

Trade and Market Power in Product and Labor Markets

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Motivation

Macro and Labor lit. — concerns over links between **market concentration**, **market power**, and **labor shares**

- In labor markets, \uparrow labor market concentration \rightarrow wages \downarrow within a firm

Trade lit. — \uparrow concentration following liberalization can be a key source of gains from trade

- Improved allocation of inputs \Rightarrow aggregate productivity \uparrow
- However, **trade can increase labor market concentration and labor market power** of large employers!

Research Questions

- How does trade affect firm and worker outcomes when firms have product and labor market power (LMP) that depends on their size?
- How are the gains from trade modified by accounting for labor market power?

Methodology

In this paper:

- Quantitative trade model with **variable market power** in product *and* labor markets
- Calibrate and estimate model parameters using Indian manufacturing data
- Counterfactual experiments using model simulations to answer research questions

Model Building Blocks

- Heterogeneous firm trade model
 - Two countries (H and F)
 - Multiple sectors $\rightarrow s \in [0, 1]$
 - Multiple production locations $\rightarrow n = 1, \dots, N$
- Roy model of worker's choice of an employer:
 - Mobile workers supply one unit of labor to chosen firm ω located in n that sells in sector s
 - Idiosyncratic match-specific productivities drawn from nested Fréchet distribution
 - α — similarity of draws across (n, s)
 - β — similarity of draws within (n, s)
 - Trade-off between firms' wage offers and match-specific productivities \Rightarrow **upward sloping** firm-level effective labor supply curves:

$$\ell_{n,s}(\omega) = \frac{w_{n,s}(\omega)^{\beta-1}}{\text{Firm } \omega\text{'s wage}} \frac{W_{n,s}^{\alpha-\beta}}{\text{(n, s)-pair wage index}} \frac{\Delta}{\text{Aggregate Shifter}}$$

- Nested CES preferences over consumption goods:
 - Firms in each sector sell differentiated varieties in national product markets
 - θ — substitution elasticity across s
 - γ — substitution elasticity within s
 - Frictionless trade within each country
 - Downward sloping firm-level product demand curves in each country (H here):

$$c_{n,s}^H(\omega) = \frac{p_{n,s}^H(\omega)^{-\gamma}}{\text{Firm } \omega\text{'s price in } H} \frac{P_s^{\gamma-\theta}}{\text{sector } s \text{ price index in } H} \frac{\Delta}{\text{Aggregate Shifter}}$$

Market Structure

Assumption: finite and fixed number of firms in each (n, s) -pair in both countries

- Oligopoly* competition in product markets
- Oligopsony* competition in labor markets

\Rightarrow Firms are large in their product and labor markets; **variable price markups and wage markdowns**

Proposition: Firm-level Outcomes

Assumption: $\alpha < \beta$ and $\theta < \gamma$

Within an (n, s) -pair, compared to less productive firms, more productive firms:

- Have larger product and labor market shares
- Charge lower prices and offer higher wages
- Charge higher markups and markdown wages by more

Proposition: Aggregate Outcomes

Assumption: countries are symmetric in all markets

Accounting for labor market power:

- Welfare losses due to inefficient allocation of inputs across heterogeneous firms
- Additional gains from trade because trade alleviates misallocation losses

Data & Parameter Estimation

Use Indian Annual Survey of Industries (ASI) supplemented with import data from UN Comtrade

- ASI \rightarrow Repeated cross-sectional survey of Indian registered manufacturing sector
- Estimate model parameters using model-implied relationships and moments

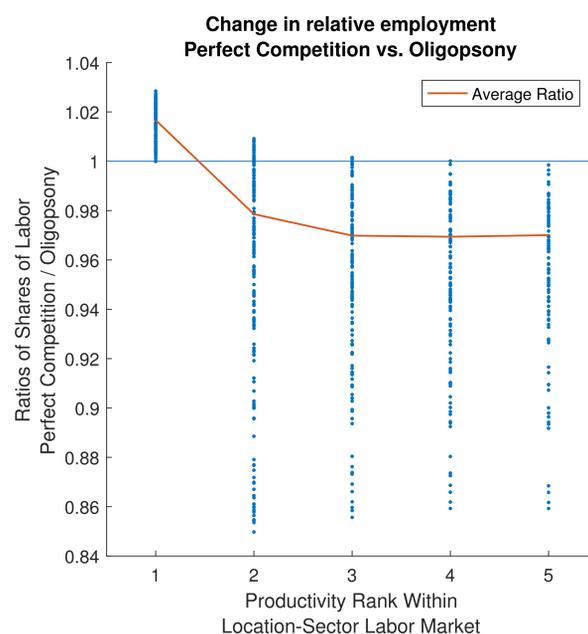
Key model implication \rightarrow for non-exporters in H :

$$\frac{w_{n,s}(\omega)\ell_{n,s}(\omega)}{v_{n,s}(\omega)} = \mathcal{F}(\mathcal{S}_{n,s}^H(\omega), \mathcal{S}_{n,s}^L(\omega); \alpha, \beta, \theta, \gamma)$$

\downarrow Labor Share of Value Added
 \downarrow Function of Parameters and Market Shares

Quantitative Analysis

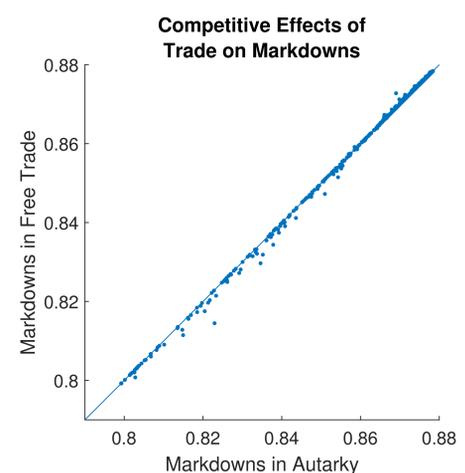
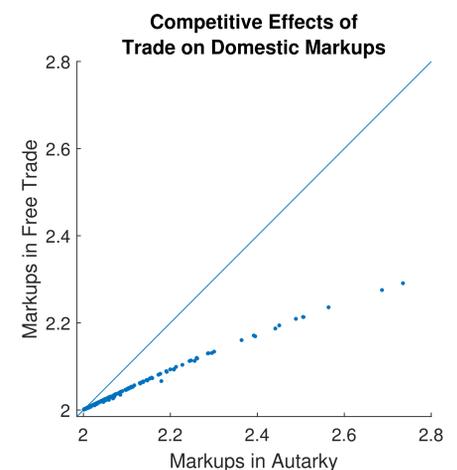
Compare equilibria with and without variable labor market power under different levels of trade openness holding extensive margin of operation fixed



Notes: Comparison of autarky equilibria. Each point is a top-five firm by prod. rank within an (n, s) -pair in a typical simulation.

Trade and Firm-level Market Power

Effects of product market trade liberalization operate through changes in markups and markdowns



Note: Each point represents a firm in a typical simulation.

Aggregate Significance

Comparing models with and without oligopsony in LM

	Income	Wages	Profits
<i>Oligopsony and Aggregate Outcomes in Autarky</i>			
% Difference	-0.35%	-15.52%	11.47%

	Income	Wages	Profits
<i>Oligopsony and Aggregate Effects of Trade</i>			
% Additional Gains	0.27%	-0.67%	4.00%

Takeaways

- Endogenous LMP is a source of input misallocation
 - Reduces welfare relative to perf. comp in LM
 - Mitigates losses caused by variable markups

Trade liberalization alleviates welfare losses arising from variable markdowns

- Misallocation losses smaller after liberalization
- Gains from trade are larger
- Wage gains are smaller because LMP increases for large firms \rightarrow **worse for workers!**

Estimates from Indian setting suggest:

- Larger effects of trade on PMP than on LMP
- Aggregate effects of endogenous LMP are small

Contact Information

The views expressed do not necessarily reflect those of the Bank of Canada or its Governing Council.

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