

# ECBS 6060: International Trade

## Winter 2020

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## Lecture 5: The Stolper-Samuelson Theorem of Winners and Losers

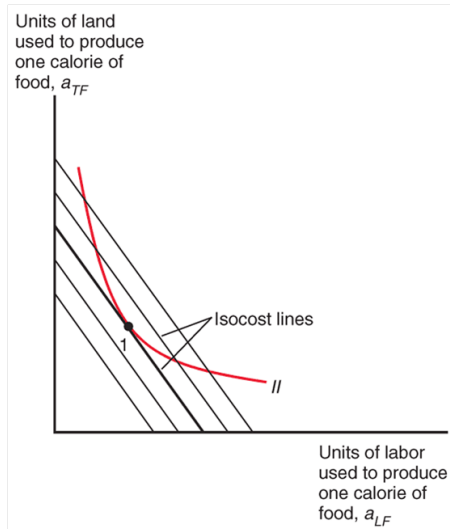
# Outline

## Today

- ▶ Trade and factor rewards. Some factors gain, some factors lose from trade.
  - ▶ The Stolper–Samuelson theorem.

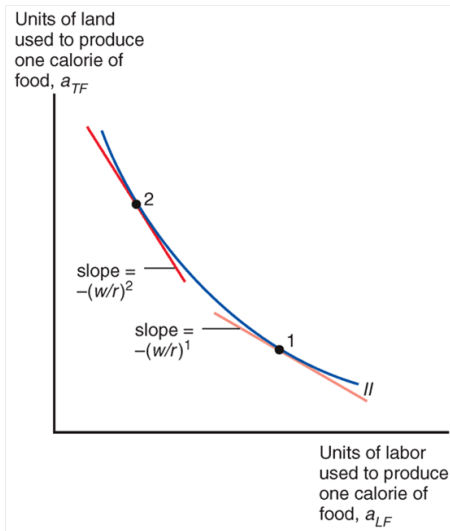
## Factor Prices and Input Choices

# Choosing the Optimal Land-Labor Ratio

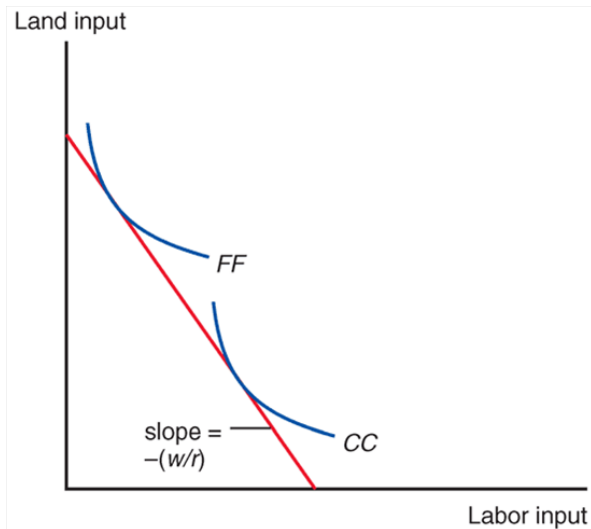


# Changing the Wage-Rental Ratio

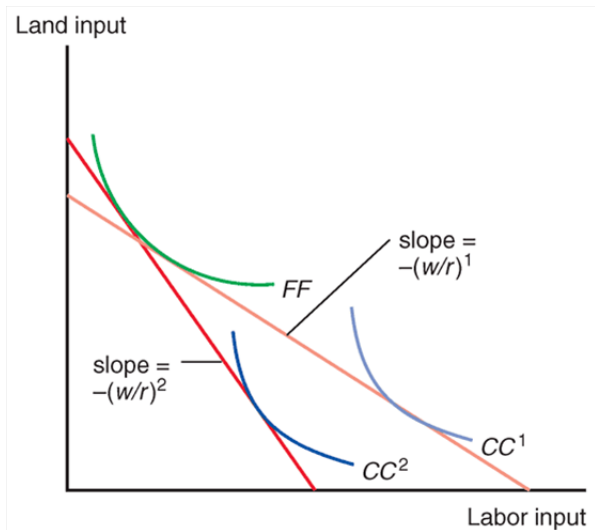
## The *Lerner* Diagram



## Determining the Wage-Rental Ratio



## A Rise in the Price of Cloth





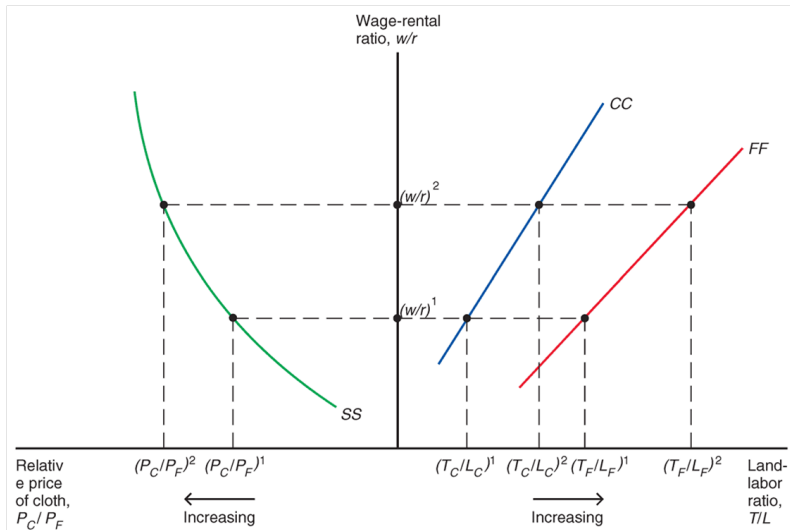
## Factor Prices and Goods Prices



## Factor Prices, Output Prices, and Levels of Factors (cont.)

- ▶ We have a relationship among input (factor) prices and output prices and the levels of factors used in production:
- ▶ **Stolper-Samuelson theorem**: if the relative price of a good increases, then the real wage or real lending/ renting rate of the factor used intensively in the production of that good increases, while the real wage or real lending/renting rate of the other factor decreases.
  - ▶ Under competition, the real wage/rate is equal to the marginal productivity of the factor.
  - ▶ The marginal productivity of a factor typically decreases as the level of that factor used in production increases.

# From Goods Prices to Input Choices



## Factor Prices, Output Prices, and Levels of Factors (cont.)

- ▶ We have a theory that predicts changes in the distribution of income when the relative price of goods changes, say because of trade.
- ▶ An increase in the relative price of cloth,  $P_C/P_F$ , is predicted to:
  - ▶ raise income of workers relative to that of landowners,  $w/r$ .
    - ▶ because of cloth sector using labor more intensively
  - ▶ raise the ratio of land to labor services,  $T/L$ , used in both industries, as land becomes relatively cheaper
  - ▶ raise the marginal productivity of labor in both industries and lower the marginal productivity of land in both industries, as more land and less labor is used
  - ▶ raise the real income of workers and *lower the real income of land owners*.

# Factor Prices, Output Prices, Levels of Factors, and Levels of Output

- ▶ An economy with a *high ratio of land to labor services* is predicted to have a *high output of food* relative to cloth and a *low price of food* relative to cloth.
  - ▶ It will be relatively efficient at (have a comparative advantage in) producing food.
- ▶ An economy is predicted to be relatively efficient at producing goods that are intensive in the factors of production in which the country is relatively well endowed.
- ▶ (These we will show later.)

## Opening up to trade

- ▶ If a land abundant country opens up to trade, this
  - ▶ raises the relative price of food to cloth,
  - ▶ raises the relative reward of land to labor.

## Opening up to trade

- ▶ If a land abundant country opens up to trade, this
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  - ▶ raises the relative reward of land to labor.
- ▶ *Abundant factors gain from opening to trade.*

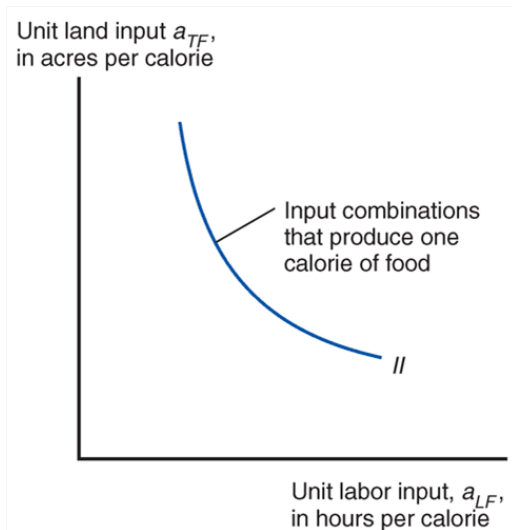
# Summary

- ▶ There are *always* distributional effects of trade between
  - ▶ different factors (Heckscher–Ohlin model)
  - ▶ later: different industries (specific factor model)
  - ▶ later: different firms (Melitz model)
- ▶ These may lead to inequality,
- ▶ and provide a political-economy motivation for trade protection.



## Additional Chapter Art

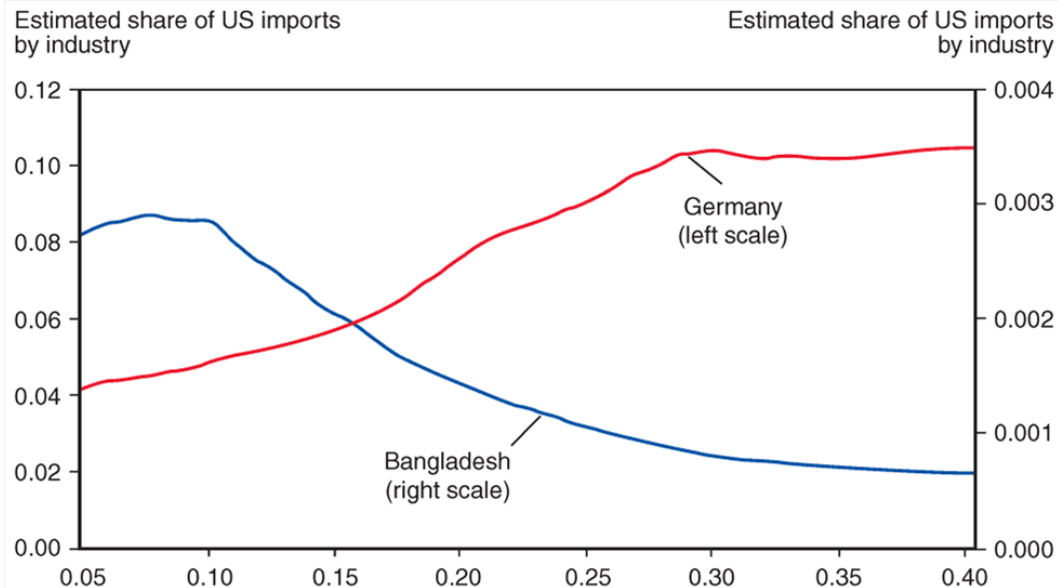
# Input Possibilities in Food Production



## Comparative International Wage Rates (United States = 100)

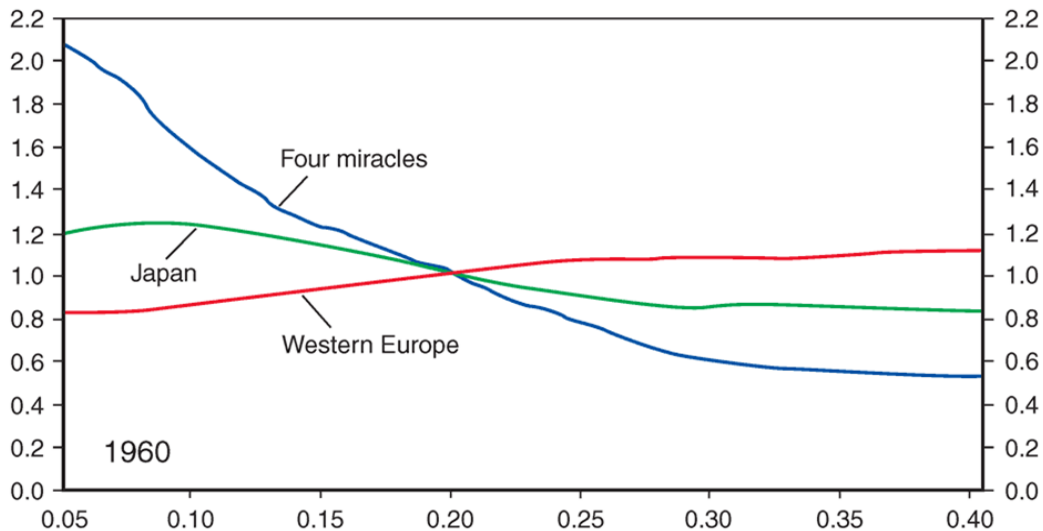
Country	Hourly Compensation of Production Workers, 2005
United States	100
Germany	140
Japan	92
Spain	75
South Korea	57
Portugal	31
Mexico	11
China*	3
* 2004	
<b>Source:</b> Bureau of Labor Statistics, <i>Foreign Labor Statistics Home Page</i> .	

## Skill Intensity and the Pattern of U.S. Imports from Two Countries



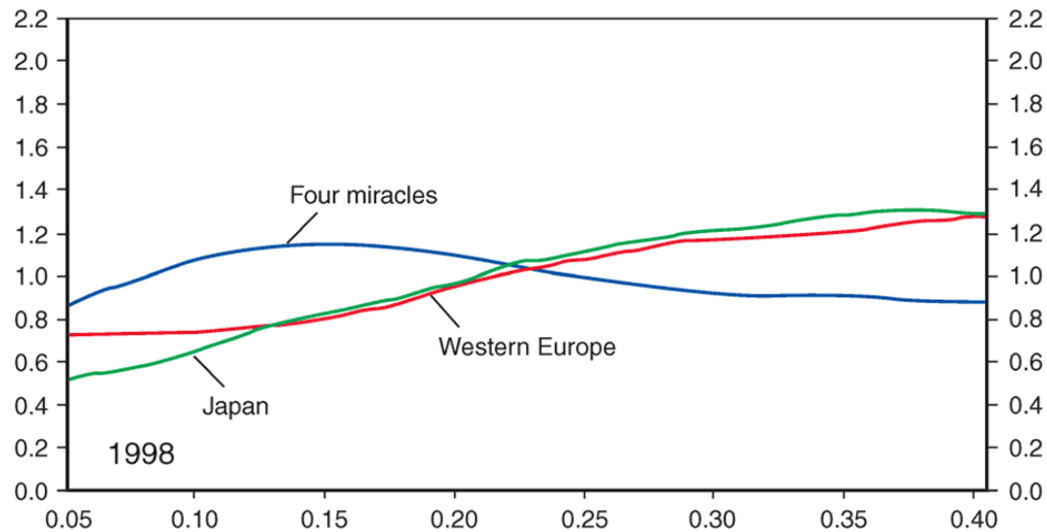
## Changing Patterns of Comparative Advantage

Share of U.S. imports by industry



## Changing Patterns of Comparative Advantage (continued)

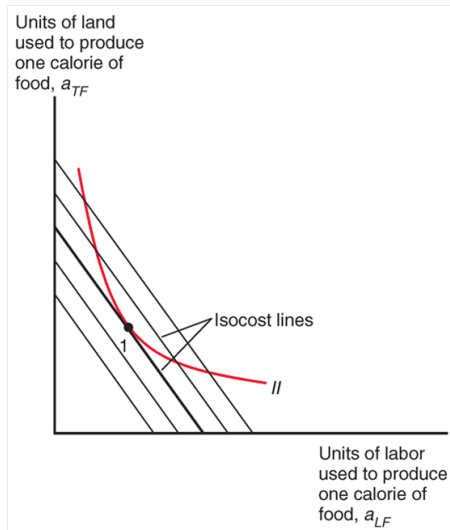
Share of U.S. imports by industry



## Estimated Technological Efficiency, 1983 (United States = 1)

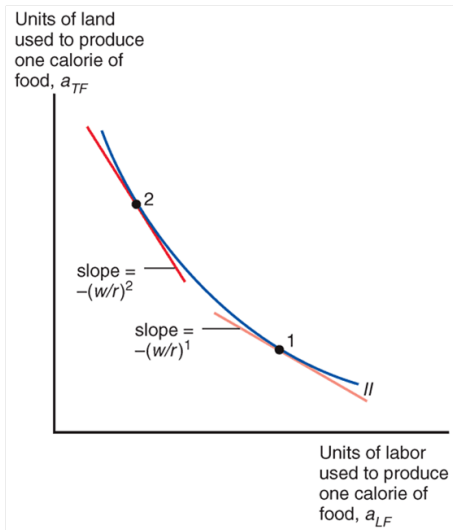
Country	
Bangladesh	0.03
Thailand	0.17
Hong Kong	0.40
Japan	0.70
West Germany	0.78
<b>Source:</b> Daniel Trefler, <i>American Economic Review</i> (December 1995), p. 1037.	

# Choosing the Optimal Land-Labor Ratio

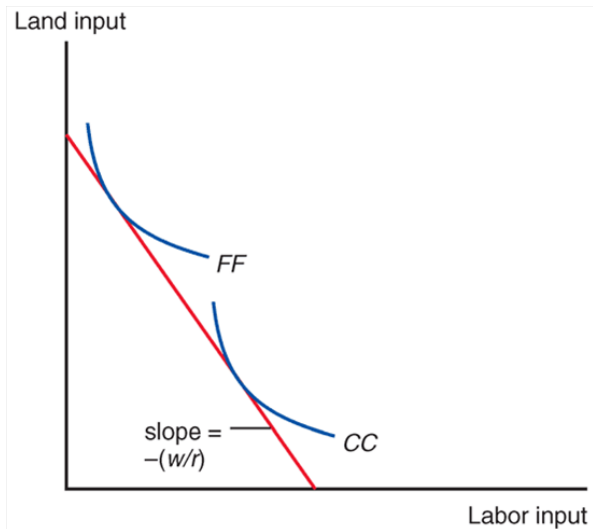




# Changing the Wage-Rental Ratio



## Determining the Wage-Rental Ratio



## A Rise in the Price of Cloth

