic non-log model to static and dynamic log models. What about static non-log model?

- Poor consumers would still have higher home-choice probabilities. But perhaps borrowing constraints + MPC heterogeneity also play role?

- No heterogeneity in θ^I. But I suspect θ^E would still be heterogeneous. May not really be about risk aversion per se, but about curvature of u. Want to understand role for dynamics here.

- No gains/losses from GE effects on interest rates. Would there still be heterogeneous gains from substitution? Here, too, I think the answer is yes.

Overall, dynamics seem to reinforce distributional effects. But would be nice to see clearly what this new machinery buys (at least quantitatively).

Understanding micro-level gains

$$\text{gain from trade}(a, z) = EPV \left[\underbrace{-\sigma_e \frac{\mathrm{d}\pi_{ii}/\pi_{ii}}{\mathrm{d}d_{ij}/d_{ij}}}_{\text{Substitution (PE)}} + \underbrace{u'(c_{ii})a \frac{\mathrm{d}R}{\mathrm{d}d_{ij}/d_{ij}}}_{\text{Asset trade (GE)}} \right]$$

- Substitution (PE): Change in home choice probability. ACR at the micro level.
- Asset trade (GE): Extra consumption from higher interest in savings

Understanding gains from substitution (PE)

Source: Heterogeneity in home choice probability responses

- Poor still gain less from trade in PE. Indicates their home choice probabilities are less sensitive to trade costs. How to square this with the fact that they have higher θ^E?

    - Poor guys have higher $|\frac{\partial \pi_{ij}/\pi_{ij}}{\partial d_{ij}/d_{ij}}|$ but also lower $|\frac{\mathrm{d}\pi_{ii}/\pi_{ii}}{\mathrm{d}d_{ij}/d_{ij}}|$?
    - EPV of $|\frac{\mathrm{d}\pi_{ii}/\pi_{ii}}{\mathrm{d}d_{ij}/d_{ij}}|$ is what matters for PE gains, not just current value. But this doesn't seem like the answer.

- Again, want to understand role for dynamics. What is the role of static heterogeneity in z? What is the role of heterogeneity in $g(a, z)$ (both in initial levels and changes)?

- Could do another version of PE analyses where $g(a, z)$ is fixed. Still doesn't get rid of effect of heterogeneity in initial levels.

Understanding gains from asset trade (GE)

Source: $r \uparrow$ good if $a > 0$, bad if $a < 0$

- Interest rates always go up when trade is liberalized, but I don't quite get why. Some sort of heterogeneous change in PPP-adjusted permanent income?

    - Would be helpful to show $g(a, z)$ before/after reform
    - Also, fix $g(a, z)$ but still allow interest rates to adjust

- GE forces play larger role in gains during reforms with less important trade partners. Opposite of what I would expect (i.e., larger GE responses to reforms that have larger aggregate impact).

    - Small market: GE increases gains heterogeneity
    - Large market: GE reduces avg. level of gains + reduces heterogeneity

- Aiyagari may be more appropriate than Huggett in quantitative analysis

    - Huggett: $\int a d\lambda = 0$. Exaggerates effects of saving supply shifts on interest rate
    - Aiyagari: $\int a d\lambda \propto r^{-\alpha}$. Attenuates effects

- Effects would be weaker in model with global financial market, i.e., $\sum_i \int a d\lambda = 0$, especially for small countries
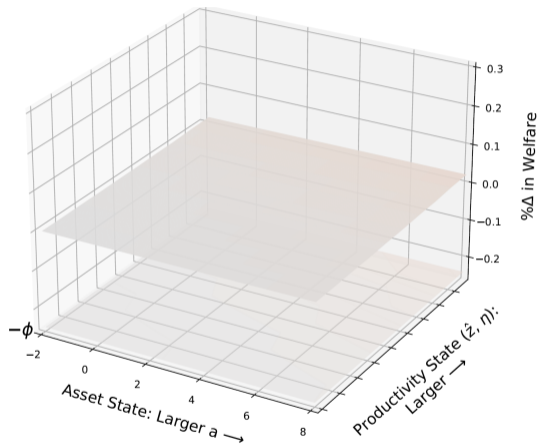
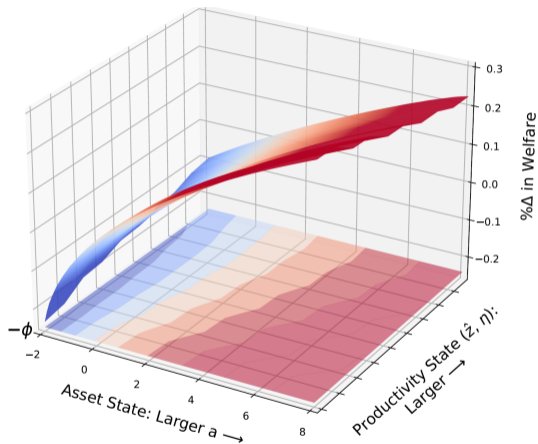# PE vs. GE: ↓ in tariffs on large market
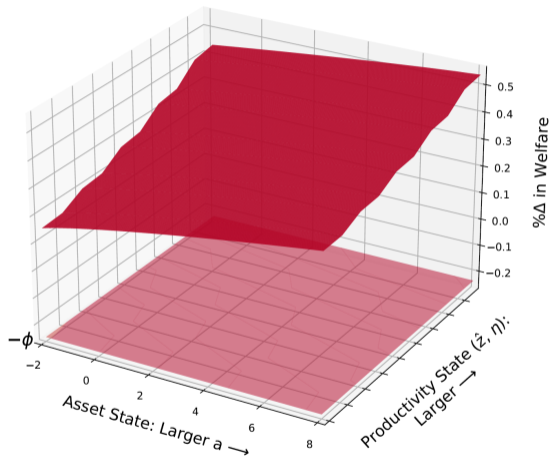
Partial equilibrium
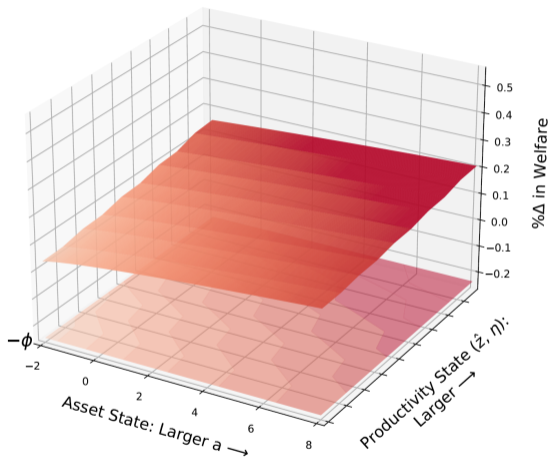
General equilibrium

PE vs. GE: ↓ in tariffs on small market

Partial equilibrium

General equilibrium

Relation to empirical evidence

Paper motivated by evidence from Auer et al. (2022)

- Poor Swiss consumers spend less on imports…
- …but were more likely to switch to imports when prices changed after 2015 appreciation

At odds with other evidence (Fagelbaul-Khandelwal, 2016; Furman et al., 2017)

- Poor consumers spend MORE on imports
- Tariffs on low-price goods are higher ("explicit regressivity")
- Implies tariff burden falls hardest on poor consumers

Whether rich or poor spend more on imports seems crucial.

- Can theory be extended so that different calibrations can deliver different patterns?
- Multiple sectors (e.g. goods and services with different income elasticities)?
- Regardless, more extensive discussion of how assumptions relate to these facts would be nice.