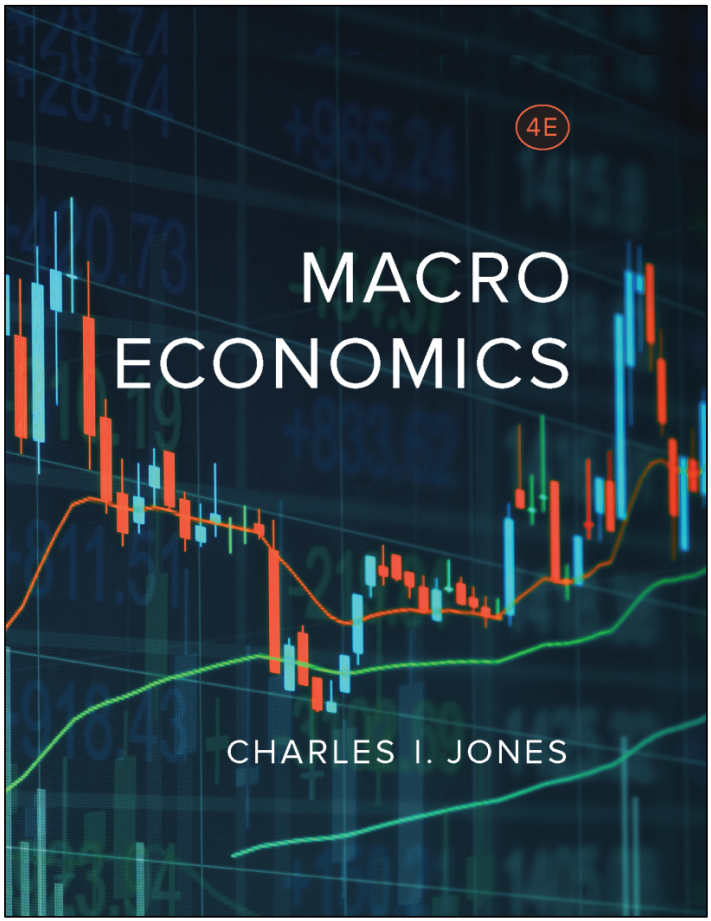
Chapter 19

International Trade



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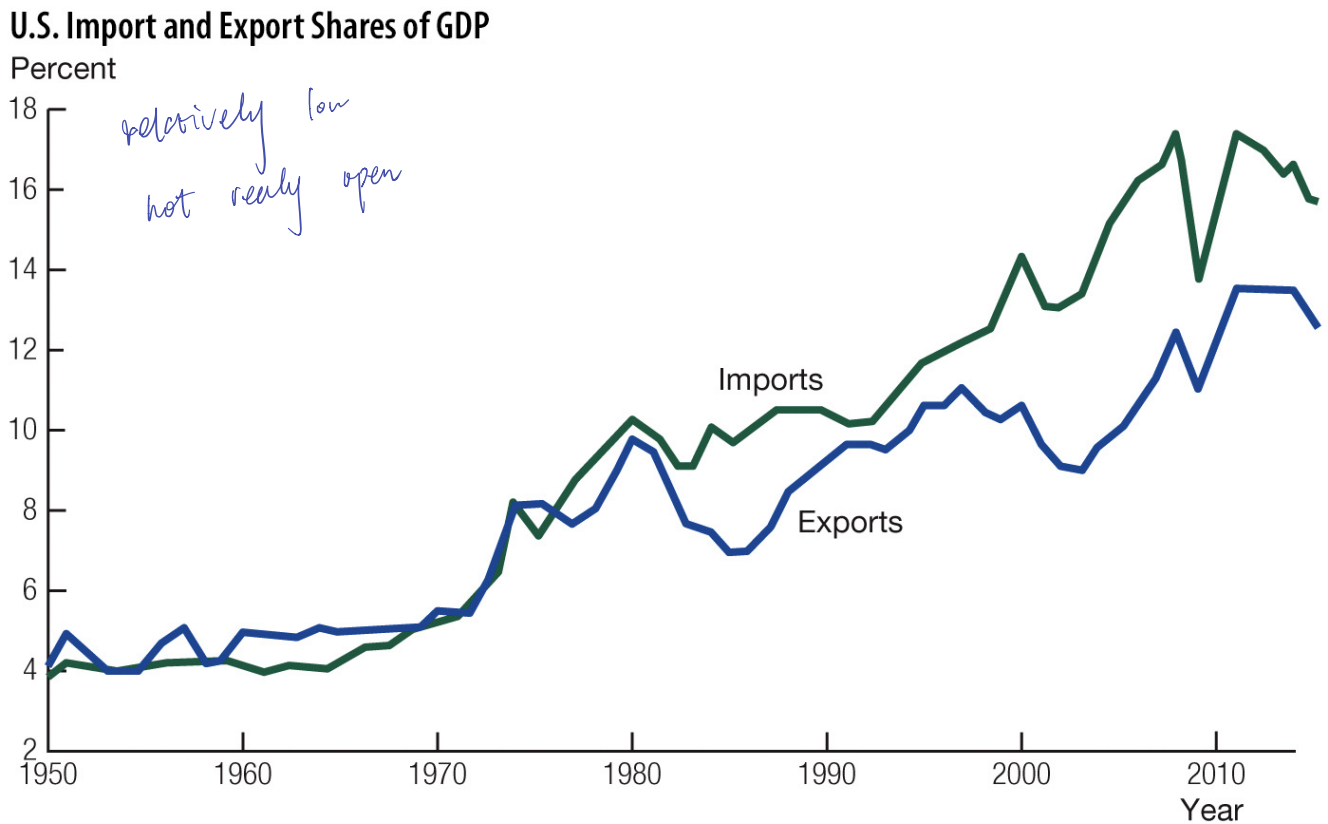
19.1 Introduction

- In this chapter, we learn:
  - Why countries trade goods and services
  - Why such trade can increase welfare
  - The roles of **comparative advantage** and **risk-sharing** in explaining trade between countries
  - The relationship between trade and the free flow of labor and capital across countries

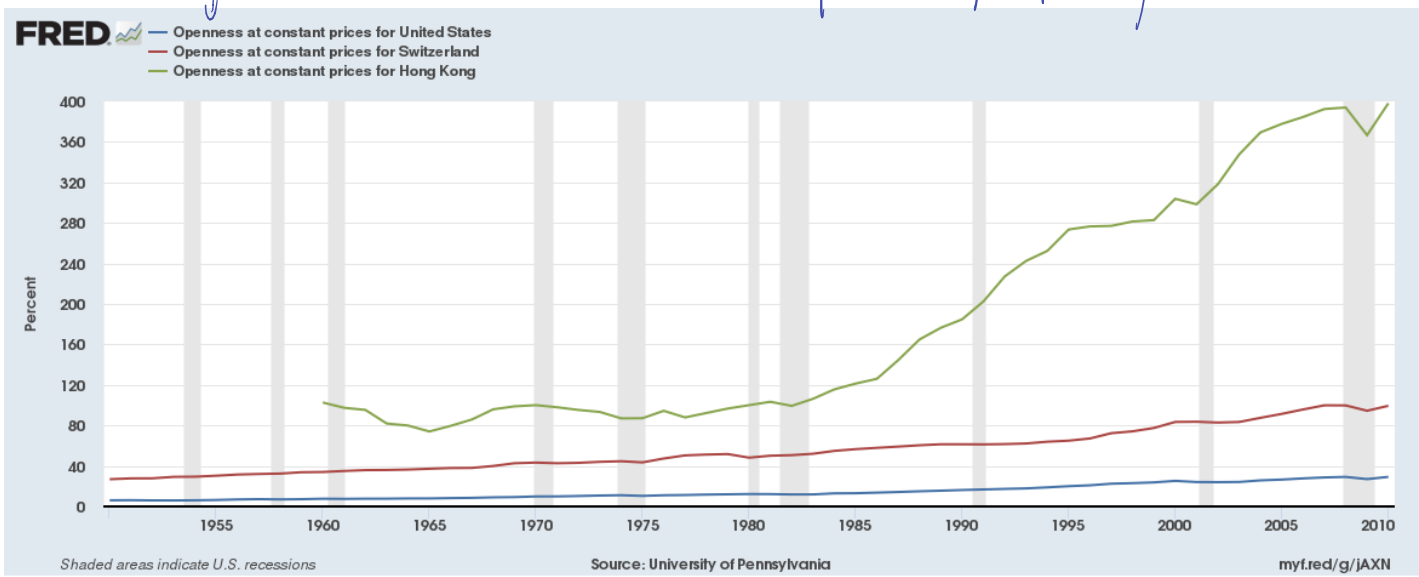
U.S. Import and Export Shares of GDP



Openness (Imports + Exports) relative to GDP

sum : import + export

openness go up everywhere. more/richer.

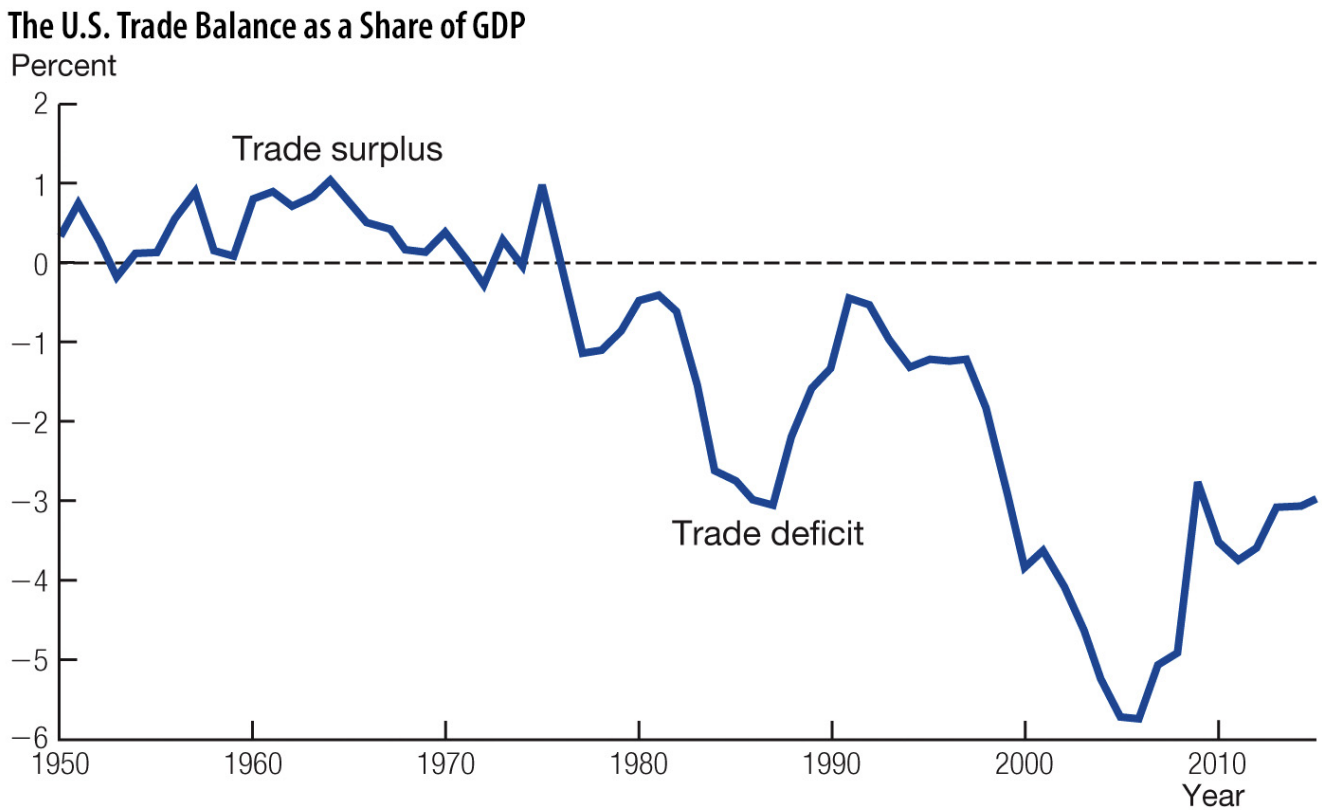


19.2 Some Basic Facts about Trade

- Imports and exports have been rising as a share of GDP over the last 50 years. Why?
  - Transportation cost have declined.
    - Deregulation (air freight, trucking)
    - containerization + intermodal cargo.
  - Countries have also reduced tariffs and quotas.
- Definition of trade balance:

  trade balance = net exports
  = exports − imports.

The U.S. Trade Balance as a Share of GDP



Some Basic Facts about Trade

- For the world as a whole:
  - Trade must be balanced

    world as a whole is a closed economy
  - Trade deficits in some countries must be offset by trade surpluses in other countries

19.3 A Basic Reason for Trade

- In the real world, someone else (at home and/or abroad) produces most of the goods an individual consumes
- Certainly, there's a lot of trade within countries (inter-national trade).
- Alternative: robinson crusoe economy.
  - each person produces all the goods he/she consumes.
  - inferior way of organizing an economy since there are gains from specialization.

A Basic Reason for Trade

- The motivation for international trade
  - Same as the reason for trade within a country
  - People value goods that other people produce more than they value what they themselves own
  - Individuals and countries can realize gains from trade

19.4 Trade across Time

- Trade is balanced if neither economy is running a trade surplus or deficit.
- Shocks such as a natural disaster may reduce the amount of the goods produced in an economy
  - However, individuals wish to smooth consumption over time. (for reasons similar to PI/LC hypothesis)
  - countries could trade over time to neutralize the impact of shocks.

Wheat Harvests in Oddtopia and Eventopia

TABLE 19.1

Wheat Harvests in Oddtopia and Eventopia

Year	1	2	3	4	5	6
			Wheat harvest			
Oddtopia	100	0	100	0	100	0
Eventopia	0	100	0	100	0	100
			Trade balance			
Oddtopia	+50	−50	+50	−50	+50	−50
Eventopia	−50	+50	−50	+50	−50	+50
			Consumption			
Oddtopia	50	50	50	50	50	50
Eventopia	50	50	50	50	50	50

The table shows the amount of wheat harvested every year in Oddtopia and Eventopia.

Trade across Time—1

- Intertemporal trade:
  -
  -
  -
  -

Trade across Time—2

- In the long run:
  - trade must be balanced
  - country budget const

What is the "Present Discounted Value" (PDV)?

for future payment you make.

- Present discounted value:
  -
  -

present discount value.

Present Discounted Value—1

- To calculate the value of a stream of **equal** payments over a given number of years:
  - Arranges the sum of each periods present discounted values into a geometric series.
  -

- If *a* is some number between 0 and 1, then calculating a geometric series is:

$$PDV = \frac{FV}{(1+i)^T} = FV\left(\underbrace{\frac{1}{(1+i)^T}}_{G(0,1)}\right)^T$$

Present Discounted Value—2

- The series for $100 initial payment for 20 years:

$$pdv = pdv_0 + pdv_1 \cdots \cdots pdv_{19}$$

$$= 100 \times \left[1 + \frac{1}{(1+R)} + \frac{1}{(1+R)^2} \cdots \frac{1}{(1+R)^{19}} \right]$$

$$= 100 \times \frac{1 - \left[\frac{1}{1+R}\right]^{20}}{1 - \left(\frac{1}{1+R}\right)}$$

- From previous page: If $a = 1/(1 + R)$, then:

$$pdv = 100 \times \frac{1 - a^{20}}{1 - a}$$

Trade across Time—3

- Trade deficit.
  -
  -
- Recall the national income identity:

$$Y = C + I + G + NX$$

- Rearranging:

$NX < 0 \Rightarrow C + I + G \rightarrow Y$.

↑ deficit $\Rightarrow$ building liability ↑.

Trade across Time—4

- Trade surplus (like Germany, for example):
  - net exports are positive.
  - some of what is produced is not used by domestic uses and can be shipped abroad.

$NX > 0 \Rightarrow C + I + G < Y$.

↳ less the produce

lending to the rest of world.

$Y = NX + C + I + G$

$NX = Y - C - I - G + T - T_{tax}$

$= \underbrace{Y - T - C}_{\text{Saving. govern}} - I + \underbrace{T - G}_{\text{public saving.}}$

S_{priv} S_{pub}

total saving.

trade balance = total saving - investment.

↓

insufficient to cover investment.

China: trade surplus : but should deficit

↓

below steady state.

US low saving rate ⇔ investing rate

insurance

Trade across Time—5

trade balance → 0.
improve welfare.

- Trade deficits are not inherently bad

country should run a trade deficit when

  -

  -

$MPK_T > R_T$
↑ away from steady state
depend on growth rate than global gdp
↓
borrow.
→ lending

19.5 Trade with Production

- Model:
  - Two countries: North and South
  - Two goods: Apples and computers
  - Assume each country spends half of its budget on each good
  - North…
    - has smaller labor force
    - is more productive ⇒ advantage in producing both apple & computer

The Setup of the North-South Example

TABLE 19.2

The Setup of the North–South Example

	North	South
Labor force	100	400
Number of apples one worker can produce	160	100
Number of computers one worker can produce	16	2

Trade with Production

- **Absolute advantage**
  - one economy can produce a particular good more cheaply than another country
  - even if
- **Comparative advantage**
  - the relative price of good is lower than in another economy.
- **Autarky** economies close to trade

Autarky—1

- Setting apple as the numéraire good, i.e. all prices in terms of apples
- The wage in the economy equals the number of apples a worker can produce

$$\frac{\text{price of apples} \times \text{consumption of apples}}{\text{wage, } w} = \frac{1}{2}$$

$$\frac{\text{price of computers} \times \text{consumption of computers}}{\text{wage, } w} = \frac{1}{2}$$

Autarky—2

- The price of a computer (p) equals the ratio of apples to computers that a worker can produce:
  - $P_N = \frac{160}{16} = 10$ $\quad P_S = \frac{100}{2} = 50.$
  - If the prices are different, everyone would produce only apples or computers, depending on which is more profitable.
- In the country with absolute advantage
  - wage is higher $\quad (W_N = 160,\ W_S = 100).$
  - computers are cheaper.

The North and the South under Autarky

TABLE 19.3

The North and the South under Autarky

	North	South
Wage, w	160 apples	100 apples
Price of a computer, p	10 apples	50 apples
Consumption of apples (per person)	80 apples	50 apples
Consumption of computers (per person)	8 computers	1 computer
Fraction of labor working to produce apples	50%	50%
Fraction of labor working to produce computers	50%	50%
Total production in the apple sector	8,000 apples	20,000 apples
Total production in the computer sector	800 computers	400 computers

Autarky—3

- Consumption of each good in each country:

$$\frac{w_{country}}{2} \Big/ p_{good,country} = q_{good,country}$$

- Consumption of computers:

$q_{computer\ N} = \frac{80}{10} = 8$ $\quad q_{computer\ S} = \frac{50}{50} = 1$

- Consumption of apples:

$\frac{80}{1} = 80$ $\quad \frac{50}{1} = 50$

Free Trade—1

- North
  - absolute ad in both goods.
  - comparative ad in producing computers.
- South
  - comparative ad. ---- apple
- Arbitrage
  - Buying a good from an economy where it is cheap
  - Selling it in an economy where it is expensive

Free Trade—2

- If countries specialize **completely** in their comparative advantage
  - Workers in both countries will be better off
- Northern workers
  - Consume more apples from the higher price of computers that they receive than under autarky
  - Wages will increase
- Southern workers
  - Can consume more computers
  - The price of a computer is now lower than it was in their country under autarky

The North and South with Free Trade

TABLE 19.4

The North and South with Free Trade

	North	South
Fraction of labor working to produce apples	0%	100%
Fraction of labor working to produce computers	100%	0%
Total production in the apple sector	0 apples	40,000 apples
Total production in the computer sector	1,600 computers	0 computers
Wage, w	400 apples	100 apples
World price of a computer, p	25 apples per computer	
Consumption of apples (per person)	**200 apples**	50 apples
Consumption of computers (per person)	8 computers	**2 computers**

Free Trade—3

- The solution can be verified by the market clearing condition: supply equals demand
  - World supply of apples = 40,000
    - All produced by the South
  - World demand of apples = 40,000
    - North: (200 apples x 100 people) = 20,000 apples
    - South: (50 apples x 400 people) = 20,000 apples
  - Analogously, you should check that demand = supply for computers

Lessons from the Apple/Computer Example

- Trade:
  - Makes people better off by allowing them to buy their goods from where they are cheap
  - Improves efficiency and welfare
  - Notes:
    - south is even
    -

19.6 Trade in Inputs

- If workers can work wherever they wish:
  - Workers will head to the more productive country where wages are higher
- Free trade
  - rely on comparative advantage
- Free migration
  - rely on absolute and
  - if no country ↑.
    no gains from free migration.

Trade in Inputs—1

- Assumptions
  - Workers are identical
  - The economy exhibits constant returns to scale
- Results
  - Wages and consumption bundles of the migrants will increase to the level of the original workers
  - The original workers will see no changes in their wages or welfare

Northern and Southern Workers with Free Migration

TABLE 19.5

Northern and Southern Workers with Free Migration

	Workers born in the North	Migrants from the South
Wage, w	160 apples	160 apples
Price of a computer, p	10 apples	
Consumption of apples (per person)	80 apples	80 apples
Consumption of computers (per person)	8 computers	8 computers
Fraction of labor working to produce apples	50%	
Fraction of labor working to produce computers	50%	
Total production in the apple sector	40,000 apples	
Total production in the computer sector	4,000 computers	

Trade in Inputs—2

- Under free migration
  -
- Under free trade
  -

Trade in Inputs—3

- The world as a whole is most efficient under free migration:
  - Output increases due to absolute advantage
  - Migration gains to the original Southern workers outweigh the foregone gains to the Northern workers from free trade
  - A deal could be made where some of the gains to the Southern workers are paid to the Northerners for switching from free trade to free migration

Moving Capital versus Moving Labor

- Recall: Solow model
  -
  -
- Free migration is more effective
  -

19.7 The Costs of Trade

- In reality:
  - Finding new jobs may take time and some workers may be unemployed
  - Farming and computer skills are different. Job training may be required

The Costs of Trade

- Trade can have winners and losers within each country
  - Job losses are usually concentrated in specific industries
  - Gains from lower prices are spread across the entire economy
  - Losers can be compensated by the winners
- Politically:
  - A strong social safety net and job retraining programs are likely important to encouraging and sharing the benefits of trade
  - Asymmetry of gains and losses can explain anti-free-trade sentiment