The Global Economy

Trade Theory

NYU STERN

Roadmap

- In the news: Nobel at Stern!
- PS1 Question 4
- Trade facts
- Ricardo's model of trade
- Distributional aspects of trade
- Trade policy

In the News: Sargent and Inflation

- Models of inflation in the 1960s and 1970s implied a very high output cost of reducing inflation. The output lost for each percent of such *disinflation* is called the "sacrifice ratio." In these models, the sacrifice ratio is structural. Inflation has its own momentum, and can be lowered only by keeping output sharply below potential.

- Sargent: "[Stopping inflation] would require a change in the policy regime: … How costly such a move would be … would depend partly on how resolute and evident the government's commitment was."[1] The key point is that *inflation depends on the behavior of wage- and price-setters who are forward looking*.

- In this view, the sacrifice ratio is not structural, but depends on the policy regime. If the policy commitment to lower inflation is credible, a quick disinflation may result in a lower sacrifice ratio because expectations about wages and prices adjust rapidly.

[1]Thomas Sargent, "The Ends of Four Big Inflations," 1982.

Sacrifice Ratio in Practice

- Volcker disinflation: What happened?
  - Volcker Fed changes policy regime: Targets reserves to lower inflation (Oct 1979 to Oct 1982)
  - 1981-85: Inflation drops by 6.7 pct points
  - Old models would anticipate output loss of about 33% relative to trend (Mankiw, 6e, p. 393)
  - Estimated loss: about 19% (Mankiw, 6e, p. 395)
- Ball (1993) examines 65 episodes of disinflation in 19 OECD countries with moderate inflation:
    - Sacrifice ratio declines with speed of disinflation ("cold turkey" policy shock cuts output losses)
    - Sacrifice ratio declines with flexibility of labor contracts (especially with contract duration)

PS1 Q4: Classify the data

- Put numbers into
  - Final expenditures
  - Payments to labor or capital
  - Intermediates

- By sector, VA=wL+rK
  - A way to check your work

Cafes

- Cheeseburgers
  - 50K in sales   Consumption
  - 7K beef sesame seeds Intermediates, imports

  - 10K catsup   Intermediates
  - 20K wages   Payment to labor
  - 3K rent   Payment to capital
  - 10K profit   Payment to capital

- VA = 50 – 7 – 10 = 33

Tomatoes

- Tomatoes
  - 8K sales to catsup makers   Sales of intermediate
  - 2K exports   Exports
  - 9K wages   Payment to labor
  - 1K rent   Payment to capital

- VA = 8+2-0=10

Blenders

- Blenders
  - 40K exports   Exports
  - 60K local sales   Consumption
  - 15K metal   Intermediate, Import
  - 15K CNC machine   Investment, Import, Payment to Capital
  - 70K wages   Payment to Labor

- VA = 100 – 15 = 85

Government

- Government
  - 10K taxes collected   Transfer
  - 10K regulator wage   Payment to labor, Gov't spending

- VA = 10

Catsup

- Catsup
  - 10K sales to local cafes   Sales of Intermediate
  - 8K tomatoes   Intermediate input
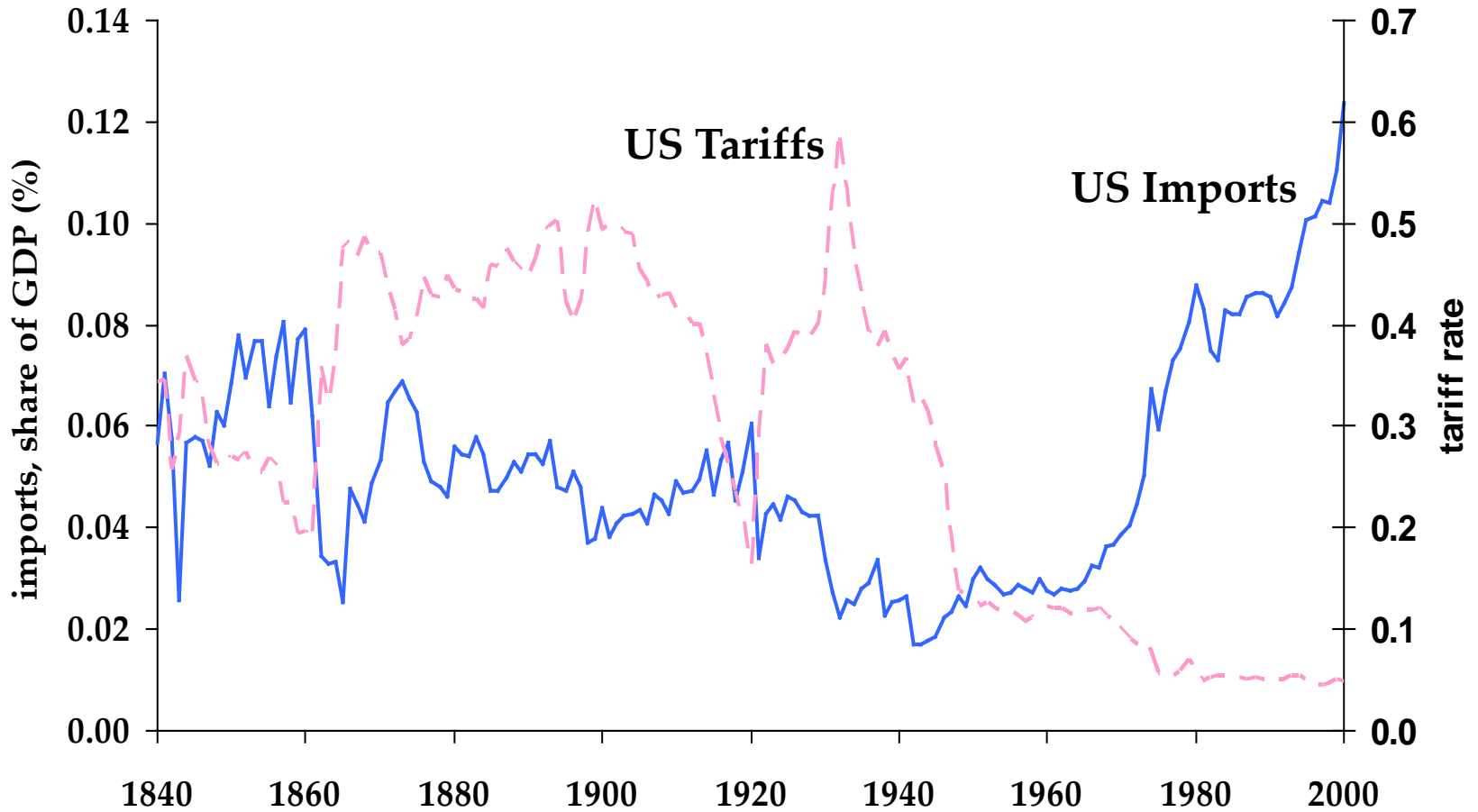 - 2K wages   Payment to labor

- VA = 10 – 8 = 2

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- Distributional aspects of trade
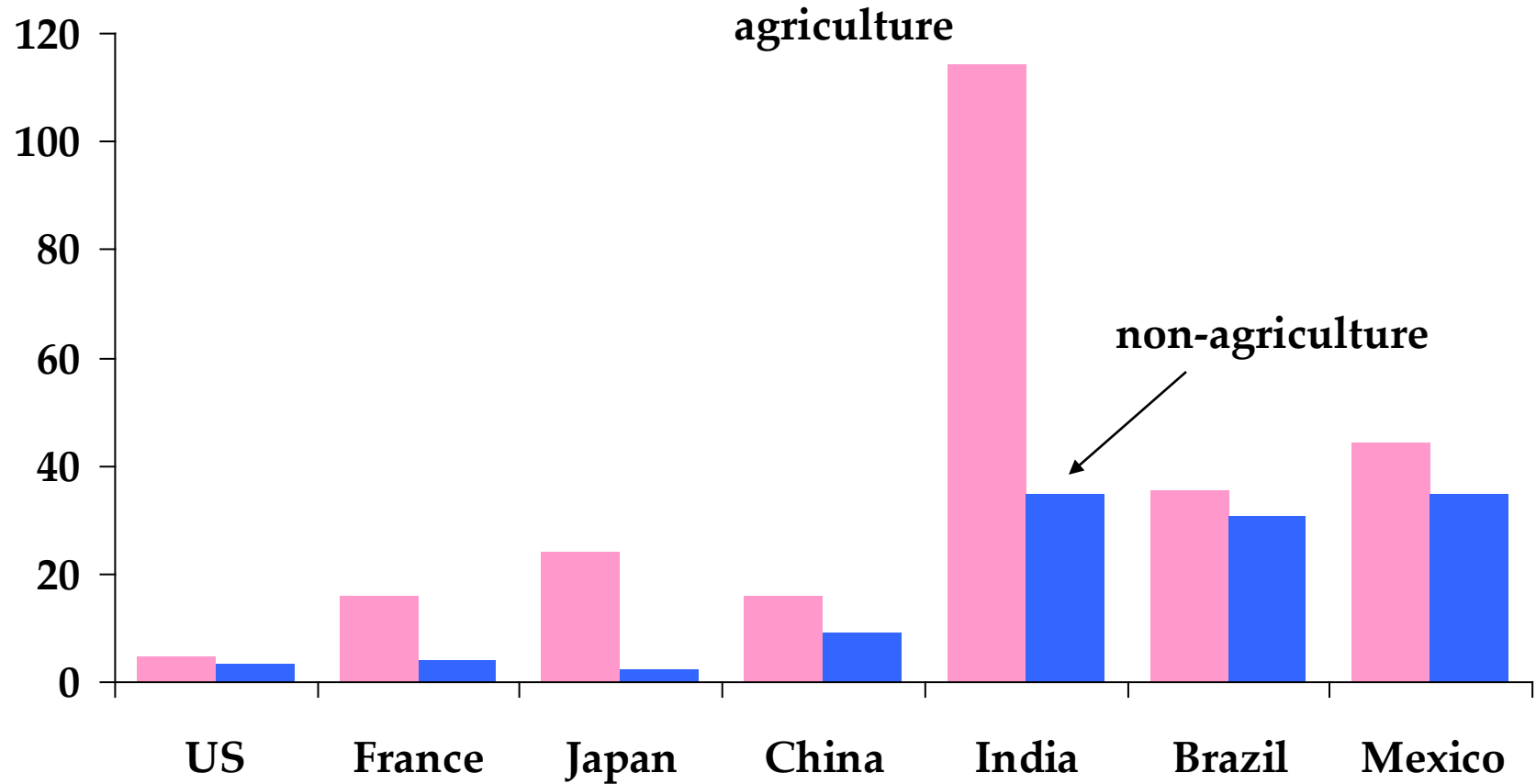- Trade policy

World trade has grown quickly

World trade / GDP

…but hasn't always

Average tariffs
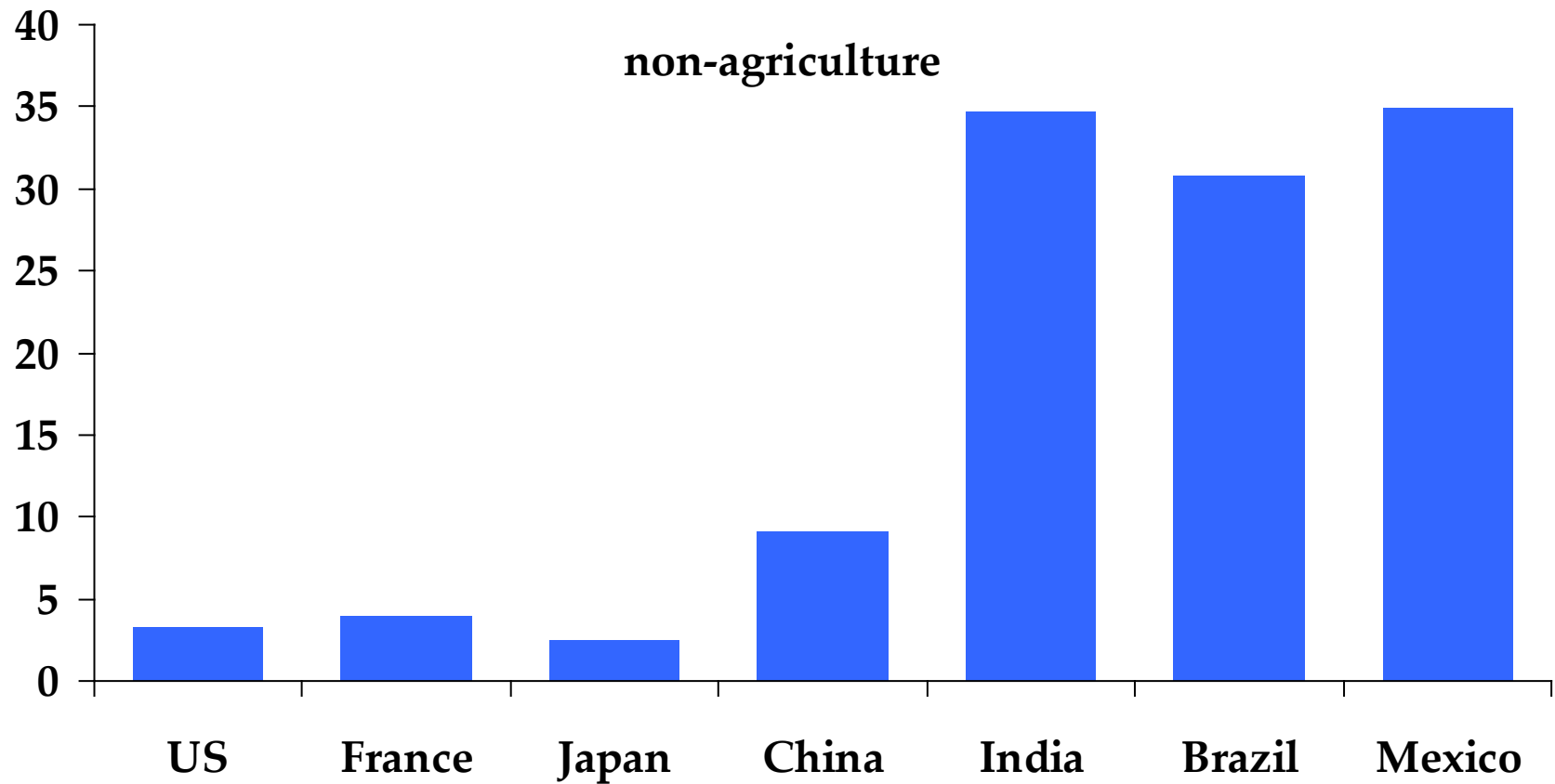
Average tariffs

More than just tariffs

- Subsidies to producers
  - Agriculture in "rich" countries
- Health and safety regulations
- Voluntary export restraints
- Anti-dumping duties

Trade facts

- Trade is becoming increasingly important
  - Reversals are possible, e.g. great depression
- Many ways to stifle trade
  - Tariffs, regulations, paperwork
- Barriers on manufactured goods low
- Barriers on agriculture much higher
  - Especially in rich countries

The logic of markets

- Adam Smith, *Wealth of Nations* (1776)

  - By pursuing his own interest, **[an individual] is led by an invisible hand to promote the interest of the society** more effectively than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. (paraphrase)

  - Logic: if two people voluntary exchange products, it suggests that both find it in their interest. It's "win-win." **Economic activity is a positive sum game.**

The logic of markets

- First theorem of welfare economics

  – Under certain conditions, **competitive markets produce a good allocation of resources**.

- What conditions?

  – Clearly defined property rights, full information

- What do we mean by a "good allocation"?

  – No one can be made better off without someone else being made worse off. ("Pareto optimal")

The logic of trade

- Voluntary exchange is "win-win"

  - Suppose two people or firms value a product or asset differently

  - Trade benefits both

- Questions

  - How do we prove this?

  - At what price do we trade?

  - How are the benefits distributed?

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Ricardo's model of trade

- David Ricardo (1817)

  - Two goods: fixed productivity in production

  - With free trade: each country produces one good

- Key concept: comparative advantage

  - Each country should produce the good at which it is comparatively most productive

Comparative advantage: true and non-trivial

Nobel laureate Paul Samuelson (1969) was challenged by the mathematician Stanislaw Ulam to:

"Name me one proposition in all of the social sciences which is both true and non-trivial."

His response: **comparative advantage**.

"That it is logically true need not be argued before a mathematician; that it is not trivial is attested by the thousands of important and intelligent men who have never been able to grasp the doctrine for themselves or to believe it after it was explained to them."

Ricardo: setup

- Two countries: US, Mexico
- Two goods: apples, bananas
- One input (labor)
- Production function: $Y = AL$ (no K)
- Productivities A (output from one unit of labor):

	Apples/hr	Bananas/hr	Labor (hrs)
US	20	10	100
Mexico	5	5	100

Opportunity cost

- Opportunity cost: the opportunity you forego when making a choice
  - This context: bananas you give up to make one more apple
- For the U.S.
  - 1 apple takes 1/20 hours
  - In 1/20 hours could make 1/20 * 10 = 0.5 bananas
  - The opportunity cost of 1 apple is 0.5 bananas

	Apples/hr	Bananas/hr	Labor (hrs)
US	20	10	100
Mexico	5	5	100

Production possibilities in U.S.

b

1000

Slope = -0.5

2000   a
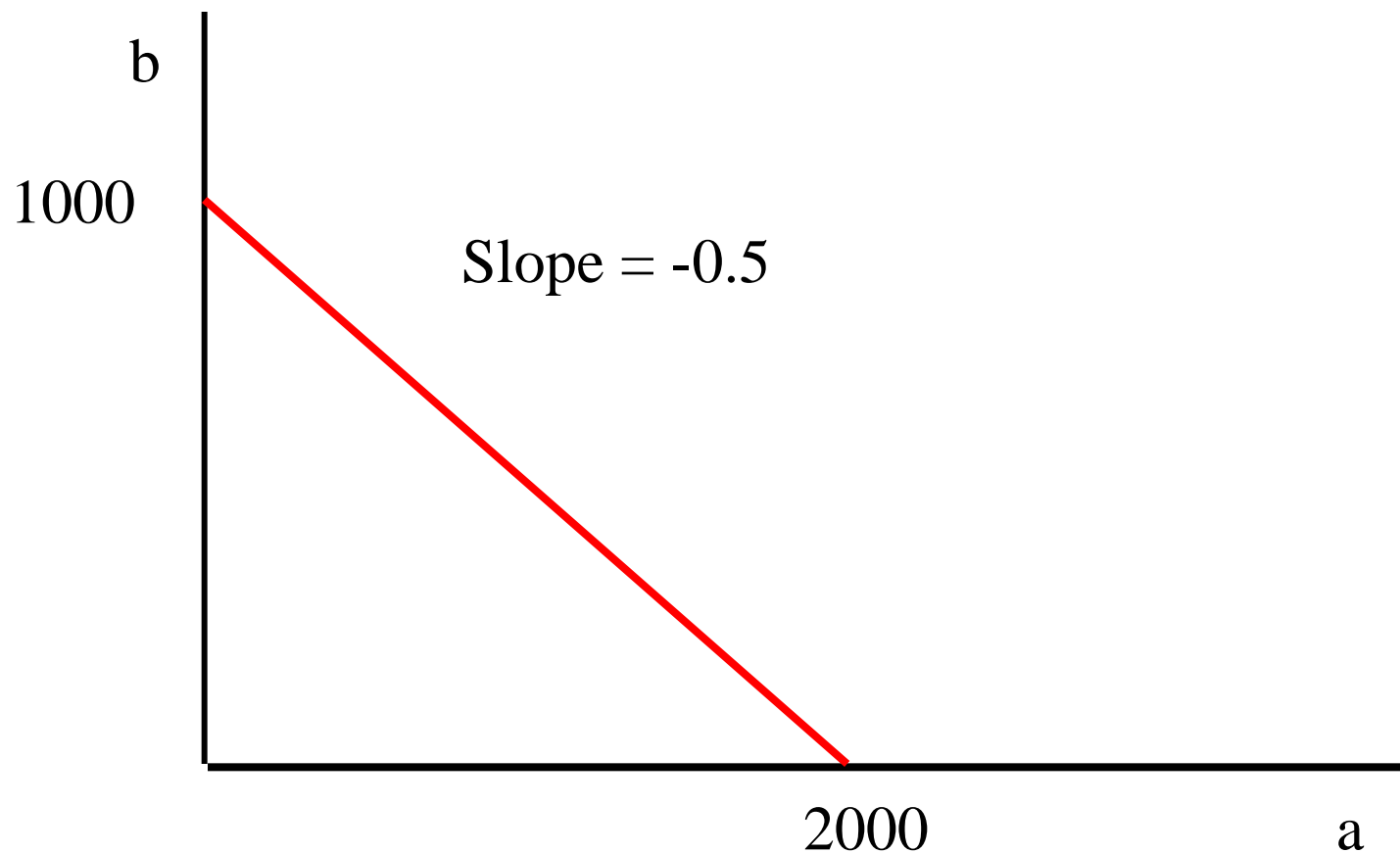
Opportunity cost

- Opportunity cost in Mexico for one apple? One banana?

	Apples/hr	Bananas/hr	Labor (hrs)
US	20	10	100
Mexico	5	5	100

Production possibilities in Mexico

Slope = -1.0

b

500

500

a
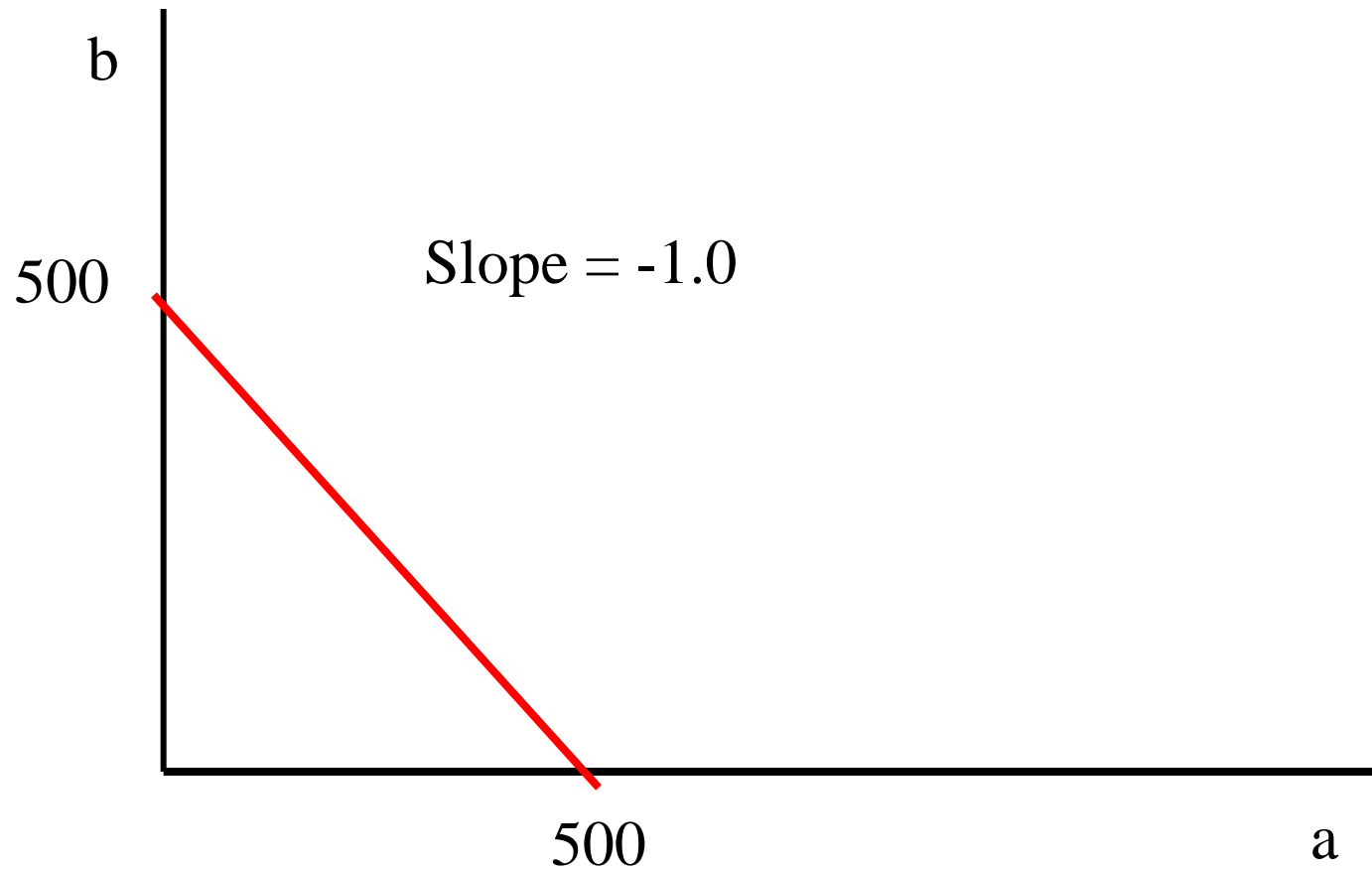
No trade: "autarky"

- In a closed economy

  Production = consumption

  Production possibility set = consumption possibility set

Prices in autarky: U.S.

- Apple production

$$\max_{L_a^{US}} \; p_a^{US} 20 L_a^{US} - w^{US} L_a^{US}$$

- First order condition (derivative w.r.t. L)

$$p_a^{US} 20 = w^{US}$$

- Banana production

$$p_b^{US} 10 = w^{US}$$

Prices in autarky: U.S.

- Apples are numeraire good
  - Only relative prices matter!
  - Same as choosing units
  - Price of bananas, wages, in terms of apples: $\text{Set } p_a^{US} = 1$
- First order conditions

$$p_a^{US} 20 = w^{US} \qquad \Rightarrow \qquad w^{US} = 20$$
$$p_b^{US} 10 = w^{US} \qquad \Rightarrow \qquad p_b^{US} = w^{US}/10 = 2$$

- Prices reflect opportunity cost

Prices in autarky: Mexico

- Apple production

- First order condition (derivative w.r.t L)

- Banana production

Prices in autarky: Mexico

- Apple production

$$\max_{L_a^M} \ p_a^{MX} 5 L_a^{MX} - w^{MX} L_a^{MX}$$

- First order condition (derivative w.r.t L)

$$p_a^{MX} 5 = w^{MX}$$
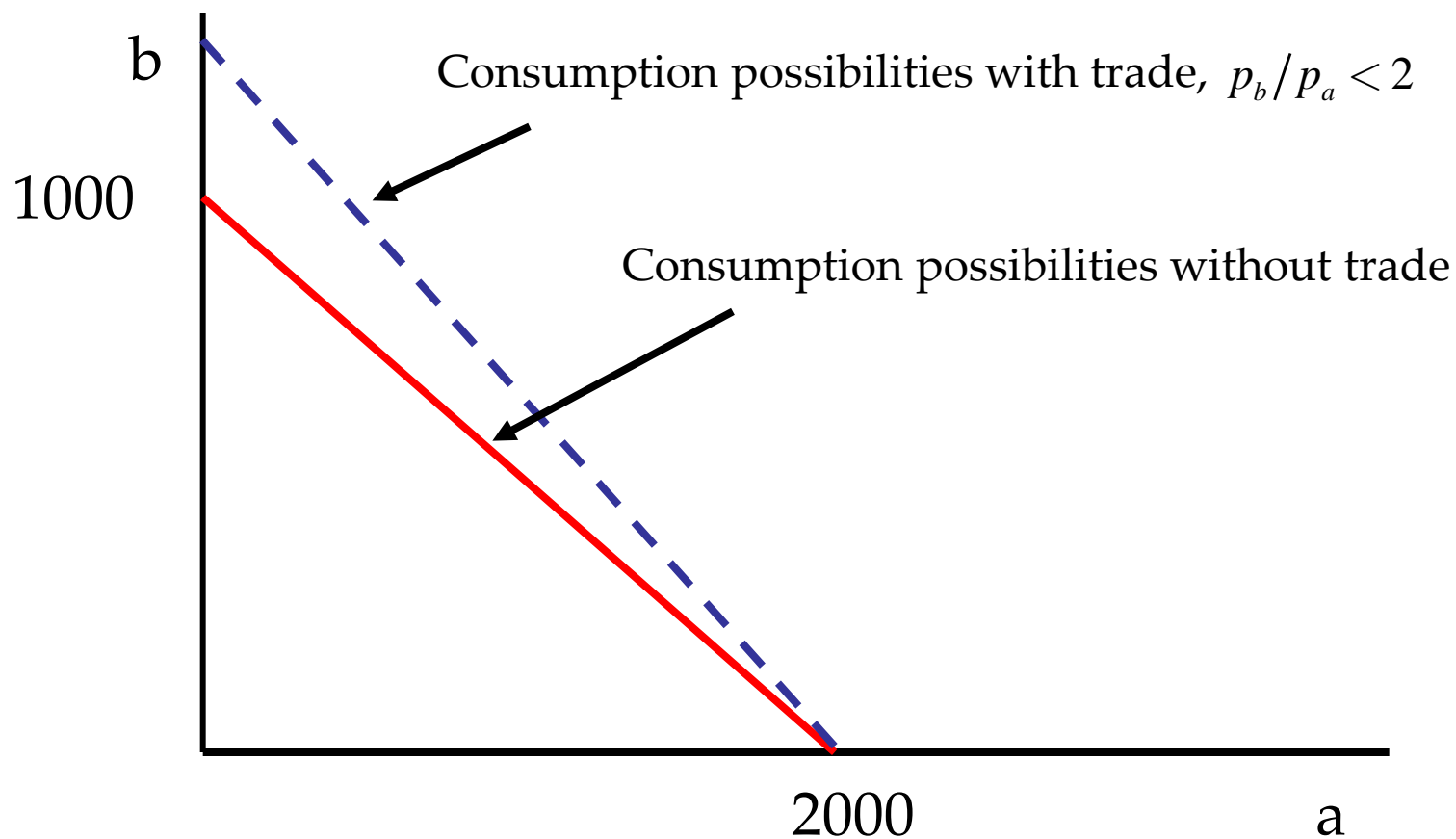
- Banana production

$$p_b^{MX} 5 = w^{MX}$$

With trade: comparative advantage

- In the U.S., what is the opportunity cost of
  - A banana?   1/10 * 20 = 2.0 apples
  - An apple?   1/20 * 10 = 0.5 bananas
- In Mexico, what is the opportunity cost of
  - A banana?   1/5* 5 = 1.0 apples
  - An apple?   1/5 * 5 = 1.0 bananas
- Who has the comparative advantage in
  - bananas? Mexico only gives up 1 apple; U.S. gives up 2 apples
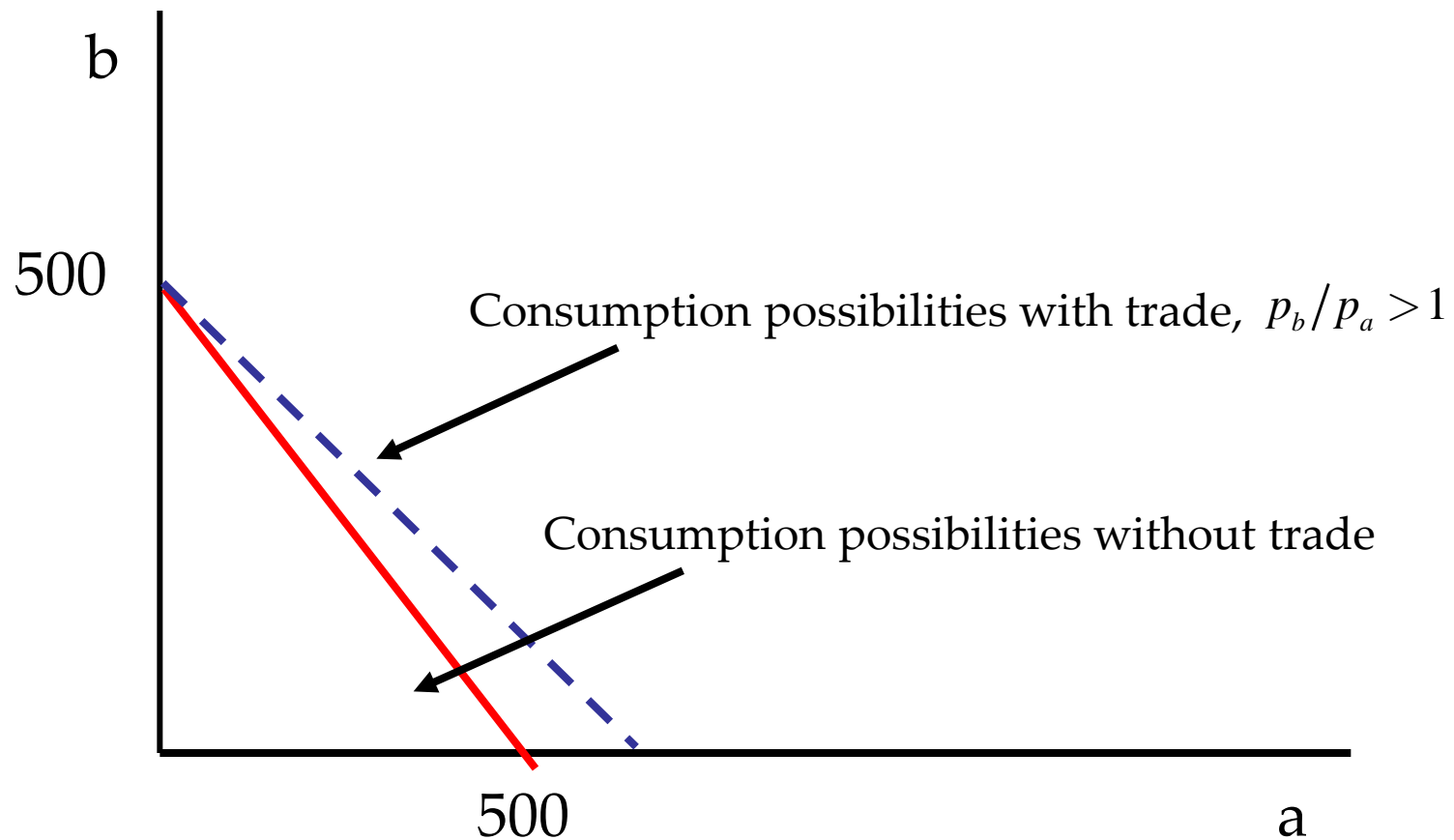 - apples? U.S. only gives up 0.5 bananas; Mexico gives up 1 banana

Trade: at what price?

- For what prices will the U.S. trade?

  - If $p_b/p_a < 2$ export apples to buy bananas

- For what prices will Mexico trade?

  - If $p_b/p_a > 1$ export bananas to buy apples

- For prices $1 < p_b/p_a < 2$ countries trade

- Actual price depends on demand as well

Consumption possibilities in U.S.

Consumption possibilities with trade, $p_b/p_a < 2$

Consumption possibilities without trade

b

1000

2000   a

Consumption possibilities in Mexico

b

500

Consumption possibilities with trade, $p_b/p_a > 1$

Consumption possibilities without trade

500

a

Trade

- Specialization

  - U.S. produces apples and exports them

  - Mexico produces bananas and exports them

- Incomplete specialization

  - If one country is relatively large

  - Large country may produce both goods, small country specializes

Impact of trade: rich country

- If $p_b/p_a = 1.334$

- In U.S. $p_a^{US} 20 = w^{US} \implies 1 * 20 = w^{US} = 20$

- Real wages; an hour's work buys:

  $w^{US}/p_a = 20$ apples (vs. 20 when no trade)

  $w^{US}/p_b = 15$ bananas (vs. 10 when no trade)

Impact of trade: poor country

- Still $p_b/p_a = 1.334$

- In Mexico
  $$p_b^{MX}\,5 = w^{MX} \quad \Rightarrow 1.334 * 5 = w^{MX} = 6.67$$

- Real wages; an hour's work buys:
  - $w^{MX}/p_a = 6.67$ apples (vs. 5 when no trade)
  - $w^{MX}/p_b = 5$ bananas (vs. 5 when no trade)

Impact of trade: productivity

- Countries specialize in the good in which they are relatively more productive

- Opening to trade increases aggregate productivity

  - Stop producing in the inefficient sector

  - Shift resources to the efficient sector

  - Two weeks ago: efficient across firm allocations

- People eat more apples and bananas

- No change in "number of jobs," but

  - No banana growers in U.S.
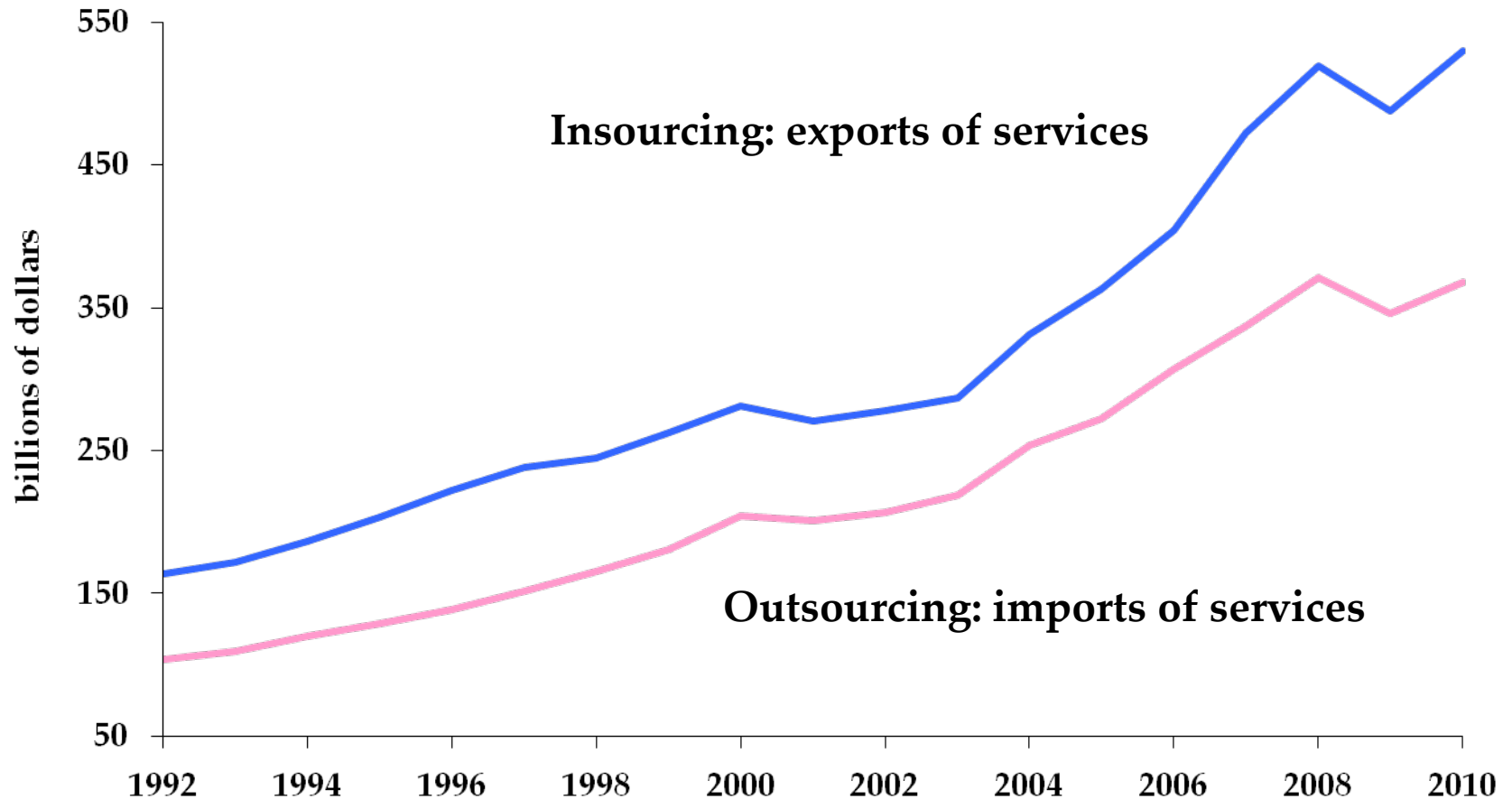
  - No apple growers in Mexico

Impact of trade: NAFTA

- Mexican auto manufacturing is booming
  - Many old factories shut down, new ones opened aimed at full North American market

- Mexican garment manufacturing booming
  - Clothes made with US cloth, shipped back to US
  - Rules of origin keep out Asian textiles

- Mexican corn farmers wiped out
  - Corn is US comparative advantage
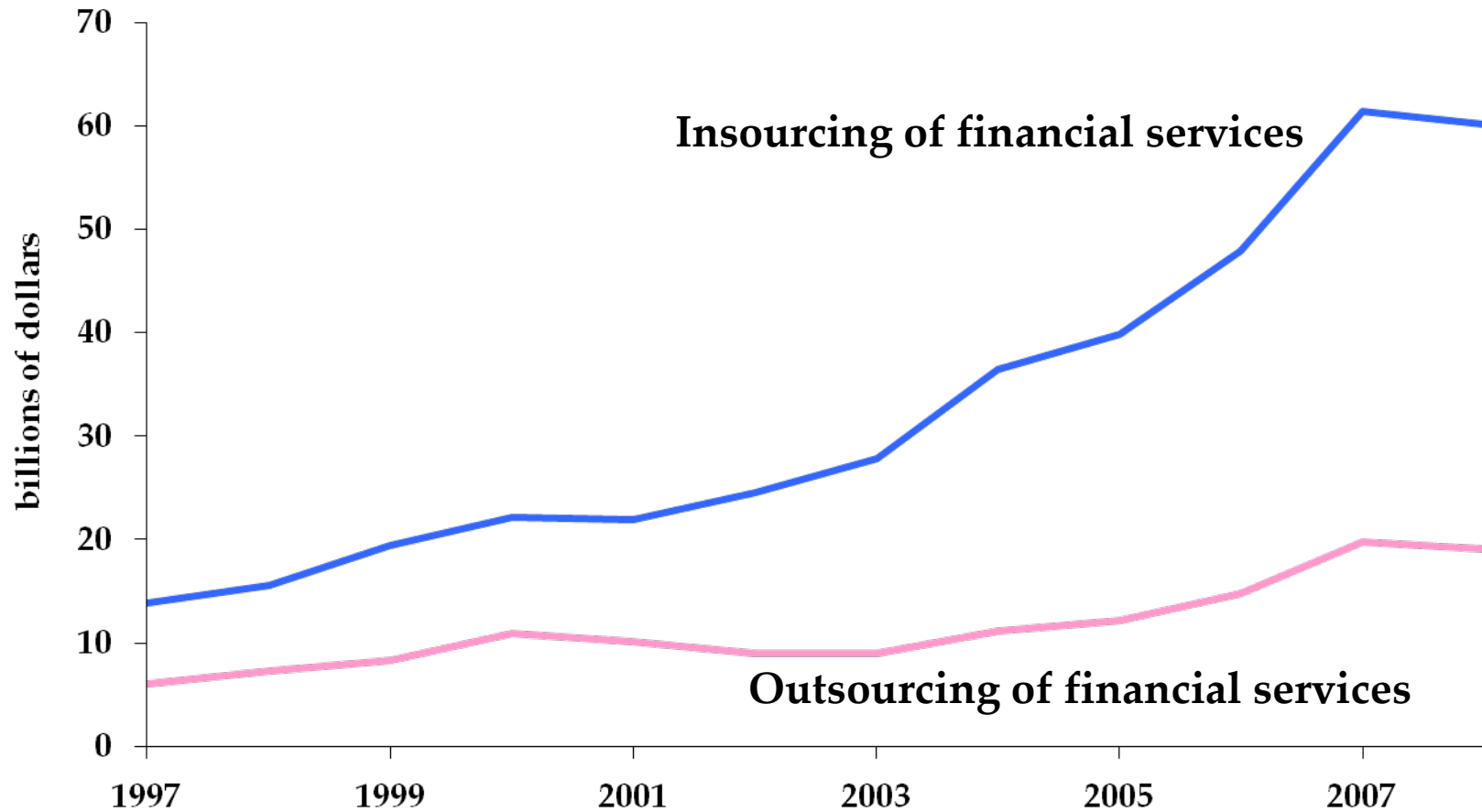 - Many small farmers displaced

Extension: outsourcing

- "Outsourcing" or "offshoring"
  - Usually means: "trade in services"

- Previously:
  - Services were difficult to trade
  - Long distance telephone calls, faxes
  - Difficult to trade *within* countries, too

- Now:
  - Some services more easily traded
  - Generated by decreases in communication costs
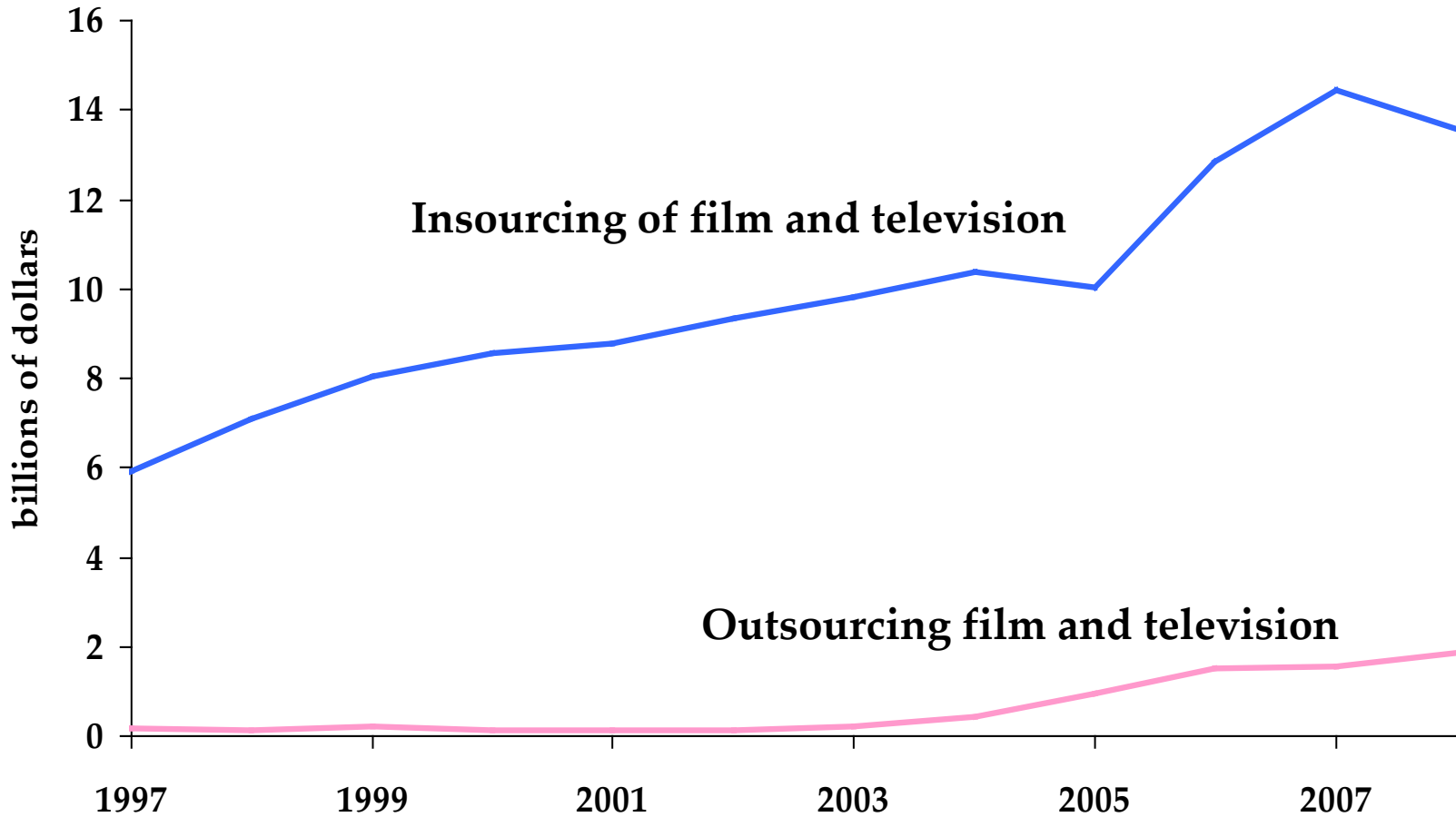 - Can be within or across firms

United States service trade

Insourcing: exports of services

Outsourcing: imports of services

United States service trade

United States service trade

billions of dollars

Insourcing of film and television

Outsourcing film and television

16 — 14 — 12 — 10 — 8 — 6 — 4 — 2 — 0

1997   1999   2001   2003   2005   2007

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What can go wrong?

- Banana producers in U.S. lose their jobs

  – We assumed perfect labor markets
  – No specific skills

- Frictions
  – The result of policies
  – The result of reality (non-transferable skill)
  – Lead to unemployment, underemployment

Distributional effects of trade

- A more general model has many inputs
  - Capital
  - "Skilled" labor
  - "Unskilled" labor
- And many goods
  - Some require a lot of capital
  - Some require a lot of unskilled labor
- How is the pattern of trade determined?

Comparative advantage, again

- Countries produce more of, and export, the goods that are *intensive* in the factor of production in which they are relatively *abundant*.
- In English
  - Countries with more skilled labor (relative to the rest of the world) will export goods that require a lot of skilled labor…and import goods that require a lot of unskilled labor
  - Countries with more capital (relative to the rest of the world) will export goods that require a lot of capital…and import goods that require less capital.

Distributional effects, again

- With trade
  - The demand for the abundant factor increases
    - Its return increases
  - The demand for the scarce factor decreases
    - Its return decreases
- In the United States
  - Demand for skilled labor increases
  - Demand for unskilled labor decreases
- Winners win more than losers lose.

Winners and losers

- On the whole, still better off: winners win more than losers lose.

- How do we make transfers?

Summary

- Trade benefits all countries
  - Lowers the price of consumption, intermediate goods
  - Increases productivity
  - Increases real wages
- Outsourcing is just another kind of trade
- What can go wrong?
  - Trade (all of it) creates winners and losers
  - Hard to compensate the losers

Trade Reality

If trade is so great…

- … why are people against it?

- Losses are visible and concentrated
  - Loss of entire industries (geographic impact)
  - Producers tend to identify with each other, organized (Q: Who are you? A: I'm a steel worker)

- Gains are less evident and more dispersed
  - All consumers pay lower prices for goods
  - All firms pay less for inputs
  - Consumers tend not to identify with each other (Q: Who are you? A: I'm a sugar consumer ?!)

The Negative Railroad

- How is trade like technology? Both alter the frontier of production possibilities. Both can displace firms and workers.

- Is reducing trade like destroying technology?

- "Whatever the protectionists may say, it is no less certain that the basic principle of restriction is the same as the basic principle of breaks in the tracks: the sacrifice of the consumer to the producer….
Frédéric Bastiat, *Economic Sophisms*, 1845.

Ways to restrict trade

- Besides tariffs
  - Subsidies to local producers
  - Health and safety regulation
  - Quotas
  - Antidumping law

Subsidies to producers: U.S. sugar

- Price supports for sugar require (almost) banning imports of sugar
  - Guaranteed prices for sugar (18-22 cents per lb.)
  - World price for sugar around 9 cents per lb.
  - U.S. expects to pay $2.15 bil. in price supports over 10 years;

    5,980 sugar and sugar beet farms in 2002 census = $351,170 per farm
- Restrictions on sugar imports cost U.S. consumers $1.9 billion per year in higher prices
  - About $19 per household per year
  - Sugar is usually consumed indirectly
- Who gains besides sugar producers?
  - Corn farmers (HFCS producers)
  - Lobbyists, lawyers

Health and safety

- EU bans hormone treated meat in 1989

- U.S. bans unpasteurized cheese

  - Cheese must be made with pasteurized milk, or aged for 60 days

- Ban on genetically modified rice

  - Only allowed for consumption in U.S., Canada

Quotas

- Limit on the amount of a good that can be imported

- Voluntary export restraints: quotas imposed by the exporting country

  - Most famous: Japanese cars in the 1980s

  - Politically more palatable?

- WTO says: drop quotas, use tariffs

Antidumping

- Antidumping
  - Foreign firms using "predatory" pricing
  - Domestic firms may file for protection
  - Must show foreign firms pricing "unfairly" and that this has caused "injury to domestic firms"
  - Unfair pricing: charging less in foreign markets than in home market
  - Economic rationale?
- Dumping duties (tariffs) imposed on foreign firms
- Antidumping is frequently used strategically
- More popular as other policy instruments are removed

No more wire hangers!!

- One remaining US based hanger producer…

- …files petition against Chinese producers

- International Trade Commission investigates
  - Finds: hangers sold below fair market value
  - Duties assessed range from 33% to 165%
  - Hanger prices double in US market

Hangers: fallout

- Who wins?
  - Domestic hanger producers
  - Wisconsin hanger plant reopens
- Who loses?
  - Dry cleaners
  - People who use dry cleaners
- Unintended consequence
  - Hanger recycling

What a mess!

- Countries set trade barriers in different ways to different countries

- Bargain bilaterally to change barriers

- Progress is slow, complicated

The World Trade Organization

- 1947 General Agreement on Trade and Tariffs
  - 23 original signers
  - Major cornerstone: nondiscrimination
- 1995 GATT becomes the World Trade Organization
  - Enforcement mechanism: none under GATT
  - Exemptions: health and safety arguments
- Progress
  - Tariffs on non-agriculture very low
  - General Agreement on Trade in Services (in the works)
  - Trade Related Aspects of Intellectual Property Rights (in the works)

WTO principles

- Tariff binding
  - A negotiated tariff is bound: the tariff can not be increased in the future

- Nondiscrimination
  - Member grant each other *most favored nation* status…now called *normal trade relations*
  - NTR: tariff rates are the same for all
  - Exceptions: regional trade agreements (e.g. NAFTA)
  - Exceptions: "escape clauses" (China and tires)

What have we learned today?

- Many ways to restrict trade

  – Tariffs, quotas, safety regulations, dumping and countervailing duties

  – Protection has a strong political component

- In spite of the gains from trade, liberalizing trade is not easy

  – Losses are concentrated and visible

  – Gains are dispersed and a subtle

  – Compensating losers is not an easy task

For the ride home

- Foreign "sweatshops"
- Pay wages that are low by US standards, but higher than alternatives in that country
- Poor working conditions by US standards
- What are the issues?
  - Is it the responsibility of "rich" nations to intervene by not trading? What is fair?
  - Other options?