

# ECON 357

## Lecture 9: Skill Biased Trade

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- Predictions of Heckscher-Ohlin:
  - 1 Reduction in trade barriers moves factor prices in opposite direction in different countries (Stolper-Samuelson).
  - 2 No prediction for increase in openness coming from increase in global supply of skill.
- In the data, increase in wage inequality (or skill premium) is correlated with trade openness, but happens in all countries (even unskill abundant).

- All models we have seen have the same technology of production for exports and domestic sales.
- Iceberg trade costs  $\Rightarrow$  factor intensities are the same for exports and domestic sales.
- What if exporting is more skill/capital intensive?
  - 1 Reduction in trade barriers increases skill premium in *all* countries.
  - 2 Increase in supply of skill workers increases globalization.

- Export sector is more skill/capital intensive:
  - Oceanic transportation
  - International marketing
  - Customize goods for foreign markets
  - etc...
- ①  $\searrow$  trade barriers  $\Rightarrow$   $\nearrow$  Exports/GDP  $\Rightarrow$   $\nearrow$  demand for skills  $\Rightarrow$   $\nearrow$  skill premium everywhere.
- ②  $\nearrow$  supply of skills  $\Rightarrow$   $\searrow$  price of skills  $\Rightarrow$   $\searrow$  price of traded/price of non traded  $\Rightarrow$   $\nearrow$  Exports/GDP.

# Trade and technological upgrading (Bustos 2009)

- Simple Melitz model with fixed cost of technology upgrading:
  - New exporters increase scale  $\Rightarrow$  reduced cost of upgrading.
  - Globalization  $\Rightarrow$  technology upgrading  $\Rightarrow$   $\nearrow$  skill premium.

# Trade and technological upgrading (Bustos 2009)

- Data on technology spending and exports by Argentine firms.
- Data on tariff reduction across sectors from MERCOSUR.
- ① Higher reduction in Brazil's tariffs  $\Rightarrow$  more technology upgrading.
- ② Most entry into exports and technology upgrading is for upper-middle size firms.

# General models with many factors of production

- Heckscher-Ohlin, or Matsuyama's extension only deal with 2 factors.
- Predictions for inequality are very crude.
- In the data, complex evolution of wage inequality:
  - 1 Different segments of the wage distribution change differently.
  - 2 Large increase in residual inequality.
  - 3 Large changes within sectors.

- International trade *and* multinational production.
- Skill biased technology:
  - more efficient firms employ disproportionately more skilled workers.
- Reduction in barriers to trade and/or multinational production:
  - 1 Reallocation of factors towards sectors intensive in the abundant factor (H-O).
  - 2 *Between* sector reallocation: inequality increase in the North, decrease in the South.
  - 3 Reallocation within sectors towards more efficient firms.
  - 4 *Within* sector reallocation: inequality increase both in the North and in the South.
  - 5 In a calibrated model, *within* reallocation stronger than *between* reallocation.
  - 6 4-6% increase in skill premium in the US over 40 years, 5% in India.

- Many factors, many sectors (continua, or any discrete numbers).
- General results on changes in both factor supply, and factor demand (through technological change or trade).
- Key properties of the aggregate production function are identified (log-supermodularity).

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- 4 Global skill biased technological change: skill downgrading and a rise in inequality both within and between countries.
- 5 Off-shoring of tasks to the South: skill downgrading and rise in inequality in both countries (world distribution becomes less skill abundant).

## Note: Diversity and Trade

- Grossman and Maggi (AER 2000): differences in diversity of factors (abilities, skills...) generate trade.
- Bombardini, Gallipoli and Pupato (2009) test some of those predictions using data on ability tests.

# Labor market frictions (Helpman, Itskhoki and Redding)

- 1 Large increase in wage inequality within sectors.
- 2 Large increase in residual wage inequality.

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- Firm *and* worker heterogeneity.
- Selection into export markets (most efficient firms).
- Labor market frictions (imperfect screening technology).

# Labor market frictions (Helpman, Itskhoki and Redding)

- ① Wage and inequality increases and unemployment decreases with ability.
- ② Trade reduces wages and increases unemployment of intermediate ability workers.
- ③ (More screening by all firms  $\Rightarrow$  more unemployment.)