Econ 340

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)

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

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%

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

That’s why minivans are “trucks”
See Schavey
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

\[
\begin{align*}
\text{Autarky price} &= P_a \\
\text{Free trade price} &= P_W \\
\text{Tariff} &= t
\end{align*}
\]

Effects of Tariffs: Small Country

\[
\begin{align*}
\text{Effect on Price} \\
\text{Tariff} &= P_W + t \\
\text{Effect on Quantities}
\end{align*}
\]
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)

Effects of Tariffs: Small Country

• 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 on Welfare
Net for country -(b+d)

Summary:
• Suppliers gain +a
• Demanders lose -(a+b+c+d)
• Government gains +c
• Net effect on country 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 $P_W$. 
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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

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

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”

Effects of Tariffs: Large Country

• 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

Effects of Tariffs: Large Country

• 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

Example of a too large 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 deadweight 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 b. So
    
    \[ \text{DWL} = 0.03\% \text{ of GDP} \]
    
    TINY!
### 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:
      \[ ERP = \frac{t_o - a t_i}{1 - a} \]
      where
      - \( t_o \) = ad valorem tariff on output
      - \( t_i \) = ad valorem tariff on input
      - \( a \) = value of input as share of value of output

### Next Time

- Nontariff Barriers
  - Quotas, etc.
  - Subsidies