Econ 340

Lecture 4
Modern Theories and Additional Effects of Trade

Outline
• Sources of Comparative Advantage
• The Heckscher-Ohlin Model
  – Main Idea
  – Intuition
  – Does the Theory Work?
• Effects of Trade
  – Changes in Production
  – Factor Price Equalization
• The New Trade Theory
  – Assumptions
  – Implications
• The New New Trade Theory

Sources of Comparative Advantage
• What determines comparative advantage?
• Answer: Many things

Definition: Comparative Advantage is
– a low price for a good,
  in autarky,
– relative to other goods
– compared to other countries.

Double comparison
Sources of Comparative Advantage

• Factor Proportions
  This will be the most important
  We’ll come back to it in a moment

Sources of Comparative Advantage

• Technology
  – This is associated with Ricardo and the Ricardian model we looked at last time
  – Technological advantage $\rightarrow$ exports
  – Advantage may be eroded over time by
    • Technology transfer to other countries
    • Multinational companies that use technology abroad
    • Technical progress that makes earlier innovations obsolete

Sources of Comparative Advantage

• Demand
  – High demand for a fixed available quantity leads to
    High price, leads to
    Comparative Disadvantage
    Thus imports
Sources of Comparative Advantage

- Scale Economies (i.e., Increasing Returns to Scale)
  - Definition: Average cost falls as output rises
  - Leads to lower cost for large countries
  - Problem: scale economies also lead to large firms, and therefore imperfect competition
    (We’ll deal with this later today, under “New Trade Theory”)

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The Heckscher-Ohlin Model

- The Factor Proportions Model
  - Also called Heckscher-Ohlin Model
  - Due to
    - Eli Heckscher (1879-1952),
    - Bertil Ohlin (1899-1979), and
    - Paul Samuelson (1915-2009)
The Heckscher-Ohlin Model

• The Factor Proportions Model
  – Main idea:
    • Comparative advantage is determined by
      – Factor endowments of countries, together with
      – Factor intensities of industries

Two differences drive trade in H-O Model
1. Countries differ in endowments of factors
2. Industries differ in factor intensities

Two differences drive trade in H-O Model
1. Countries differ in endowments of factors
   – Labor
   – Capital
   – Land
   – Skill (Human capital)
   – Resources
2. Industries differ in factor intensities
The Heckscher-Ohlin Model

1. Countries differ in endowments of factors
2. Industries differ in factor intensities
   Examples:
   - Agriculture uses lots of land
   - Textiles & apparel use lots of unskilled labor
   - Autos use lots of capital
   - Computers use lots of human capital

Implication of #1 and #2:

Heckscher-Ohlin Theorem:
Countries have comparative advantage in,
and therefore export,
goods that use relatively intensively
their relatively abundant factors
The Heckscher-Ohlin Model

- **Intuition**
  - Abundant factors are cheap (in autarky)
  - Cheap factors produce cheap goods
  - Hence comparative advantage

- **Crucial for the model:**
  - Factors (labor, capital, etc.) are perfectly mobile within a country across industries
  - Thus all labor is paid the same wage – wages, etc., do not differ by industry.

Many of you will forget this on exams, when I ask what happens to wages in one industry or another.

The Heckscher-Ohlin Model

- **Does the H-O Theory Work Empirically?**
  - Evidence against
    - Leontief Scarcity Factor Paradox
      - In early 1950s, Wassily Leontief (1906-1999) measured capital (K) and labor (L) in US exports (X) and imports (M).
    - Found:
      \[
      \frac{K_x}{L_x} \text{US exports} \quad \frac{K_M}{L_M} \text{US imports}
      \]
    - More recent studies have been mixed.

The Heckscher-Ohlin Model

- **Does the H-O Theory Work?**
  - Evidence in favor
    - US exports agricultural goods and high-tech goods, intensive users of our abundant land and human capital
    - Developing countries export textiles and apparel, intensive in unskilled labor
    - Most recent studies have found increasing evidence that trade patterns do depend on
      - Factor proportions, as the H-O theory says,
      - But also on differences in technology
  - Conclusion:
    - H-O theory is an important part of the story,
    - But it is not the whole story
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Effects of Trade
(according to H-O Theory)

• Trade causes:
  – Production: of export good †
of import good ‡
  – Factors (labor, capital, etc.) to move industries:
    toward export sector
  – Industries expand, contract, or may disappear
    (as in Ricardian model)
  – Factor demands: for abundant factor †
    for scarce factor ‡
  – Factor prices: of abundant factor †
    of scarce factor ‡

Effects of Trade
(according to H-O Theory)

• Two important implications for factor prices:
  – Factor Price Equalization
    • Trade causes prices of factors in different countries to move
together, even to become equal across countries
  – Stolper-Samuelson Theorem
    • Real price (i.e., wage in terms of goods it can buy) of a
country’s abundant factor rises due to trade
    • Real price (wage) of its scarce factor falls

NOTE: This means that there are losers from trade: the
owners of a country’s scarce factor.
(In the US, that is (unskilled) labor)
Effects of Trade
(according to H-O Theory)

- Implications of the Stolper-Samuelson Theorem
  - See Bivens
  - If the Stolper-Samuelson Theory is right for the US, then labor loses from trade
  - That’s a lot of people, perhaps a majority of the population
    • Though really it is only low-skilled labor that loses, which is fewer
  - And it implies increased inequality
    • True even more so with only the low-skilled being hurt

- What should we do about it?
  - Bivens, though himself a critic of trade, does not say to restrict trade
  - He advocates other policies to redistribute income toward low-wage workers
    - large-scale social insurance programs
    - universal health care
    - stable pension income
    - disability and life insurance
    - lifetime of access to high-quality public education
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The New Trade Theory

• New Trade Theory
  – Developed in the early 1980s
  – Most prominent contributor was Paul Krugman, now a New York Times columnist
    • Won Nobel Prize 2008

• Assumptions of the New Trade Theory
  One or more of
  – Increasing returns to scale
  – Imperfect competition
    • Monopoly (one seller)
    • Oligopoly (few sellers)
    • Monopolistic competition (many sellers, but each with some market power)
  – Product differentiation
• None of these were allowed in the Ricardian and H-O Models
The New Trade Theory

- Implications of the New Trade Theory
  1. Countries may export the same good to each other
  2. Countries may lose from trade
  3. More and broader reasons for countries to gain from trade
  4. New rationales for using policy to affect trade

  More on each of these…

1. Countries may export the same good to each other
   - This is called Intra-Industry Trade (IIT)
     - Example: US both exports and imports cars
The New Trade Theory

• Explanations for IIT
  – Definitions of “industry” may be too large, and include
    • Different, but similar, products
      – Toyotas
      – Fords
    • Goods at different stages of processing
      – Autos
      – Auto parts

The New Trade Theory

• Explanations for IIT
  – Same good sold across different borders
The New Trade Theory

• Explanations for IIT
  – Differentiated products – the same, but advertised as different (brands of jeans)

• Explanations for IIT
  – Identical products sold by firms from different countries into each other’s markets
The New Trade Theory

2. Countries may lose from trade
   - This is not actually likely, but it wasn’t even possible in the Ricardian and H-O Models
   - One story: small country may be forced to specialize in an industry with decreasing returns to scale

3. More and broader reasons for countries to gain from trade
   - New gains from each new assumption:
     • Cost reductions due to scale economies
     • Reduced market distortions due to increased competition
     • Consumer benefit from access to more variety
   - Implication: It is possible for all people in a country to gain from trade
     • Contrast to H-O Model and Stolper-Samuelson Theorem, where somebody must lose

4. New rationales for using policy to affect trade
   - Called “Strategic Trade Policy” – See Krugman article
   - How?
     • If some industries are better to have than others (due perhaps to scale economies), “industrial policy” may promote these industries
     • If imperfectly competitive firms earn profits, trade policy may be used to get more profit for a country’s own firms
The New Trade Theory

- Strategic Trade Policy: Boeing-Airbus Game
  - \( P = \text{produce}, \ N = \text{not produce} \)
  - No subsidy,
  
  Boeing choice depends on Airbus

Payoff Matrix

\[
\begin{array}{c|c|c}
 & \text{P} & \text{N} \\
\hline
\text{P} & -5 & 0 \\
\hline
\text{N} & 100 & 0 \\
\end{array}
\]

Equil. If Boeing moves first, since now Airbus will not enter

Airbus choice does not depend on Boeing

Payoff Matrix

\[
\begin{array}{c|c|c}
 & \text{P} & \text{N} \\
\hline
\text{P} & -5 (\text{+10}) & 0 \\
\hline
\text{N} & 100 & 0 \\
\end{array}
\]

Equil. With no subsidy if Boeing moves first

Airbus Subsidy = +10

Equil. With subsidy if Boeing moves first

Airbus Subsidy = +10

Equil. With subsidy if Boeing moves first
The New Trade Theory

- Boeing-Airbus Game results
  - If Boeing moves first, without subsidy Airbus will not enter
    • Boeing and US gain +100
    • Airbus and EU gain 0
  - If EU pays subsidy, Airbus will enter and Boeing will exit
    • Airbus gains 110, EU gains 100 (=100-10)
    • Boeing and US gain 0
  - Thus EU gains and US loses from EU subsidy

The New Trade Theory

4. New rationales for using policy to restrict trade
   - But note Krugman’s conclusion: These arguments are not likely to be usable:
     • Empirical difficulties: Hard to know where to intervene
     • Entry: Benefits will be dissipated by new firms
     • General equilibrium: Help in some sectors hurts others
     • Retaliation: Other countries may react
     • Political economy: Industries lobby for help

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The New New Trade Theory

- Heterogeneous Firms
  - Due to Marc Melitz (UM Phd 2000)
  - Assumes that firms within an industry differ in productivity (+ other assumptions of New Trade Theory)

• Implications:
  - More productive firms are larger & earn more profits
  - Opening to freer trade causes
    - Most productive firms to expand and export
    - Least productive firms to shut down
    - Thus average productivity rises

➢ Yet another new source of gain from trade!
➢ Also new losers: Those in least productive firms in all tradable industries (inc. exports)

Next Time

• Tariffs
  - What are they and how are they used?
  - What effects do they have?
    • Theory: Supply and Demand
    • Data