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.)
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 (△ACE) by having access to world market and free trade.
The Impact of a Tariff on Consumers (2 of 2)

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 \( \Delta BCD \)
- Consumer surplus down by areas \( a+b+c+d \)
- $30 * D_1 \leq a+b+c+d \leq 30 * D_0$
- Exact area of \( \Delta d \) 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) $\uparrow $ $330$
- Domestic supply $\uparrow $ 0.75 mm
- Producer surplus is now area $g+a$, so producer surplus $\uparrow$ 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.
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 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
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

- 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.
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)
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