

Aggregate Implications of Firm Heterogeneity: A Nonparametric Analysis of Monopolistic Competition Trade Models^a

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^aThe views and opinions expressed are those of the authors alone and do not necessarily reflect those of the Central Bank of Chile.

Overview

- *Tour de force* on the role of firm heterogeneity for the welfare gains from trade
 - Great read for understanding, organizing and expanding the literature of the welfare gains from trade
 - Plus, it checks many boxes: Theory insights, estimation strategy, quantitative implications
 - Enjoyed reading it and learned a lot, it is insightful and tightly assembled
- Structure and contribution of the paper
 - Transformation of space of analysis: Rich firm primitives $\Rightarrow$ Intensive and extensive margin elasticities
 - Intensive and extensive margin elasticities $\Rightarrow$ Welfare gains from trade
 - Estimate intensive and extensive margin elasticities through flexible gravity regressions
 - Quantify welfare implications relative to literature benchmarks
- Will focus my attention on three types of comments
 - I. Theory flexibility
 - II. Supporting facts
 - III. Quantitative application
- Flavor of my comments: Unpack more their current strategy and results

I.a. Theory Flexibility: Supply versus Demand

- Theory relaxes assumptions on distribution of firm primitives $\Rightarrow$ Very flexible on supply side
- Less flexible on the demand side: CES and other parametric demand systems
 - Not an issue per se because of their push of the frontier on the supply side
 - Although maybe could tone down the general non-parametric claims
- Would be useful to know what are the minimal assumptions you need on the demand side
 - Only aggregation properties so that one can build an aggregate price index?
- Which is the most flexible demand system they could allow for?
 - A discussion about this in the paper would be useful
- This could expand the flexibility and scope of the paper

I.b. Theory Flexibility: Benchmark More Flexible Frameworks

- Paper in between fully parameterized models and more flexible frameworks
- Current strategy is to compare their results to parameterized models using Pareto or Log-Normal
 - It is evident that their approach is more general than those parameterized benchmarks
- But there are other general frameworks that claim flexibility for studying welfare gains from trade
 - Best alternative I can think of: Baqaee and Farhi trade paper
 - B&F does not assume distributions and can do large changes by chaining small changes
 - One benefit of B&F: Allow for flexible wedges, which matters for gains from trade (Bai et al., 2024)
 - One cost of B&F: CRS, but can combine their trade paper with rents paper to overcome that
- Would be useful to tackle directly the costs and benefits relative to that alternative benchmark

II.a. Supporting Facts and Moments Behind Identification

- Would be useful to unpack more the estimation strategy
 - Which are the key moments that identify the two elasticity functions in practice?
 - Some moments are standard, eg, cross-sectional correlation between distance and average trade flow
 - Other moments are less standard, eg, correlation between export firm share and colonial ties
- Which fact can they show before estimation to motivate the features that other frameworks miss?
 - Maybe they can reverse engineer this based on their current estimation results?
- Suggestion: Provide direct empirical support/validation to current quantitative takeaways
 - Eg, “the impact of trade shocks on firm entry is weaker in markets with few exporters”
 - Can they show cross-country differences of the impact of the China shock?
- This can be useful to help digest more some takeaways that are currently a bit dense
 - Eg, “revenue potential differences are larger among firms with high entry potential that operate in markets with a low n ”
- Might create tensions $\Rightarrow$ Would need to show that other frameworks cannot generate those results
 - But it looks feasible given their current results

II.b. Supporting Facts and Distribution of Primitives

- Can one reverse engineer their results to infer what do we learn from distributions of primitives?
 - Would it be possible to infer which class of distributions is consistent with their results?
 - But then need to square that with moments that are used to calibrate standard distributions
- Currently, distributions takeaways appear to be too general, so not sure we learn so much
 - Eg, “developing countries have a higher density of firms with low revenue potential”
- They can do more on this front because some results are interesting and stark along development
- In this process, one fact that does not help with their inversion strategy
 - Inversion strategy requires distribution of primitives to be continuous
 - But typically exporters are in the upper tail of firm distributions within their markets
 - In the data, those parts of the distribution are not very continuous
 - Can they show more directly how much of this is an issue?

III.a. Quantitative Application: Building Intuition

- Currently, it is not straightforward to digest the takeaways from the welfare gains from trade results

$$\ln \frac{\hat{w}_i}{\hat{P}_i} = \underbrace{\frac{1}{\sigma-1} \ln x_{ii}^0}_{\text{Demand Substitution}} + \underbrace{\frac{1}{\sigma-1} \ln \hat{N}_i}_{\text{Firm Entry}} + \underbrace{\frac{1}{\sigma-1} \ln \hat{n}_{ii} \frac{\rho_{ii}(n_{ii}^1)}{\rho_{ii}(n_{ii}^0)}}_{\text{Exporting Selection}} \quad (1)$$

- They project the components of welfare gains from trade against $\ln x_{ii}^0$
- To build intuition, can they show directly how firm entry and exporting selection depend on $\ln x_{ii}^0$?
 - Probably not straightforward for exporting selection since it is a function of non-parametric elasticities
 - But maybe feasible given that results show exporting selection log linear with respect to import share
- Intuition behind selection is interesting and useful in terms of mapping to sufficient statistics
 - Higher revenue potential of entrants into exporting compared to incumbents $\Rightarrow$ Larger welfare gains
 - An object that might be useful in producing related facts before the estimation to motivate the theory
 - Especially given that current results show that this term contributes more than firm entry and also varies more between countries

III.b. Quantitative Application to a Real Event

- Would it be possible to apply the setting to a real event and exploit cross-country time-variation?
 - As opposed to current strategy that focuses on cross-sectional variation
- For instance, look at variation of exposure to China shock across countries and markets
- Compare effects across countries-markets relative to more direct measures from the data:
 - Firm export share
 - Measures of revenue potential of entrants relative to incumbents
- This would help in terms of bringing more direct evidence to validate the insights of the paper

Less Relevant Comments: Food for Thought

1. Macro implications beyond trade? Can they speak to broader macro questions?
2. Would be good to have a structural source of the residuals in the estimating equations (32) and (33) (other than measurement error), to think more about identification threats
 - Creates a tension because the strategy folds typical sources of residuals
3. The notation of the paper is not the smoothest to follow, especially of the new objects
 - Eg, ϵ vs ε , ρ vs ϱ
4. Can use the framework to think about welfare gains from sourcing decisions for production?
5. When they benchmark other distributions in the literature, what if those are more general? Eg, estimate alternative trade elasticities with a mixture of log-normal distributions across different country-sector attributes?

Final Remarks

- Super relevant paper that expands our understanding of firm heterogeneity for gains from trade
- Looking forward to the new draft of the paper!