Announcement

• Accessing Canvas links from online syllabus:

  – Problems arise if
    • You’ve previously opened Canvas and let it expire
      – Need to go back into Canvas to re-enter
    • You try to access links from a mobile device.
      – This won’t work.

  – Let me know if these cause big problems for you, as I might copy the syllabus itself into Canvas
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
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%

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

That’s why minivans are “trucks”

See Schavey
Who Uses Tariffs?

• Aside: Schavey, “The Catch-22 of U.S. Trade”
  – 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 = $P_w$

Lecture 5: Tariffs
Effects of Tariffs: Small Country

Tariff \( P_w + t \) causes a change in price from \( P_a \) to \( P_w + t \). The effect on price is shown in the diagram.
Effects of Tariffs: Small Country

Effects on Quantities

Tariff $P_{W+t}$

$P_a$

$P_W$

$Lecture 5: Tariffs$
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
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
  – 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...

Gain from price decrease, or loss from price increase
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

Gain from price increase, or loss from price decrease
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

Diagram of tariff effects with labeled areas and quantities:
- Tariff $P_w + t$ applied
- Suppliers gain area $+a$
- Quantity supplied $Q_s^0$ to $Q_s^1$
- Quantity demanded $Q_d^0$ to $Q_d^1$
Effects of Tariffs: Small Country

Effects on Welfare
Demanders lose \(-(a+b+c+d)\)
Effects of Tariffs: Small Country

Effects on Welfare
Government gains +c

Tariff

P

P_a

P_W+t

P_W

Q_S^0

Q_S^1

Q_D^1

Q_D^0

Q

Lecture 5: Tariffs
Effects of Tariffs: Small Country

Net for country: $-(b+d)$

Country loses from tariff

Lecture 5: Tariffs
Effects of Tariffs: Small Country

Summary:

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

\[P\]
\[Q\]
\[P_a\]
\[P_{W+t}\]
\[P_W\]
\[Q_{S0}\]
\[Q_{S1}\]
\[Q_{D0}\]
\[Q_{D1}\]

‘Dead Weight Loss’ =
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. \( P \)

- Why?
  - Because, with less import demand by large country, world demand shifts left.

Lecture 5: Tariffs
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

\[ P_{W}^{0} + t \]

\[ P_{W}^{1} + t \]

\[ P_{W}^{0} \]

\[ P_{W}^{1} \]

Tariff

\[ Q_{S}^{0} \quad Q_{S}^{1} \quad Q_{D}^{1} \quad Q_{D}^{0} \]
Effects of Tariffs: Large Country

Effects of tariff on Welfare

Suppliers gain +a'}
Effects of Tariffs: Large Country

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

Effects of tariff on Welfare
Government gains + (c’+e’)

$Lecture 5: Tariffs$
Effects of Tariffs: Large Country

The diagram illustrates the effects of a tariff on welfare. The price before the tariff is $P_W^0$, and after the tariff, it becomes $P_W^1 + t$. The quantity demanded and supplied before the tariff and after the tariff are denoted as $Q_{S0}$, $Q_{S1}$, $Q_{D0}$, and $Q_{D1}$ respectively.

The effects of the tariff on welfare can be calculated as:

$$\text{Net for country} = e' - (b' + d')$$

If $e' > (b' + d')$, the country gains from the tariff.
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: 
    \[ TOT = \frac{P_{\text{exports}}}{P_{\text{imports}}} \]
    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

• 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:
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
    \[
    \text{DWL} = 1.2\text{--}3.4 \text{ billion per year}
    \]
  – 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)
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, so 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:

    $$ ERP = \frac{t_o - at_i}{1 - a} $$

    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