

## The Basic Analysis of a Tariff

- ◆ Types of tariffs
- ◆ Impact of a tariff on consumers
- ◆ Impact of a tariff on producers
  - » Effective rate of protection concept
- ◆ Government's share: tariff revenue
- ◆ Net national impact of a tariff
- ◆ What is the 'optimal size of a tariff' (too small, too big, just right)
- ◆ Non-tariff barriers (Chapter 8)
- ◆ Other arguments for tariffs (Chapter 9)

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 1

## Types of Tariffs

- ◆ Specific tariff: An amount per physical unit of import
  - ◆ \$ per ton of steel
  - ◆ \$ per 8-cylinder automobile
- ◆ *Ad valorem* (meaning "on the value"): A percentage of the estimated market value of the goods (at importer's dock)
  - ◆ 10% tariff on imported leather bags
  - ◆ 25% tariff on imported luxury automobiles
- ◆ Tariffs, and more tariffs
  - ◆ Most-Favored-Nation (MFN) status
  - ◆ Generalized System of Preferences (GSP)
  - ◆ Regional preferences (Common Market)
  - ◆ Bilateral preferences (US/Canada auto agreement; EC & former colonies, etc.)

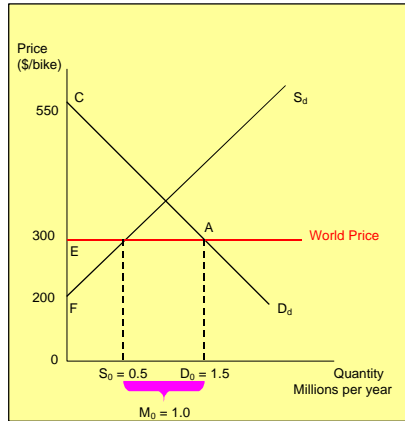
Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 2

## The Impact of a Tariff on Consumers (1 of 2)

### US Market for Bicycles with Free Trade



Prof. Levich

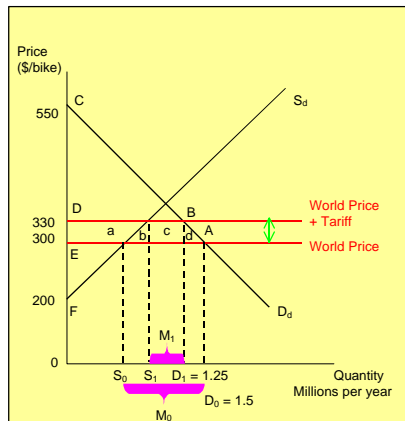
C45.0001, Economics of IB

Chapter 7, p. 3

- ◆ Begin with the case of a small country, “price-taker”
- ◆  $\Rightarrow$  US can import unlimited number of bicycles at \$300
- ◆ US manufacturers produce 0.5 million/yr.
- ◆ US consumers demand 1.5 million/yr
- ◆  $\Rightarrow$  US imports 1.0 units/yr.
- ◆ US consumers enjoy consumer surplus ( $\Delta ACE$ ) by having access to world market and free trade

## The Impact of a Tariff on Consumers (2 of 2)

### The Effect of a Tariff on Consumers



Prof. Levich

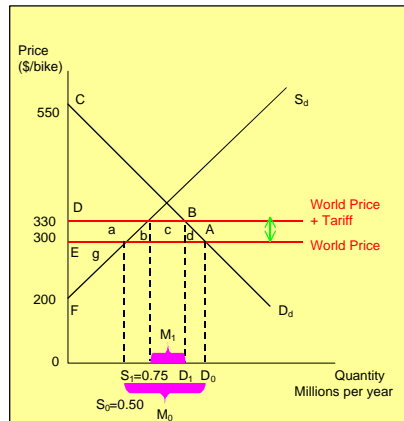
C45.0001, Economics of IB

Chapter 7, p. 4

- ◆ Suppose the US puts a 10% tariff on imported bicycles
- ◆ Price of bicycles (imported & domestic bicycles)  $\uparrow$  \$330
- ◆ Consumer demand  $\downarrow$  1.25 mm
- ◆ Consumer surplus is now  $\Delta BCD$
- ◆ Consumer surplus  $\downarrow$  by areas  $a+b+c+d$
- ◆  $\$30 * D_1 \leq a+b+c+d \leq \$30 * D_0$
- ◆ Exact area of  $Dd$  depends on price elasticity of demand

## The Impact of a Tariff on Producers

### The Effect of a Tariff on Producers



Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 5

- ◆ Continue with the example of the US putting a 10% tariff on imported bicycles
- ◆ Price of bicycles (imported & domestic bicycles) ↑ \$330
- ◆ Domestic supply ↑ 0.75 mm
- ◆ Producer surplus is now area  $g+a$ , so producer surplus ↑ by trapezoid  $a$
- ◆ Exact area of trapezoid  $a$  depends on price elasticity of supply
- ◆ Trapezoid  $a \leftrightarrow$  transfer from consumers to producers

## Effective Rate of Protection (ERP)

- ◆ ERP provides a better indicator of tariff protection for an industry, or for a production activity
- ◆ Example: Shoe industry
  - ◆ World price of shoes: \$40
  - ◆ Price of imported leather \$30
  - ◆ \$10 =  $V$  = Value added in shoe industry under free trade
- ◆ Suppose 25% nominal tariff on imported shoes
  - ◆ Domestic price of shoes = \$40 x 1.25 = \$50
  - ◆ \$20 =  $V'$  = Value added in shoe industry with tariff protection
- ◆ Define:  $(V' - V) / V = (20-10)/10 = 100\%$  as the "Effective Rate of Protection"
- ◆ Interpretation: The marginal producer of shoes can have 100% greater costs than under free trade, and still compete in domestic market

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 6

## Effective Rate of Protection - A Twist

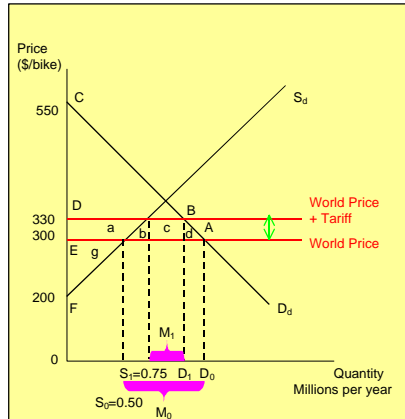
- ◆ Suppose now that Congress imposes a 10% nominal tariff on imported leather (*Why would Congress do this?*)
- ◆ With these **two** tariffs in place we have
  - ◆ Domestic price of shoes =  $\$40 \times 1.25 = \$50$
  - ◆ Price of imported leather =  $\$30 \times 1.10 = \$33$
  - ◆  $\$17 = V'' =$  Value added in shoe industry with two tariffs
- ◆ Effective Rate of Protection is now
$$(V'' - V)/V = (17-10)/10 = 70\%$$
- ◆ Effective rate of protection *on shoe manufacturing* ↓ when tariffs are raised on inputs
- ◆ Effective Rate of Protection ↑ when
  - » Nominal tariffs on outputs ↑
  - » Nominal tariffs on inputs ↓

## Effective Rate of Protection - Lessons

- ◆ ERP can be > or < nominal tariff rate
- ◆ ERP equal nominal tariff rate, only when  
Tariff (inputs) = Tariff (outputs)
- ◆ ERP can be < 0 (If tariffs on inputs > tariffs on outputs)
- ◆ For the above reason, tariff structures are often lower on raw materials and semi-finished products, and higher on final goods.
  - » This structure works against LDCs that want to diversify away from raw materials and into higher value-added final products.
- ◆ Manufacturers can raise their Effective Rate of Protection by
  - » Seeking higher nominal tariffs on outputs, or
  - » Lower nominal tariffs on inputs

## Government Revenue from a Tariff

### Government Revenue from a Tariff



Prof. Levich

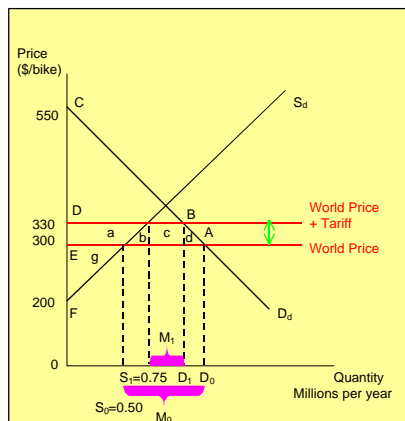
C45.0001, Economics of IB

Chapter 7, p. 9

- ◆ In our bicycle example, the government collects \$30 per unit on  $M_1 = 500,000$  bikes.
- ◆ Tariff revenue = rectangle  $c = T \times M_1 = \$15$  million
- ◆ Important questions are:
  - » What does the government do with the tariff revenue?
    - ◆ Good projects
    - ◆ Wasteful spending
  - » Administrative costs of collecting tariff revenue

## Putting the Pieces Together: The Net National Loss from a Tariff

### Net National Loss from a Tariff



Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 10

- ◆ Consumers lose:  $a+b+c+d$
- ◆ Producers gain:  $a$
- ◆ Gov't collects:  $c$   
Net national loss =  $b + d$
- ◆ With the numerical values in this example, the costs are:
  - » Consumer loss: \$41.25 mm
  - » Producer gain: 18.75
  - » Tariff revenue: 15.00
  - Net National Loss: \$ 7.50 mm
- ◆ The "Deadweight Losses"
  - » "b" production deadweight loss
  - » "d" consumers deadweight loss

## Sizing up the Net National Loss

- ◆ Why b+d is *underestimate* of the national loss
  - » Stock vs. Flow: “b+d” per year, take the NPV
  - » Net vs. Gross: “b+d” is net cost; gross redistribution impact of expanding and contracting sectors
  - » Ignores dynamic effects
    - ◆ Keep senile industries too long
    - ◆ Robs infant industries of new capital
  - » Ignores costs of:
    - ◆ Rent-seeking behavior (lobbying to obtain tariff protection)
    - ◆ Cost of collecting tariffs, policing borders, anti-smuggling
- ◆ Why b+d is *overestimate* of the national loss
  - » Dynamic effects on viable infant industries
  - » Tariffs may attract FDI that brings technology and externalities

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 11

## Could a Nation Ever Gain by a Tariff?

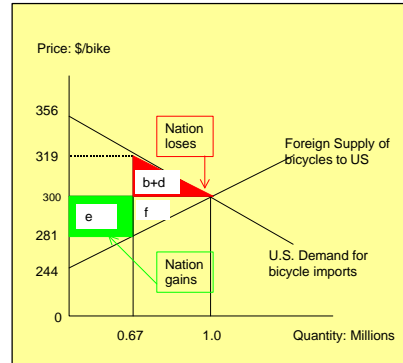
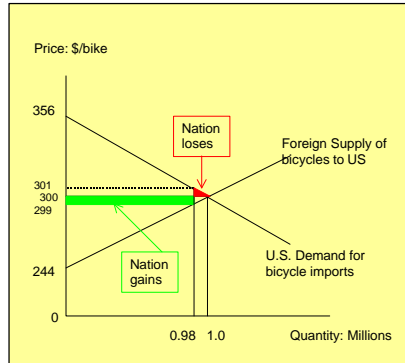
- ◆ Assume nation is a large country: a “price maker”
- ◆ A large buyer may have “monopsony power”
  - » A large country tariff reduces demand
  - » In order to offset tariff impact, exporter may lower price
  - » Importer has “buying power”
  - » Importer improves its TOT =  $P(\text{exports}) / P(\text{imports})$
- ◆ When national producer gain > consumer loss,  
⇒ net national gain from tariff
- ◆ Beware!
  - » Still redistribution effect - from consumers & toward producers
  - » Still world loss - deadweight production loss
  - » Assumes no retaliation by exporting countries

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 12

## A Tariff that Affects Foreign Selling Price can Result in a National Gain



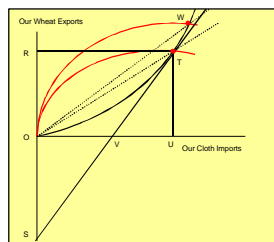
- With a small tariff (\$2), buying power of importing country leads exporter to lower price by \$1 to retain high sales. Gains > Loses in importing country
- Optimal strategy calls for raising tariffs further until area (e-b-d) is maximized
- Notice that area f remains a deadweight loss for the world

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 13

## Conditions for the Optimal Tariff



- ◆ The lower the foreign supply elasticity, the higher is the importers optimum tariff rate
  - » So if foreign supply is infinitely elastic (i.e. they will supply any amount at a fixed price) then the optimal tariff is zero
- ◆ Using offer curve analysis (above, Appendix Figure D.2) importing nation improves its TOT ( $P_W/P_C \uparrow$ ) and reaches a higher trade indifference curve (not shown)

Prof. Levich

C45.0001, Economics of IB

Chapter 7, p. 14

## Summary of Tariff Basics

- ◆ For the typical “small” country that is a price-taker:
  - » Tariff results in a loss in national welfare
  - » Tariff results in a redistribution of income from consumers of the imported product to producers of import substitutes
- ◆ The degree of protection afforded an industry is better described by the effective rate of protection
  - » The ERP depends positively on tariffs on outputs, and negatively on tariffs on inputs
- ◆ A “large” country can benefit by a tariff
  - » When foreign supply is price elastic
  - » When retaliation is ruled out
- ◆ World welfare declines as a result of tariffs