

REVIEW MICROECONOMIC TOOLS FOR HEALTH ECONOMICS

EE 474 Health Economics

Semester 1/2014

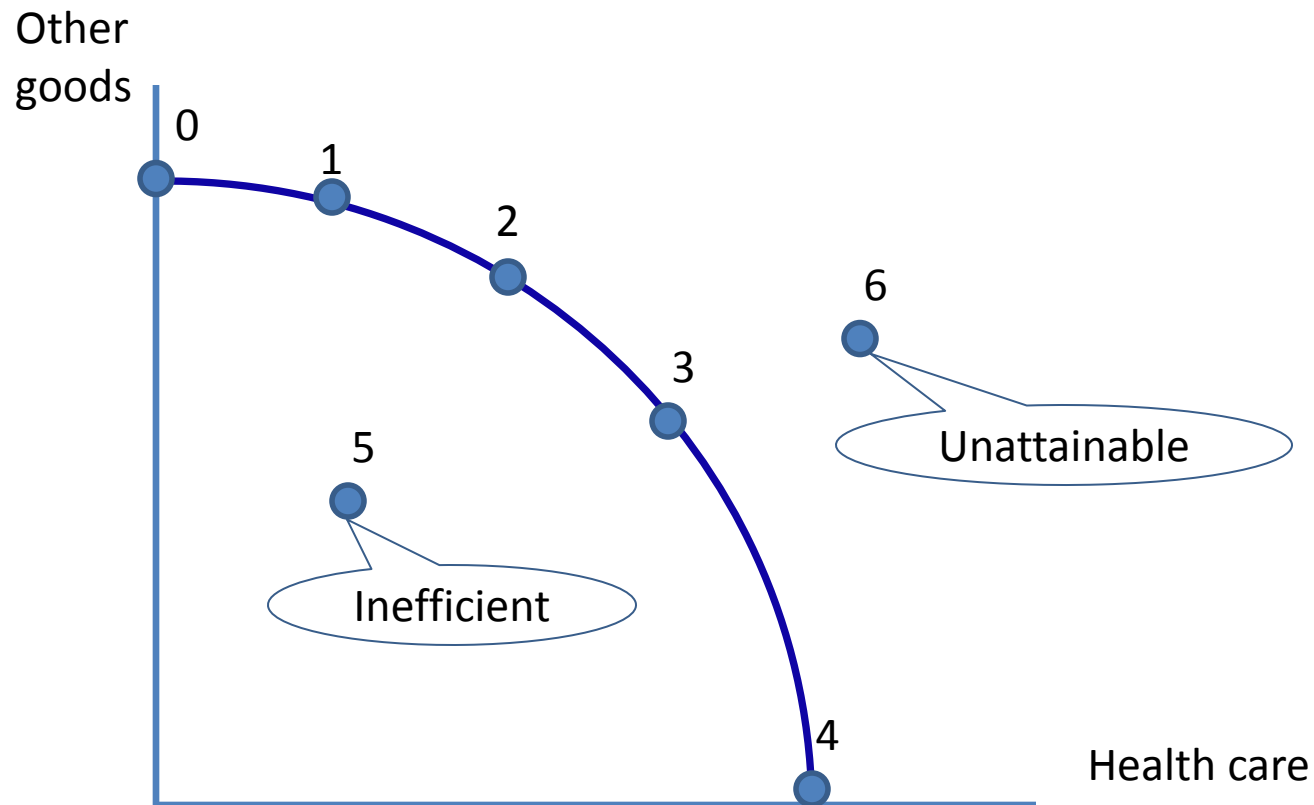
Topics

- Opportunity cost and production possibility frontier
- Consumer behavior theory
- Production and cost
- Perfect competition
- Monopoly

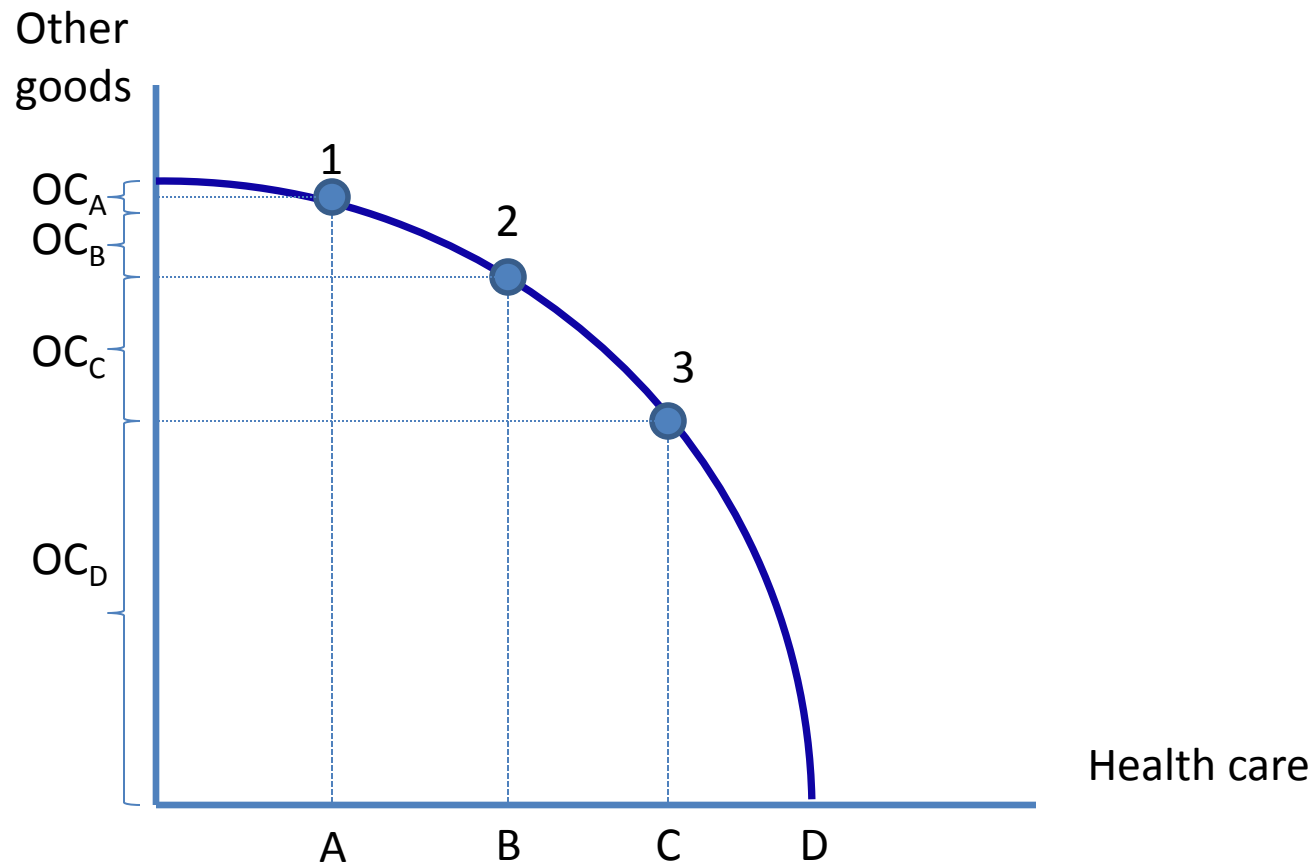
Opportunity costs

- Recall the national health expenditure in Thailand from the first lecture is about 4% of GDP.
- The **opportunity cost of health care** is represented by the other things in the economy that could be produced with the same resources.
- Opportunity cost:
 - *What must be given up*
 - Depicted by the **production possibility frontier (PPF)**.

Production Possibility Frontier (PPF)



PPF and Opportunity Cost



PPF and Opportunity Cost

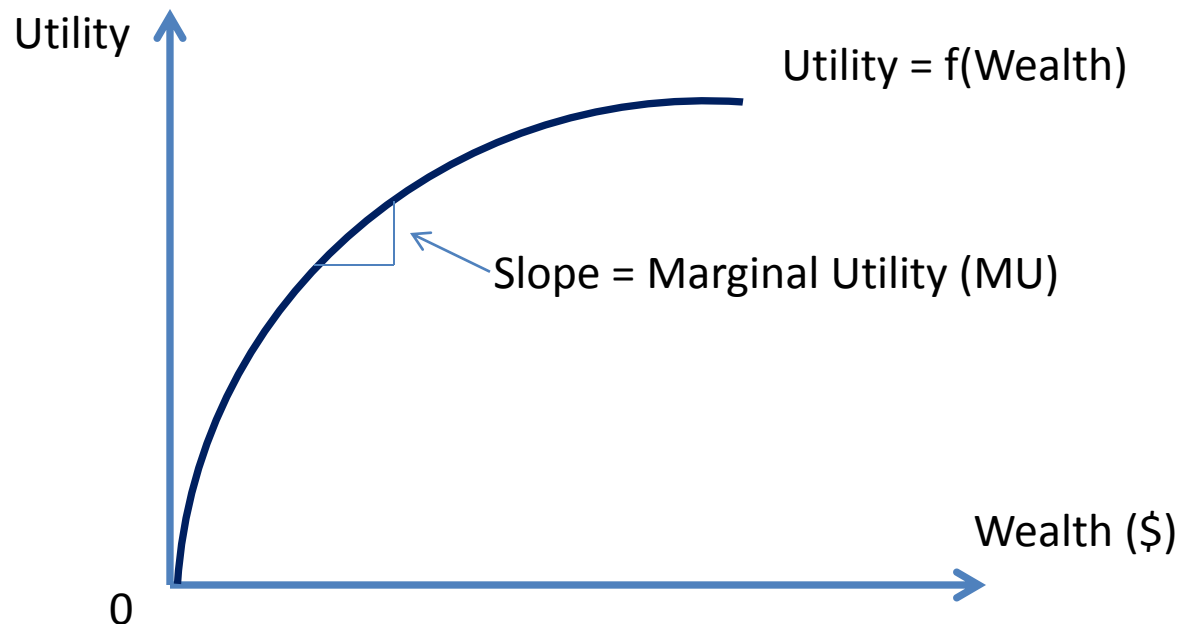
- The PPF illustrates the trade-offs between health care and other goods.
- The **slope of PPF** represents the **opportunity cost**:
 - Changing and becoming *steeper* at each level of health care.
- **Opportunity cost is increasing as more health care is produced .**
 - *The Law of Increasing Opportunity Cost*
 - Rationale?

Consumer Theory

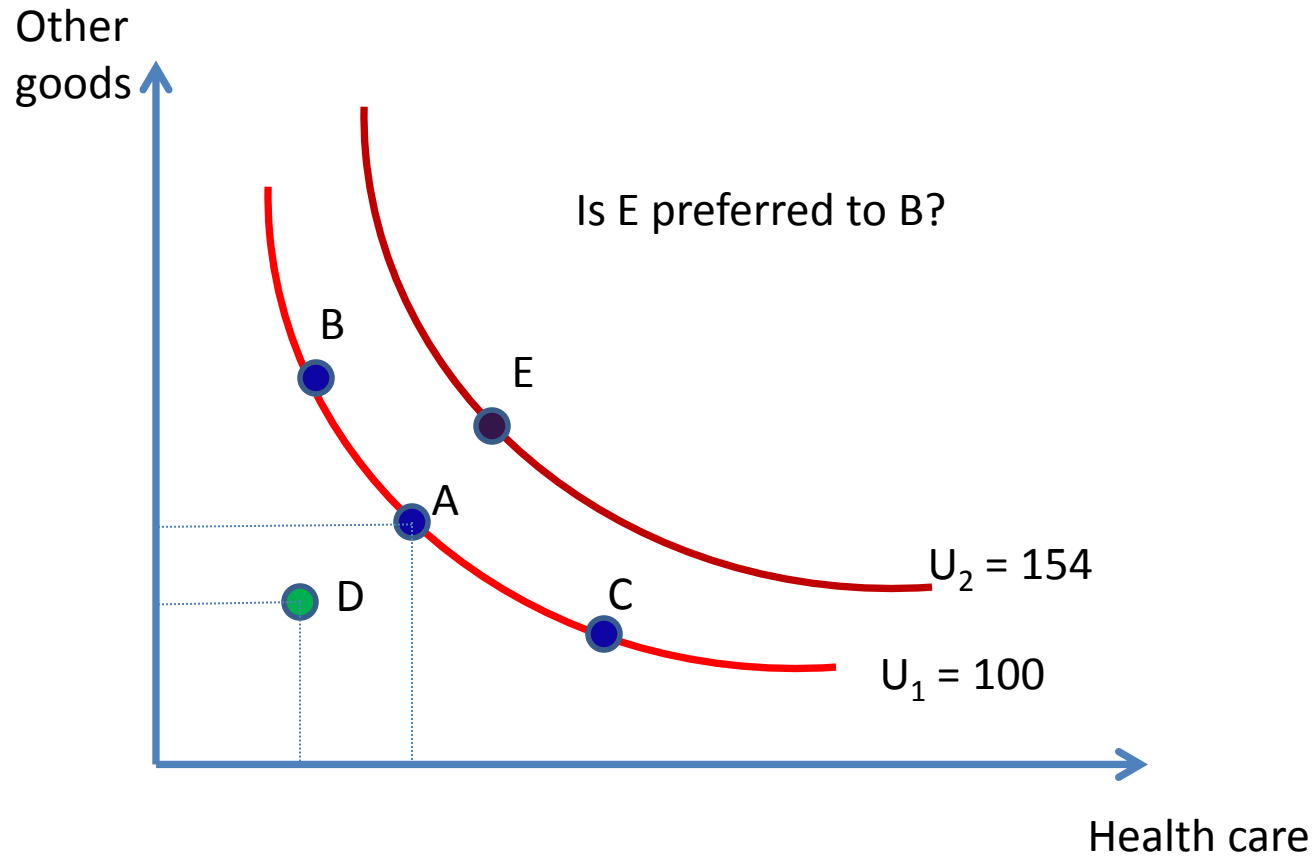
- Preference
- Budget constraint
- Consumer's equilibrium
- Derivation of demand curve
- Market demand
- Elasticities of demand

Preference

- Consumer's preference is represented by a **utility function**.
 - *Utility is a measure of the level of satisfaction.*
- Example: Amy's utility as a function of wealth

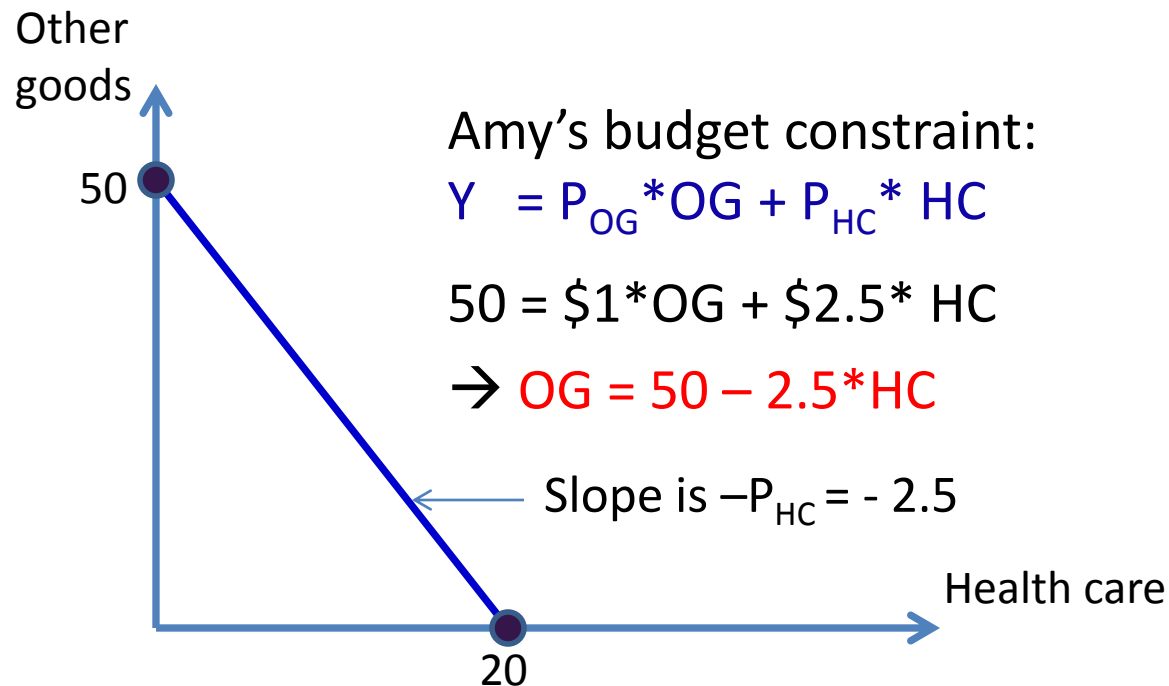


Consumer's Preferences for Two Goods: Indifference Curve

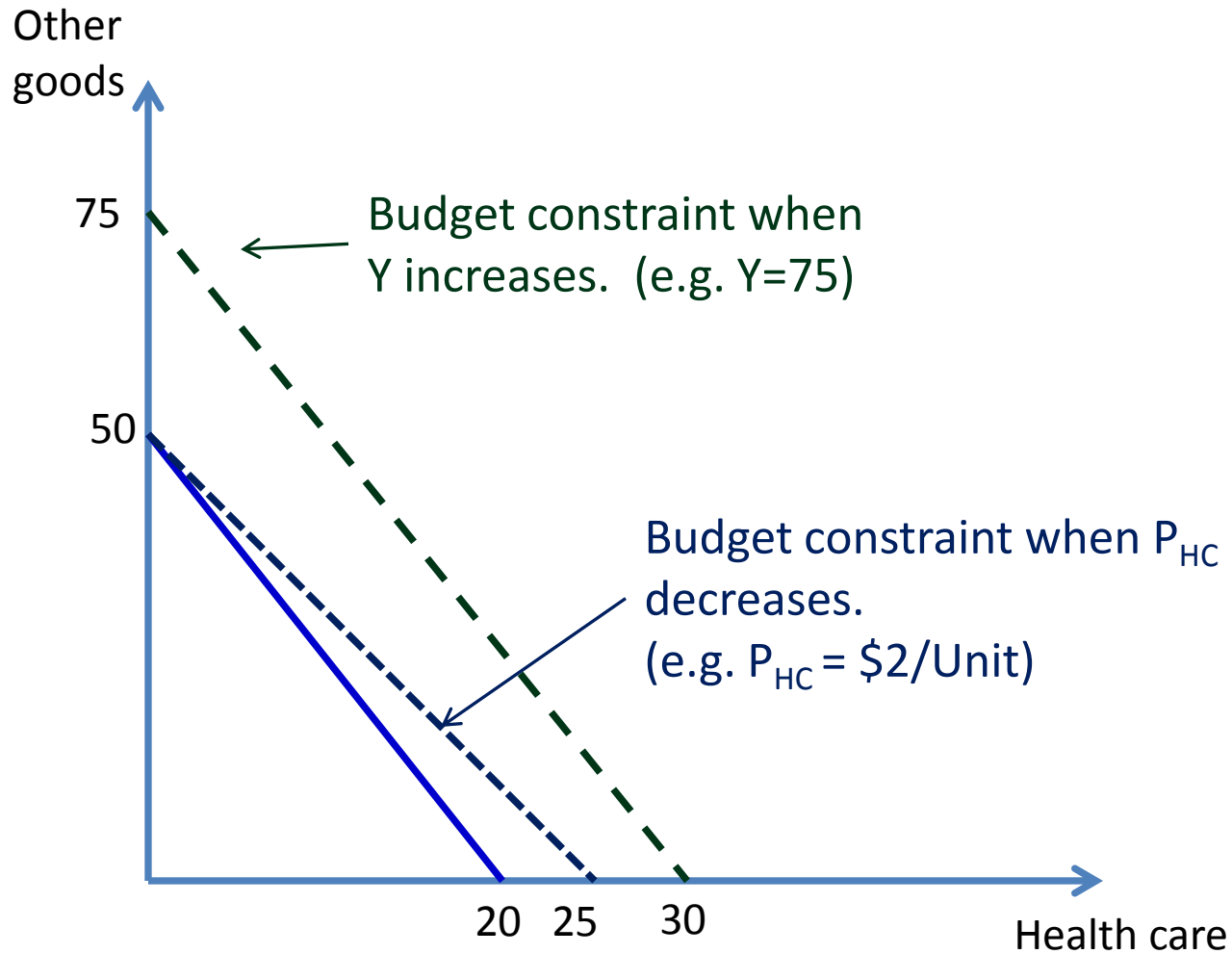


Budget Constraints

- Budget constraint depicts what the consumer **can afford**.
- Example: Suppose Amy has \$50 income and has to choose between 2 choices: health care ($P_{HC} = \$2.5$ /unit) and other goods ($P_{OG} = \$1$ /unit).



Budget Constraints

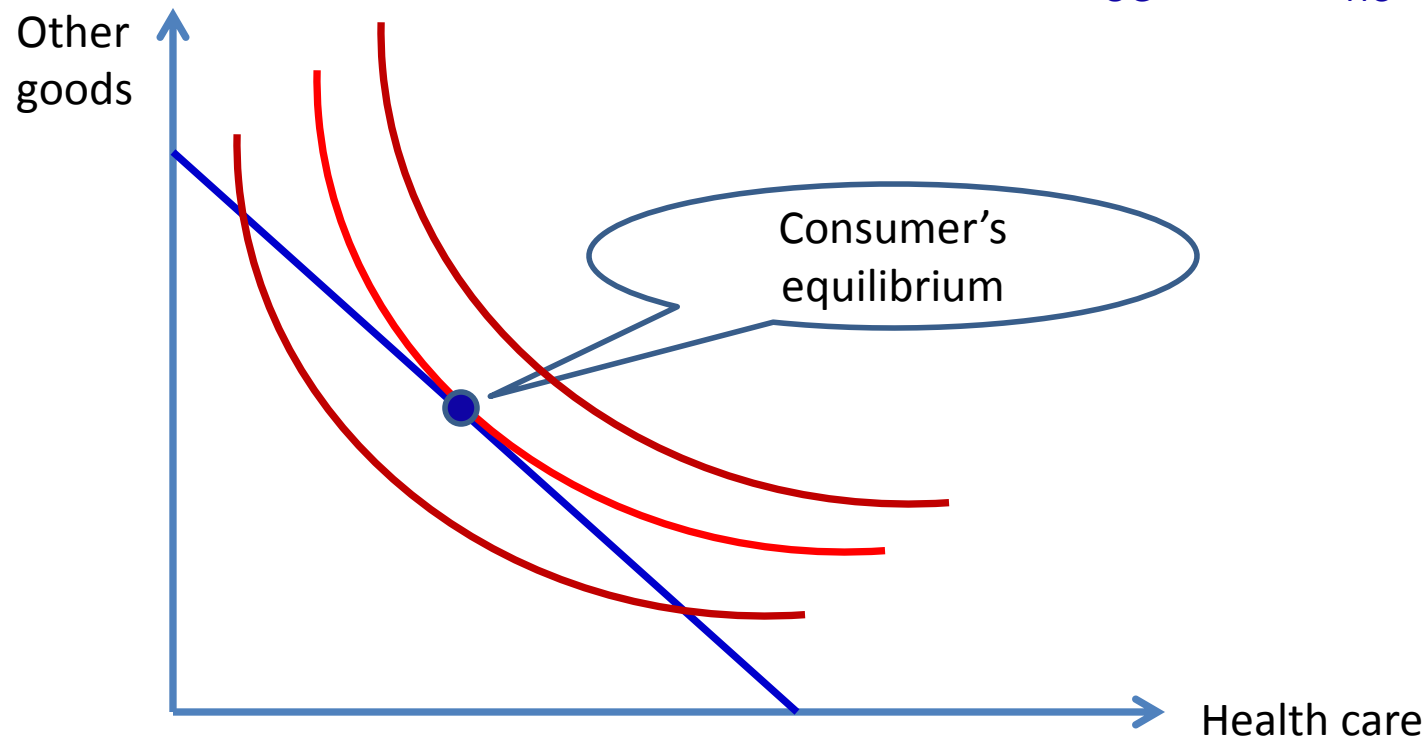


Consumer's Equilibrium

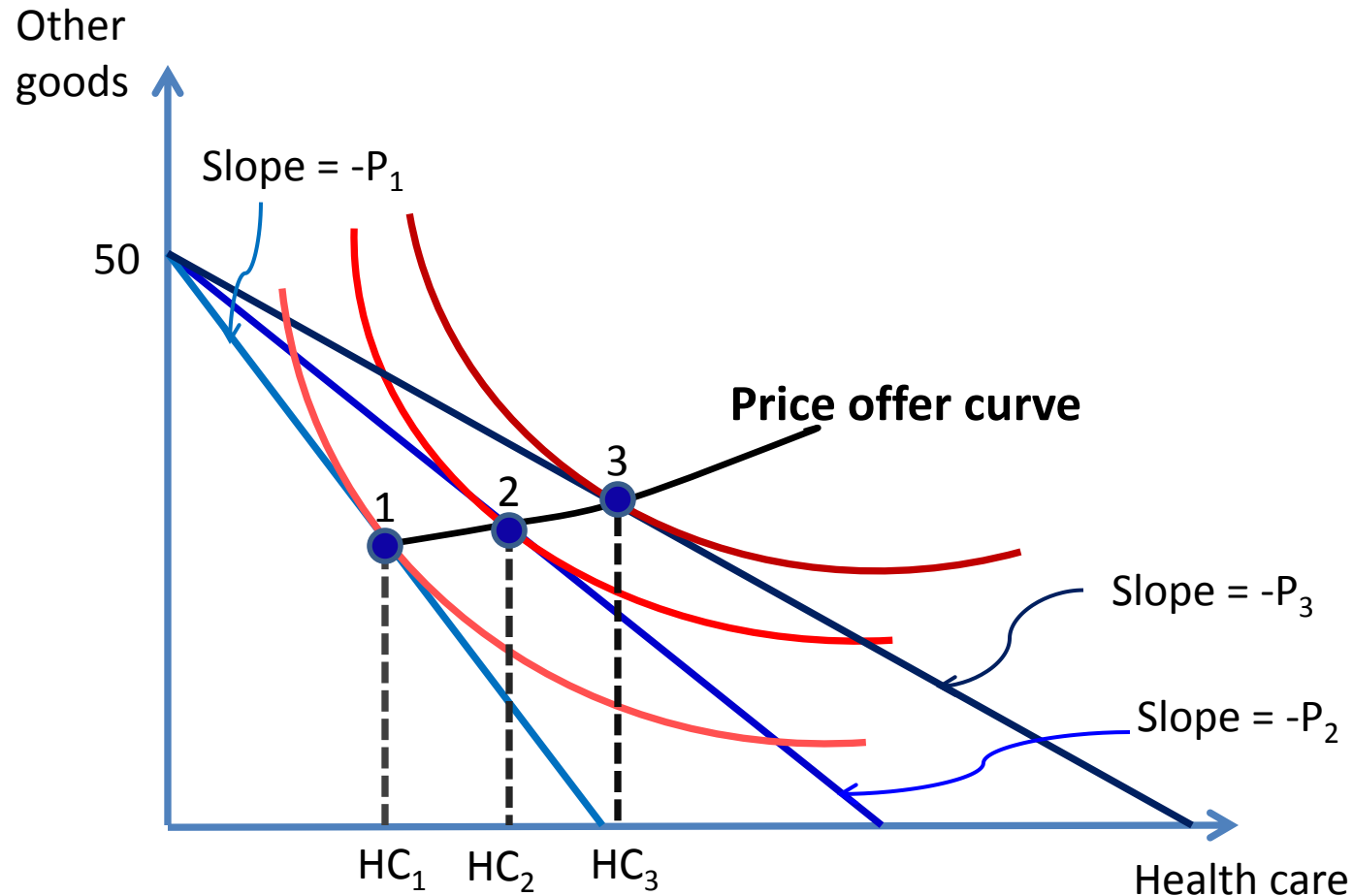
- Consumer's problem:

$$\text{Max } U(\text{HC}, \text{OG})$$

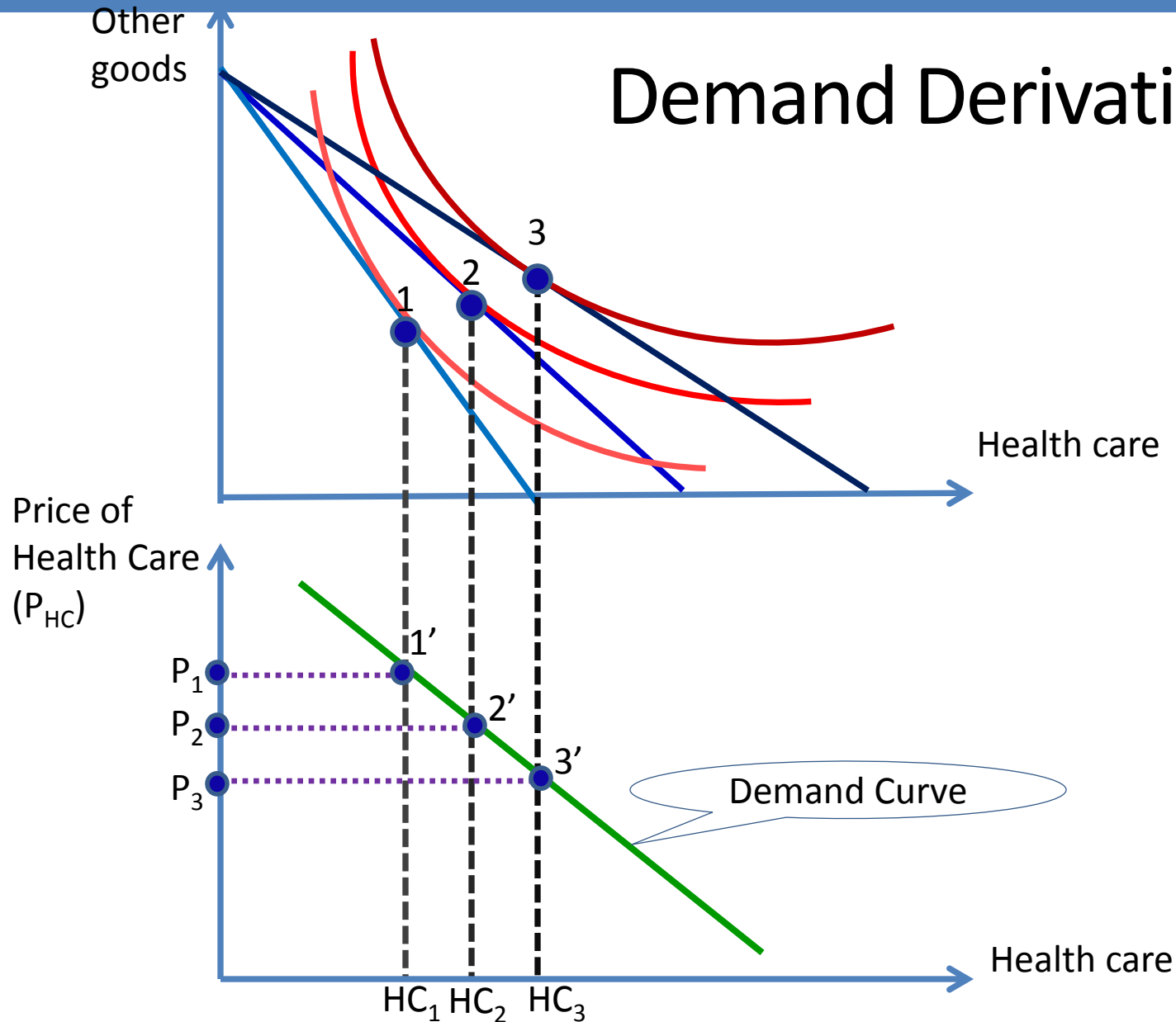
$$\text{subject to } Y = P_{\text{OG}} * \text{OG} + P_{\text{HC}} * \text{HC}$$



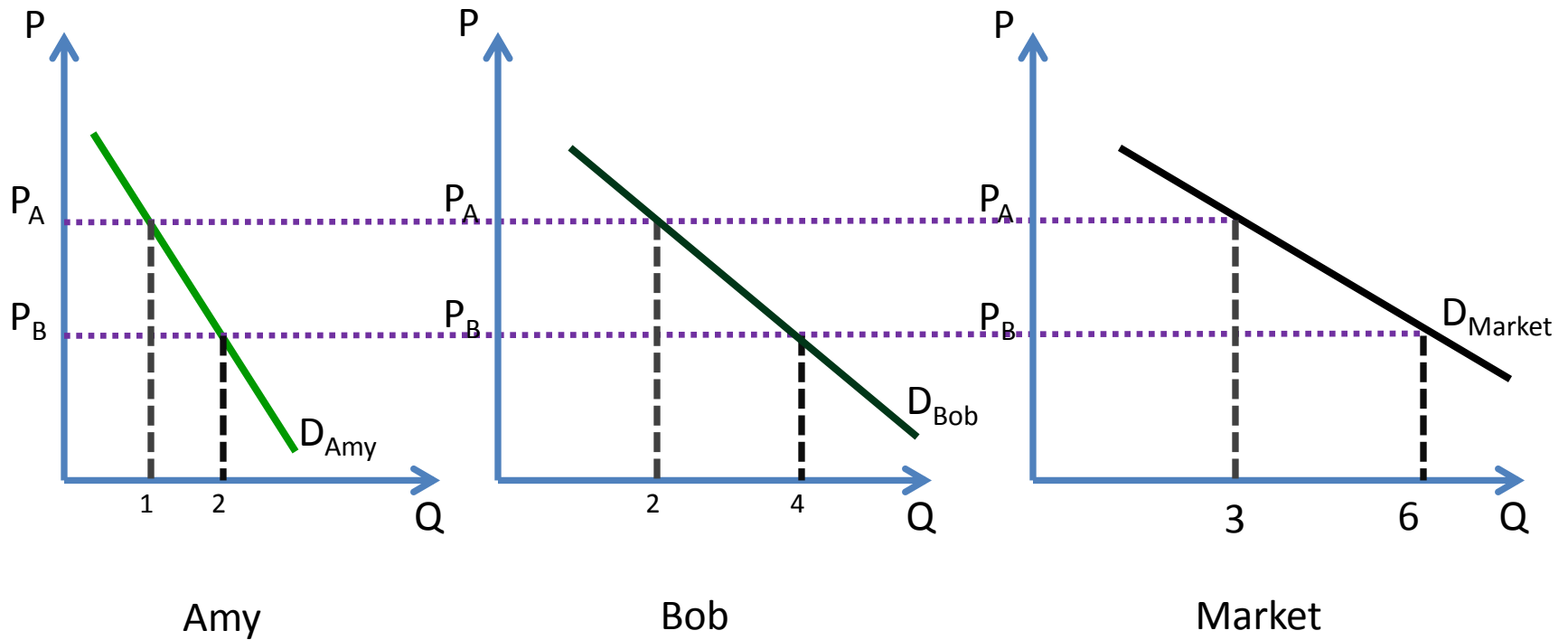
What happens if the P_{HC} falls?



Demand Derivation



Market Demand Curve



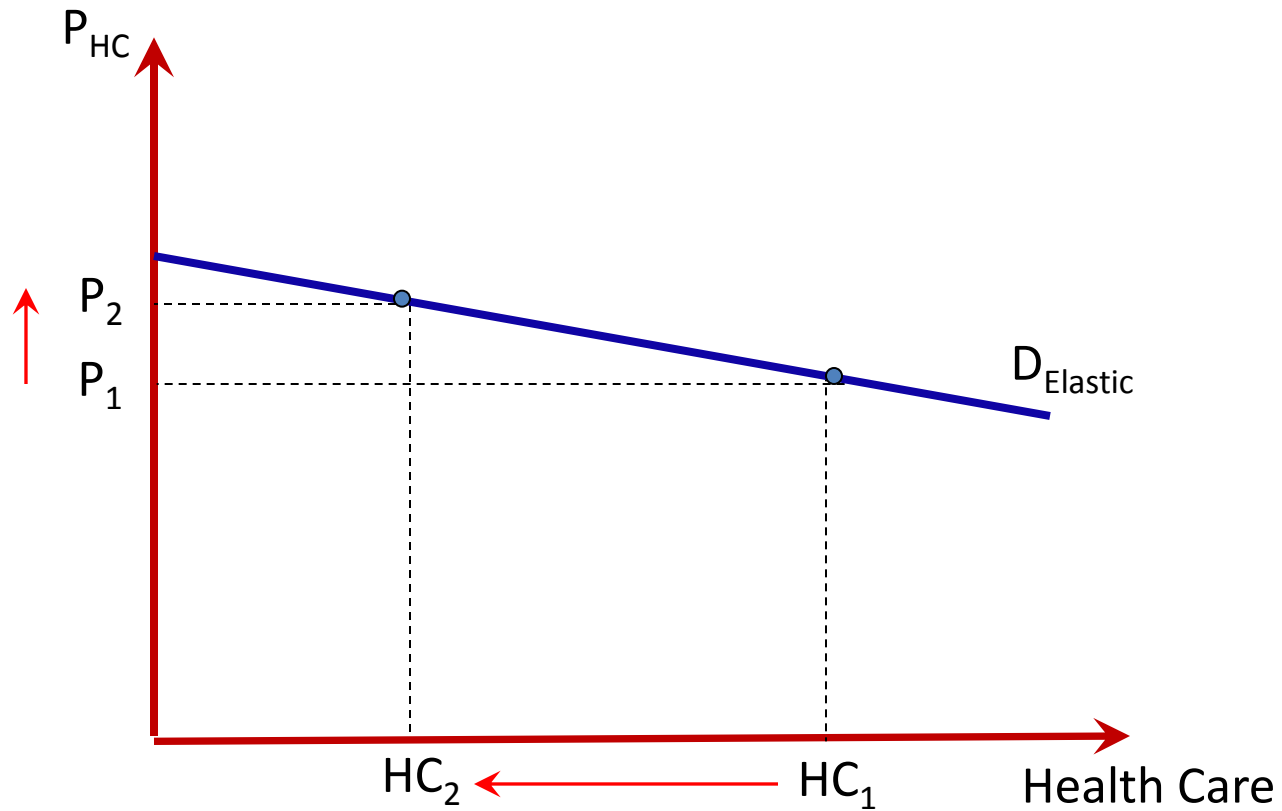
Elasticities

- **Elasticities** measure the **responsiveness** of a dependent variable to a 1 percent change in an independent variable
 - Elasticity = $(\% \Delta \text{dep variable}) / (\% \Delta \text{indep variable})$
$$= (\Delta Y / Y) / (\Delta X / X)$$
- The more elastic a relationship is, the more responsive it is:
“Elastic” = “responsive”
- 3 elasticities of demand:
 - *Price* elasticity of demand: $(\% \Delta Q_D) / (\% \Delta P)$
 - *Income* elasticity of demand: $(\% \Delta Q_D) / (\% \Delta I)$
 - *Cross-price* elasticity of demand: $(\% \Delta Q_X) / (\% \Delta P_Y)$

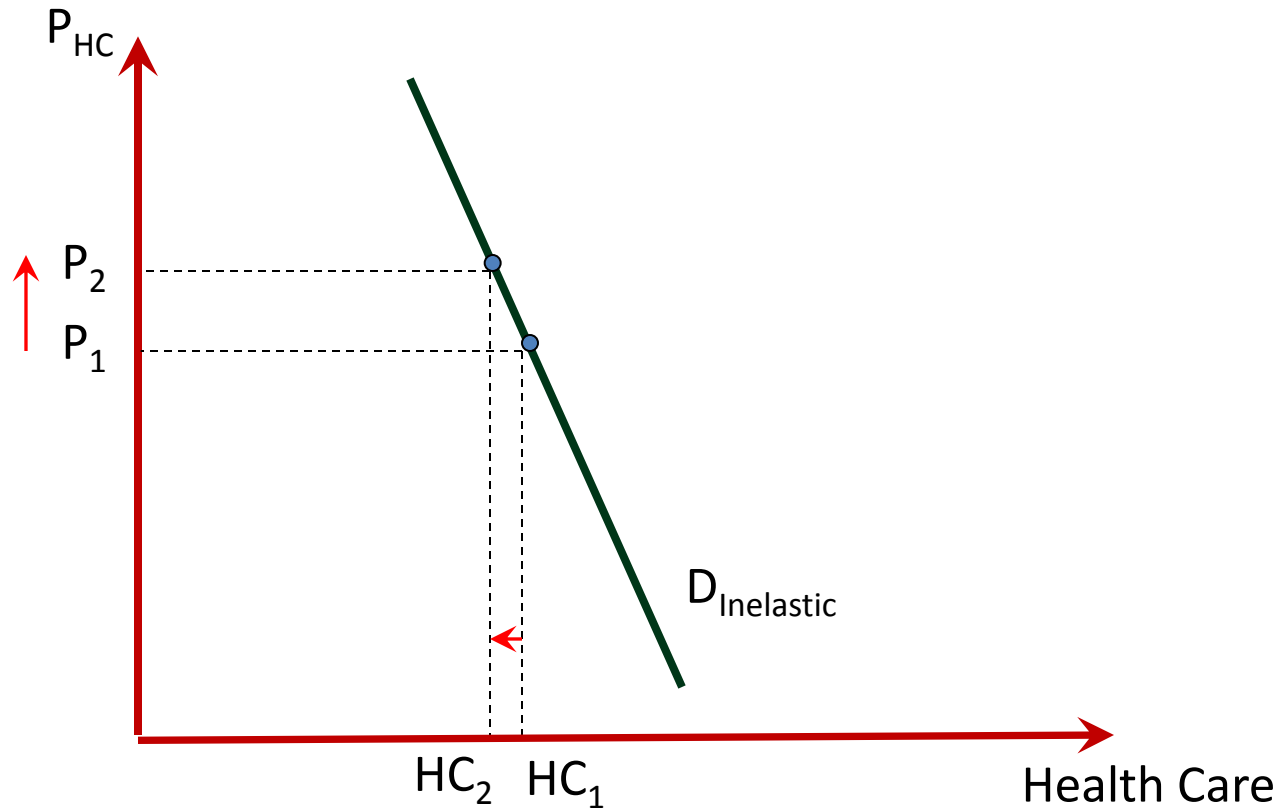
Price Elasticity of Demand (η_D)

- $\eta_D = (\% \Delta Q_D) / (\% \Delta P) = (\Delta Q_D / Q_D) / (\Delta P / P)$
- The price elasticity of demand is **negative** because demand is **downward sloping**.
- The price elasticity of demand is often expressed as an absolute value:
 - If $|\eta_D| > 1$, demand is **elastic**. → “Luxuries”
 - If $0 < |\eta_D| < 1$, demand is **inelastic**. → “Necessities”

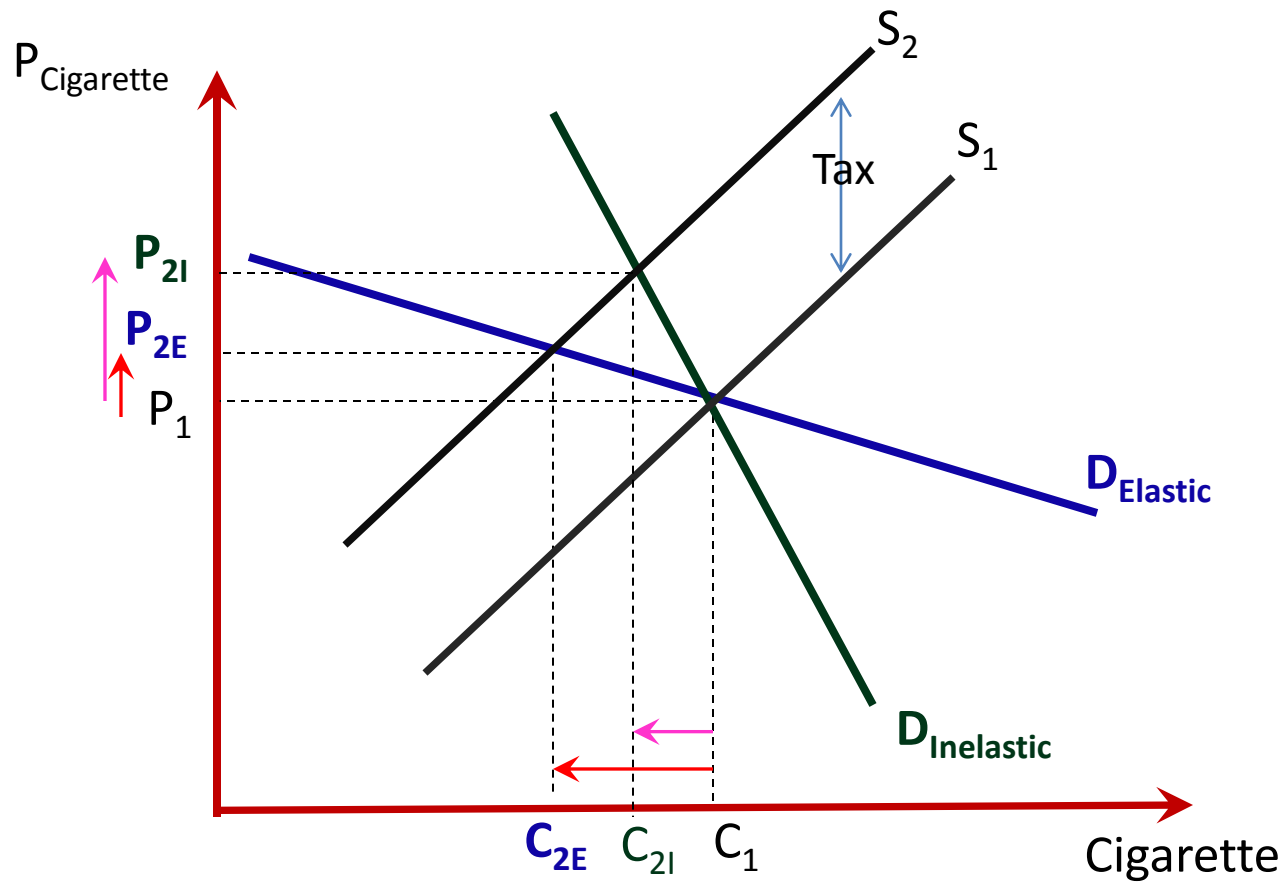
Elastic Demand



Inelastic Demand



Impact of Cigarette Tax



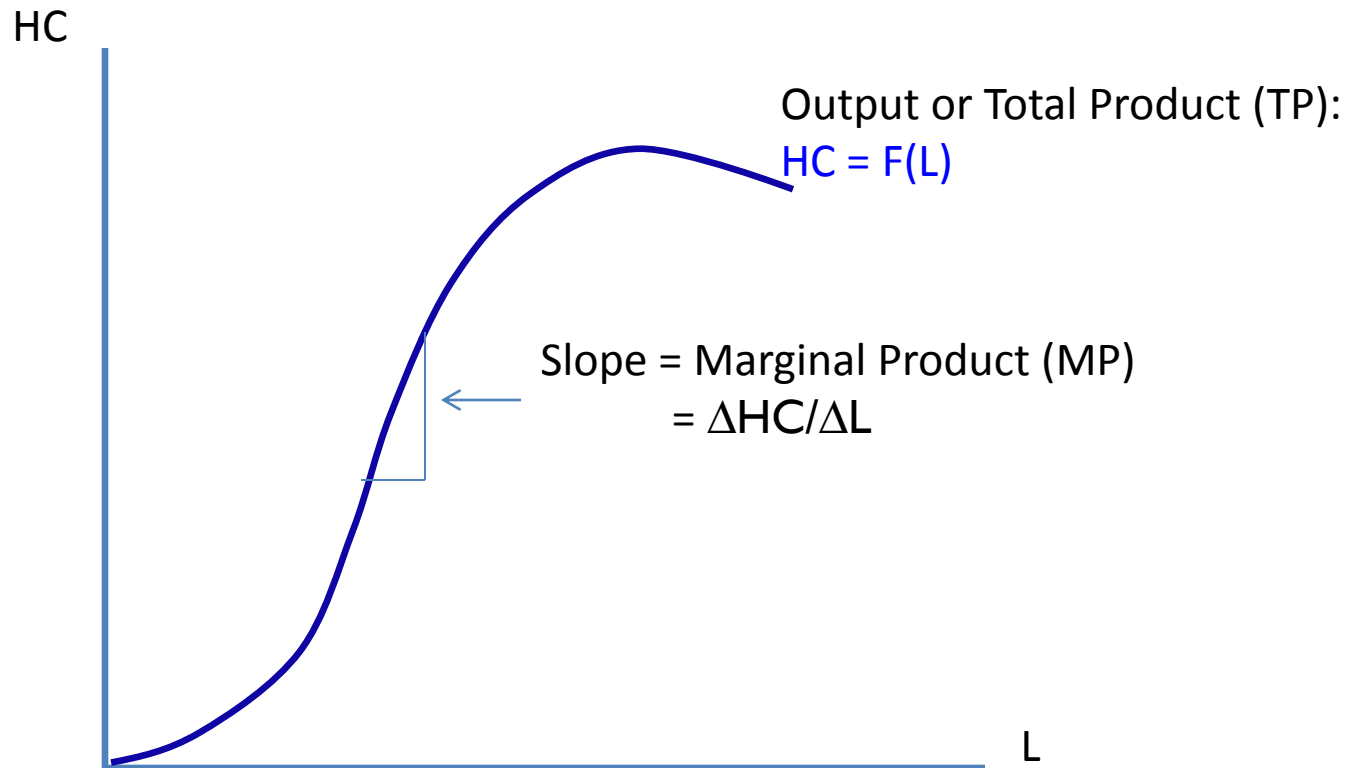
Production and Market Supply

- Production function
- Cost minimization:
 - Isoquants
 - Isocost curves
- Firm's supply curve under perfect competition
- Market supply

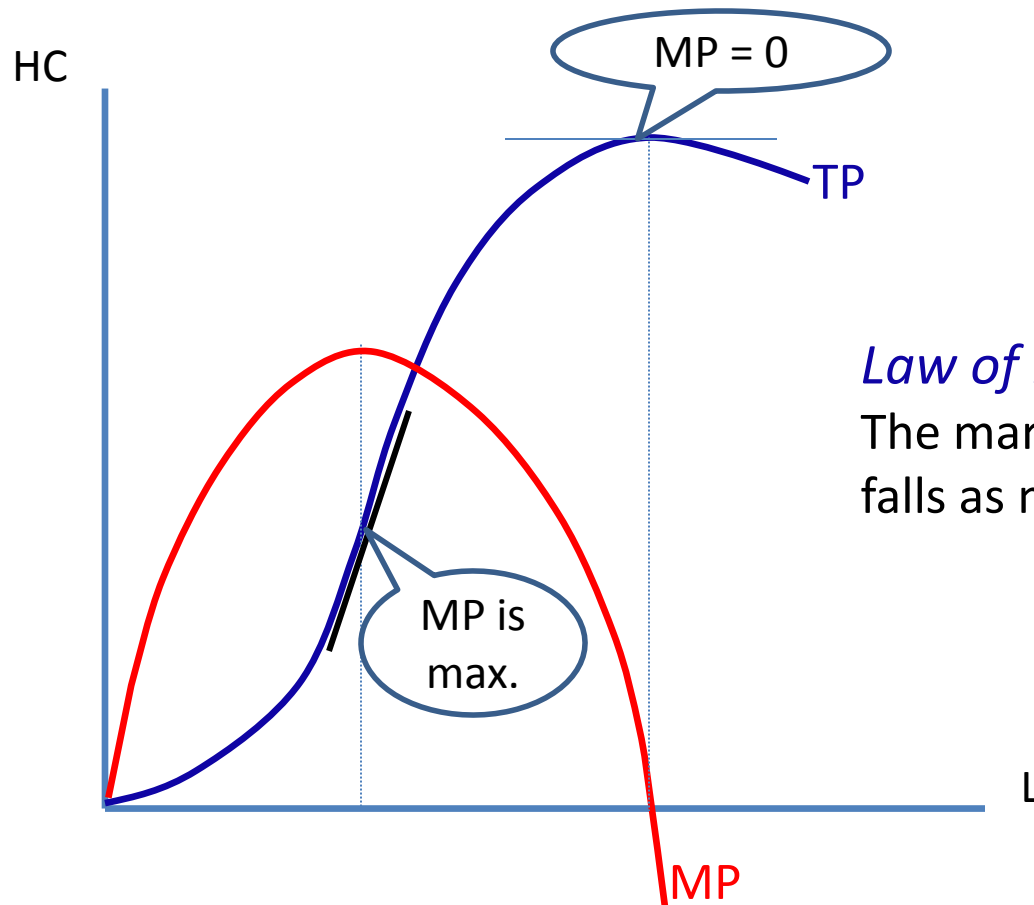
Production Function

- Production function shows the **maximum output** that can be produced from different combinations of inputs: $Q = f(X_1, X_2, X_3, \dots)$
- Example: $Q = f(K, L) = K^{0.2}L^{0.8}$
 - Q is output
 - K and L are inputs.
 - This function is called “Cobb-Douglas” function.

Production Function: 1 Input & 1 Output

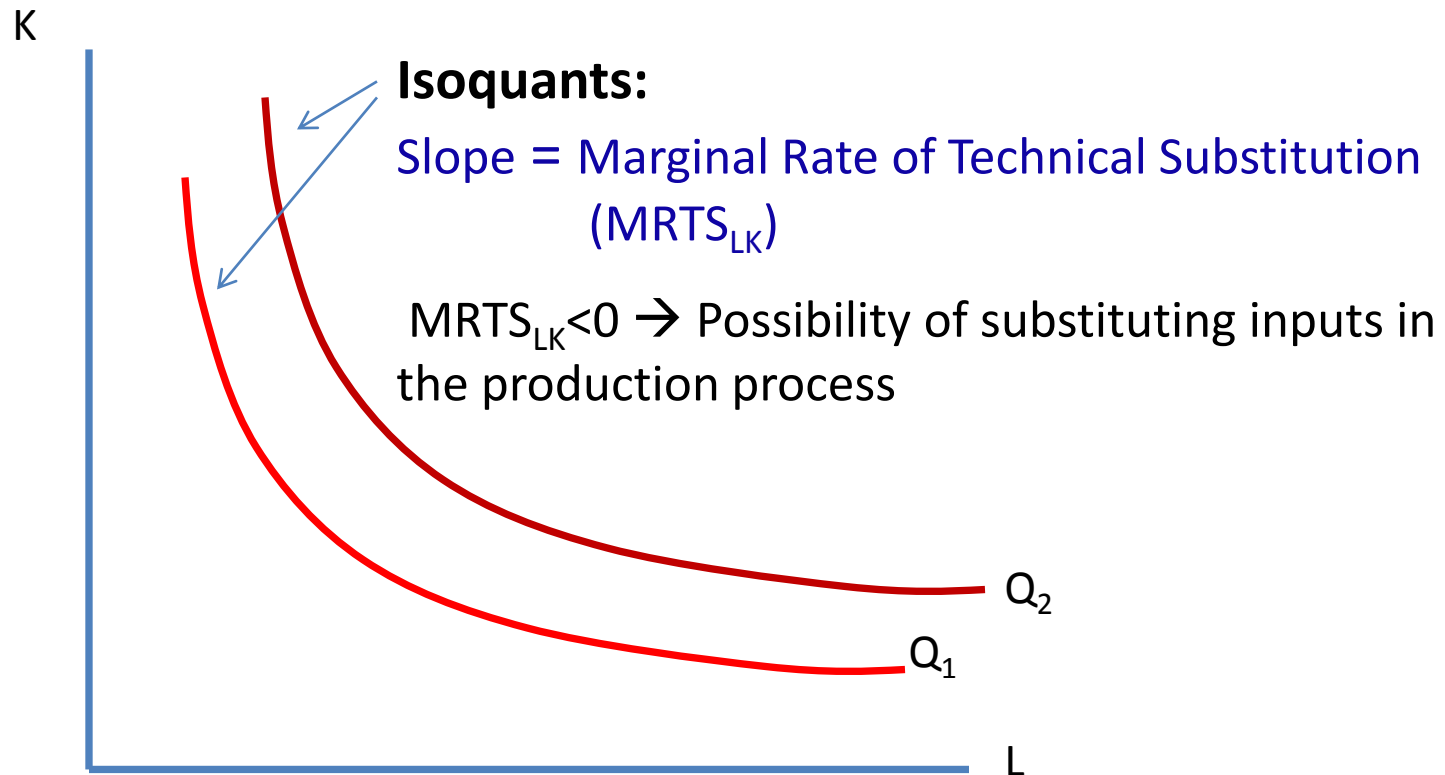


Production Function



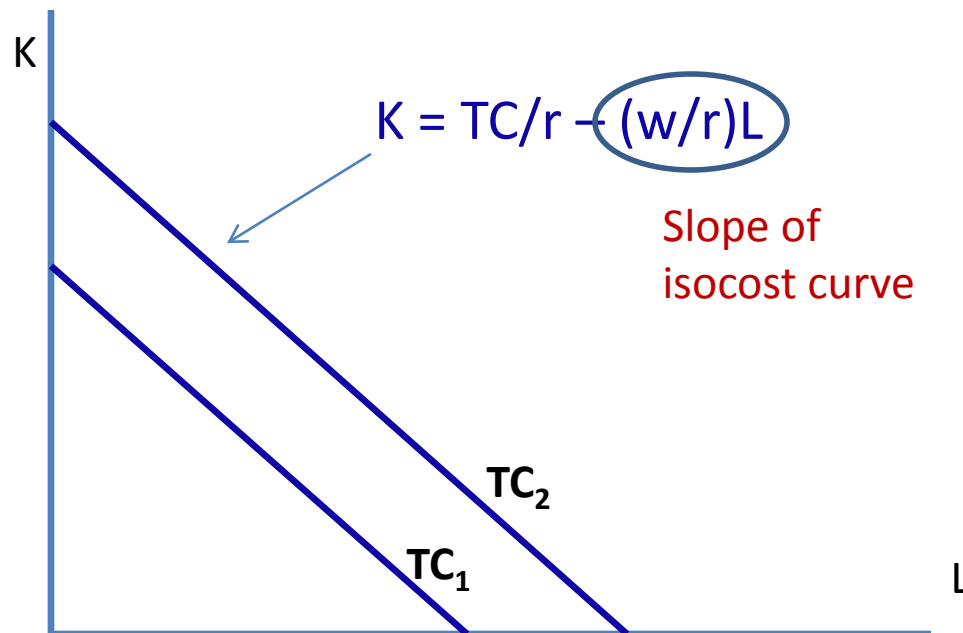
Law of Diminishing Returns:
The marginal product of labor falls as more output is produced.

Production of 2 Inputs: Isoquant



Isocost Curve

- The isocost curve represents all the combinations of K and L that could be purchased at a given cost.
- $TC = rK + wL$, where r is the price per unit of capital and w is the price per unit of labor

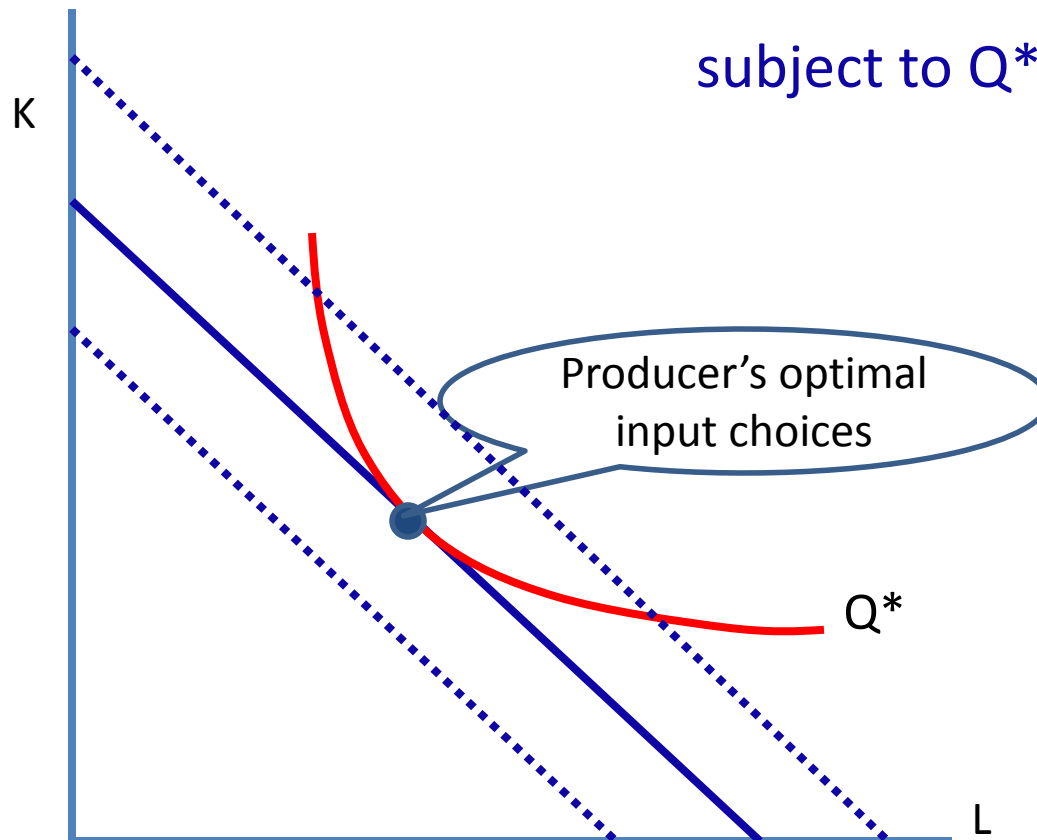


Cost Minimization

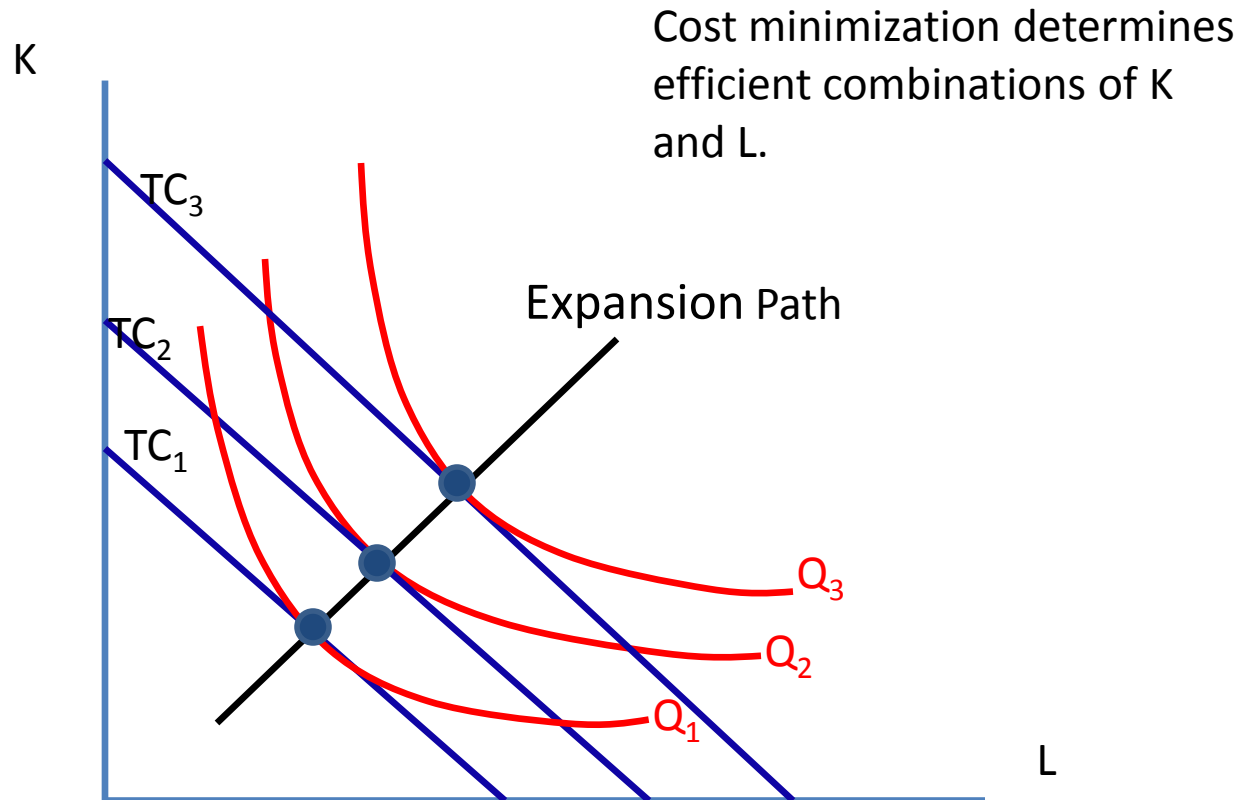
- Producer's problem:

$$\text{Min TC} = rK + wL$$

$$\text{subject to } Q^* = Q(K,L)$$



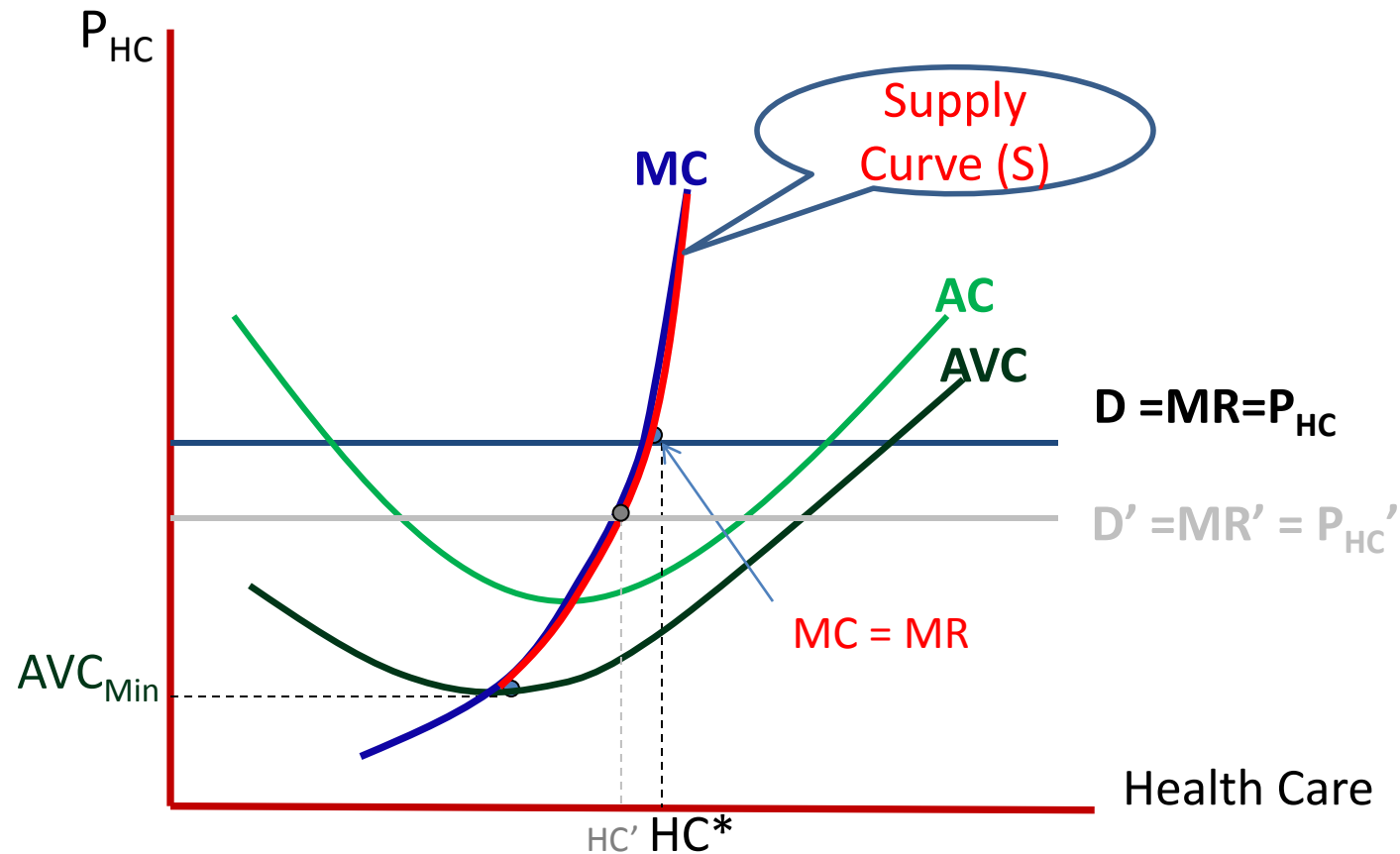
Efficient Combinations of Inputs



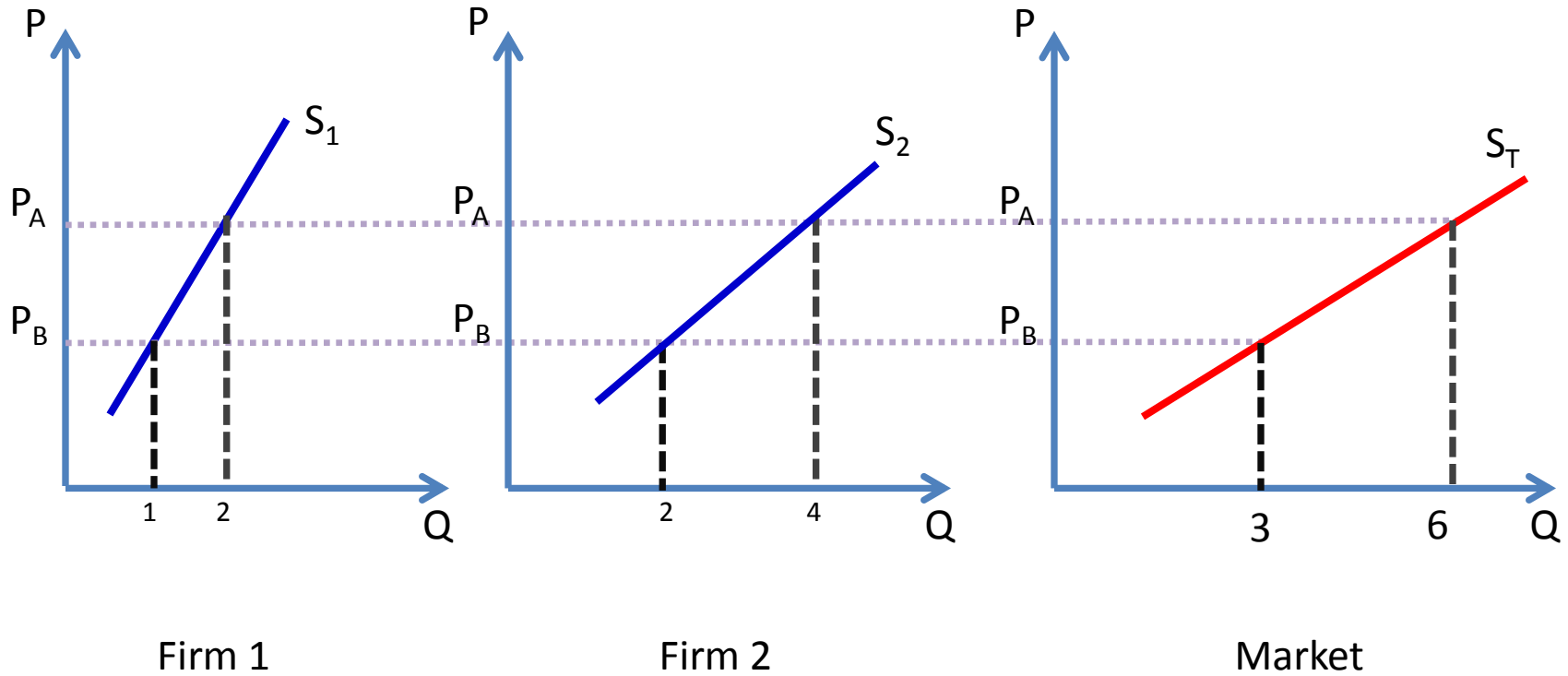
Firm's Supply Curve under *Perfect Competition*

- To derive the supply curve, we need to know the **demand curve of the firm's product**.
 - Need to know the market structure
 - Assumptions of **perfect competition**:
 - Large number of sellers and buyers → “Price takers”
 - Homogeneous product
 - Perfect information
 - No barriers to entry or exit
- *Demand curve is flat: $D = MR = P$.*

Competitive Firm's Supply Curve



Market Supply



Monopolist

