The Trade Workhorse: The Heckscher-Ohlin Model

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- Last time
  - The specific factors model:
    - Analyze trade and the income distribution
    - A short-run model: some factors can only be used to produce a single good
    - Trade can hurt owners of some factors
    - As trade "grows the pie", the right taxes can improve welfare for all
  - Political economy:
    - Trade often unpopular as losses from trade are concentrated in an industry, while benefits are diffused
  - Migration:
    - In the simplest model, migration hurts high wage labor
    - Again, the pie grows, so that taxes can compensate

- Today: The Heckscher-Ohlin Model
  - Introduction
  - The point
  - The model
    - Setup and assumptions
    - Production possibilities
    - Production and prices
    - Autarchy equilibrium
    - Trade equilibrium
  - The big four theorems
  - The problems
    - Assumptions
    - Evidence
  - Moving forward

- Quick note on this chapter of the textbook.

Heckscher-Ohlin: Rise of a theory

- From a book by Ohlin published in 1933
- Original point $\rightarrow$ trade and long-run income distribution
- Attractive model
  - Elegant: Can be analyzed graphically
  - Enough complexity to tackle many trade issues
    - Effect of trade liberalization
    - Effect of tariffs
    - Effect of technological change on trade patterns
    - Effect of technological change on income distributions
  - Clear, testable predictions
  - Developed and extended by famous economists
    - Ohlin (Nobel 1979)
    - Samuelson (Nobel 1970)

Heckscher-Ohlin: Downfall

- Some quotes:
  - *. . . the Heckscher-Ohlin model is hopelessly inadequate as an explanation for historical and modern trade patterns, unless we allow for technological differences across countries.*
    -Robert Feenstra, Distinguished Professor of Economics at University of California, Davis, 2004
  - *It is time to declare Stolper-Samuelson [an important result of the HO model] dead. Stolper-Samuelson says that trade liberalization will raise the real income of the abundant (unskilled) labor in poor countries. Stolper-Samuelson, qua theorem, is not wrong, of course. But if we use it, as we so often have, as if it provides a reliable answer to this question of real human significance, then it is worse than wrong - it is dangerous.*
    -Donald Davis and Prachi Mishra, 2007

Heckscher-Ohlin: Why the hate?

- Heckscher-Ohlin is a scientific theory: testable predictions
- Predictions have often not been backed up by data
- Assumptions also seem unusual in the modern world

The point

- Hecksher-Ohlin about long-run effects of trade
- Embodied in the idea that all factors are costlessly mobile

The point

- Famous implications are the four theorems (paraphrase):
  1. *Heckscher-Ohlin*: Countries with more of a resource will export goods for which that resource is more useful in production
     ex: China exports labor intensive manufactured goods
  2. *Rybczynski*: If a country gets more of a resource, it will more than proportionally increase its production of goods for which that resource is more useful in production
     ex: if Denmark got more labor, it would increase its production of textiles
  3. *Stolper-Samuelson*: A change in the price of a final good for which a particular resource is more useful in production will increase the payments to that resource
     ex: if the price of textiles goes up, Chinese workers get higher wages
  4. *Factor-price equalization*: Trade should cause factor prices to converge
     ex: Danish and Chinese workers should be paid the same wages

Model - Plan of attack

- Setup and assumptions
- Production possibilities
- Production and prices
- Autarchy equilibrium
- Trade equilibrium

Setup

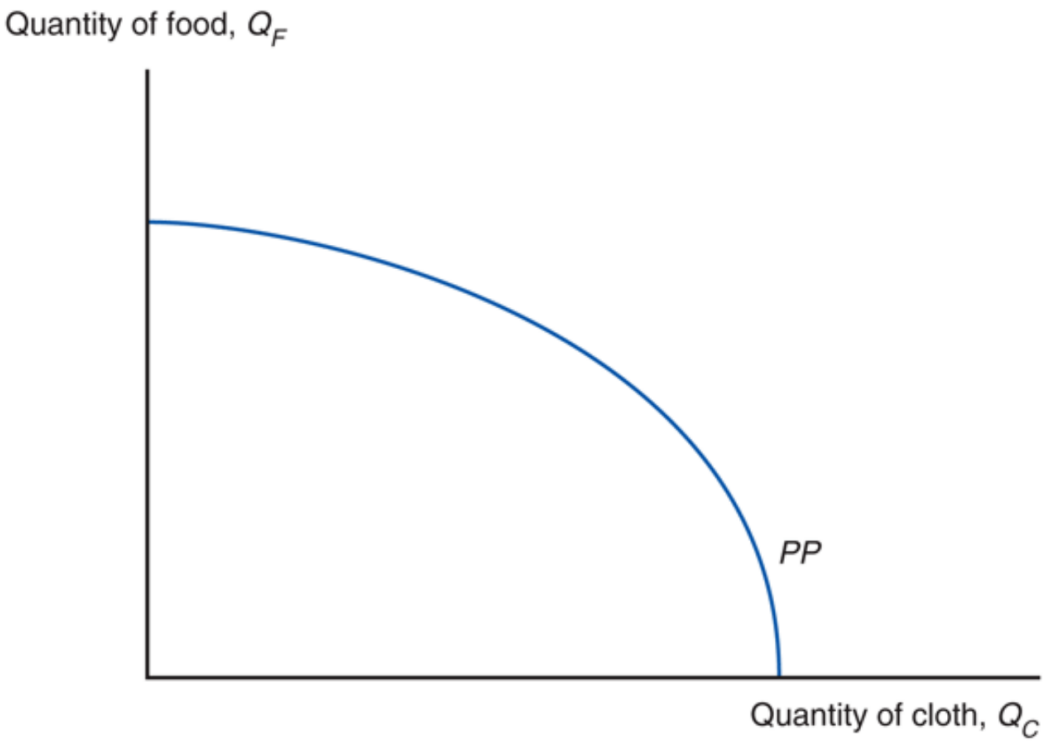
- Two countries: Home (H) and Foreign (G)
- Two goods: Clothes (C) and Food (F)
- Two factors: Labor (L) and Capital (K)
- Sometimes called the 2 x 2 x 2 model

Setup

- Clothes and Food can be produced with combinations of Labor and Capital
- Both countries have the same production technology
- Production technologies are Constant Returns to Scale (double both inputs, double output)
- Each country has a different endowment of Labor and Capital
- Labor and Capital cannot move between countries, even in the long run
  - No shipping of machines allowed
  - No moving abroad
- As before, competitive firms with zero profit

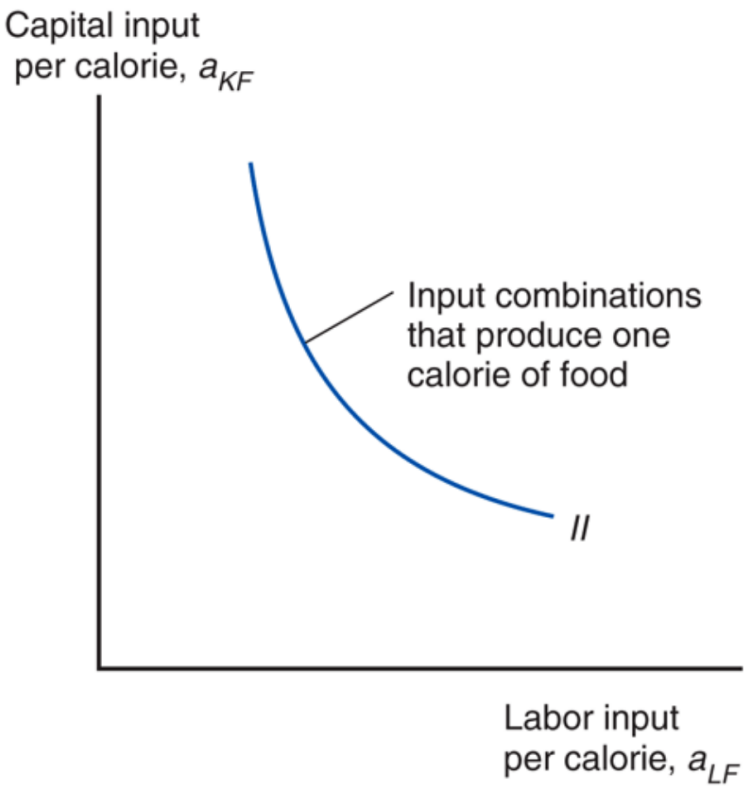
Production Possiblities Frontier

- Recall: Slope = take a bit of Labor from Food production and put it into Clothes production
- Now also: Slope = take a bit of Capital from Food production and put it into Clothes production
- In notation: Slope $= -\frac{MPL_F}{MPL_C} = -\frac{MPK_F}{MPK_C}$ (why must ratios equal?)
- Why is the frontier concave?



Input Possiblities

- Fix the amount of, say, Food we want to produce
- Slope = if I produce a bit more Food with Labor, how much Capital is freed up?
- In notation: Slope $= -\frac{\frac{1}{MPK_F}}{\frac{1}{MPL_F}} = -\frac{MPL_F}{MPK_F}$
- Why is the curve convex?

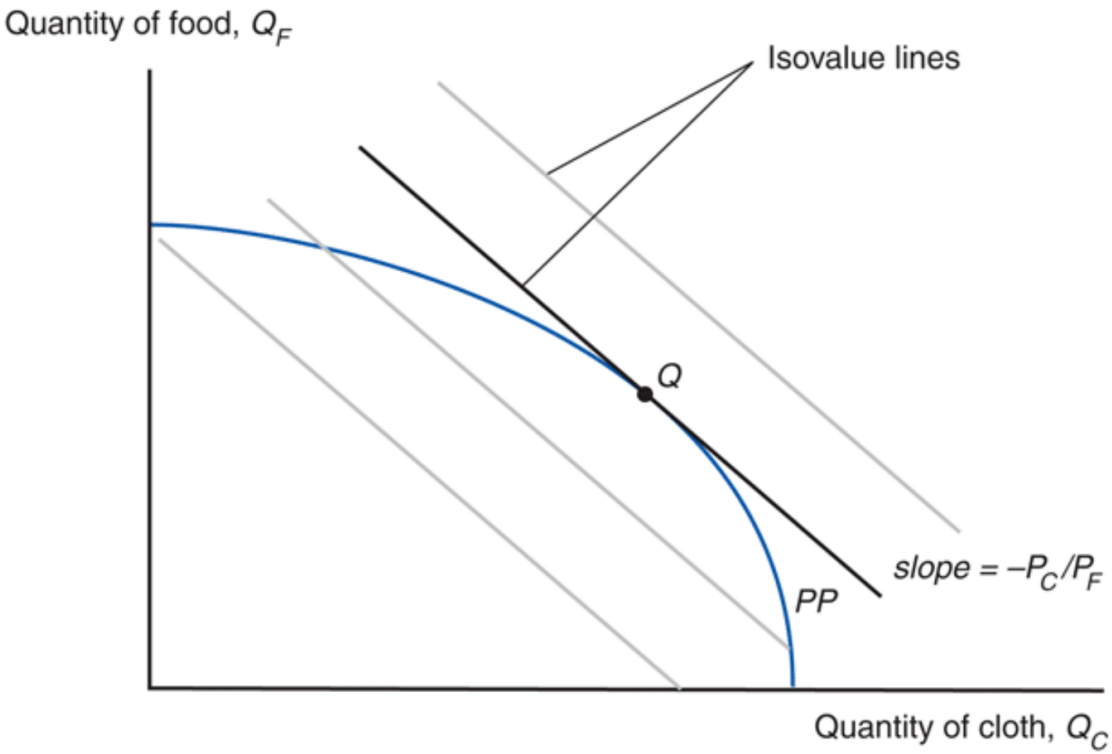


Pause

- We have described the environment
- We have described what it is possible to produce
- Now what will be produced in equilibrium?
- With what mix of factors?

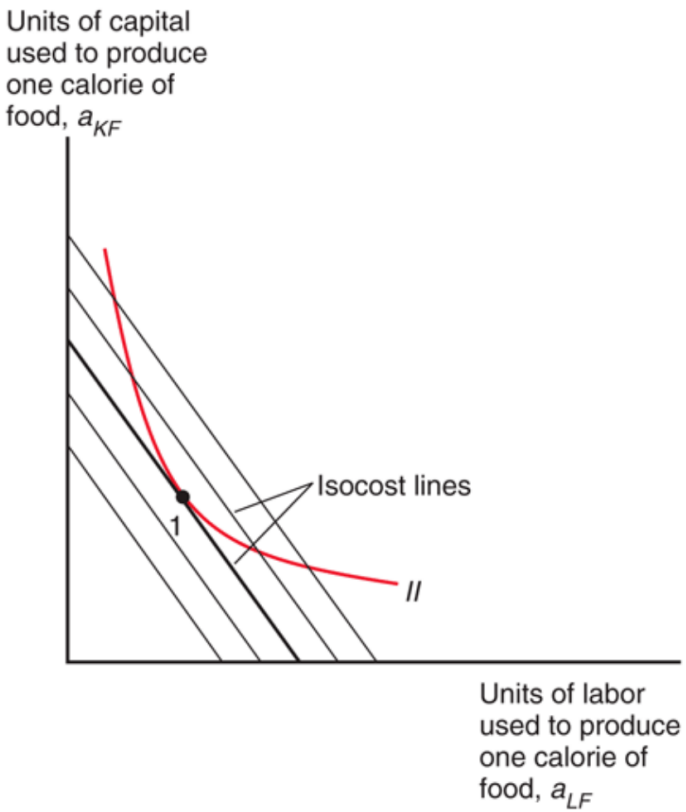
Output price ratio and production

- Suppose we have the price ratio $\frac{P_C}{P_F}$
- Then $\frac{P_C}{P_F} = \frac{MPL_F}{MPL_C} = \frac{MPK_F}{MPK_C}$ (why?)
- Production given by the point on the PPF tangent to $-\frac{P_C}{P_F}$



Input price ratio and production

- Suppose we have the price ratio $\frac{w}{r}$
- Then $\frac{w}{r} = \frac{MPL_F}{MPK_F} = \frac{MPL_C}{MPK_C}$ (why?)
- Input bundle given by the point on the input possibilities curve tangent to $-\frac{w}{r}$



Input price change and production