

International Trade: Lecture 3

Classical Trade Theories and Models

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Analytical framework

Following Adam Smith's great tradition, political economy centers on two types of problems – resource allocation and income distribution. In International Trade theory, resource allocation studies production, consumption, import and export decisions between trading countries; income distribution examines how income is distributed among various production factors (labor, land, and capital). Within the general equilibrium framework, all markets (home and foreign) clear and are simultaneously determined.

Reasons for international trade

- 1 Natural resources and factor endowments
- 2 Transaction costs (information, risks, and institutions)
- 3 Transportation costs (proximity and transportation mode)
- 4 Absolute advantage: production cost
- 5 Comparative advantage: opportunity cost
- 6 Demand diversity and economics of scale

Outline

- 1 Absolute Advantage
- 2 Comparative Advantage
- 3 Trade Equilibrium

Absolute advantage: assumptions

- 1 Two country: home (H) and foreign (F)
- 2 Two goods: apple (a) and banana (b)
- 3 One production factor: labor hours (measured in time)
- 4 Home country can either produce 4 apples or 6 bananas per hour
- 5 Foreign country can either produce 6 apples or 4 bananas per hour
- 6 Production function displays constant return to scale
- 7 Individuals prefer more variety and average consumption
- 8 No transportation and transaction costs in the economy
- 9 All markets clear: 1) production=consumption; 2) total import value = total export value; 3) labor market full employment.

The production constraint

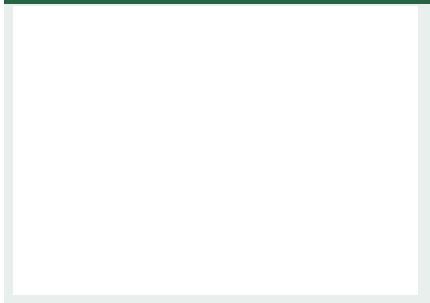
Home country can either produce 4 apples or 6 bananas per hour.
Foreign country can either produce 6 apples or 4 bananas per hour.

		Home	Foreign
Productivity (unit/hr)	apple	4	6
	banana	6	4
Labor requirement (time/unit)	apple		
	banana		
Opportunity cost per unit output	apple		
	banana		

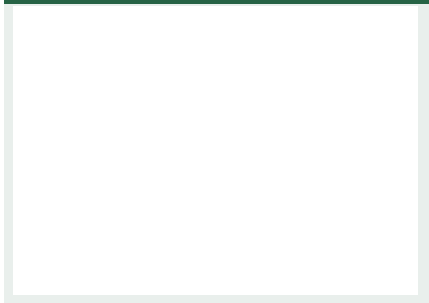
Closed economy and autarky equilibrium

Autarky equilibrium condition: production = consumption

Home country PPF



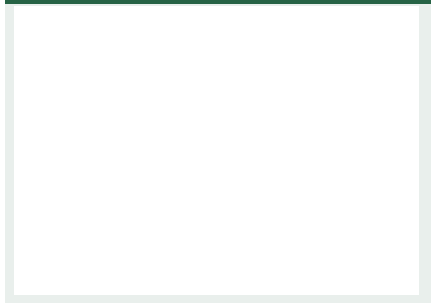
Foreign country PPF



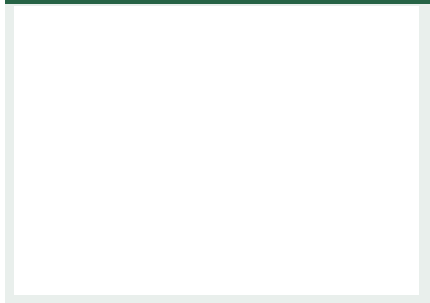
From autarky to trade

Can countries benefit from trade? Suppose $(P_a/P_b)^* = 1 : 1$

Home country PPF



Foreign country PPF



From trade to specialization

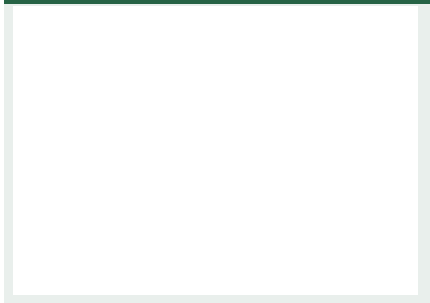
Can countries benefit more from trade? How?

		Home	Foreign
Productivity (unit/hr)	apple	4	6
	banana	6	4
Opportunity cost per unit output	apple	1.5b	0.67a
	banana	0.67a	1.5b
Production specialization	apple		
	banana		

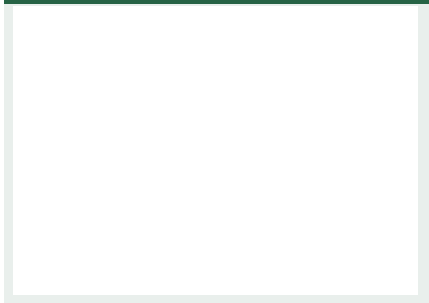
Specialization and trade: new equilibrium

Suppose exchange rate $(P_a/P_b)^* = 1 : 1$

Home country PPF



Foreign country PPF



Summary table

		Home	Foreign	Total
Autarky equilibrium	apple	2	3	5
	banana	3	2	5
Production specialization	apple			
	banana			
Trade equilibrium	apple			
	banana			
Net gains from trade	apple			
	banana			

Note: exchange rate $(P_a/P_b)^* = 1 : 1$.

Questions

- 1 Why is country willing to trade?
- 2 What is the economic basis for trade?
- 3 What determines the specialization pattern?
- 4 What determines the terms of trade?
- 5 What are the benefits from trade?
- 6 Who gains more from trade?

Income distribution after trade

- In equilibrium, labor market competition drives nominal wage equal across sectors and the value of marginal product shall be the same everywhere: $W_a = W_b = P_a \times MP_a = P_b \times MP_b$.
- Labor can work in either sector and earn a real wage rate equal to the quantity of product produced per time unit (MP).
- Real wage rates, $W_a/P_a = MP_a$ and $W_b/P_b = MP_b$, are determined by a country's productivity.
- In autarky equilibrium, $(W_a/P_a)^H = MP_a^H = 4Q_a$ and $(W_b/P_b)^H = MP_b^H = 6Q_b$.
- In trade equilibrium with specialization, given $(P_b/P_a)^* = 1$, H worker's real wage in terms of banana is 6, H worker's real wage in terms of apple is $(P_b/P_a)^* MP_b = 1 * 6 = 6$, which is greater than the autarky real wage, 4 units of apple.

International trade equilibrium

- In the analysis above, the relative price for trade is given. But how is it determined in models?
- In practice, it is determined by international market competition. In theory to solve equilibrium:
- Derive home country supply curve of the export product
- Derive foreign country demand curve for the import product
- International price and quantity in trade equilibrium are simultaneously determined by 1) home country productivity and consumption preference; 2) foreign country productivity and consumption preference; 3) market clearing condition: home export = foreign import.

Beyond absolute advantage

- Absolute advantage theory attributes international trade to differences in absolute productivity or production cost.
- However, if one country has absolute advantage in both goods, can trade still occur between two nations?
- Ricardo made a brilliant and lasting contribution to economic thought by showing that even if one country is more efficient than another in producing all commodities, trade between the two nevertheless can be of mutual benefit.
- Trade is driven more than and goes beyond absolute advantage

Beyond absolute advantage: example

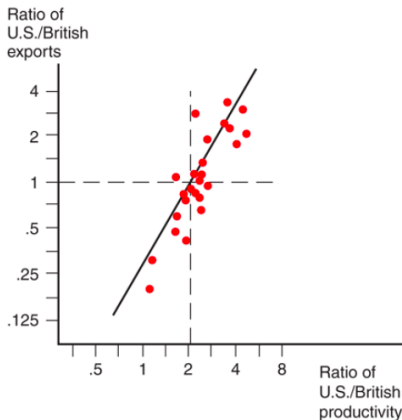
A very poor country like Bangladesh is less productive in almost all industries than China but the growth of its clothing exports were rapidly gaining those of China, previously the dominant supplier.

	B's output per worker as % of China	B's exports as as % of China
All industries	28.5	1.0
Apparel	77	15.5

Source: McKinsey and Company; UN Monthly Bulletin of Statistics. 2011.

Beyond absolute advantage: evidence

Bela Balassa (1963) compares the ratio of U.S. to British exports in 1951 with the ratio of U.S. to British labor productivity for 26 manufacturing industries. British labor productivity was lower than American productivity in almost every sector. Nonetheless, the amount of overall British exports was about as large as the amount of American exports at the time.



Model setup

- Home country can either produce 4 apples or 6 bananas per hour.
- Foreign country can either produce 3 apples or 2 bananas per hour.
- Average consumption preferences;
- No transportation and transaction costs.

		Home	Foreign
Productivity (unit/hr)	apple	4	3
	banana	6	2
Opportunity cost per unit output	apple		
	banana		

Summary table

		Home	Foreign	Total
Autarky equilibrium	apple	2	1.5	
	banana	3	1	
Production specialization	apple			
	banana			
Trade equilibrium	apple			
	banana			
Net gains from trade	apple			
	banana			

Note: exchange rate $(P_a/P_b)^* = 1 : 1$.

Gains from trade: U.S. embargo 1807-1809

- The U.S. Congress imposed a nearly complete halt on international trade at the request of President Thomas Jefferson between December 1807 and March 1809.
- A complete stop of all trade is called an embargo. The U.S. imposed its embargo because Britain was at war with Napoleon, and Britain wanted to prevent ships from arriving in France that might be carrying supplies or munitions.
- U.S. trade fell dramatically during this period. U.S. exports (e.g., cotton, flour, tobacco, and rice) fell from about \$49 million in 1807 to \$9 million in 1809. It is estimated that U.S. GDP was 5% lower than it would have been without the trade embargo.

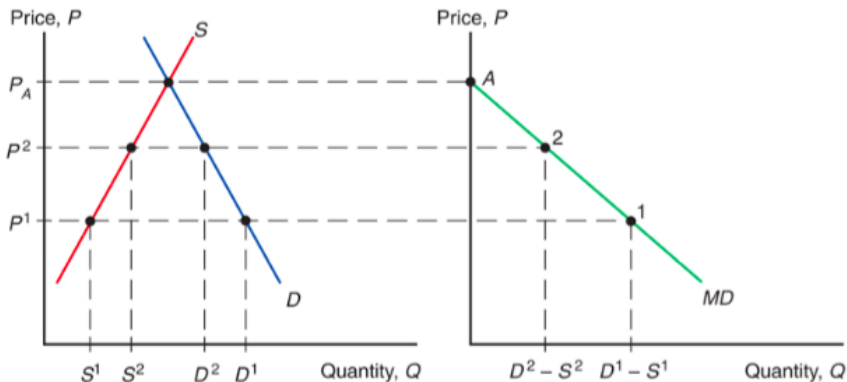
Gains from trade: Japan opening-up in 1854

- After 200 years of self-imposed autarky, Japan was forced by the U.S. to open up and establish commercial ties in 1854.
- When trade was opened, the prices of Japan's exports (e.g., silk and tea) to the U.S. increased, and the prices of U.S. imports (such as woolens) decreased.
- These price movements were a terms-of-trade gain for Japan.
- Benhofen and Brown (2005) estimate that Japan's gains from trade after its opening were 4% to 5% of GDP; Japan's trading partners, such as the U.S., also gained from being able to trade in a newly opened markets.

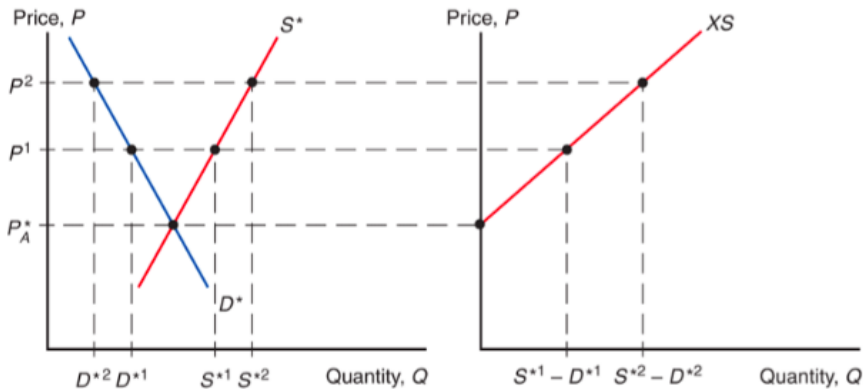
Demand and supply method

- An **import demand curve** is the difference between the quantity that Home consumers demand minus the quantity that Home producers supply, at each price.
- An **export supply curve** is the difference between the quantity that Foreign producers supply minus the quantity that Foreign consumers demand, at each price.
- In equilibrium, import demand = export supply, home demand – home supply = foreign supply – foreign demand
- Also, home demand + foreign demand = home supply + foreign supply, world demand = world supply.

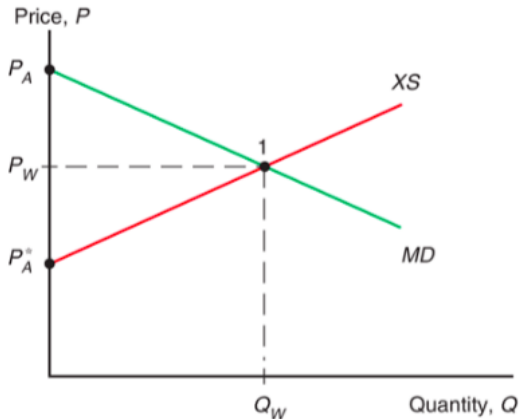
Deriving home import demand



Deriving foreign export supply



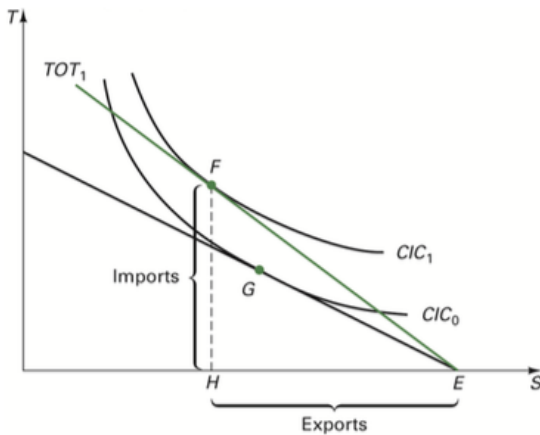
Deriving world trade equilibrium



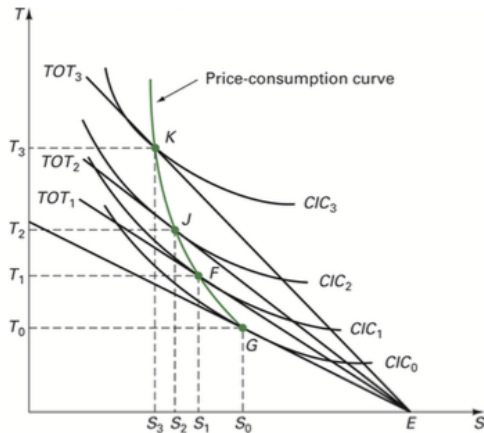
Offer curve method

- To determine international trade equilibrium, we need to solve for a unique price such that imports and exports are balanced in both countries.
- By adjusting the terms of trade (TOT), home country will export more of its advantaged goods for importing its disadvantaged goods from foreign country.
- This way we can trace out the home country's offer curve, drawn in an export-import system.
- Similarly, we can derive foreign country's offer curve.
- The international trade equilibrium is the intersection of the two offer curves.

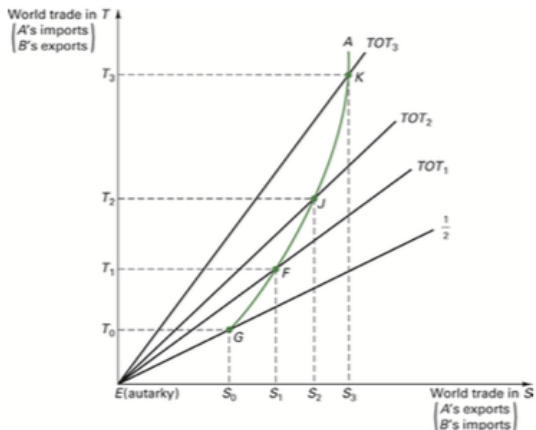
Home country's trade equilibrium



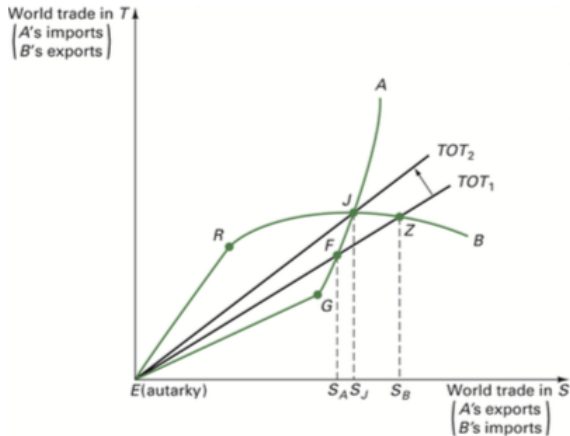
Home country's price-consumption curve



Home country's offer curve



International trade equilibrium



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- [3] Bela Balassa, 1963, An empirical demonstration of classical comparative cost theory, Review of Economics and Statistics, 45, 231-238.
- [4] D. Bernhofen and J. Brown, 2005, Estimating the comparative advantage gains from trade, American Economic Review, 95, 1, 208-225.