Lecture 20-23

- The Heckscher-Ohlin Model
- The Rybczynski Theorem
- The Heckscher-Ohlin Theorem
- The Stolper-Samuelson Theorem
- The Factor Price Equalization Theorem
- Summary

The Heckscher-Ohlin Model

- Basic setup:
  - Two countries: US and China
  - Two homogeneous goods: autos & corn
  - Two homogeneous factors: labor & capital
- Production:
  - Identical technology (production function)
  - Different fixed endowments: US more K, China more L
  - Autos more K-intensive, corn more L-intensive (by K/L)
  - Factors perfectly mobile within countries and perfectly immobile between countries
  - CRS, no transportation costs, perfect competition
- Consumption:
  - Identical tastes & preferences (indifference curves)
  - Homothetic tastes & preferences (no income effect)

PPF and Endowments

- Assumptions:
  - Two goods: X and Y
  - Two factors: L and K, K>L
  - Production:

    (fixed coefficients → some unemployment)
    - X uses 3 unit of L and 2 unit of K (L/K=1.5)
    - Y uses 2 unit of L and 3 units of K (L/K=0.5)
    - X is more L-intensive, Y is more K-intensive
- Full employment lines:
  - Labor: 3X + 2Y = L
  - Capital: 2X + 3Y = K
- The shape of PPF:
  - More K: PPF shifts out more toward X
  - More L: PPF shifts out more toward Y

Patterns of Trade

- The Rybczynski Theorem: (one country, constant prices)
  - Increase K-endowment at given commodity prices
    - PPF shifts out more for the relatively more K-intensive good
    - Production of the relatively more K-intensive good rises more than proportionately, production of the relatively more L-intensive good falls
  - An increase in the endowment of one factor causes a more than proportionate increase in the output of the good which uses that factor relatively intensively and an absolute decline in the output of the other good (*more L needed in the K-intensive sector to absorb extra K*)
- The Heckscher-Ohlin Theorem: (two countries)
  - A country with more K-endowment produces more K-intensive good
    - Gain from trading the more K-intensive good for the more L-intensive good at a more favorable price, i.e. a lower opportunity cost
    - Gain from specialization in the production of the more K-intensive good
  - A country will export the commodity that uses relatively intensively its relatively abundant factor of production, and it will import the good that uses relatively intensively its relatively scarce factor of production (Figure 8 on p.97, extreme case: Figure 15 on p.152)

Good Prices and Factor Prices

- An example for a small economy:
  - Each unit of wine uses 3 L & 2 K

    Each unit of cheese uses 2 L & 3 K

    (Wine is more L-intensive as 3/2>2/3)
  - Perfect competition: P = MC
  - Suppose the world price of wine is 10 and so is the price of cheese, what are the wage and rent?
    - 3w+2r=10 and 2w+3r=10 so that w=r=2
  - Suppose the world price of wine increases by 25% and that of cheese stays at 10, what are the new wage and rent?
    - 3w+2r =12.5 and 2w+3r=10 so that w=3.5 r=1
- Lessons from the above example:
  - As wine becomes relatively more expensive, wage rises by (3.5-2)/2=75%, greater than the increase in price of wine
  - At the same time, rent falls
  - For a given price, wage and rent are uniquely determined

Terms of Trade and Income Effect

- Stolper-Samuelson Theorem:
  - From autarky to trade: export the good with a higher world relative price $\rightarrow$ the relative price for the good that uses more intensively the abundant factor $\uparrow \rightarrow$ factor price of the abundant factor $\uparrow$ and that of the scarce factor $\downarrow$
  - With full employment both before and after trade takes place, the price of the abundant factor will increase more than proportionately and the price of the scarce factor will fall so that trade implies that the owners of the abundant factor will find their real incomes rising and the owners of the scarce factor will find their real incomes falling
- Factor Price Equalization Theorem:
  - In equilibrium, with both countries facing the same relative (and absolute) product prices, with both having the same technology, and with constant returns to scale, relative (and absolute) costs will be equalized. The only way this can happen is if, in fact, factor prices are equalized.

Summary

- Sources of gains from trade
  - Terms of trade improvement
  - Differences in consumption
  - Differences in production
    - Technology differences
    - Endowment differences
    - Other (will discuss later)
- Ricardian Model
- Heckscher-Ohlin Model

  (with fixed and flexible input/output coefficients)