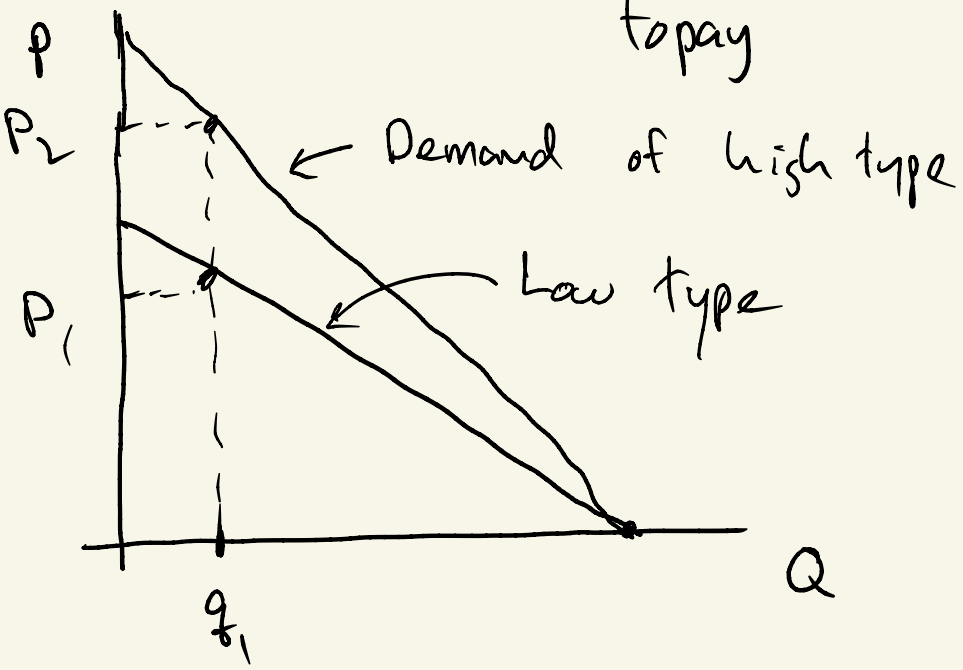
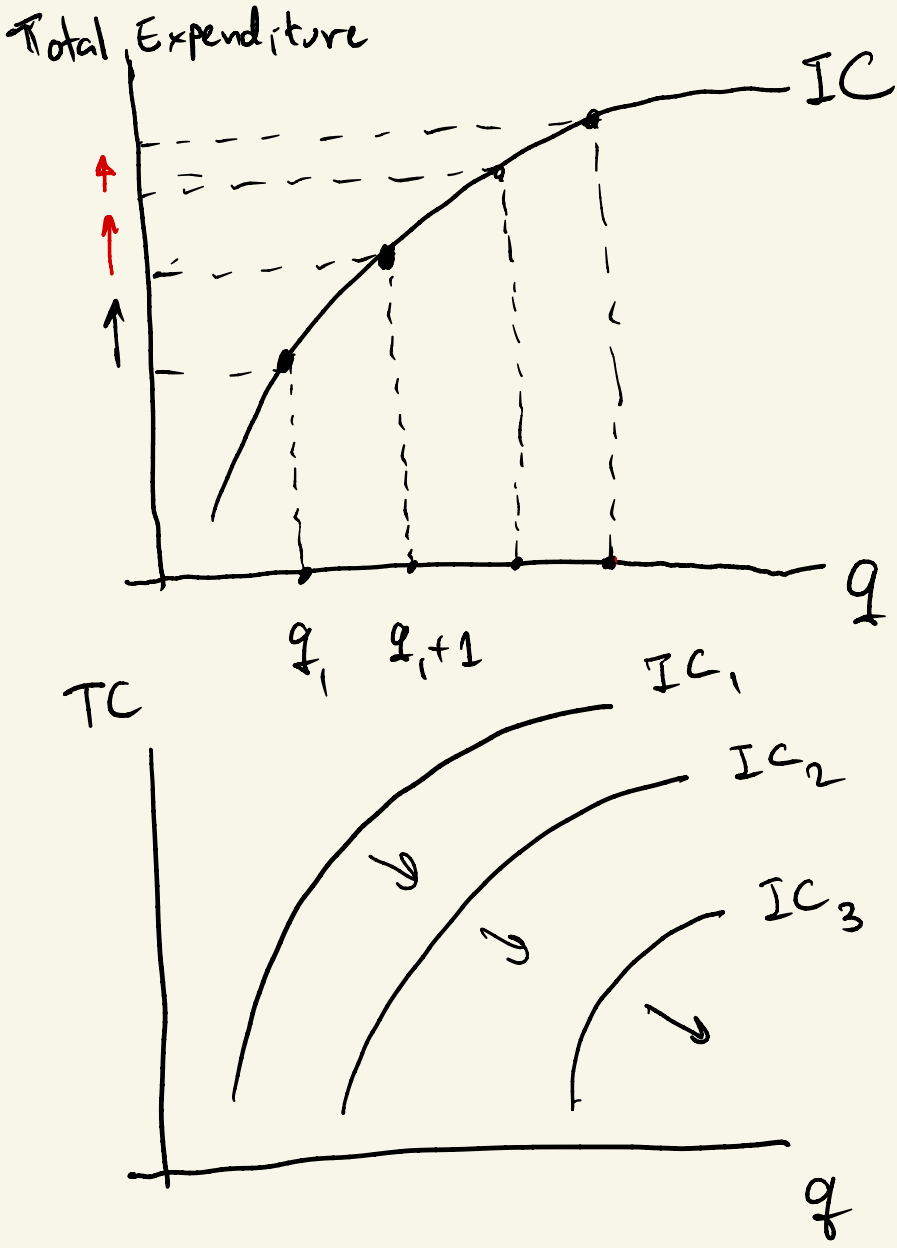
- 2nd Degree Price Discrimination
  - Willingness to pay is unobservable
  - Know that buyer have different willingness to pay
- Tools for the firm
  - Two-part tariff
  - Multi-part tariff
  - Menu Price or Price schedule
  - Bundling or Tie in Sale
- Nonlinear Pricing

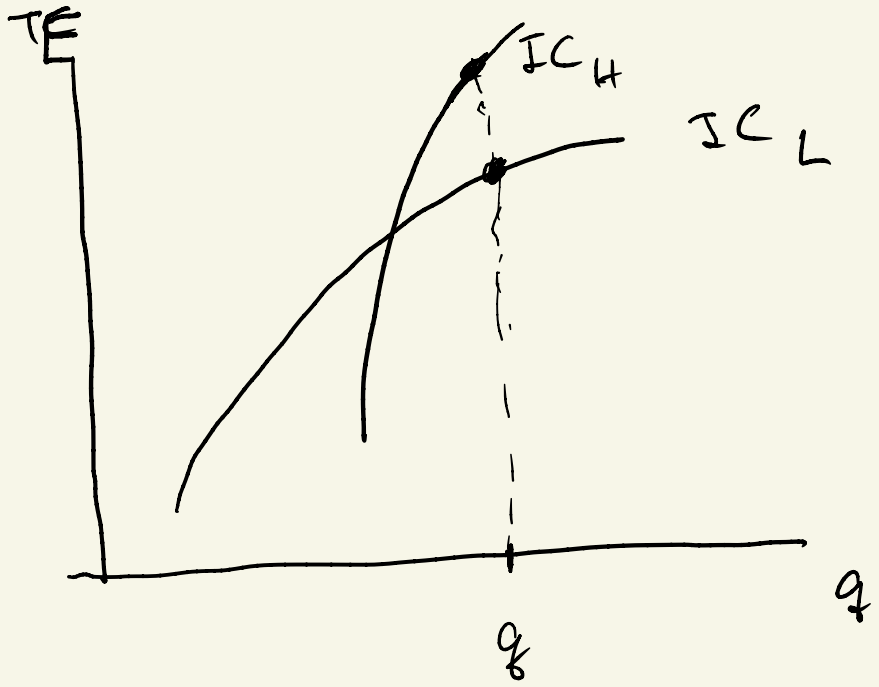
Firm charge	a lump-sum	and per unit
Play Station 4.		
Theme Park		
Nepresso/ Printer.		
Football game	membership Fee	ticket

A Single two-part tariff

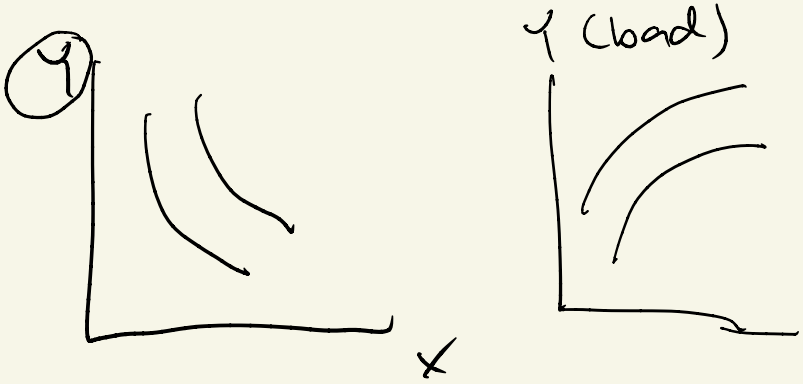
- 2 types of consumers
  1. High type => Higher willingness to pay
  2. Low type => Lower willingness to pay




Total Expenditure
IC
q
q_1
q_1+1
TC
IC_1
IC_2
IC_3
q



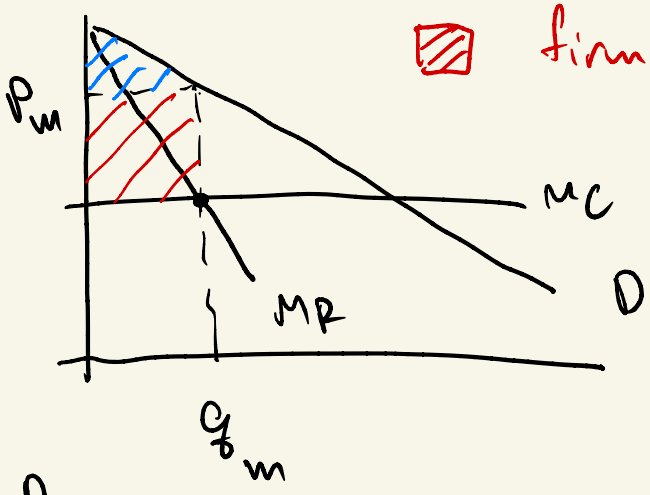
- The firm can increase their profit by offering two-part tariff

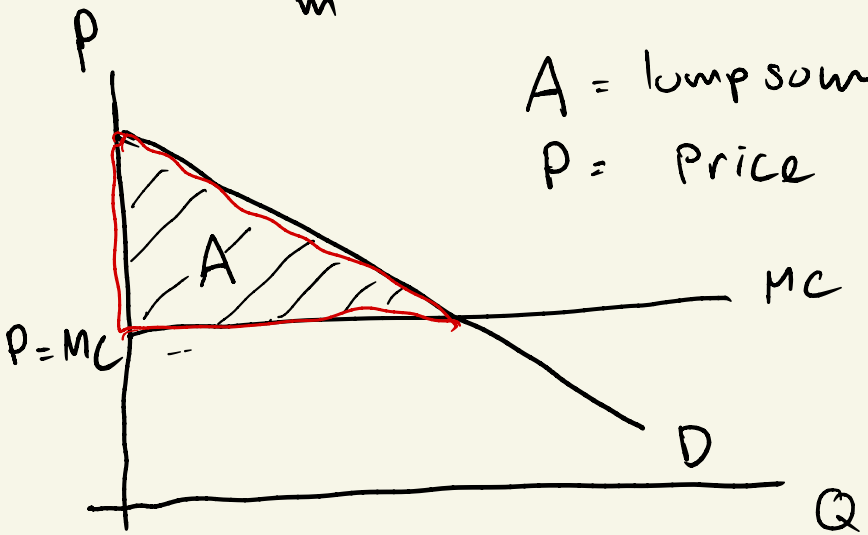


Ex: 1 group of consumer.

Consumer surplus

firm Π



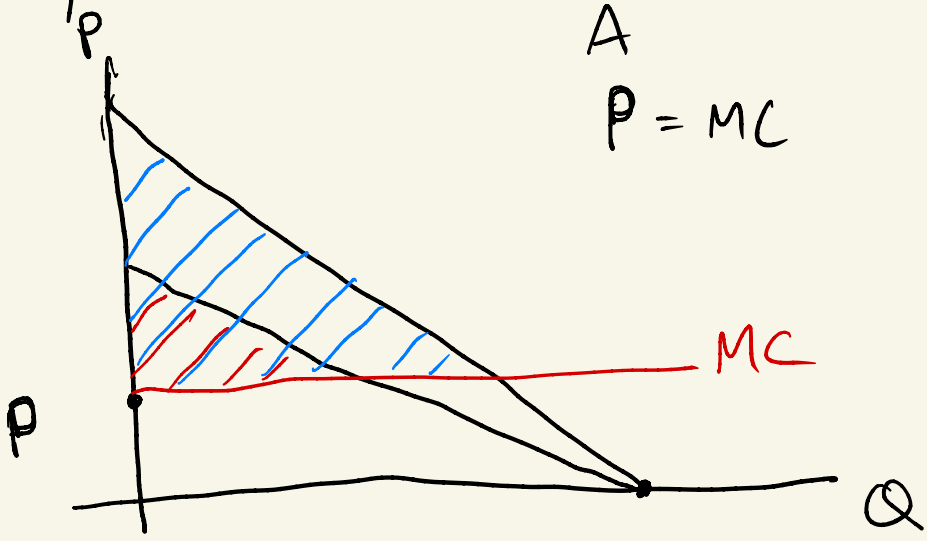


A = lump sum

P = Price

= firm Π

2 Types of Consumer



 = Surplus of H

 = Surplus of L

Option 1 A =  $\Rightarrow \Pi = 2 \times$ 

Option 2 A =  $\Rightarrow \Pi =$ 

Ex: Optimal A depends on relative size of two types of consumer

If L-type population is α

H type population is $1-\alpha$

Total population is 1

- Π from selling to both high & low type = α  + $(1-\alpha)$ 

= 

(option 1)

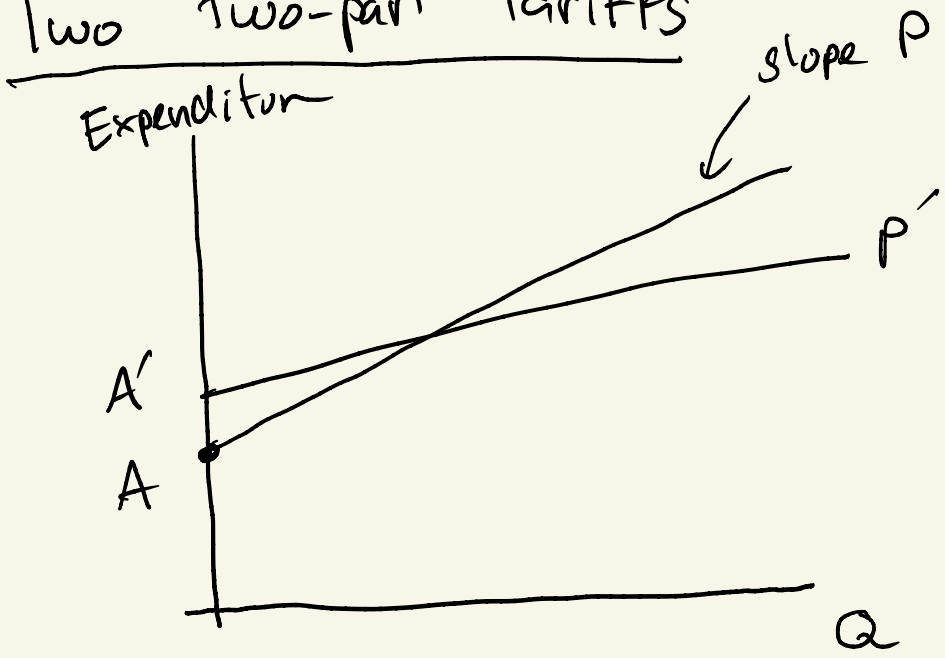
- Π from selling to H type only

= $(1-\alpha)$  (option 2)

If α is very high option 1 might be better than option 2

- Firm could do better by charging two two-part tariffs

Two two-part tariffs



Two-part tariff (A, p)

Total expenditure

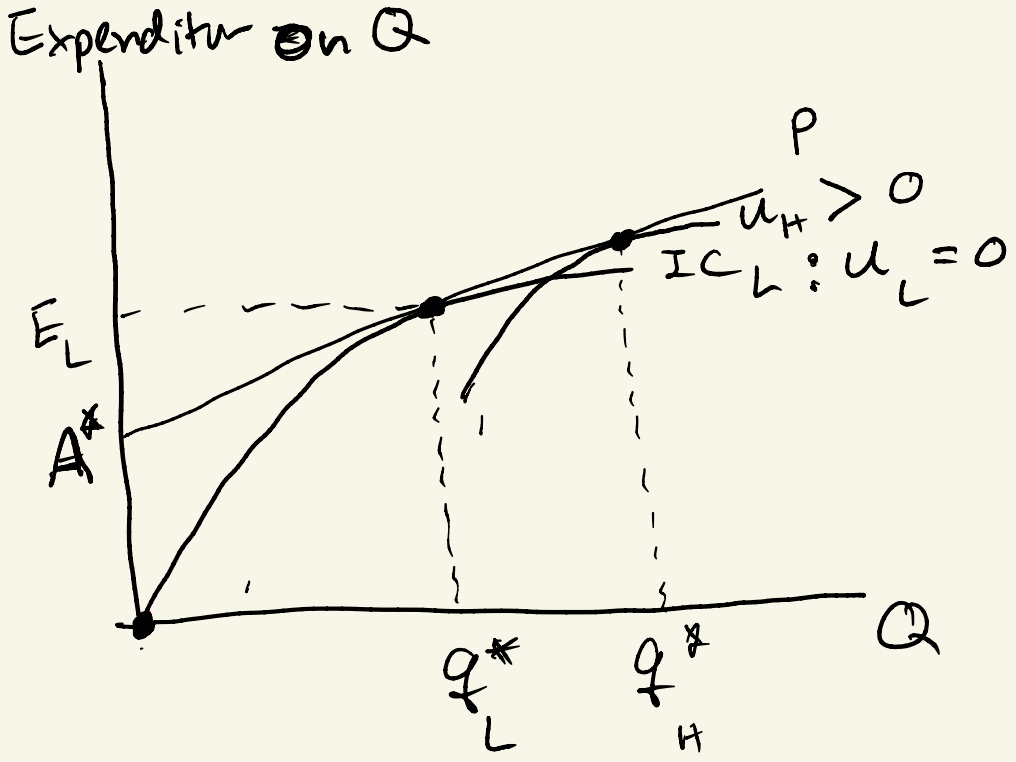
$$E = A + pQ$$

Single Two part tariff

- 2 group of consumer
  H, L

- firm choose option 1
  - serve both groups of consumers
  - $P = MC$, $A =$ 

- Consumer with L willingness to pay will receive zero surplus and H type receive positive surplus



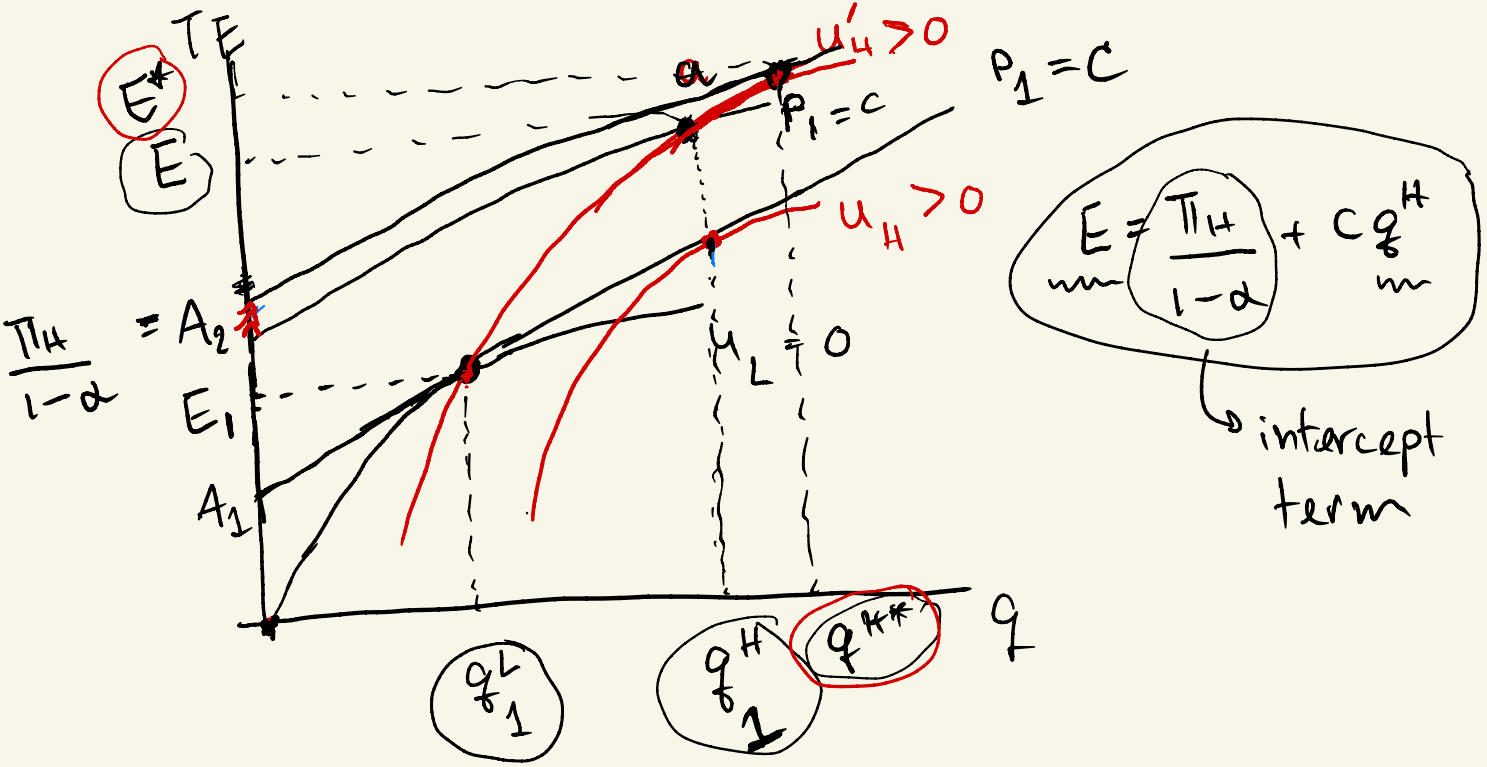
Church & Ware Ch 5

↳ In moodle after the class

- Suppose at the beginning the firm charge (A_1, P_1)

  A_1 = lump-sum payment, P_1 = per unit price

- If the firm wants to maximize profit at price P_1 A_1 must be chosen such that the surplus of L-type consumer = zero



If firm want H type to consume at a. firm has to offer single point menu => Demand a payment of $\bar{E}$ and allow consumer to consum q^H_1

For any pricing scheme (A, P), the total profit that the firm receive from High type consumers is equal to

$$\pi_H = \underbrace{(1-\alpha)}_{\text{population of H type}} \left[\underbrace{A + Pq^H}_{\text{(Total income of firm)}} - \underbrace{Cq^H}_{\text{(Total exp of consumer)}} \right]$$

$$E$$

$$\pi_H = (1-\alpha)\left[E - Cq^H \right]$$

$$E = \frac{\pi_H}{1-\alpha} + Cq^H$$

Optimal multiple non-linear prices is to set $(A_1, P_1 = c)$ with maximum $q = q_1^L$

sell q^{H*} at price E^*

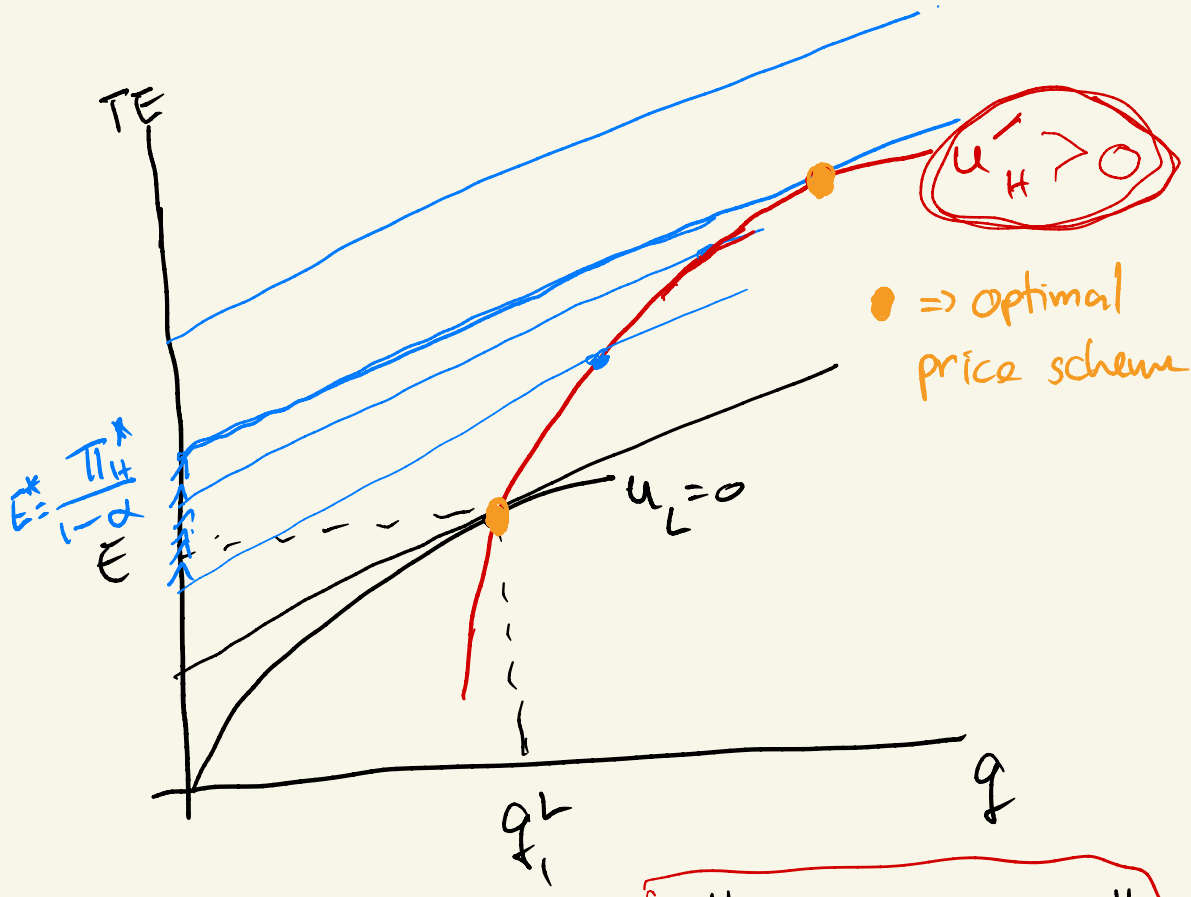
↕

sell q_1^L at price E_1

→ L type consumer will consume q_1^L and pay $E_1 = A_1 + cq_1^L$

→ H type will be indifferent between (E_1, q_1^L) and (E^*, q^{H*}) because these two points lies on the same IC ($u'_H > 0$)

(assume that they consume (E^*, q^{H*}))



(q^H, E^H) =>

$$E^H = \frac{\pi_H}{1-\alpha} + cq^H$$