EC569 Economic Growth
Growth in the Open Economy (Lecture 8)

İlhan Güner
School of Economics
University of Kent

March 5, 2018

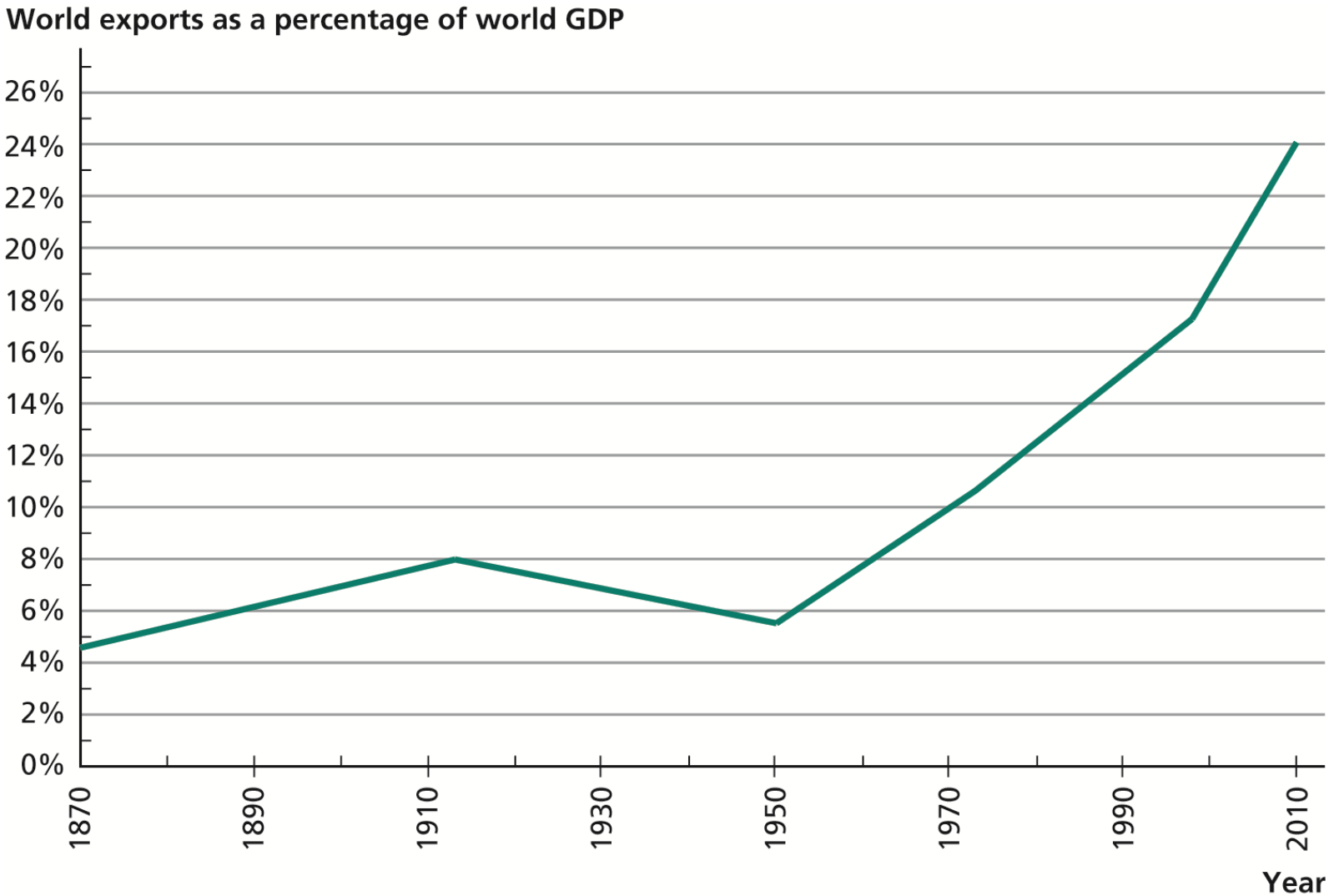
Overview

1. How does being open to world economy affect a country's economic growth?
2. What are the particular channels through which openness affects growth?
3. Why are some people opposed to openness?

Autarky versus Openness

- **Autarky**: a country does not interact economically at all with the rest of the world
- Openness
  - the exchange of final goods and services
  - flow of factors of production across borders
- Measuring openness
  - Quantities of goods and factors flow across borders
  - **Law of one price:** if two countries trade freely with each other, the same good will sell for the same price in both markets

Figure 11.1: Growth of World Trade, 1870–2010



Sources: Maddison (2001), World Bank (2007a).

Growth of world trade

- 1st wave of globalization: mid 1800s - 1914
- retreat from global integration: 1914 - 1950
- 2nd wave of globalization: 1950 -

Globalization: the Facts

- Capital mobility
  - golden age of international capital flows: late 1800s-WWI
  - retreat from global integration: WWI - 1990
  - emerging market investment boom: 1990 -
- Labor mobility
  - peak of labor market integration: 1914
  - end of colonization
  - the rise of nationalism: WWII-
  - current wave of globalization

Globalization: The Causes

- Decline in transport costs
- Increase in the ease of transmission of information (decline in the cost as well)
- Trade policy

Transport Costs

- Before 1800
  - Sailing ships, canal boats, animal-drawn carts
  - Slow and expensive
  - international trade if large differences in the price of goods among countries
  - high ratio of value to weight, e.g., gold and spices
- In the 19th century
  - Railroad and steamship reduced cost of transportation
  - In 1850, the US had 9,021 miles of railway
  - In 1910, the US had 249,902 miles of railway
- Containerized freight (1953) led to 2–fold increase in the speed with which ships are loaded
- Air freight after WW2

Transmission of Information

Time required for the information to flow from London to New York

- In the early 19th century, by sailing ship, 3 weeks
- By 1860s, by steamship, 10 days
- in 1866, by transatlantic telegraph, 2 hours
- in 1914, one minute
- in 1927, the US - British telephone service (by radio)

Transmission of Information, cont'd

Cost of a three-minute call between London and New York (in 1996 dollars)

- in 1930: $300
- in 1960: $50
- in 1996: $1
- now: free over the internet

Reduction in communications costs

- simplified the coordination of economic activity
  - enabled freer flow of goods and factors of production
- allowed new types of trade (in services)

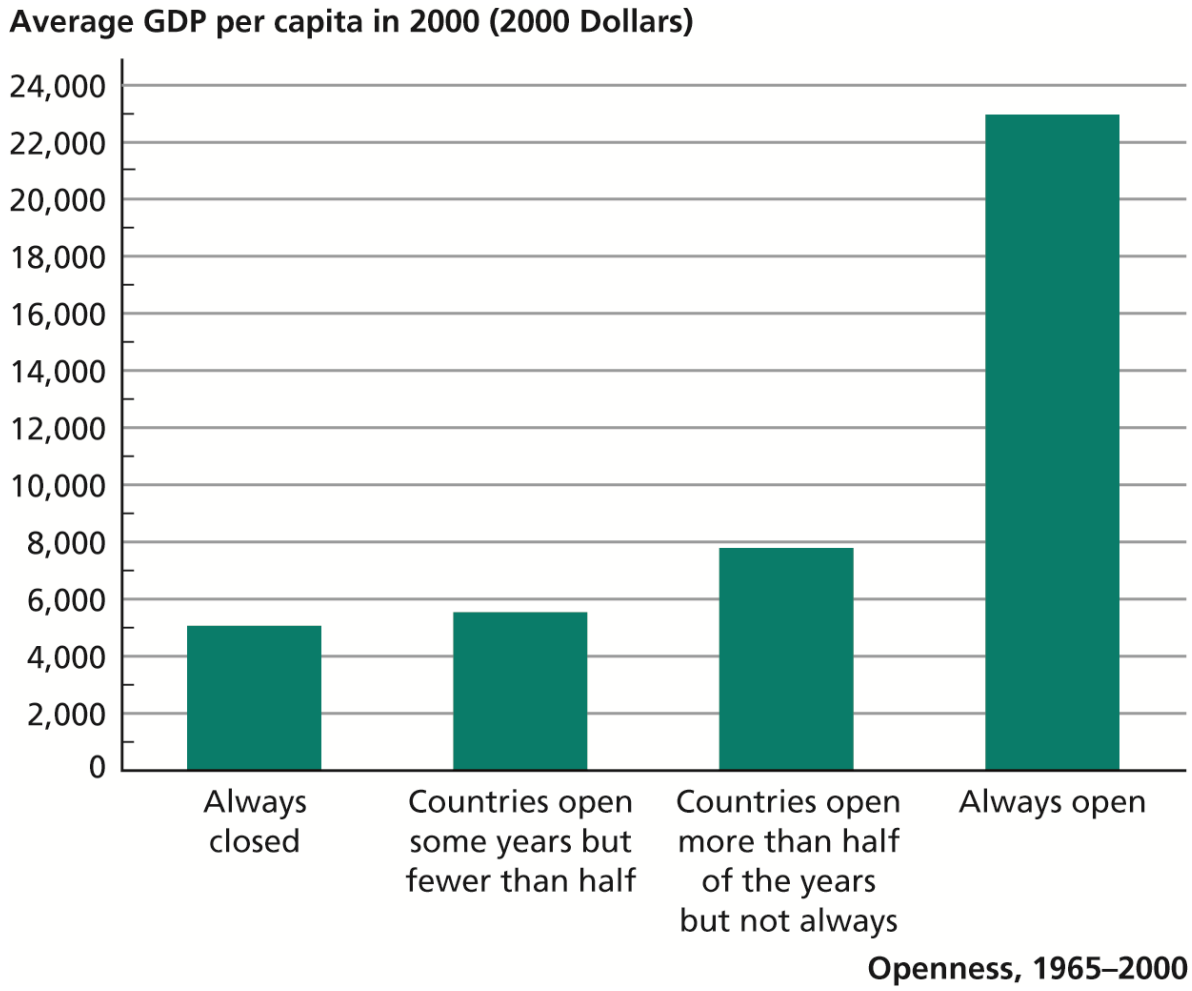
Trade Policy

- Reductions in trade restrictions (GATT, WTO)
- Average tariffs in the industrial countries
  - 40% at the end of WW2
  - 6% by 2000
- In 2010, average tariff were 2.8% among OECD countries
- 8.2% among middle-income countries
- 11% among poor countries
- Among industrialized countries, the highest tariff is on aggriculture

The Effect of Openness on Economic Growth

How does being open to world economy affect a country's economic growth?

Figure 11.2: Relationship between Economic Openness and GDP per Capita

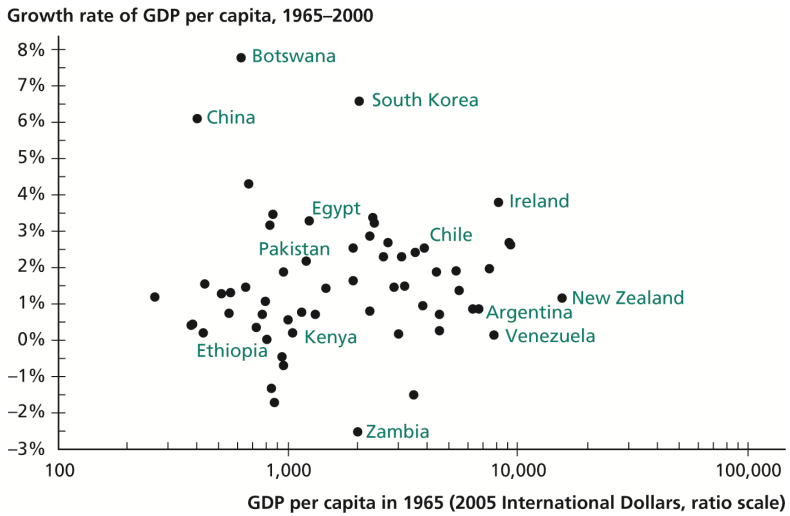


Sources: Sachs and Warner (1995), Wacziarg and Welch (2008).

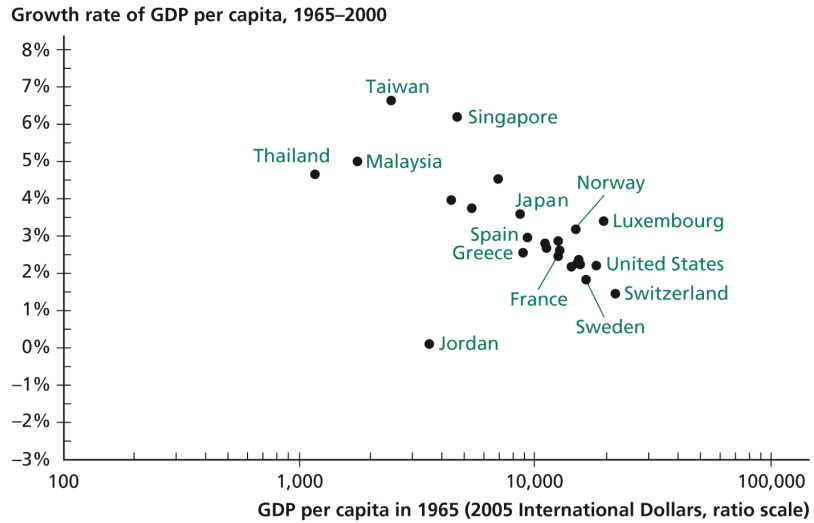
Figure 11.2

- Measure of openness: level of tariffs, manipulation of exchange rate, and government monopoly on export
- For each year from 1965-2000: 1 if open, 0 if not
- Always open countries are 4.5 times as rich as never open countries
- Countries open more than half the time are 1.5 times as rich as countries that are open less than half the time

Figures 11.3 and 11.4: Growth in Closed and in Open Economies



Sources: Sachs and Warner (1995), Wacziarg and Welch (2008), Heston et al. (2011).



Sources: Sachs and Warner (1995), Wacziarg and Welch (2008), Heston et al. (2011).

- Closed economies (left graph): closed for some or all the years with the available data
- Open economies (right graph): open entire period
- Average growth: 1.5% in the closed group, 3.1% in the open group
- Negative relationship between initial GDP and growth in the open economies

How Changes in Openness Affect Growth

- Trade liberalization led to rapid growth in
  - Japan (1858) 65% increase in growth over two decades
  - South Korea (1964-1965), income doubled in 11 years
  - Uganda and Vietnam (1990s)
- Trade embargo in the US (1807-1809, Jefferson) led to unemployment and bankruptcies

The Effect of Geographical Barriers to Trade

- Geography: an exogenous factor that affects openness to trade
- Frankel and Romer (1999)
  - Geographical factors affect trade
  - How does geographically determined trade volume affect income per capita?
  - Raising the ratio of trade to GDP by one percentage point would raise income by .5%–2%
- Feyrer (2009a, 2009b)
  - Natural experiment: Closing of the Suez Canal (Egypt – Israel fight, 1967–1975)
  - Significant reduction in trade volumes for countries that trading distance increased as a result
  - Air freight led to increase in trade volume
  - Led to increase in income (if trade cost decreased)

Openness and Growth

What are the particular channels by which being open to the outside world affect's a country's level of income per capita?

- through factor accumulation
- through productivity

Growth with Capital Mobility

Physical capital flows across national borders through

- foreign direct investment ($248M of $659M private capital flows into developing countries, 2010)
- portfolio investment
- government grants
- lending from banks and multinational agencies like World Bank

Solow Model in the Open Economy

- An economy fully open to capital flows
  - Investment can be financed by foreign savings
  - Domestic savings can finance foreign investment
- Law of one price holds ($r = r_w$)
- Small open economy
- Output per worker

$$y = Ak^{\alpha}$$

- rental rate of capital

$$r_w = r = \text{MPK} = \alpha A k^{\alpha - 1}$$

- capital per worker

$$k = \left(\frac{\alpha A}{r_w} \right)^{1/(1-\alpha)}$$

Solow Model, cont'd

- Output per worker

$$y = Ak^{\alpha} = A\left(\left(\frac{\alpha A}{r_w}\right)^{1/(1-\alpha)}\right)^{\alpha} = A^{1/(1-\alpha)}\left(\frac{\alpha}{r_w}\right)^{\alpha/(1-\alpha)}$$

- **Implication #1:** Output per worker does not depend on saving rate as opposed to output per worker in the closed economy, $y^{ss} = A^{1/(1-\alpha)}\left(\frac{\gamma}{n+\delta}\right)^{\alpha/(1-\alpha)}$
- GDP per worker will not be higher in the higher saving rate country
- GNP per worker will be higher in the higher saving rate country

GNP vs Saving Rate

- Closed economy: $\uparrow$ saving rate $\Rightarrow \uparrow$ investment rate $\Rightarrow \uparrow$ capital stock $\Rightarrow \uparrow$ GDP
- Open economy: $\uparrow$ saving rate
  - Increase in capital stock would lower the marginal product of capital
  - transfer capital abroad (higher return)
  - until marginal product of capital equals world level
  - capital stock per worker returns to its original level
  - GDP stays the same
  - GNP goes up

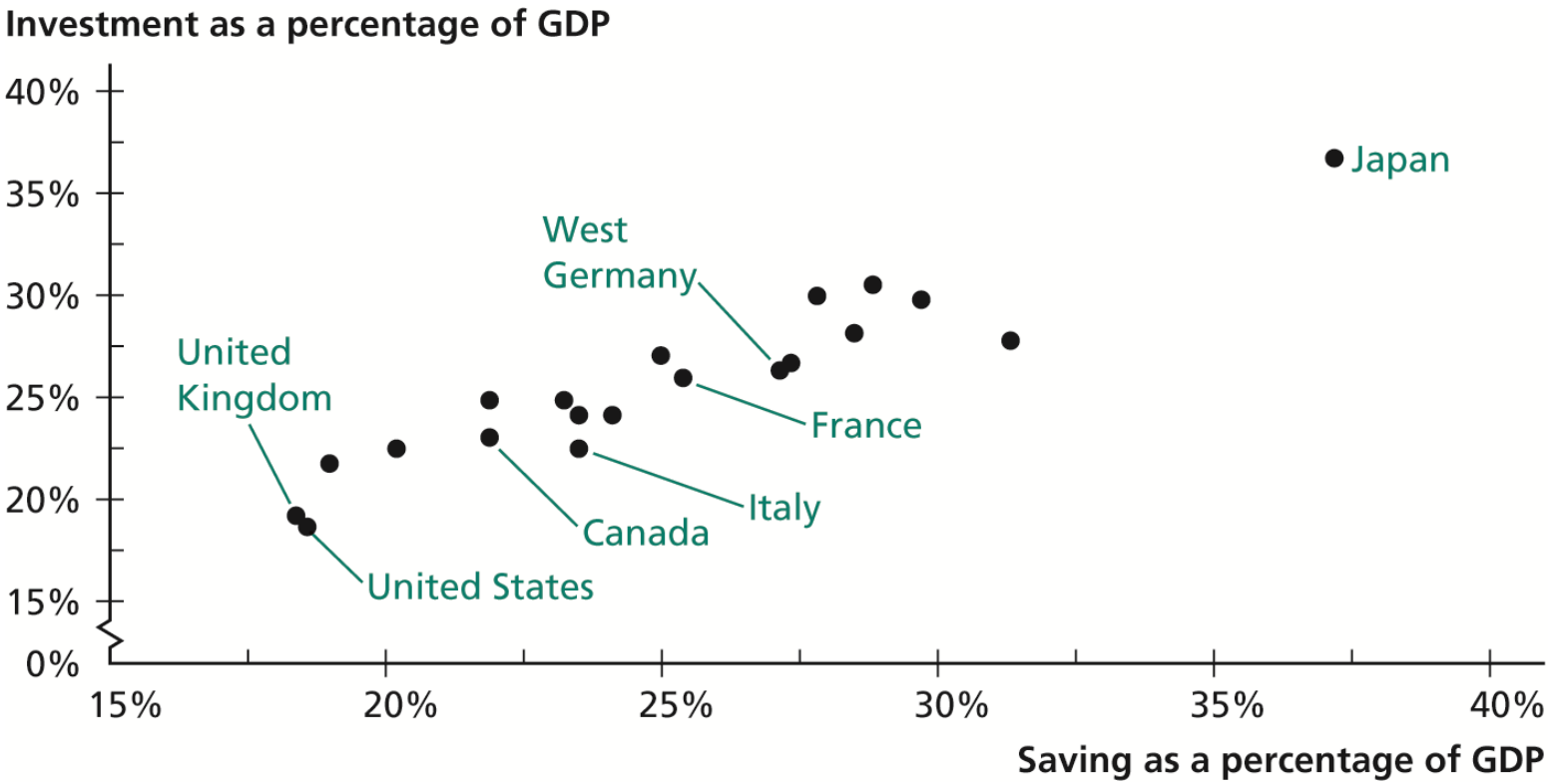
Solow Model, cont'd

- **Implication #2:** Opening to free capital flow raises GDP of low saving rate country
- A country with low level of capital (after war or a natural disaster) would benefit from opening to free capital flow
- **Implication #3:** Opening to free capital flow decreases GDP of high saving rate country
- GNP in both low and high saving countries will be higher after openness to trade

Feldstein-Horioka Puzzle

- saving and investment rates should be uncorrelated in the open economy
- savings retention coefficient: fraction of additional saving ending up as additional domestic investment
  - 0.89 for the period 1960-1974
  - 0.60 for the period 1990-1997
- Presumption of free capital movement is inappropriate

Figure 11.5: Saving and Investment Rates of Industrialized Countries, 1960–1974



Sources: Feldstein and Horioka (1980).

Lucas Paradox

- capital should flow from capital rich countries to capital scarce countries
- major capital flow from China to the US

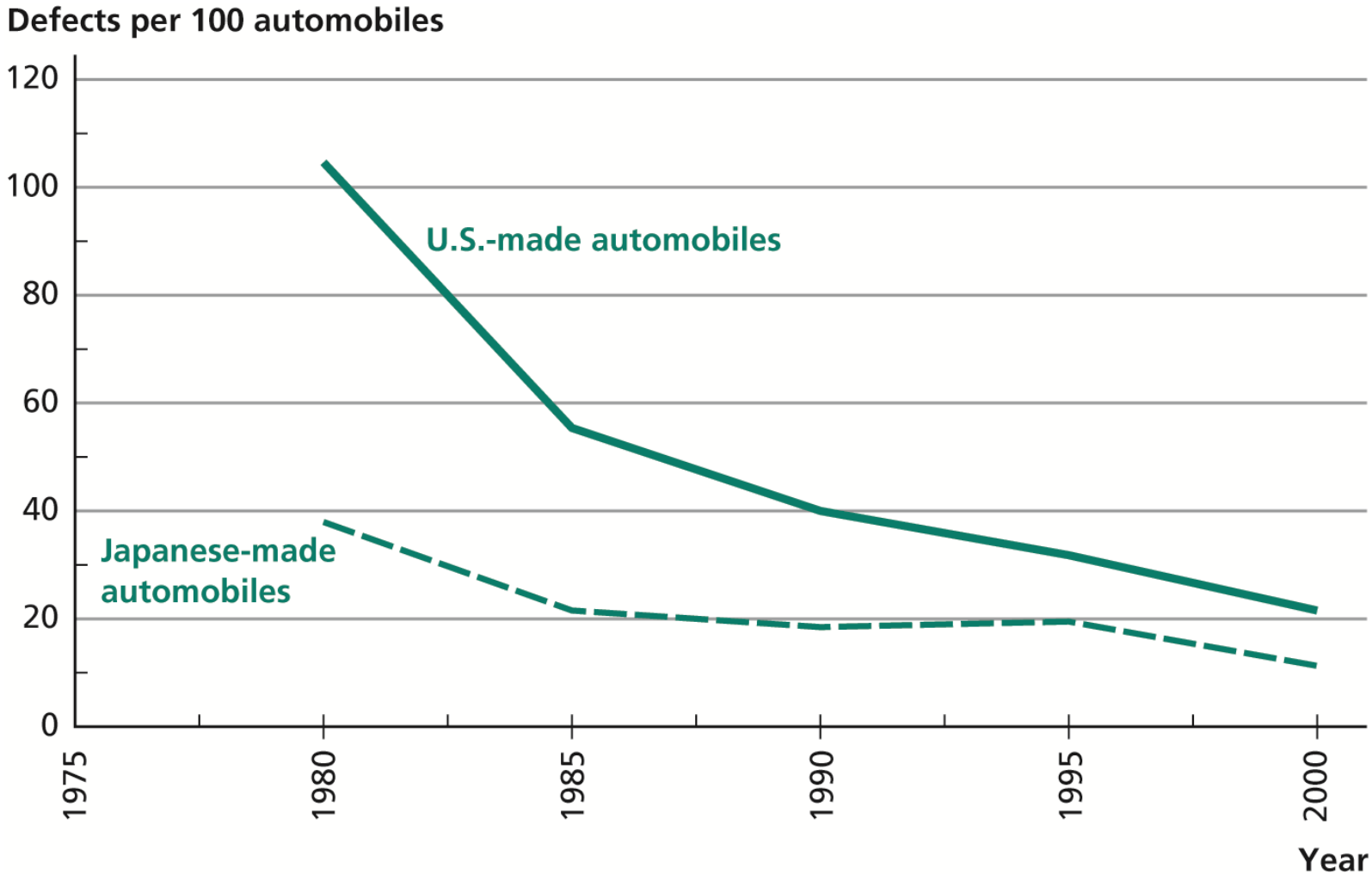
Openness and Productivity

- Gains from trade
  - comparative advantage: improvement in resource allocation
    - Natural endowments: tropical fruit in Guatemala
    - Abundance of factors of production well suited to production of a good: the polishing of small diamonds in India
    - It has already specialized in it (movies in the US)
  - increasing returns to scale leads to gains from specialization even without comparative advantage
  - Tariff reduction agreements under the Uruguay Round (1986–1994) raised world purchasing power by $73B per year (.2% of world GDP) [Brown, Deardorf and Stern (2002)]

Openness and Productivity, cont'd

- Competition
  - exposure to global competition forces improvement in efficiency
  - weakens monopolies who lead to resource misallocation
  - in 1965: imports account for 6% of the U.S. car market
  - in 1980: 27% (75% of which was from Japan)
  - Led to increase in quality of American cars
  - After completion the US - Canada trade agreement, productivity in previously protected industries rose 3 times as unprotected industries

Figure 11.6: Quality of U.S.-and Japanese-made Automobiles



Source: "Are Today's Cars More Reliable?" *Consumer Reports* 66(4) (April 2001), p. 12.

Openness and Productivity, cont'd

- Technology transfer
  - foreign direct investment: factories, management
  - importing embodied technology: key inputs, capital goods
  - importing ideas generated abroad
  - interaction among countries: innovative organizational techniques
- Incentive to R&D
  - larger market and profit opportunity

Opposition to Openness

- Workers and firms that have comparative disadvantage
  - Reallocation of factors of production to different sectors / geographies are costly
  - Adjustment takes long time
  - Gains accrue to large number of people, each gains a small share
  - Losses accrue to small number of people, each shoulder a high burden
- Firms losing monopoly power
- Owners of factor of production (openness leads to lower returns if capital was scarce before openness)
- Higher return to low educated people without trade

Thank you!

Transport Costs, cont'd

- 1838: regular steamship transport across the Atlantic ocean began
- Only high value items
- In the 19th century, shipping cost decreases by .88% per year
- 1842: the fastest ocean liner, 10 knots top speed
- 1912: 18 knots top speed
- Suez Canal (1869) cut London - Bombay trip by 41%.
- The total carrying capacity of world shipping increased by a factor of 29 between 1820 and 1913.
- 1920, average cost of shipping one ton of freight: $95
- 1990: $29
- Containerized freight (1953) led to 2–fold increase in the speed with which ships are loaded
- Air freight after WW2

Implications of Declining Transport Costs

- 1870: Wheat was 58% more expensive in London than in Chicago
- in 1913: gap was 16%
- Annual export of cut flowers from Kenya to Europe: nothing in 1960s to $446 M in 2008
- Second half of 20th: value of weight ratio in the US increased threefold
- Lighter materials: transistors, fiber-optic cable
- weightless goods: entertainment, communications, specialized knowledge

	Price Before Opening (U.S. cents per pound)	Price After Opening (U.S. cents per pound)
Tea	19.7	28.2
Sugar	22.7	11.2

Source: Huber (1971).