Who Pays for Markups in a Global Economy?

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UIBE

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May 2023

Penn State University (May 2023)

Background and Motivation

Two notable economic trends of recent decades

1. increased globalization
2. rise of markup distortions

Two Natural Questions

1. has trade modified the overall cost of markup distortions?
2. has the incidence of markup distortions shifted inter-nationally?

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focus of literature on pro-competitive effects of trade

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This paper: we examine the *second* question.

Roadmap

Step 1: we derive semi-parametric formulas for the impact of trade on the cost of markup distortions ($\Delta\mathscr{D}$) in open economies

$$\Delta\mathscr{D} = \Delta\text{MLD}\left(\frac{1}{\mu}\right) + \log\frac{\text{average expenditure-side markup}}{\text{average output-side markup}}$$

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What does ***international rent-shifting*** represent?

- markups generate rents (or profits) that are rebated to consumers
- the burden of markups falls disproportionally on nations that specialize in low-markup goods and pay net markup rents to the RoW. Suggestive Evidence

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Step 2: we estimate firm-level markups using *demand* and *cost-based* techniques

Step 3: we plug estimated markups into our simple formula to measure $\Delta\mathscr{D}$ and, in particular, the cost of international rent-shifting among 65 major economies.

Preview of Findings

We estimate systematic *rent-shifting* from low-income to high-income countries:

- Trade has raised the cost of markups by 21% for *low-income* countries.
- Trade has lowered the cost of markups by 10% for *high-income* countries.

Preview of Findings

We estimate systematic *rent-shifting* from low-income to high-income countries:

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Policy Implication: two ways to neutralize international rent-shifting:

1. [1st-best] internationally-coordinated markup correction.
2. [2nd-best] rent-shifting is akin to a hidden tariff $\Longrightarrow$ can be neutralized if high-income countries unilaterally lower their tariffs on low-income partners by **7%**.

Conceptual Framework

Demand: The representative consumer in country i purchases firm-level variaties from various countries, deriving an indirect utility

$$W_i = V_i\left(Y_i, \{\mathbf{p}_{ni}\}_n\right)$$

- Y_i is expendable income
- $\mathbf{p}_{ni} \equiv \{p_{ni}(\omega)\}$, where $p_{ni}(\omega)$ is the price of firm ω from country n.

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Supply: Country n is populated by fixed set of firms that use labor (with inelastic supply L_n) as the sole primary production input and charge a markup over marginal cost

$$p_{ni}(\omega) = \underbrace{\mu_{ni}(\omega)}_{\text{markup}} \times \frac{\tau_{ni} w_n}{\varphi_n(\omega)}$$

- w_i is the equilibrium wage rate
- τ_{ni} is the trade iceberg cost; $\varphi_n(\omega)$ is labor productivity

General Equilibrium:

- Markup rents are rebated to households in the firms's country of origin
- National-level expenditure is equal to wage income plus rents: $Y_i = w_i L_i + \Pi_i$
- Labor markets clear in each country

Key Equilibrium Outcomes:

- $e_i(\mu)$ is the expenditure share on goods with markup $\mu \in \mathcal{M}$
- $\lambda_{ni}(\mu)$ is the expenditure share on goods from origin n conditional on μ
- $y_i(\mu) = \frac{\lambda_{ni}(\mu) \times e_i(\mu) \times Y_i}{\sum_\ell \lambda_{n\ell}(\mu) \times e_\ell(\mu) \times Y_\ell}$ is sales share of goods with markup μ

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The Welfare Cost of Markups

Notation: *Arithmetic and Harmonic Mean*

Let $F(.)$ be some generic function:

[arithmetic mean] $$\mathbb{E}_{\omega}[F(\mu)] = \int_{\mu} F(\mu)\,\omega(\mu)\,d\mu$$

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[harmonic mean] $$\widetilde{\mathbb{E}}_{\omega}[F(\mu)] = \left(\int_{\mu} F(\mu)^{-1}\,\omega(\mu)\,d\mu\right)^{-1}$$

The Welfare Cost of Markups

- The welfare gains from correcting monopoly distortions are

$$\Delta W_i = \underbrace{\left(\int_{\mu}^{\mathbf{1}} \frac{\partial \log W_i(\boldsymbol{\mu}, \mathbf{w})}{\partial \log \boldsymbol{\mu}} \cdot \mathrm{d} \log \boldsymbol{\mu} \right)}_{\text{net cost of markups} \sim \mathscr{D}_i} + \underbrace{\left(\int_{\mu}^{\mathbf{1}} \frac{\partial \log W_i(\boldsymbol{\mu}, \mathbf{w})}{\partial \log \mathbf{w}} \cdot \mathrm{d} \log \mathbf{w} \right)}_{\Delta \text{factoral terms of trade}}$$

- **Proposition:** The welfare cost of markups (net of factoral ToT effects) are approximately given by

$$\mathscr{D}_i \approx \left(\log \mathbb{E}_{e_i} \left[\frac{1}{\mu} \right] - \mathbb{E}_{e_i} \left[\log \frac{1}{\mu} \right] \right) + \log \left(\frac{\widetilde{\mathbb{E}}_{e_i}[\mu]}{\widetilde{\mathbb{E}}_{y_i}[\mu]} \right)$$

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- *Sufficient statistics* for measuring the (net) cost of markups: $\mathbb{S} = \{ e_i(\mu), y_i(\mu) \}_{\mu \in \mathcal{M}}$

Trade-Induced Change in the Cost of Markups

- Under *autarky* (A) there would be no decoupling between national-level output and expenditure (*i.e.*, $y_i^A(\mu) = e_i^A(\mu)$ for all $\mu \in \mathcal{M}$), implying

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- The existing literature has focused primarily on Δdispersion paying much less attention to international rent-shifting.

A Closer Look at International Rent-shifting

Exposure to ***international rent-shifting*** is determined by specialization patterns

$$\log\left(\frac{\widetilde{\mathbb{E}}_{e_i}[\mu]}{\widetilde{\mathbb{E}}_{y_i}[\mu]}\right) \approx \text{Cov}\left(\frac{y_i(\mu)}{e_i(\mu)}, \frac{1}{\mu}\right) \times \widetilde{\mathbb{E}}_{e_i}[\mu]$$

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Index of revealed comparative advantage

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- **Two Possible Outcomes:**
  (a) RCA in high-markup goods $\longrightarrow$ $Cov\left(\frac{y_i(\mu)}{e_i(\mu)}, \frac{1}{\mu}\right) > 0$
  (b) RCA in low-markup goods $\longrightarrow$ $Cov\left(\frac{y_i(\mu)}{e_i(\mu)}, \frac{1}{\mu}\right) < 0$

- **Verbal summary:** Countries that specialize in high-markup goods benefit from rent-shifting at the expense of others $\Longrightarrow$ the incidence of markup distortions shifts inter-nationally.

Measurment

Data Requirements

- The *non-parametric* formulas require international data on expenditure and output by markup level, which is unavailable.l\pause
- For measurement, we impose two parametric assumptions:
  1. homothetic ACDR (*e.g.*, Kimball) or single aggregator (Matsuyama-Ushchev) preferences
  2. firm-level productivity distribution is Pareto
- The cost of markup distortions under the above parameterization can be *"exactly"* measured with a set of *industry-level* sufficient statistics ($k \sim \text{industry}$):

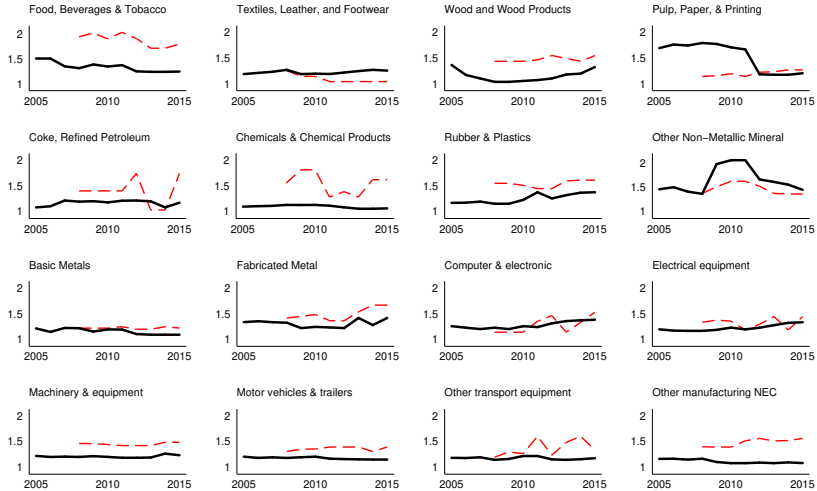
$$\mathbb{S} = \left\{ \underbrace{\mu_k}_{\text{avg. markup}} , \underbrace{e_{i,k}}_{\text{exp. share}} , \underbrace{y_{i,k}}_{\text{output share}} \right\}.$$

Data Sources

- **Observable shares:** OECD Inter-Country Input-Output (ICIO) Tables, covering 64 major countries and 36 industries during 2005-2015.

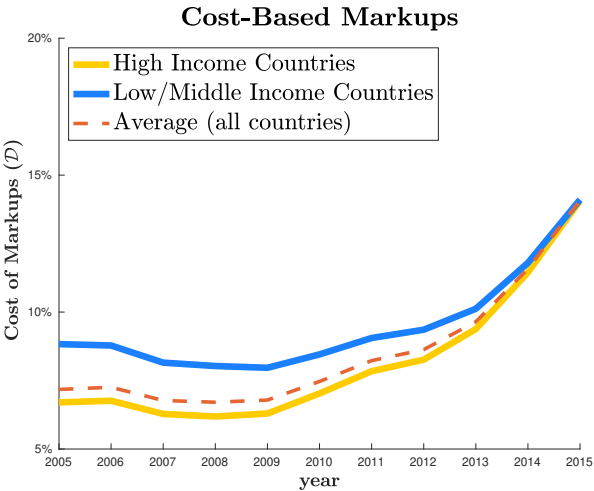
- **Markups:** We estimate markups using both *cost-based* and *demand-based* techniques
  - **cost-based:** we apply *De loecker & Warzynski's (2012)* technique to Worldscope data, covering 71,546 firms in 134 countries
  - **demand-based:** we apply *Lashkaripour & Lugovskyy's (2023)* identification strategy to transaction-level (high-frequency) import data from Colombia, covering 226,288 firms from 251 countries

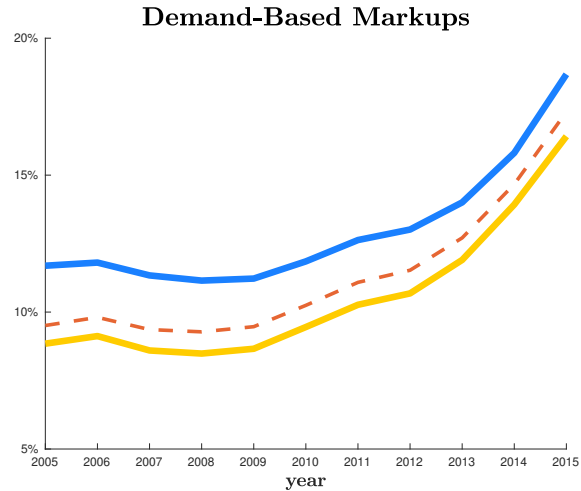
Markup Estimation Results

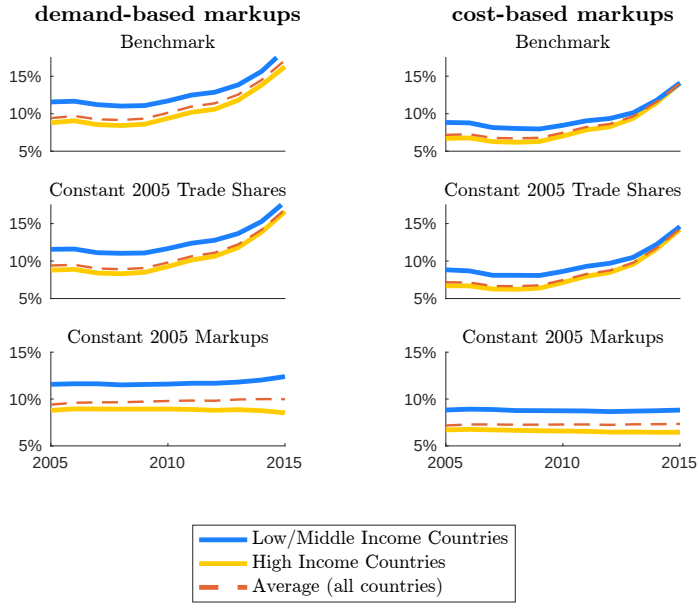


Quantitative Results

The Welfare Cost of Markups ($\mathcal{D}_i$)






demand-based markups
cost-based markups
Benchmark
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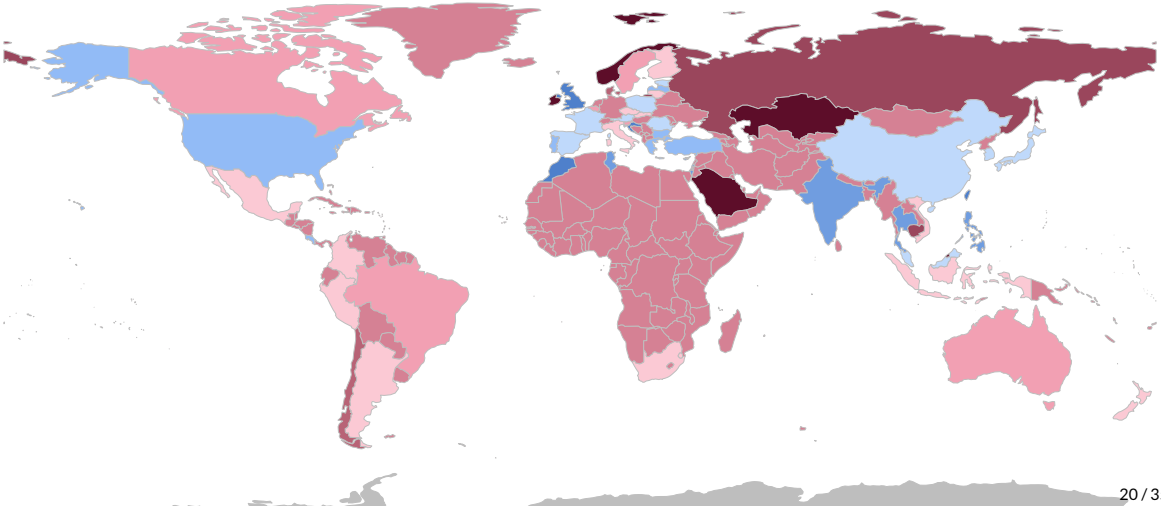
Constant 2005 Trade Shares
Constant 2005 Trade Shares
Constant 2005 Markups
Constant 2005 Markups
15%
10%
5%
2005
2010
2015
Low/Middle Income Countries
High Income Countries
Average (all countries)

% Change in the Cost of Markups due to Rent-Shifting ($\Delta\mathcal{D}$)



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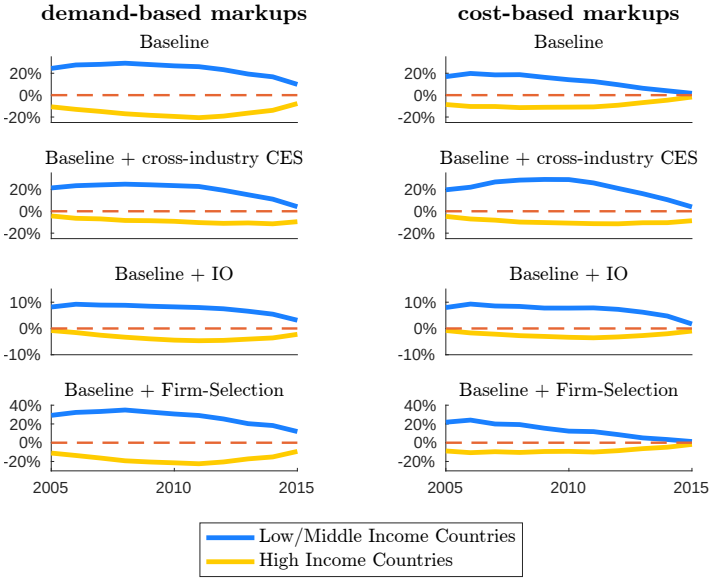

Main Takeaways

(a) Trade has caused systematic rent-shifting from low- to high-income countries $\longrightarrow$ the cost of markups is borne disproportionately by low-income countries anatomy of rent-shifting

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- Income is all but a proxy for fundamentals that shape comparative advantage.

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- Income is all but a proxy for fundamentals that shape comparative advantage.

(b) *Demand-* and *cost-based* markup estimates yield starkly similar aggregate predictions

- This is encouraging news for the methodological debate regarding markup estimation.

Implications for International Policy

Duality between Rent-Shifting and Tariffs

- International rent-shifting redistributes from low- to -high-income countries $\longrightarrow$ is akin to a hidden tariff collected by high-income countries

- To see this, express welfare as an explicit function of tariffs ($\mathbf{t}$) and markups ($\boldsymbol{\mu}$):

$$W_i = \mathcal{W}_i\left(\mathbf{t}\,,\,\boldsymbol{\mu}\right), \qquad \text{where} \qquad \begin{cases} \mathbf{t} = \{t_1, ..., t_N\} \\ \boldsymbol{\mu} = \{\mu_1, ..., \mu_K\} \end{cases}$$

where t_i is the uniform tariff applied by i on all trading partners

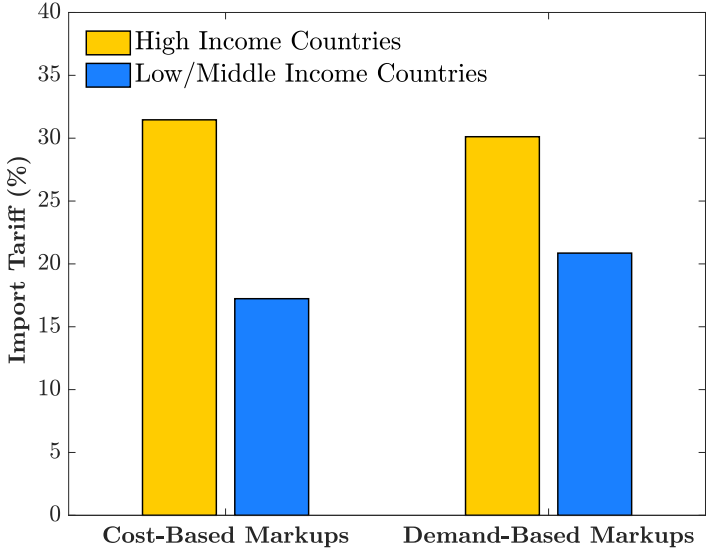
Duality between Rent-Shifting and Tariffs

Proposition—Suppose applied tariffs ($\mathbf{t}$) are sufficiently small and trade elasticities are sufficiently homogeneous across industries. The rent-shifting effects associated with $\boldsymbol{\mu}$ are observationally equivalent to a hidden tariff, $\tilde{\mathbf{t}}$. In particular,

$$\mathcal{W}_i\left(\mathbf{t}+\tilde{\mathbf{t}}\,,\,\mathbf{1}\right)=\underbrace{\mathcal{W}_i(\mathbf{t}\,,\,\boldsymbol{\mu})}_{\text{status quo}};\qquad\qquad \forall i=1,...,N$$

where $\tilde{t}_n$ is increasing in the net rents collected by country n from the rest of the world.

The Hidden Tariff Equivalent of Rent-Shifting



Neutralizing Rent-Sifting to Restore Reciprocity

- ***Takeaway***: International rent-shifting disrupts the balance of market access concessions under the WTO, undermining *reciprocity*.

- Two policy reforms can restore reciprocity and ensure 1st-best gains from trade for low-income countries:

  1. Correct markup distortions with domestic subsidies (1st-best solution, but can be difficult under WTO/GATT rules)
  2. Unilateral **7%** tariff reduction by high-income countries to neutralize rent-shifting

Conclusions

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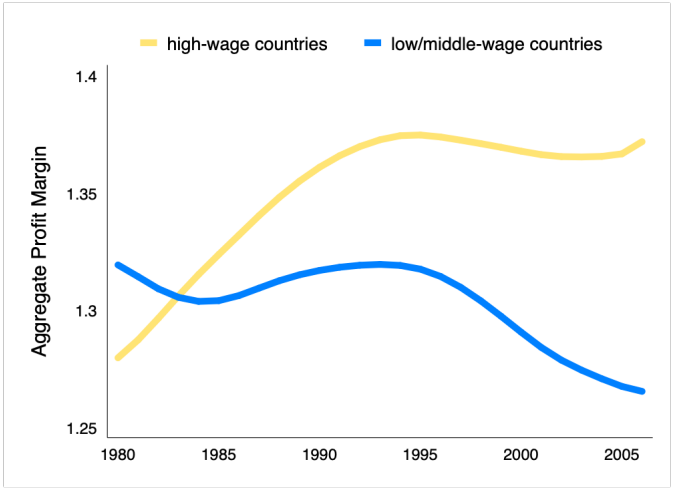
Policy Implication: Unilateral tariff liberalization by high-income countries is a possible remedy for international rent-shifting.

Thank you.

International Divergence in Accounting Profit Margins



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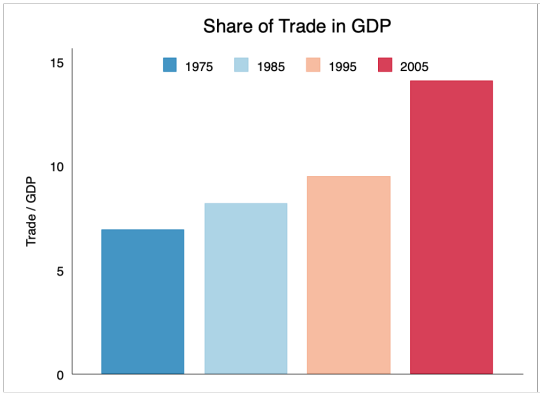
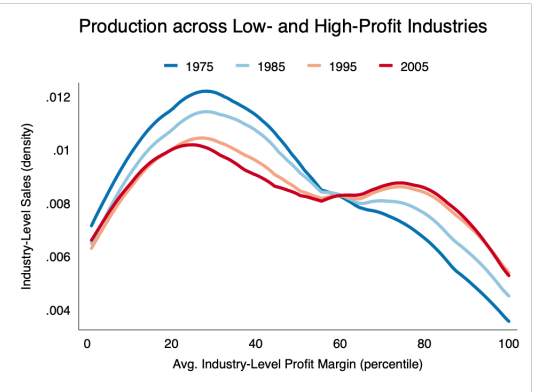
Trade Openness Coincides w/ Specialization in High-Profit Industries

The United States





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Variable and Heterogenous Markups

- Suppose we replace CES preferences with the homothetic sub-class of preference in *Arkolakis, Costinot, Donaldson, & Rodriguez-Clare* (2018).

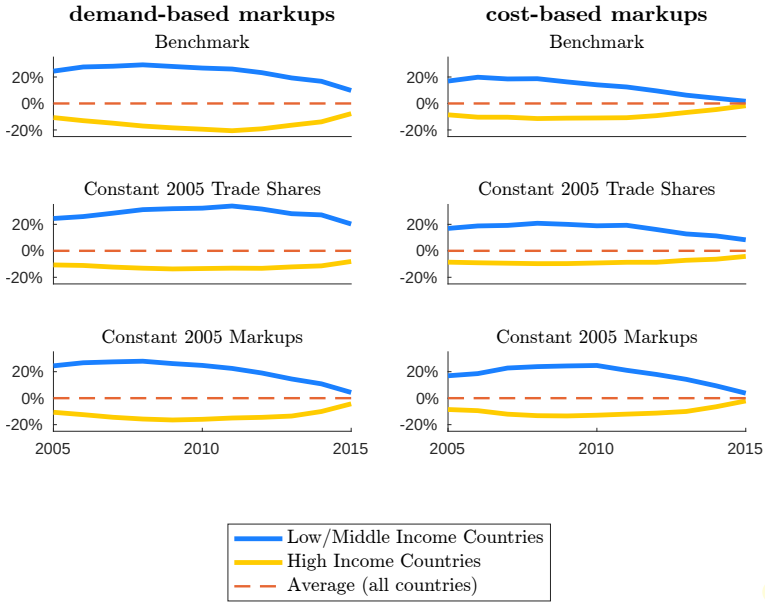
- Then, markups are variable and increasing in firm productivity, φ

$$\mu(\varphi) = \frac{\varepsilon(\varphi)}{\varepsilon(\varphi) - 1}, \qquad \mu'(.) > 0$$

- If the firm productivity distribution is Pareto $\Longrightarrow$ the sales-weighted average markup in each country ($\overline{\mu}_k$) is invariant to trade $\partial \overline{\mu}_k / \partial \tau = 0$

- Markups are more costly in this case, but trade modifies the cost of markups only through rent-shifting: return

$$\Delta \mathcal{D}_i = \log \mathbb{E}_{e_i}\left[\frac{1}{\overline{\mu}}\right] - \log \mathbb{E}_{r_i}\left[\frac{1}{\overline{\mu}}\right]$$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The Anatomy of International Rent-Shifting

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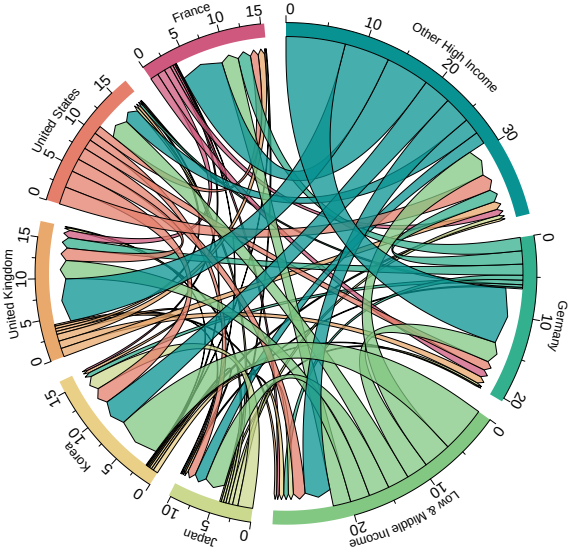

Determinants of RCA in High-Markup Industries

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