# Heterogenous Firms, Trade/FDI and Inequality/Welfare

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Feb 2017

# Motivation

- Long history of Welfare gain from globalization.
- But link between Inequality and globalization still remains under explored.
  - Some papers talk about this link but only restricts to trade. $\Longrightarrow$
    - What happens if we consider FDI as well?
  - Most of the literature on this link considers some sorting/matching in the labor market that leads to higher inequality. $\Longrightarrow$
    - Can a rent- sharing mechanism explain this link?

# Methodology

- Melitz (2003)
  - Homothetic preference
  - Firm heterogeneity
  - Monopolistically competitive output market.
- Additional feature
  - Wage is firms' rents ($w(\phi) = \phi^{\theta}$ for $\forall\theta \in (0, 1)$)
  - FDI: Horizontal FDI with Proximity Concentration
- Lorenz Curve and GINI
  - Employment distribution from the equilibrium distribution of firms productivity.
  - Apply a random variable transformation technique, using the wage equation, to obtain the weighted wage distribution.
  - Construct the Lorenz curve and GINI coefficient to study the economy at different state.

# Assumptions

- 2 symmetric countries, 2 goods.
- Homogenous final output (Not traded in open market)
- Heterogeneous intermediate goods (traded in open market) compete in monopolistic market.
- Firms pay $f_e$ to draw their productivity $\phi$ from a Pareto distribution $g(\phi) = \frac{\alpha}{\phi^{\alpha+1}}$ for $\forall \phi > 1$ and $\alpha > \varepsilon$.
- Once in production firms pay $f > f_e$if serves only domestic market, $f_x \tau^{\sigma-1} > f$ if serves export market and $f_I > f_x \tau^{\sigma-1}$ if serves investment market.
- A Tariff/Transportation cost $(\tau > 1)$ is in place for exporters.
- Firms share their rent with her workers $\theta\epsilon(0,1)$.
- Constant elasticity of substitution $\sigma > 1$.
- A labor market without any sorting/matching (no unemployment).
- $L$ number of workers supply $l = 1$ hours of labor inelastically.

# Consumer Side

- The consumer face CES utility, $U = Y = [\int_{\phi \in \Omega} q(\phi)^{\frac{\sigma-1}{\sigma}} d\phi]^{\frac{\sigma}{\sigma-1}}$.
- The Demand function for a variety is given by: $q(\phi) = Rp(\phi)^{-\sigma} P^{\sigma-1}$. $R$ is the aggregate income and $P$ is the aggregate price index. I will normalize the Price index $P = 1$. Note that, $P$ represents the price for final output, $Y$, as well.
- The demand for export good is $q_x(\phi) = Rp_x(\phi)^{-\sigma} P^{\sigma-1}$ and for FDI the demand is $q_I(\phi) = Rp_I(\phi)^{-\sigma} P^{\sigma-1}$, where $p_x$ and $p_I$ is the price charged by exporters and investors respectively.
- Firms offer wage $w(\phi) = \phi^{\theta}$. The limiting case of rent-sharing parameter will be 1 and 0. At 0 we go back to standard Meltiz (2003) model; On the other hand, at 1 all firm charge same price and end up making same profit. Hence we cannot distinguish between firms.
- Individual has no preference over their employment. It is solely firms decision.

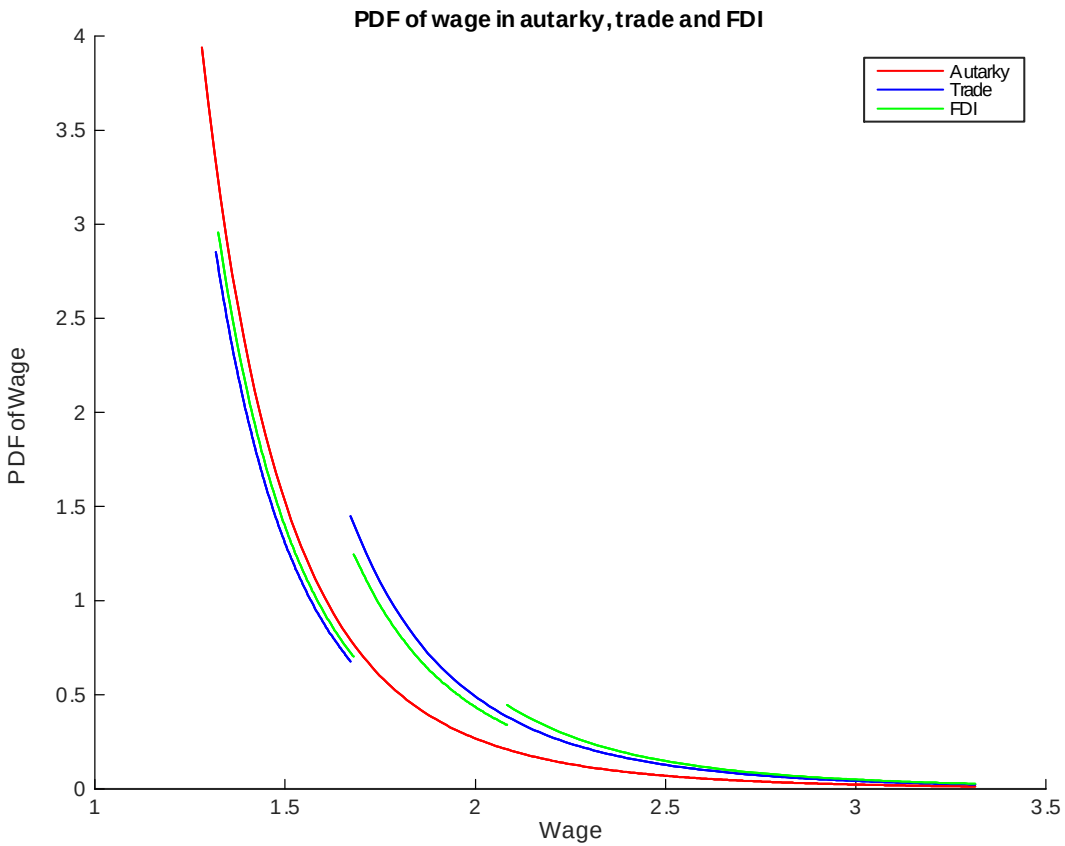
# Production side

- Firms pay all the fixed cost using final output $Y$.
- After paying $f_e$, firms draw their productivity $\phi$ from a PDF $g(\phi)$. If their productivity is high enough they go for production or else they exit the market.
- Firm uses labor as a variable input of production:$l(\phi) = q(\phi)/\phi$.
- Firms charge $p(\phi) = \frac{\sigma}{\sigma-1}\phi^{\theta-1}$ once they observe $\phi$; but exporters charge $p_x(\phi) = \tau p(\phi)$ and investors charge $p_I(\phi) = p(\phi)$.
- Revenue earned by domestic producers only, exporters and investors are given by $r_d(\phi) = R\phi^{\varepsilon}[\frac{\sigma-1}{\sigma}]^{\sigma-1}$, $r_x(\phi_x) = \tau^{1-\sigma} r(\phi_x)$ and $r_I(\phi_I) = r(\phi_I)$ respectively[1].
- Firm's profit $(\pi_s(\phi) = \frac{r_s(\phi)}{\sigma} - f_s$ for $s = d, x, I)$ function is an increasing function of their productivity. Hence from zero profit condition $(\pi_s(\phi_s^*) = 0)$ I can segregate producers into three different groups: domestic producers only, exporters and domestic market producers and lastly investor and domestic market producers.

[1] Note that $\varepsilon = (1-\theta)(\sigma-1)$.

# Results

- As countries open up new channels to access foreign market in the presence of rent-sharing
  - ↑ inequality and welfare



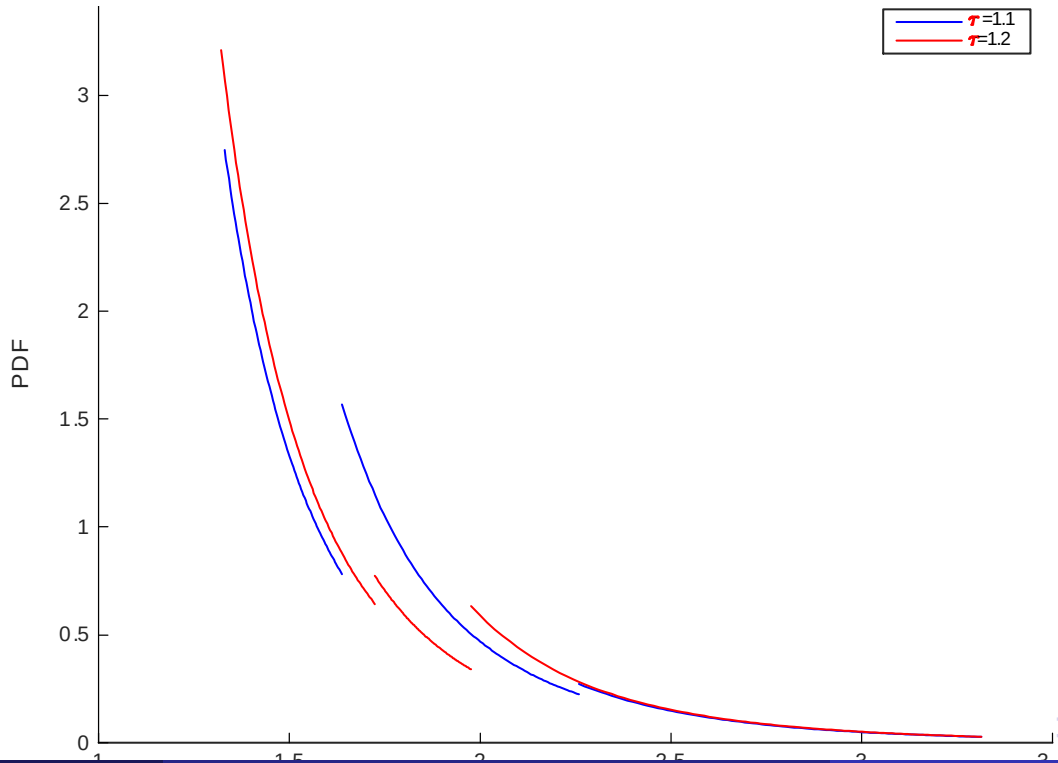

1.*pdf*

# Results

- Exposure to foreign market enables some highly productive exporters and investors to expand their market share.
  - These market shares are absorbed from the exiting and surviving shrinking producers.
- To satisfy this additional foreign demand, they hire the workers who lost jobs from exiting and shrinking firms.
- In this way some of the population move away from the average wage, as the average wage of exporters and investors increase relatively more compare to the whole economy.

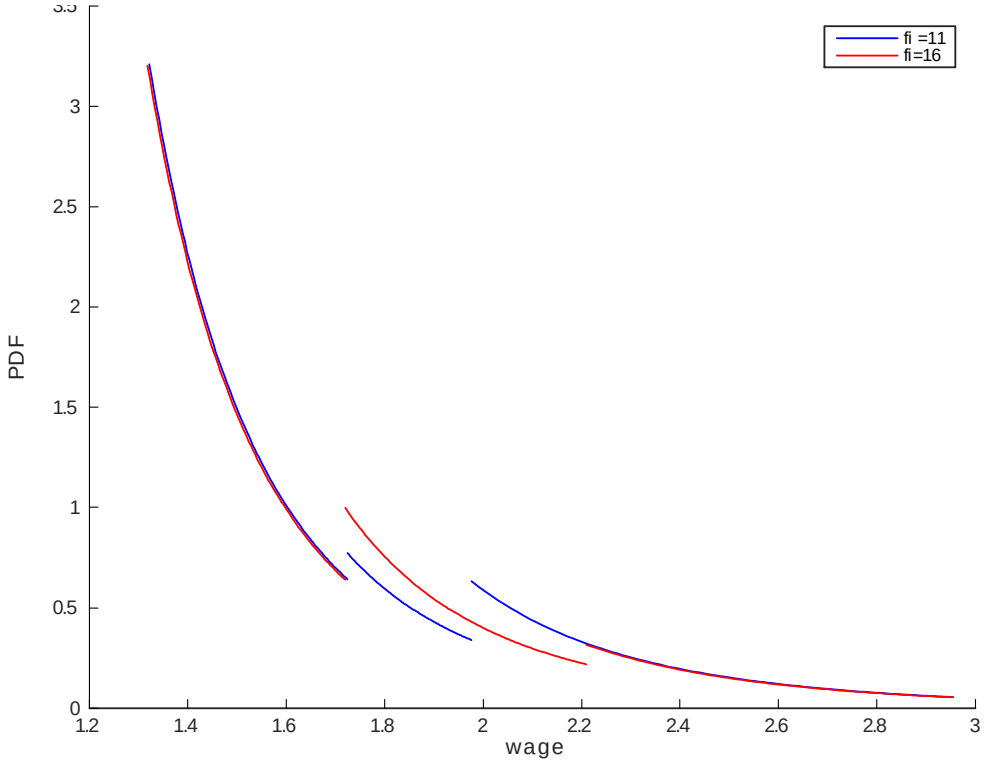
# A symmetric bilateral tariff reduction

- A symmetric bilateral tariff reduction: $\downarrow$ inequality but $\uparrow$ Welfare per worker
  - Some highly productive domestic producers find exporting is more profitable. $\Longrightarrow$ $\uparrow$ competition.
  - Some least productive investors find exporting is more profitable. $\Longrightarrow$ $\downarrow$ competition.



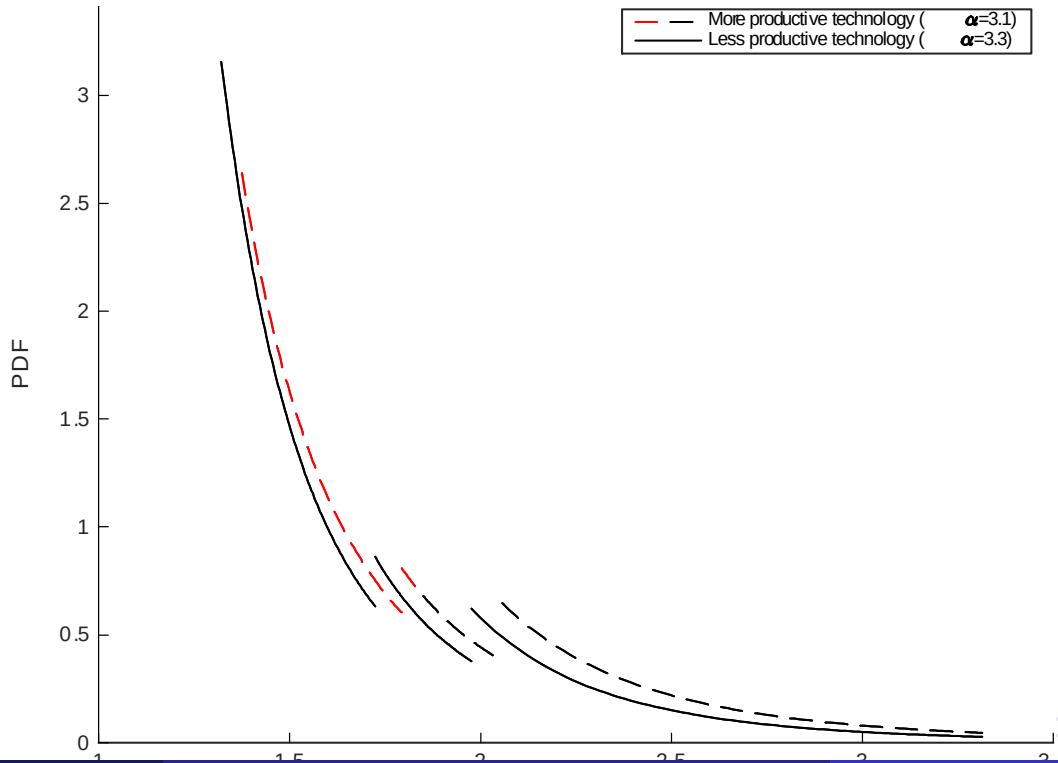
# A symmetric reduction of fixed cost to invest

- A decrease in fixed cost to invest: $\uparrow$ inequality and $\uparrow$ Welfare per worker
  - Opens up investing opportunity to some highly productive exporters. $\Longrightarrow$ $\uparrow$ competition in the foreign market; that pushes out some least productive exporters.



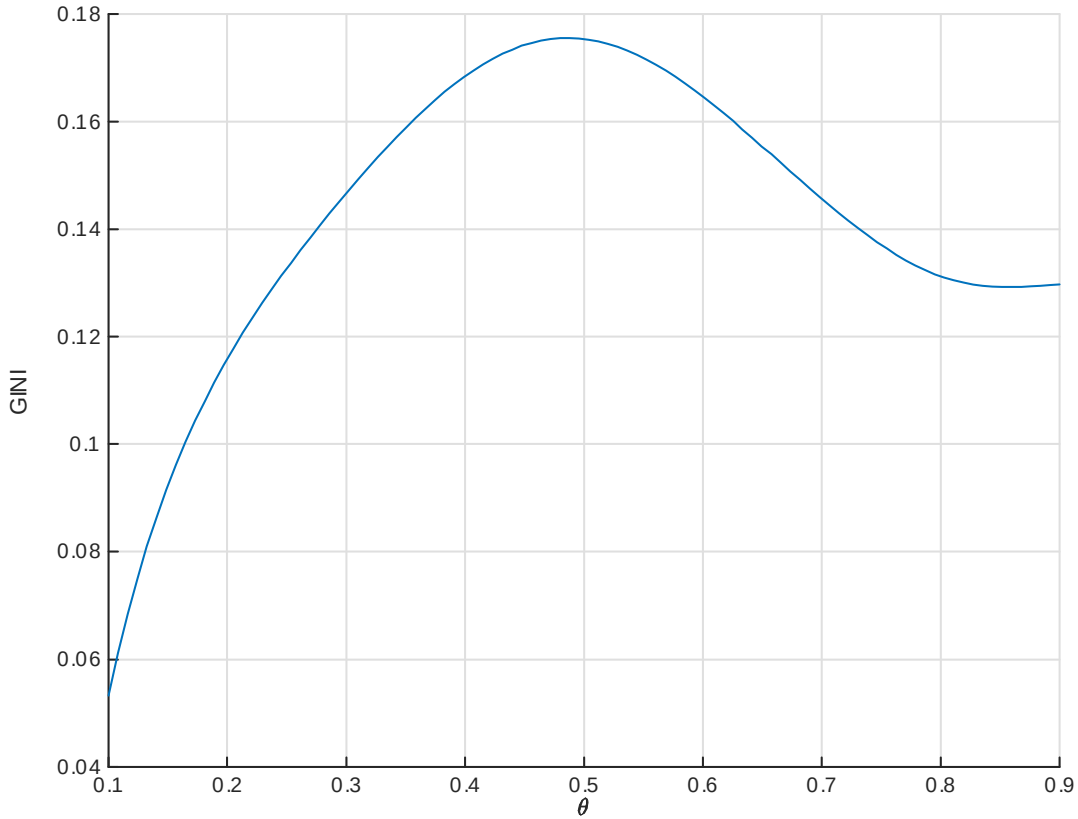
# The effect of Technological Improvement

- A decrease in shape parameter ($\alpha$): $\uparrow$ inequality and $\uparrow$ Welfare per worker
  - Some least productive domestic firms exit the market due to $\uparrow$ competition.$\Longrightarrow$This market share is absorbed by surviving firms.
  - Change in market share: Investors $>$ Exporters $>$ Domestic producers only.



# Effect of rent-sharing on inequality.

- $\theta \in (0.1, 0.5)$: A positive relation between inequality and rents. $\Longrightarrow$ Since workers from high productive firms earn more.
- $\theta >$ 0.5: Firms share majority of their profit and cannot compete in the foreign market. $\Longrightarrow \downarrow$ their market share and inequality decreases.



## The End

- Questions
- Suggestions