

Chapter 9(a): Trade Impediments in a Competitive Setting

Nature of the WTO née GATT. One of the great institutions<sup>①</sup> designed by the Allies after WWII. Focus initially was on tariff reduction so as not to repeat the 'beggar thy nation' policies of 1930's during the Great Depression.

The GATT/WTO now includes policies with respect to some services and copyrights. Does not include investment.

Among key strategies of membership:

- 1- MFN = most favoured nation - what is given to one nation must apply to all.
- 2- Tariffs can be imposed for 'unfair' trading practices like 'dumping.'
- 3- Freely trade goods + services w/out quotas
- 4- Export subsidies must/should be explicit.
- 5- Can temporarily raise tariffs to protect local ~~producers~~ producers.
- 6- Regional Trade Agreement like NAFTA or EU are OK.

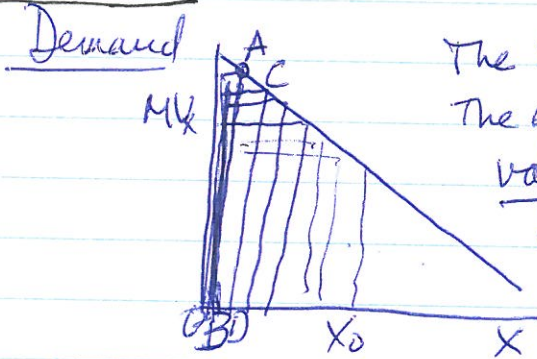
<sup>①</sup> The others include the International Monetary Fund (IMF), the World Bank for Reconstruction & Development (the World Bank) and the United Nations (the UN). The Bank for International Settlements (the BIS), however, predates.

So why are tariffs and trade impediments so popular?

+ This can be best approached by understanding what a tariff is and what consequences it has.

\* A tariff is a tax on imports

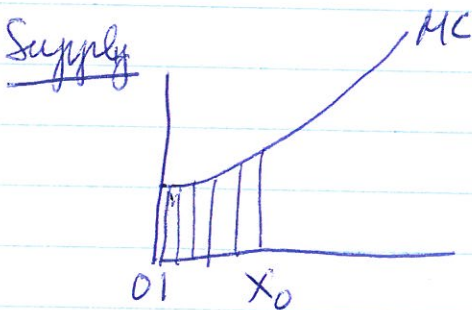
Preliminaries



The 1st unit generates a marginal value, The second unit, (C) generates the marginal value of an additional unit, ..., and so forth.

Therefore the area under the demand schedule represents the value to the consumer of consuming, say,  $X_0$ .

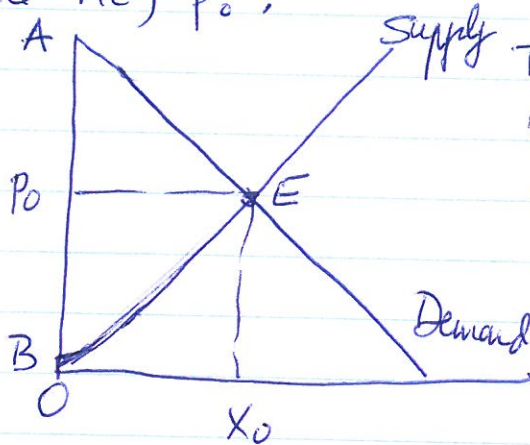
It is the sum of all the marginal values from  $0 \rightarrow X_0$  which is the  $\Delta$  (in this case) under the demand (marginal value) schedule.



The first unit produced costs  $(O-1)$  the marginal cost which is the bar under the MC schedule.

Every additional unit adds MC costs. The area under the MC (or supply) schedule is the total cost of producing, say,  $X_0$ .

Thus we can write at equilibrium amounts  $X_0$  and price (price = MC)  $p_0$ .



The area  $OAEX_0$  is the value of consuming  $X_0$  to the consumer. ~~The~~

The area  $OBEX_0$  is the total cost of producing  $X_0$ .

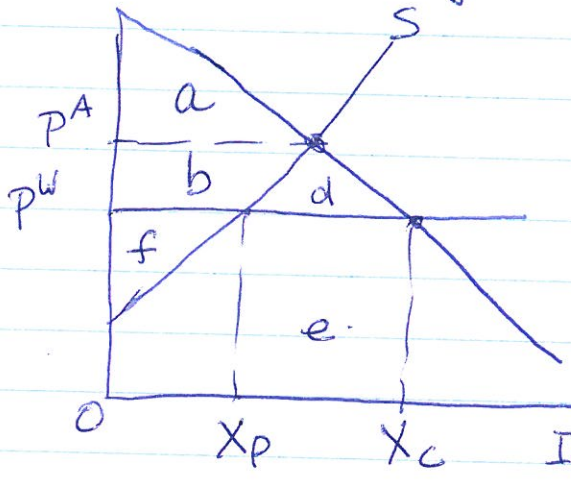
The consumer pays  $OP_0EX_0$ , but since it is worth in total  $OAEX_0$ , then  $AP_0E$  is termed consumer surplus. It represents what the consumer would have been willing to pay for  $X_0$  in addition to what is actually paid  $OP_0EX_0$ , rather than do without  $X_0$ .

The producer receives  $OP_0EX_0$ , but the total cost of production is  $OBEX_0$ . The area  $BP_0EX_0$  is termed producer's surplus and represents a rent received by the fixed factors of production.

Thus the areas in the diagram have useful economic meaning\*.

\* We are ignoring any number of technical issues which devotees of microeconomic theory can try to qualify this story.

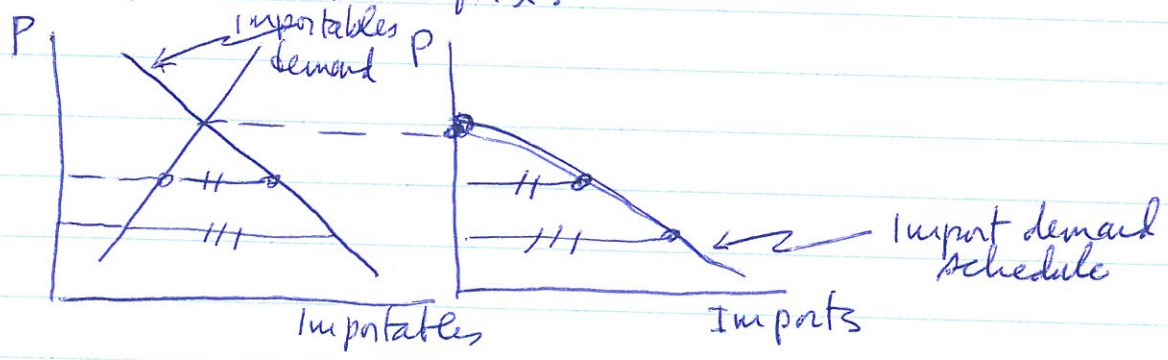
Now consider a country that imports a good: a small country



$P^A$  = autarky price  
 $P^W$  = world price

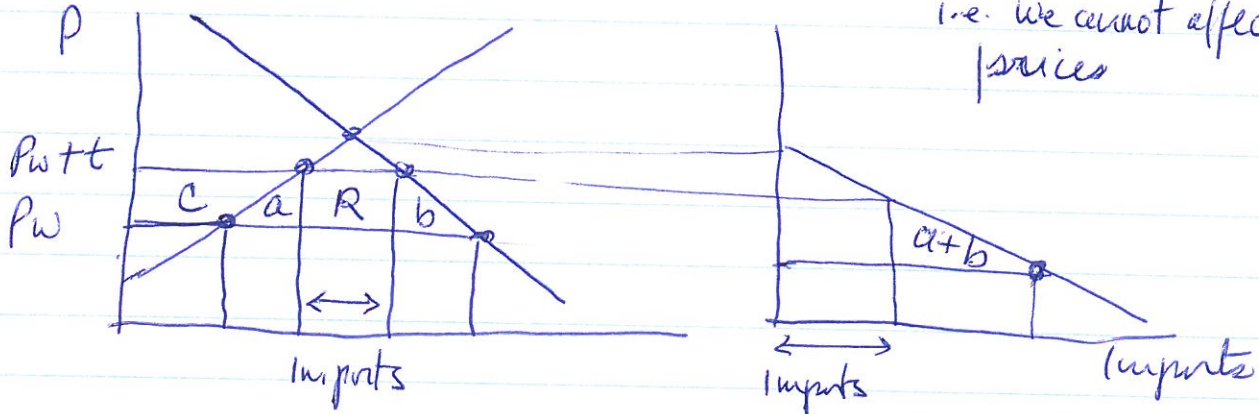
Home consumption is now  $X_c$   
 Home production is now  $X_p$   
 Imports are  $X_c - X_p$

- Home consumer surplus is  $a + b + d$
  - Home cost of consumption is  $P^W \times X_c$  of which
  - home producers receive  $X_p \times P^W$
  - Foreign producers receive  $P^W \times (X_c - X_p)$  [area e]
  - Area f is producer (home) surplus
  - Home cost of production is now the area under the supply schedule from 0 to  $X_p$ .
- Home - Consumer's gain  $b + d$ ; producers lose  $b \rightarrow$  net gain  $d$
- We can also write the import demand schedule as the excess demand for X.



Now impose a tariff,  $t$ .

The price at home is now  $p^w + t$ : we are a small country.  
i.e. we cannot affect world prices



$a + b$  are deadweight losses

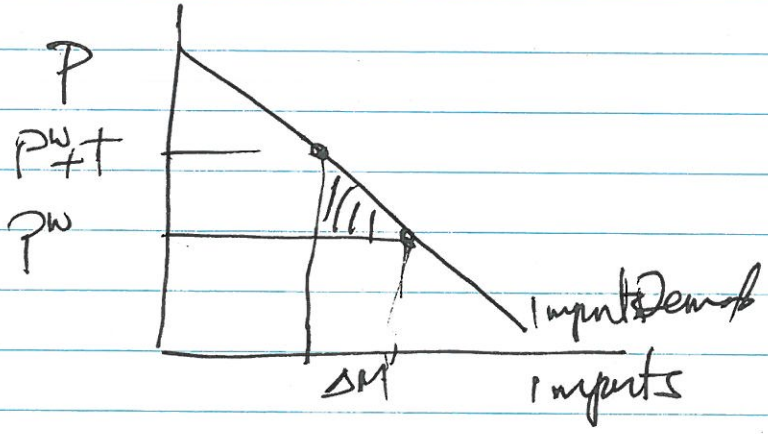
$R$  = tariff revenue

producers gain  $c$

consumers lose:  $c + a + R + b$

- winners + losers means that there is rentseeking behaviour

- Even though the winners gain more than the losers lose, the winners may not be able to bribe the losers to prevent the tariff



$$DWL = \frac{1}{2} t \Delta M$$

$$= \frac{1}{2} t \frac{\Delta M}{P^w M}$$

$$\frac{\frac{\Delta M}{M}}{\frac{\Delta P}{P}} = \epsilon$$

$$\frac{DWL}{P^w M} = \frac{1}{2} \left( \frac{t}{P^w} \right) \cdot \left( \frac{\Delta M}{M} \right)$$

$$\epsilon \cdot \frac{\Delta P}{P} = \left| \frac{\Delta M}{M} \right|$$

e.g for steel:  $\frac{t}{P^w} : .3$

$\frac{\Delta M}{M} : .3$

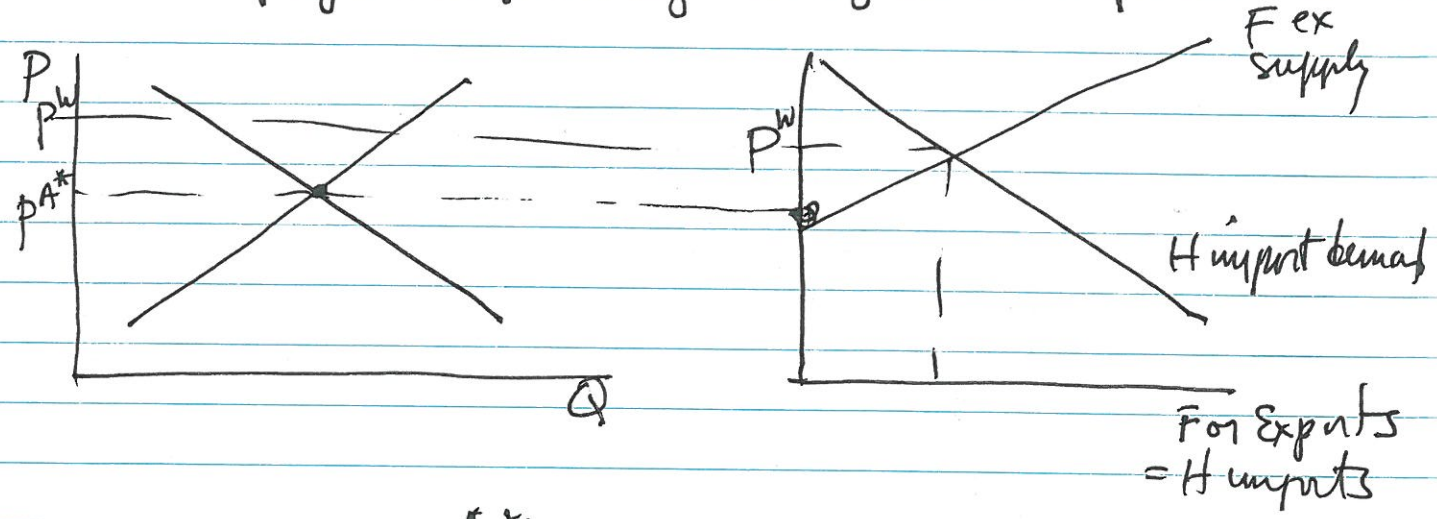
$$\therefore DWL = \frac{1}{2} (.3)(.3) = 4.5\% \text{ of import value}$$

$$\text{Also} = \frac{DWL}{P^w M} = \frac{1}{2} \left( \frac{t}{P^w} \right) \epsilon \frac{\Delta P}{P^w} = \frac{1}{2} \left( \frac{t}{P^w} \right)^2 \cdot \epsilon$$

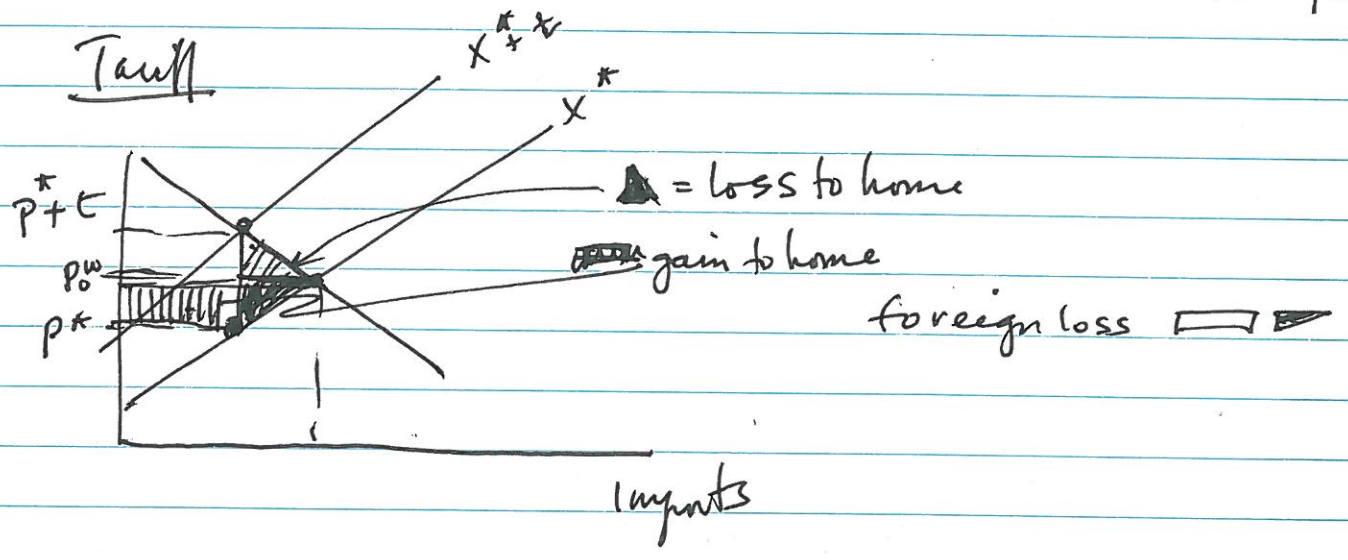
$$= ~~1/2~~ .045 \cdot \epsilon$$

# Tariffs for a Large Country

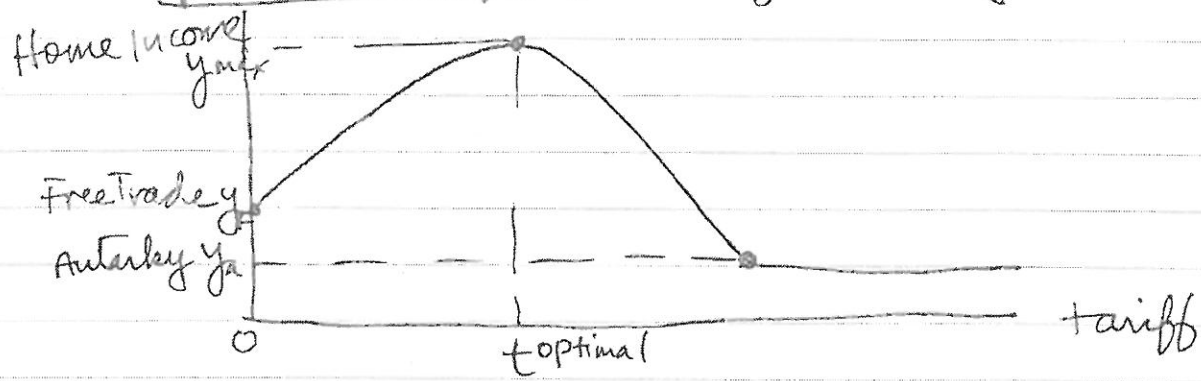
World supply no longer exog. at a given world price



## Tariff



### Optimal Tariff: In a large country



$$dy = -M dp^* + (p - p^*) dM$$

$p^*$  is world price  
 $p$  is domestic price  
 $(p - p^*) = t$  tariff rate

As the tariff increases from 0, the fall in world prices raises income. The tariff wedge is the difference between the domestic and world price. As the tariff increases, imports fall as they are more expensive. The optimal tariff,  $dy = 0$  at a maximum, is where the increased tariff lower world price is just balanced by the fall in imports:

$$M dp^* = (p - p^*) dM \quad (\text{note } dp^* < 0 + dM < 0)$$

$$\frac{dp^*}{p^*} = \frac{dM}{M} \cdot t \quad \text{rate of tariff is } t \text{ : } (p - p^*) = t p^*$$

$$t^{\text{optimal}} = \left[ \frac{dM}{M} / \frac{dp^*}{p^*} \right]^{-1}$$

$$= \frac{1}{\left( \frac{dX^*/X^*}{dp^*/p^*} \right)} = \frac{1}{E^*}$$

and since our imports are their exports we get the formula ~~for the tariff~~ that gives the tariff in terms of foreign export supply

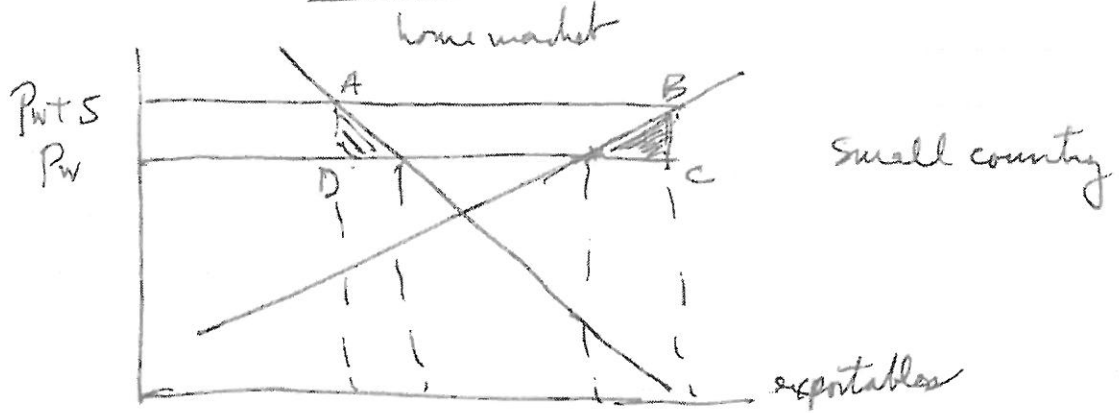


More commonly we write

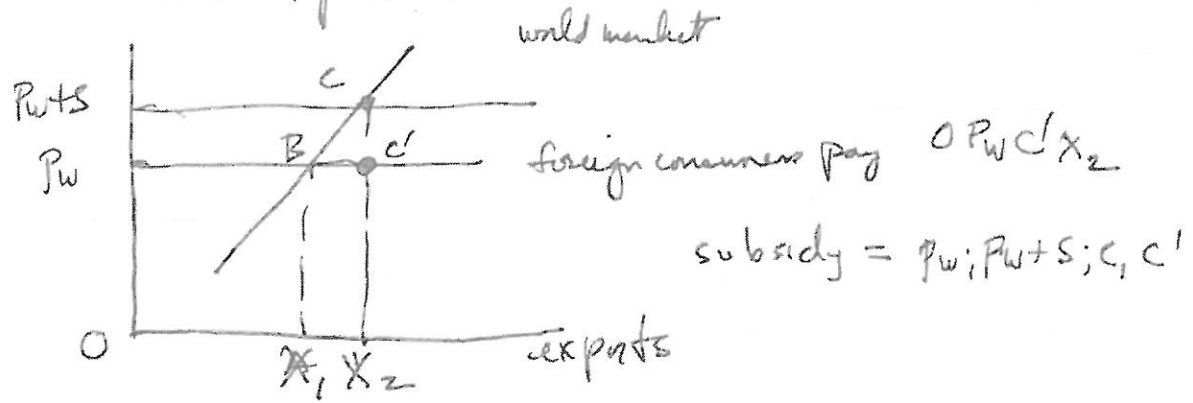
$$t^{\text{optimal}} = \frac{1}{\hat{M}/\hat{p}^*} = \frac{1}{\frac{\hat{M}^* - \hat{p}^*}{\hat{p}^*}} = \frac{1}{\epsilon^* - 1}$$

$$(\text{recall, } pM = M^* \Rightarrow \hat{p}^* \hat{M} = \hat{M}^*)$$

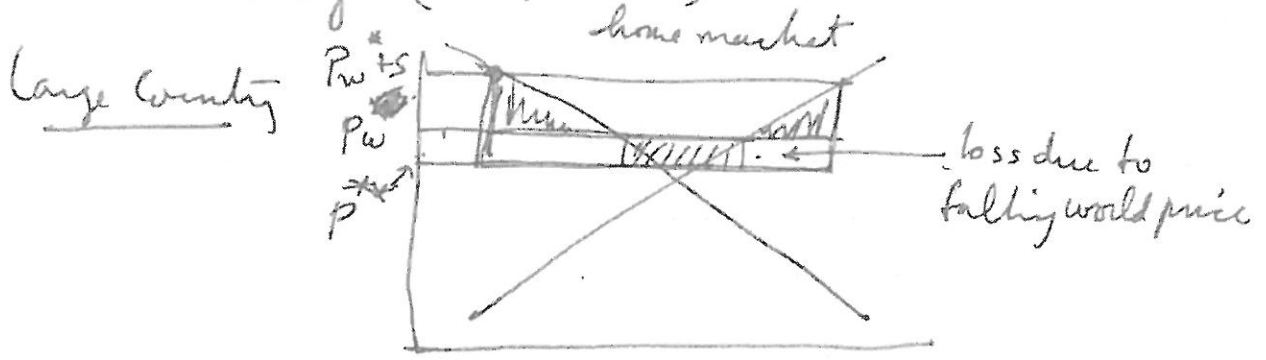
Export Subsidy



Need <sup>import</sup> tariff + subsidy to prevent re-import. Home consumers pay  $P_w + S$  since exports get that on their exports!



My complaint, you still need to raise  $S \times X_2$  to pay for the subsidy. (lump sum?)



#1

## Many kinds of subsidies

### Food aid

- direct food gifts drive down foreign prices + suppress agriculture in the "aided" country!
- Better to have cash to buy + distribute local crops!

## Ag. subsidies are a miracle on their own

- HK try to eliminate direct subsidies

Chapter 9(b)

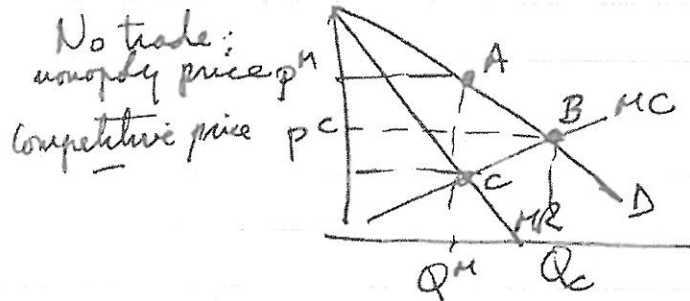
## Tariffs + Quotas + Imperfect Competition

We saw like 87% of economists that tariffs + quotas reduce welfare. (optimal tariff?)

New theory of imperfect competition revived these debates 1980 w/ strategic trade policy - gov policy could give local firms advantage

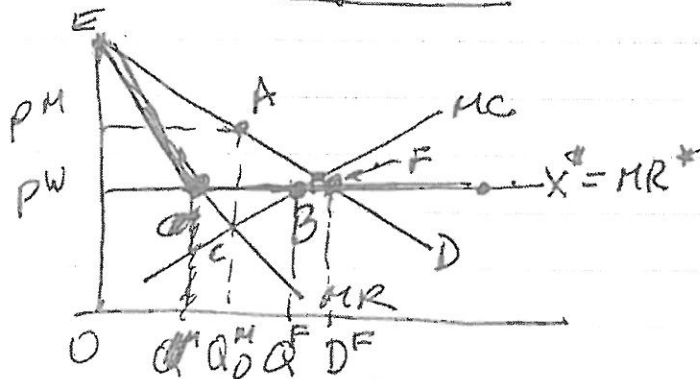
look at cases of (discriminating monopolist facing the home country ~~etc~~ which leads to what is termed dumping (and antidumping tariffs) & the venerable infant industries argument for tariff protection

## Tariffs + Quotas of home monopoly



monop  
output < compet output  
 $P^M > P^C$   
Welfare loss: ABC  
due to monopoly

## Free-Trade Equilibrium



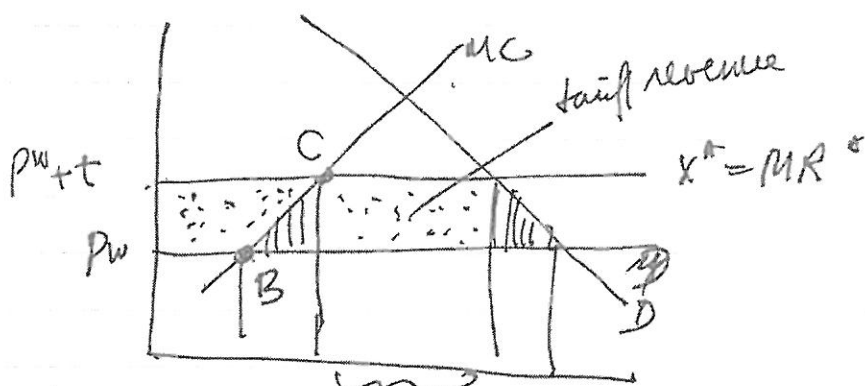
With  $P^W$  and home  
"small",  $MR = X^*$   
( $MR = \overline{ECB}$ )

Imports are  $\overline{BF}$   
Free trade production is  $\overline{OQ^F}$   
" " consumption is  $\overline{D^F}$   
at prices  $P^W$ .

Thus the home monopoly is  
broken by  $P^W$  which is  
(in our small country) looks like  
competitive firms.  
Consumer

Thus home gains more than monopoly loss. since gets  
 $\overline{EFP^W}$ .

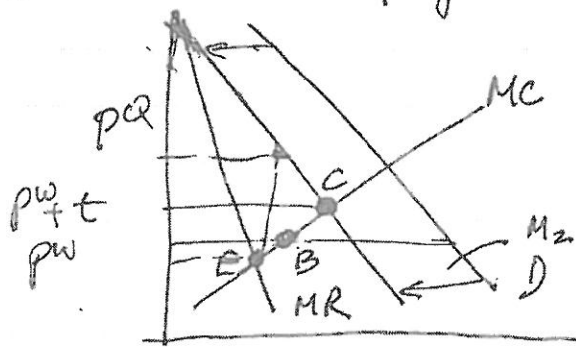
## Impose a tariff at home



All as before since  
 $MR = P^w + t$

## However, a Quota has different results

- (1) if a quota equivalent to a tariff is imposed in a competitive setting, it is equivalent subject to the disposal of what was ~~for~~ tariff revenue. (quota rents)
- (2) With a monopoly, there is not such equivalence



- Quota amount  $M_2$  so local demand is  $D - M_2(P^w)$
- MR is now downward sloping leading to E ( $MR = MC$ ) and price  $P^Q$  which is higher than  $P^w + t$ .

Local output may even fall below (B) (as drawn)

- Home welfare reduced by higher price which restricts domestic consumption.
- Quota rents are the right to sell cheaply purchased (foreign goods) at high domestic prices. Can be dissipated or given to foreigners (VERs)

Auto-VER in the US are a classic example  
See figure 9-5.

1980  $P_w = 5150$

1985  $P_{us} = 8050 = \text{\$}1100 \text{ quota rent} + \text{\$}1650 \text{ quality improvement} + \text{\$}150 \text{ (anyway)} = \text{\$}2100$

Therefore

$\text{\$}1,100 \times 2 \text{ million units sold} = \text{\$}2.2 \text{ billion minimum cost to US consumers.}$

• Since European substitutes also increased in price, Total loss =  $\text{\$}7.9 \text{ billion}$

• Price of US cars now sheltered by Japanese quota rose 43% from  $\text{\$}4,200$  in 1979 to  $\text{\$}6,100$  in 1981!  
- minimal quality increase.

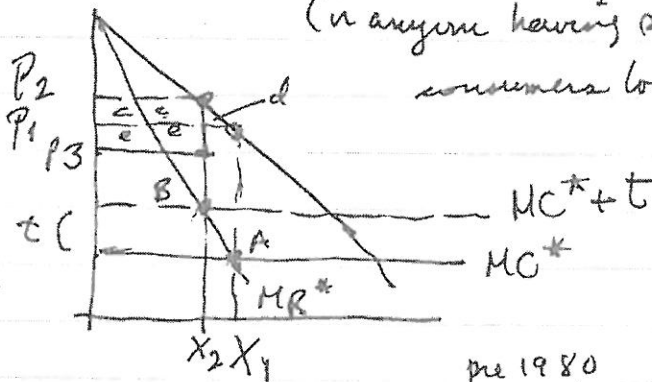
∴ All in all very costly to consumers!

Tariffs ↓ Suppose now the Monopolist is in the foreign country  
Home imposes tariff

Foreign monopolist selling into home market  
(in anyway having some monopoly power)

$P_2 - P_3 = t$

$P_3 = P_2 - t$



consumers lose  $c+d$  gain  $e+c$  as revenue

net  $(e+c) - (c+d) = e-d$

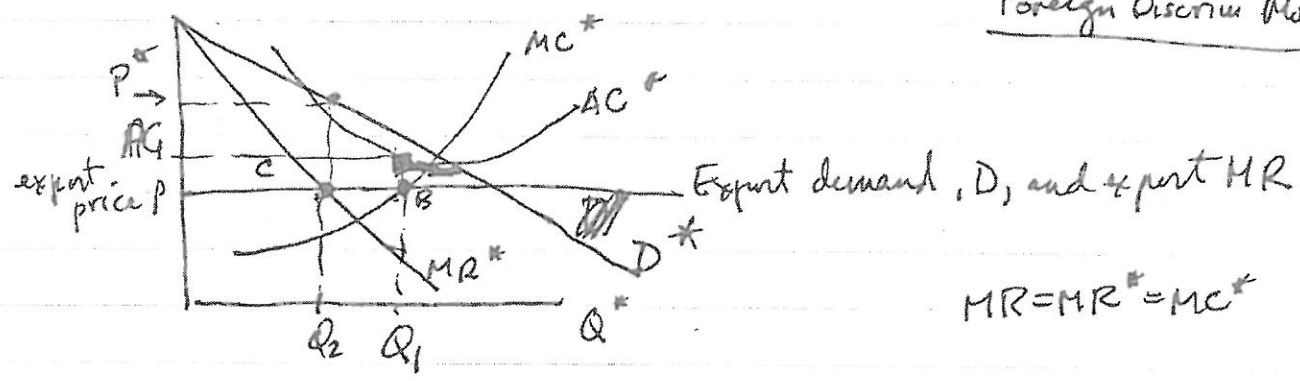
pre 1980

Case of Japanese Trucks: 4% tariff; 1967 trucks 25% (retaliation for US chicken subsidies); 1980 reclassified Japanese trucks  $\approx \pm 2\%$ . PUS ↑ 12% (9% absorbed by Japanese producers.) (#=25)

Dumping: sporadic, persistent, predatory

- price discrimination (requires separate markets)
- dumping  $\equiv$  price in export market is below home market or less than average cost to produce
- WTO allows anti-dumping duties.

Foreign Discriminatory Monopolist



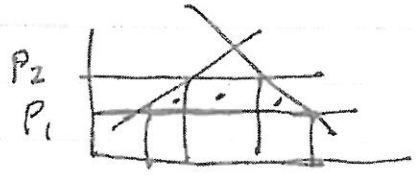
$MR = MR^* = MC^*$

- (1) Produce at  $Q_1$ ,  $MR = MC^*$  point B at price  $P$
- (2) Local sales are  $Q_2$ :  $MR^* = MR$  point C at price  $P^*$

Notice that the foreign firm sells at  $P^* > P$  in the export market. Further  $AC > P$  as well.

Anti-dumping duties

- (1)  $t = P^* - P$  foreign-home price
- (2) incentive to raise price in the home market

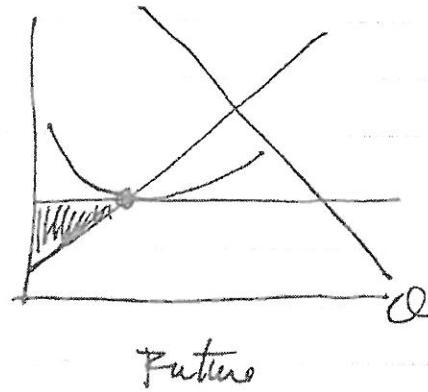
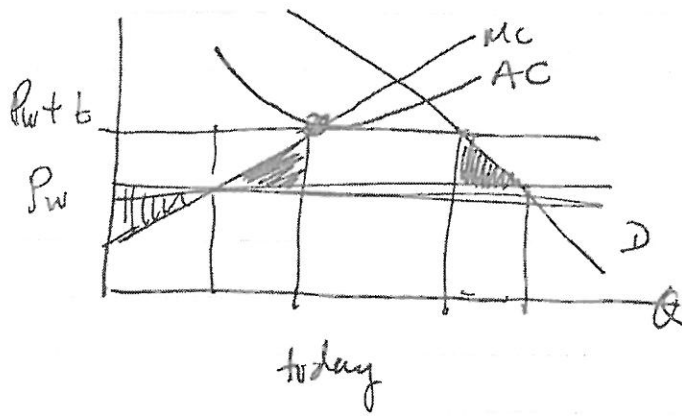


$\therefore$  Net loss to consumer  $\dots$  since there is no revenue.

Foreign producers are forced to raise prices in our market



# Infant Industry Protectionism



(1) H Davidson 1980s (US):

45%, 30, 15, 10 expired in 1987  $\therefore$  success as  
HD became solvent by 1987.

$$\frac{DWL}{P \cdot M} = \frac{1}{2} \frac{t}{P_w} \left( \frac{\Delta M}{M} \right)$$

$$3.8 \frac{1}{2} (0.45)(0.17) \quad 0.38 = 16 \text{ m}\$$$

Total over 4 years: 112.5 million DWL  
So what were the gains?

- (1) Govt. gives protection - non-economic: if it were economic, bank/investor would loan it.  
 $\therefore$  even if successful in a particular case need to look more broadly.

Jobs Saved

	<u>Cost</u>	Jobs 'Saved'	Cost/Job
EU			
AG		121,000	106,751
Clothing		39,000	168,000
Text.		33,000	182
Japan			
AG		76,000	762,000
Clothing		13,000	461,000
Textiles		2700	445,000
US			
Ag		6,000	486,000
Clothing		152,000	138,000
Textiles		16,000	202,000

Gerber, P134

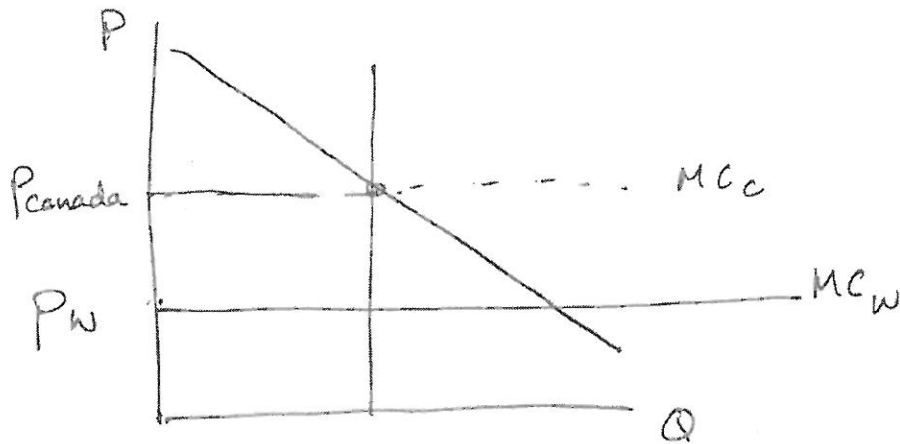
Summing Up (mid 1990's) - billions.

Tariff + Quota Costs

	PS	TR	QUOTA RENTS	DWL	NATL WELF LOSSES
<u>EU</u>					
AG	4.7	3.0	.3	4.9	5.2
Cloth	1.5	1.5	2.3	1.5	3.1
Textiles	2.3	1.5	1.7	.6	2.3
<u>Japan</u>					
AG	43.	1.1	6.9	7.2	14.1
Cloth	1.6	.4	2.7	1.7	4.4
Textiles	.8	.3	.1	.01	.2
<u>US</u>					
AG	1.8	.2	.6	.3	1.0
Cloth	9.9	3.5	5.4	2.3	7.7
Textiles	1.7	.6	.7	.2	.9

Messerlin, Measuring the Costs of Protection in Europe. 2001

## Milk Marketing Boards



- You must have a quota to sell milk in Canada.
- 1 kg of quota is roughly one dairy cow's output per year (1 kg is of butterfat.)
- Effective tariff is

Dairy ranks behind grain & red meat industries at ~~\$~~ \$1 billion in 2000.

CD Howe Freeing Up Food (April 2010)

$$\text{quota value} = \frac{(P_{\text{milk}} - MC_{\text{milk}}) (1 - \delta \text{ risk})}{r + d - g}$$

g = growth of net return  
 r = interest rate  
 d = default risk

	Value Dairy Quota	Poultry + Eggs
1995	7.6	2.0
2001	14.1	3.4
2008	21.0	7.2
avg annual growth	10.7	13.9