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

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%

Who Uses Tariffs?

“Chicken tax” Raised in 1983 in retaliation against Europe’s tariffs on chickens

That’s why minivans are “trucks”*

*See Schaeve
Who Uses Tariffs?

  - US tariffs are much larger against developing countries than against developed countries
  - Who gains and loses?
    - 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

\[ P_a = \text{Autarky price} \]
\[ P_W = \text{Free trade price} = \text{world price} \]

\[ Q_a^0 \quad Q_W^0 \]

\[ Q_a^1 \quad Q_W^1 \]

Effects on Price

\[ P_a \quad P_W^+ \quad P_0 \]

Effect on Quantities

\[ Q_a^0 \quad Q_W^0 \quad Q_a^1 \quad Q_W^1 \]
Effects of Tariffs: Small Country

• Thus: what happens due to a tariff:
  – Domestic output rises
    (Employment also rises in this industry)
  – Domestic demand falls
  – Domestic price rises
    (by full amount of tariff)
  – Imports (=D−S) fall
  – Suppliers gain
  – Demanders lose
  – Gov’t gets tariff revenue
    (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
Demanders lose \(- (a + b + c + d)\)

P
Q
S
D
P
W
P

Q_0^D Q_0^S Q_1^D Q_1^S

Country loses from tariff

Effects on Welfare
Government gains \(+ c\)

P
Q
S
D
P
W
P

Q_0^D Q_0^S Q_1^D Q_1^S

Net for country
\(- (b + d)\)

“Dead Weight Loss” =

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 led 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. \( P_W \)

• 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

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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 "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.

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 "Terms of Trade" Effect
  - Definition: $TOT = \frac{P_{\text{exports}}}{P_{\text{imports}}}$
  - 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

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

Example of a too large tariff:
Effects of Tariffs: Large Country

- The “optimal tariff”

![Diagram showing the net welfare with respect to the tariff and optimal tariff](image)

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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
    \[
    \text{DWL} = $1.2\text{-}3.4 \text{ billion per year}
    \]
  - 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 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 assumes perfect competition. Thus
     • All buyers and sellers are too small, individually, to affect price (even if the country is large)
     • Answers could be different if firms had monopoly power (as they likely would if they had significant economies of scale)

• 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, so then both lose

• 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 it
     • The Effective Rate of Protection takes account of tariffs on both inputs and outputs to gauge the level of protection in an industry:
       \[ ERP = \frac{(t_o - at_i)}{(1 - a)} \]
       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