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)

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

US Market for Bicycles with Free Trade

- Begin with the case of a small country, “price-taker”
- US can import unlimited number of bicycles at $300
- US manufacturers produce 0.5 million/yr.
- US consumers demand 1.5 million/yr
- US imports 1.0 units/yr.
- US consumers enjoy consumer surplus (ΔACE) 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

- Suppose the US puts a 10% tariff on imported bicycles
- Price of bicycles (imported & domestic bicycles) ↑ $330
- Consumer demand ↓ 1.25 mm
- Consumer surplus is now ΔBCD
- Consumer surplus ↓ by areas a+b+c+d
- $30 * D₁ ≤ a+b+c+d ≤ $30 * D₀
- Exact area of Δd depends on price elasticity of demand
The Impact of a Tariff on Producers

- 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 ⇔ 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
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
  \[ \frac{(V^* - V)}{V} = \frac{(17-10)}{10} = 70\% \]
- 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
  \[ \text{Tariff (inputs)} = \text{Tariff (outputs)} \]
- 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

- In our bicycle example, the government collects $30 per unit on $M = 500,000$ bikes.
- Tariff revenue = rectangle $c = T \times M = $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

- 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

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(exports) / P(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
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

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 ↑) and reaches a higher trade indifference curve (not shown)
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