Lecture 5: Tariffs

Outline: Tariffs

• What Are They?
• Who Uses Them?
• Effects of Tariffs
  – Small Country Case
    • Effects on quantities and prices
    • Effects on economic welfare
  – Large Country Case
    • Effect on world price
    • Effect on welfare
  – Size of These Effects
• Addenda on Tariffs

What Are Tariffs?

• Tariffs are Taxes on imports
• Two main types
  – Ad valorem: % of value
  – Specific: $ per unit
• How are they implemented?
  – At the border, by customs officers
  – They determine
    • What good it is
    • What price to use for ad valorem tariffs
  – Customs officers have power that may be abused (e.g., bribery)
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Who Uses Tariffs?

- Virtually all countries
- How big are tariffs?
  - In US, today, average only 2-3%
  - In developing countries, often around 20%
  - Both used to be much higher
  - Some particular tariffs are still much higher
  - And President Trump has put tariffs of
    - 25% on steel
    - 10% on aluminum
    - 10% so far on $50 billion of Chinese exports

Who Uses Tariffs?

- Sample US tariffs
  - Cars: 2.5%
  - Trucks: 25%
  - Men’s cotton shirts: 19.7%
  - Women’s blouses: 26.9%
- Tariffs facing exports of developing countries:
  - Nepal: 13.2%
  - Bangladesh: 13.6%
  - See Schavey

Chicken tax
Raised in 1963 in retaliation against Europe’s tariffs on chickens

That’s why minivans are “trucks”
Who Uses Tariffs?

  - US tariffs are much larger against developing countries than against developed countries
  - Who gains and loses?
    - Some US workers gain, but they have social policies to protect them (unemployment insurance, etc.)
    - Developing-country workers lose, and their governments are too poor to help
  - WTO Agreement on Textiles and Clothing (1995) promised to eliminate quotas on these products by 2005, but not tariffs. (It did.)
  - Why “Catch-22”? 
    - Countries can only develop by exporting
    - But if they do, we raise tariffs!

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Effects of Tariffs

- Easy to see from supply and demand
- Consider a good whose price would be above the world price without trade
- We will look at two cases:
  - Small country: Too small for its behavior to matter for the world price
  - Large country: Large enough (in market for this good) that its behavior may change world price
Effects of Tariffs: Small Country

- Autarky price = $P_a$
- Free trade price = world price = $P_W$

Effect on Price

- Tariff $P_W + t$
- Free trade price = $P_W$
- Autarky price = $P_a$

Effects on Quantities

- $Q_D^0$ to $Q_D^1$
- $Q_S^0$ to $Q_S^1$
Effects of Tariffs: Small Country

- Why the price increase?
  - On imports
    • Tariff is simply added to the price paid to foreign exporters
  - On domestically produced goods
    • Buyers don’t pay the tariff
    • But if price stayed below \( P_W + t \), demand for the domestically produced good would be greater than supply
    • This shortage would drive up price

- Thus: what happens due to a tariff:
  - Domestic price rises
    (by full amount of tariff)
  - Domestic output rises
    (Employment also rises in this industry)
  - Domestic demand falls
  - Imports \((D-S)\) fall
  - Suppliers gain
  - Demanders lose
  - Gov’t gets tariff revenue
  - World sells less to us
    (but it doesn’t lose, because we’re too small for it to notice)

- How much do we gain and lose?
- Use changes in “consumer surplus” and “producer surplus” from Econ 101
Reminder: Change in Consumer Surplus

When price changes, Consumers
- Gain from price decrease
- Lose from price increase
  - By amount equal to area to the left of the demand curve

while…

Reminder: Change in Producer Surplus

Producers
- Gain from price increase
- Lose from price decrease
  - By amount equal to area to the left of the supply curve

Effects of Tariffs: Small Country

- Apply these to the effects we found for a tariff
- Also note that the government (and thus the taxpayer) of the country gets benefit of tariff revenue
Effects of Tariffs: Small Country

Effects on Welfare
Suppliers gain +a

Effects on Welfare
Demanders lose -(a+b+c+d)

Effects on Welfare
Government gains +c
Effects of Tariffs: Small Country

Summary:
- Suppliers gain: +a
- Demanders lose: -(a+b+c+d)
- Government gains: +c
- Net effect on country:
  
  \[ \text{Loss} = -(b+d) \]

Effects of Tariffs: Small Country

- Dead Weight Loss
- Why?
  - Because demanders and suppliers both are misled by the tariff to behave as if the good’s value were \( P_W + t \), when in fact the country can buy or sell it for \( P_W \).

"Dead Weight Loss" =
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Effects of Tariffs: Large Country

- If the country is not small, but large, then
  - when it reduces its imports of the good from the world market
  - the world price will fall.
- Why?
  - Because, with less import demand by large country, world demand shifts left.

Effects of Tariffs: Large Country

- Results due to tariff and fall in world price:
  - Domestic price rises, but by less than the tariff
  - Thus, compared to the same tariff in a small country
    - Output (and employment) rises by less
      - Thus the benefit to suppliers is smaller
    - Demand falls by less
      - Thus the harm to demanders is smaller
    - Imports fall by less
    - Tariff revenue is larger (since imports fall less)
Effects of Tariffs: Large Country

Effects of tariff on Welfare
Suppliers gain
⁺a'

Effects of tariff on Welfare
Demanders lose
⁻(a'⁺b'⁺c'⁺d')
Effects of Tariffs: Large Country

Suppliers gain: $a'$
Demanders lose: $-(a'+b'+c'+d')$
Government gains: $(c'+e')$
Net effect on country: $+e'-(b'+d')$

Summary:

- Suppliers gain
- Demanders lose
- Government gains
- Net effect on country: $+e'-(b'+d')$
Effects of Tariffs: Large Country

- This possibility of gain from a tariff goes under several names:
  - The "terms of trade" effect of a tariff
  - The "monopoly" effect of a tariff
  - The "optimal tariff"

The "Terms of Trade" Effect

- Definition: A country's "Terms of Trade" is defined as the price of its exports relative to its imports
  - If TOT rises, the "terms of trade improves"
    - because the country gets more imports in return for its exports
    - A tariff by a large country drives down the world price of its imports
      - and thus improves its terms of trade

The "monopoly" effect

- From Econ 101, a monopoly firm increases its profit by
  - Selling less to the market, and hence raising the price that it gets
- A large country can increase its welfare by
  - Buying less from the market (via a tariff), and hence lowering the price that it pays
- Note: Large country could also gain by restricting exports, as OPEC has done with oil (Not in recent years, but it is trying again)
Effects of Tariffs: Large Country

• The “optimal tariff”
  – If a large country uses a tariff that is too large, it must lose.
  – Thus there is some level of tariff that is optimal

Effects of Tariffs: Large Country

• The “optimal tariff”

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The Size of These Effects

• See Feenstra
  – Uses analysis like this one to measure effects of protection
  – Sectors with high US protection in 1985:
    • Automobiles
    • Dairy
    • Steel
    • Sugar
    • Textiles and Apparel
      (All these had quotas and other NTBs as well as tariffs.)

The Size of These Effects

• See Feenstra
  – For 1985, U.S. average tariffs caused dead-weight loss (DWL) for U.S. of
    \[ \text{DWL} = \$1.2-3.4 \text{ billion per year} \]
  – Sounds like a lot! But U.S. 1985 GDP was \$4,181 \text{ b. So}
    \[ \text{DWL} = 0.03\% \text{ of GDP} \]
    TINY!

The Size of These Effects

• Why is the loss from tariffs so small?
  – Most U.S. tariffs are small
  – But note, this is only the DWL
  – The transfer from consumers, to producers and to government, is much larger
The Size of These Effects

- Why so small?
  - DWL grows with the square of the tariff
  - Example:
    • Doubling the tariff
    • Multiplies DWL by 4
  - So DWL due to small tariff is smaller than the tariff itself might suggest

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Addenda on Tariffs

- Three more things:
  1. The model we are using makes several assumptions:
    • Perfect competition:
      - All buyers and sellers are too small, individually, to affect price (even if the country is large). Answers could be different otherwise
    • Partial equilibrium
      - Market is small part of large economy, so that effects on other markets can be ignored
    • Homogeneous products
      - The imported good is a perfect substitute for domestically produced good
Addenda on Tariffs

• Three more things:
  
2. The large-country tariff
  • Harms the other country (or rest of world)
  • Lowers world welfare. Thus the rest-of-world loses more than the tariff-levying country gains.
  • The other country may retaliate with its own tariff. Then both lose.

Addenda on Tariffs

• Three more things:
  
3. Effective Protection
  • Just as a tariff on an industry’s output helps it by raising its price, a tariff on its input hurts the industry.
  • The Effective Rate of Protection takes account of tariffs on both inputs and outputs to gauge the level of protection in an industry:
  \[ ERP = \frac{(t_o - at)}{(1 - a)} \]
  where
  \[ t_o = \text{ad valorem tariff on output} \]
  \[ t_i = \text{ad valorem tariff on input} \]
  \[ a = \text{value of input as share of value of output} \]

Next Time

• Nontariff Barriers
  – Quotas, etc.
  – Subsidies