

Market economy and public policy 4

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Today

- Homework from last week
 - Monica's indifference curve and price
- From utility function to demand curve in math.
- Introduction of Market Intervention by government

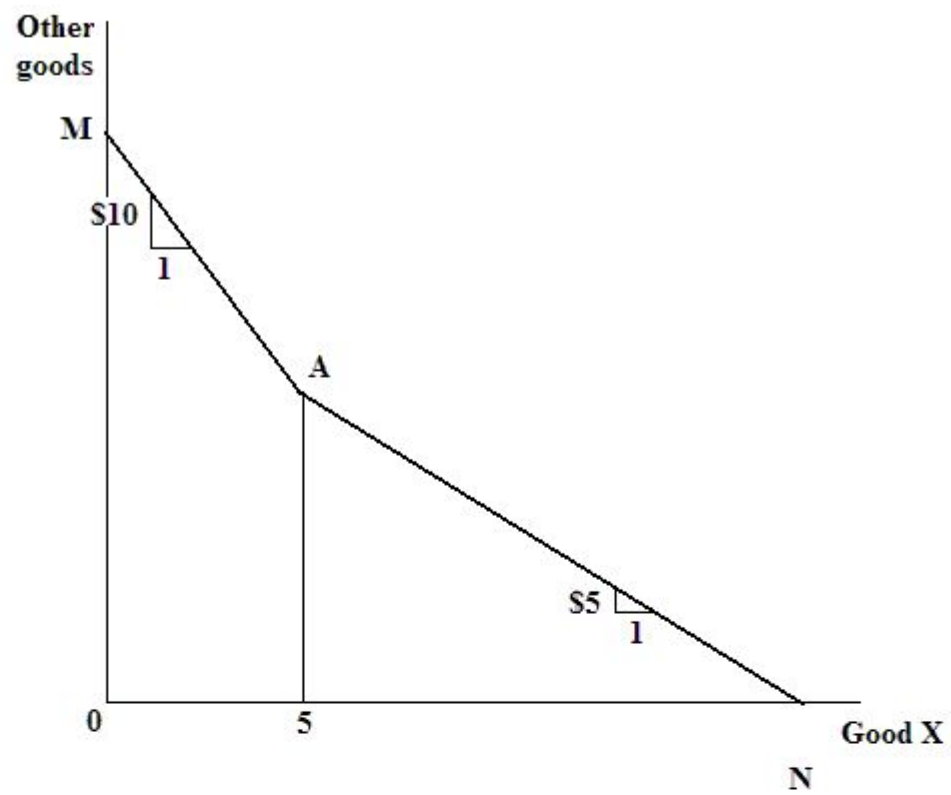
Homework 2

Translate to Ukrainian language

- Price Elasticity of Demand
- (Demand Elasticity)
- Price Elasticity of Supply
- (Supply Elasticity)
- Marginal rate of substitution

Homework *

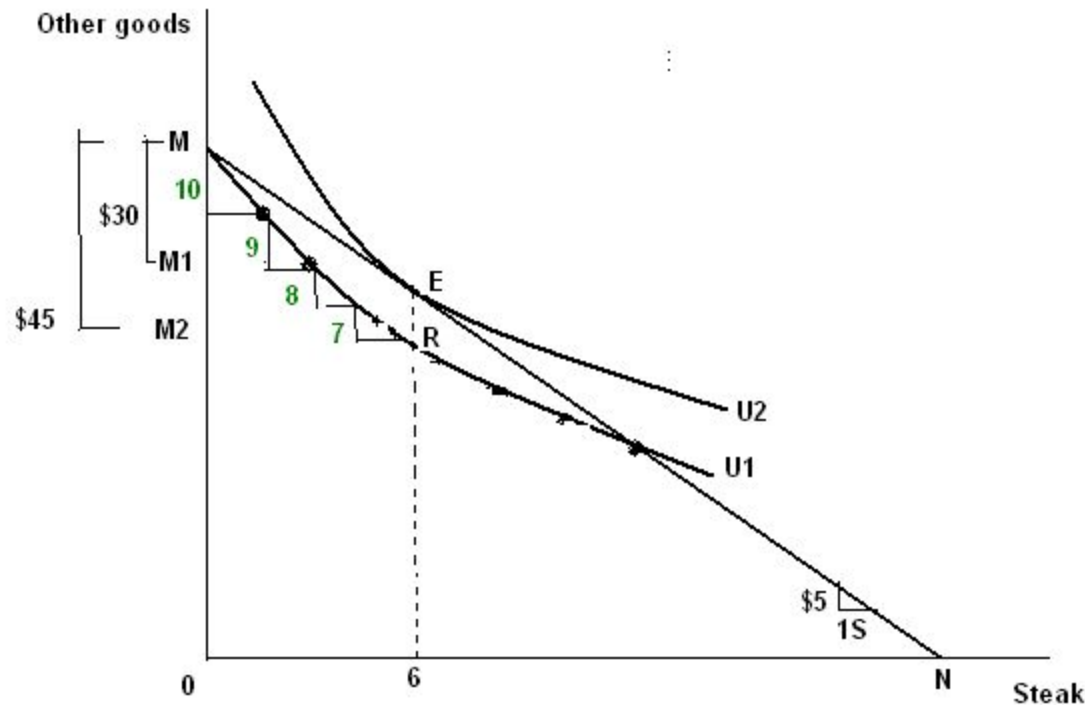
- A consumer must pay \$10 per unit of good X for the first 5 units, but only \$5 per unit for each unit in excess of 5 units. How does the budget line look like?



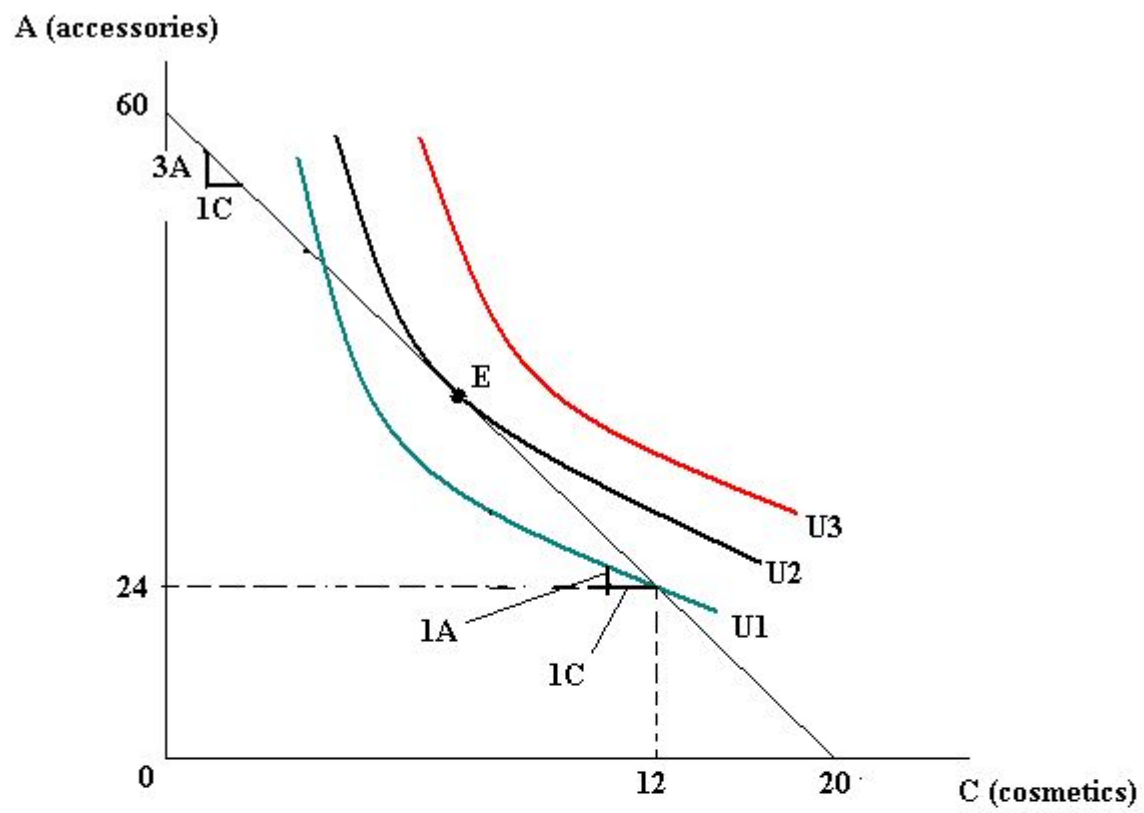
Homework

- Monica spends her entire monthly income of \$600 on cosmetics and accessories.
- The price of cosmetic is \$30, and the price of accessory is \$10.
- If she consumes 12 cosmetics and 24 accessories, her MRS is $1A/1C$. Is she in equilibrium at this point on her budget line?
- Show the result in a picture.

Marginal rate of substitution (MRS)



MRS: Other goods/Steak



Condition for the Maximum Utility

$$I = \sum_{i=1}^n P_{x_i} X_i \dots\dots\dots (1)$$

$$L = U(X_1, X_2, X_3, \dots, X_n) + \lambda(I - \sum_{i=1}^n P_{x_i} X_i) \dots\dots\dots (2)$$

$$\frac{\partial L}{\partial X_i} = \frac{\partial U}{\partial X_i} - \lambda P_{x_i} = 0 \dots\dots\dots (3)$$

$$\frac{\partial L}{\partial \lambda} = I - \sum_{i=1}^n P_{x_i} X_i = 0 \dots\dots\dots (4)$$

$$\frac{\frac{\partial U}{\partial X_i}}{\frac{\partial U}{\partial X_j}} = \frac{P_{x_i}}{P_{x_j}} \dots\dots\dots (5)$$

where, $i \neq j$.

2. Non-linear model (Cobb-Douglas function [1]):

$$U = \prod_{i=1}^n X_i^{C_i} \dots\dots\dots (7)$$

where,

$$\sum_{i=1}^n C_i = 1 \dots\dots\dots (8)$$

$$X_i = \frac{I}{P_{X_i}} \frac{C_i}{\sum_{j=1}^n C_j} \dots\dots\dots (9)$$

$$\frac{C_i}{\sum_{j=1}^n C_j} = \beta_i \dots\dots\dots (29)$$

Cobb-Douglas 2 dimensional case

$$U = F^{\alpha} C^{1-\alpha}$$

$$I = FP_F + CP_c$$

$$L = F^{\alpha} C^{1-\alpha} + \lambda(I - FP_F - CP_c)$$

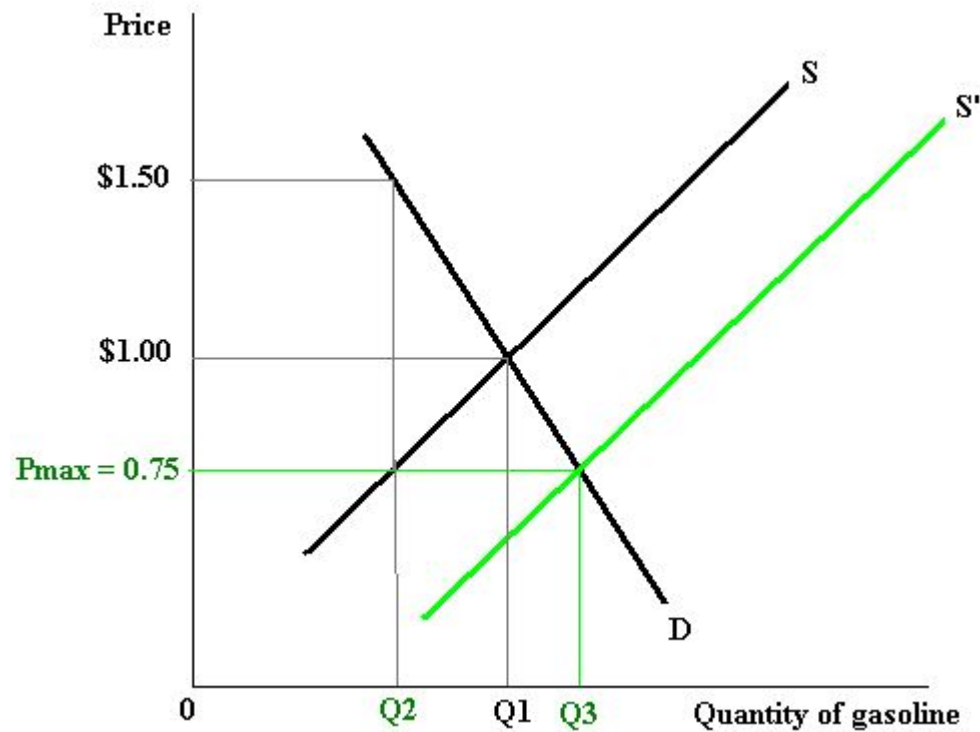
$$\partial L / \partial F = \alpha F^{\alpha-1} C^{1-\alpha} - \lambda P_F = 0$$

$$\partial L / \partial C = (1-\alpha) F^{\alpha} C^{(1-\alpha)-1} - \lambda P_c = 0$$

$$\partial L / \partial \lambda = I - FP_F - CP_c = 0$$

$$F = \alpha I / P_F \quad C = (1-\alpha) I / P_c$$

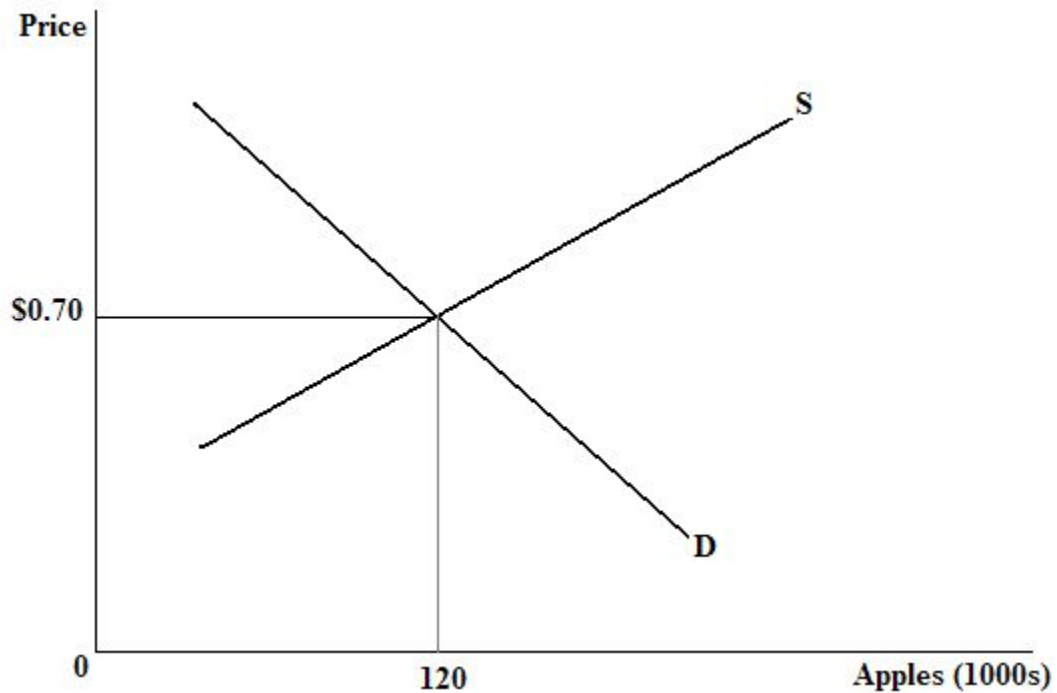
Price setting by government



How to respond to shortage?

- Divide?
- Non price rationing
 - First come, first serve
 - Waiting line = cost to consumer
- Quality deterioration
 - Show the product less attractive
 - Open fewer hours per day or fewer days per week
 - Self-service pumping
 - Eliminate special services, such as wiping windows
- Black market
 - With Q2, consumer could pay \$1.50
 - Penalties
- In a long run...

Governmental purchase apple case



The supply and demand for apples

Demand

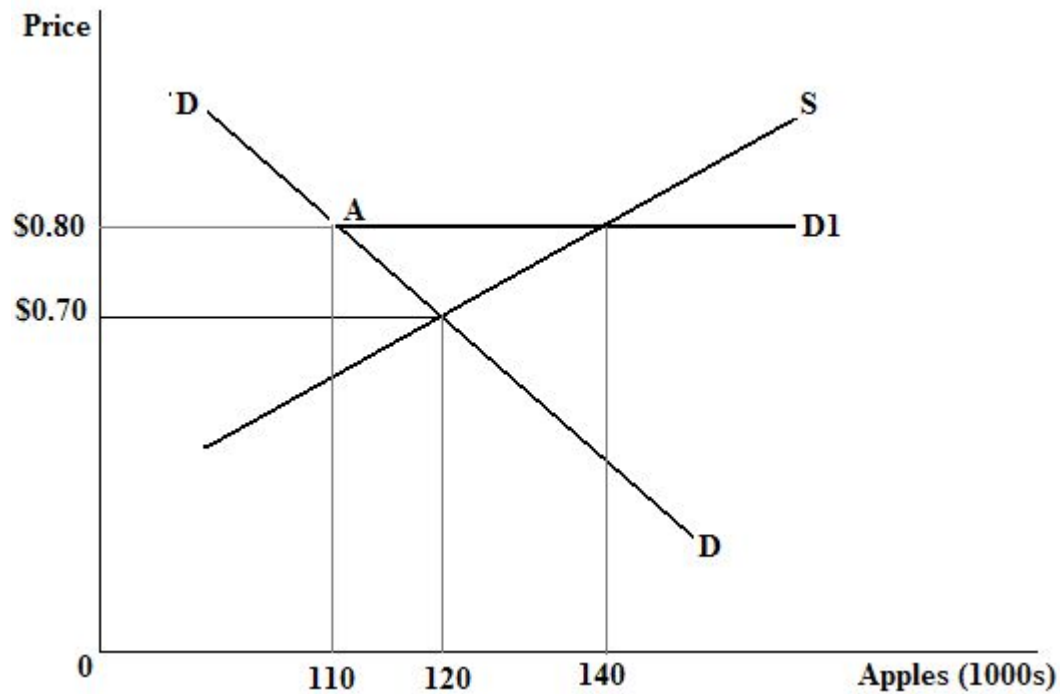
Supply

Price for pound	Quantity demanded per Year	Price per pound	Quantity supplied per year
\$0.90	100000	\$0.60	100000
0.80	110000	0.70	120000
0.70	120000	0.80	140000
0.60	135000	0.90	150000

What is the market equilibrium price and quantity?

Questions

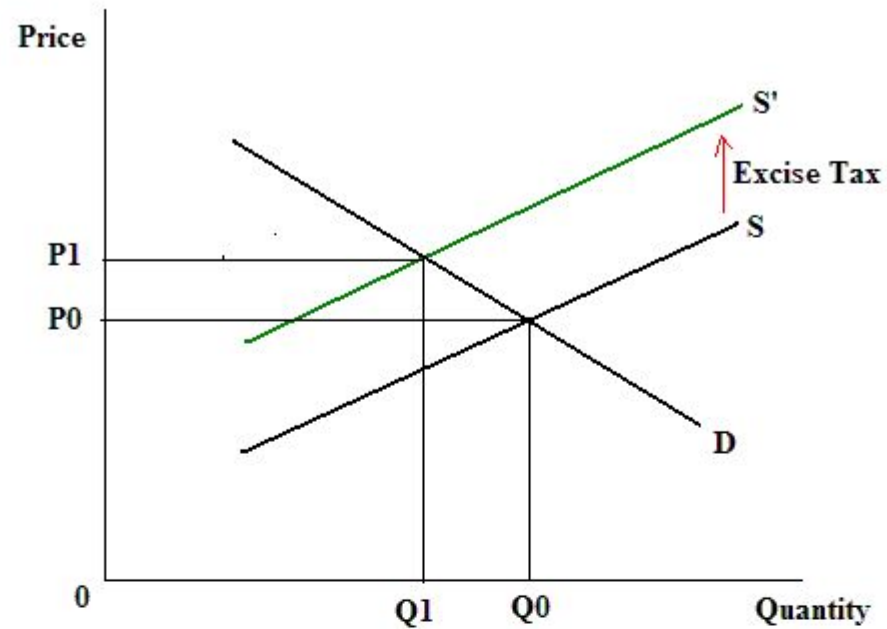
- The government agrees to purchase as many pounds of apples as growers will sell to it at a price of \$0.80.
 - a. How much will the government purchase,
 - b. how much will consumers purchase, and
 - c. how much will be produced?



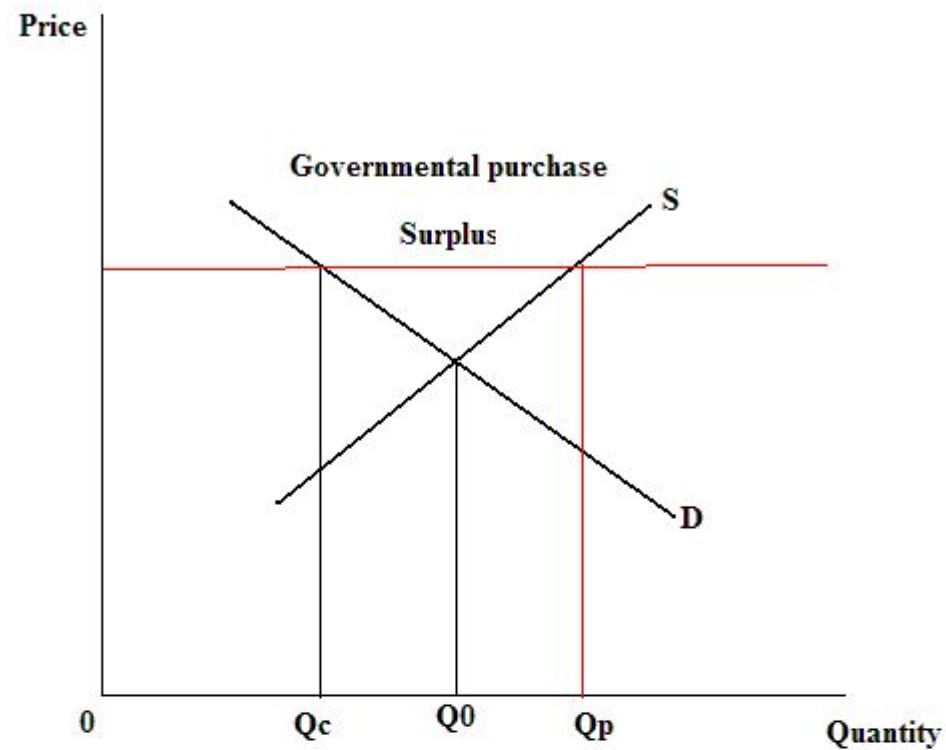
- a. Governmental purchase = $140\,000 - 110\,000 = 30\,000$
- b. Consumer purchase = 110 000
- c. Produced apples = 140 000

Intervention by government

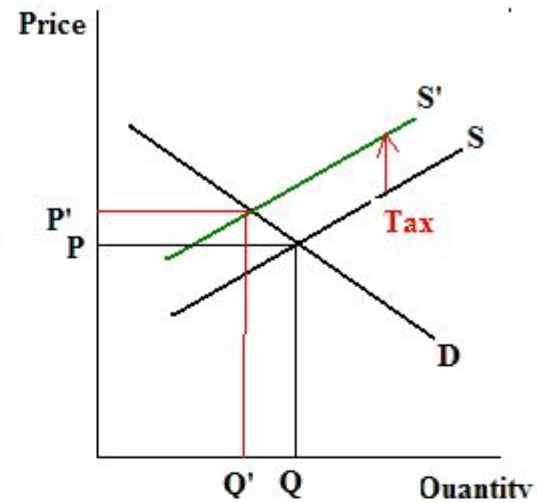
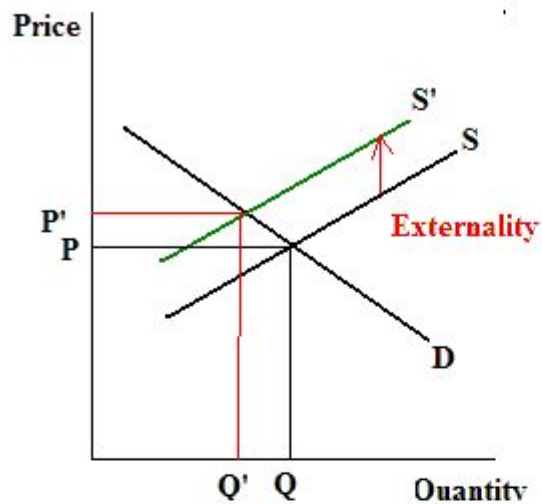
Tax



Government purchase

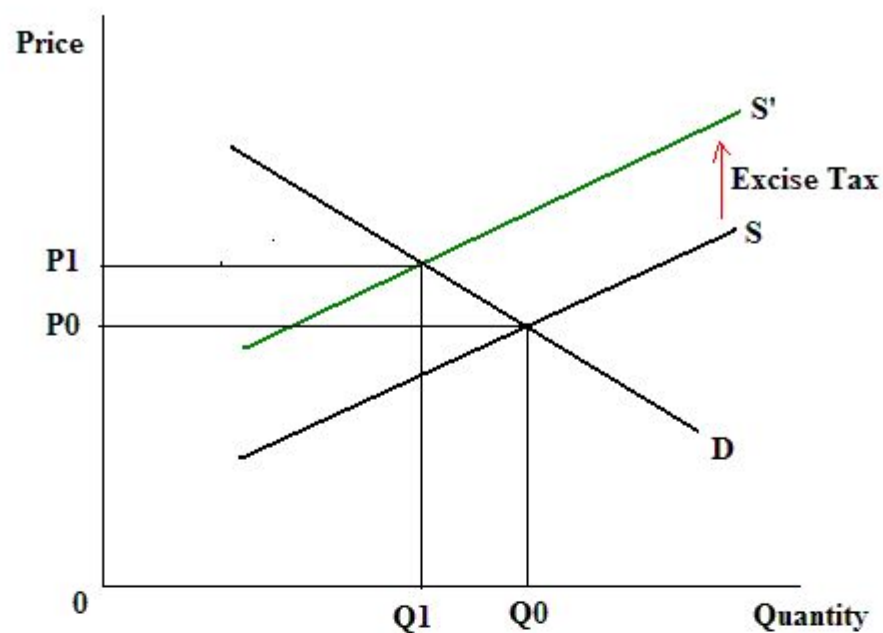


Emission trade ?

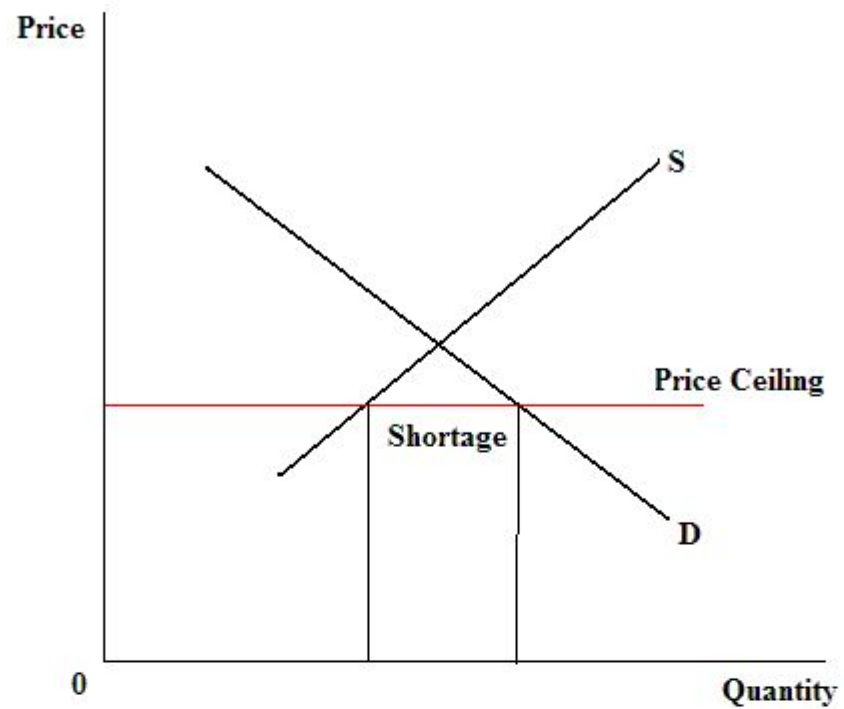


Intervention by government (1)

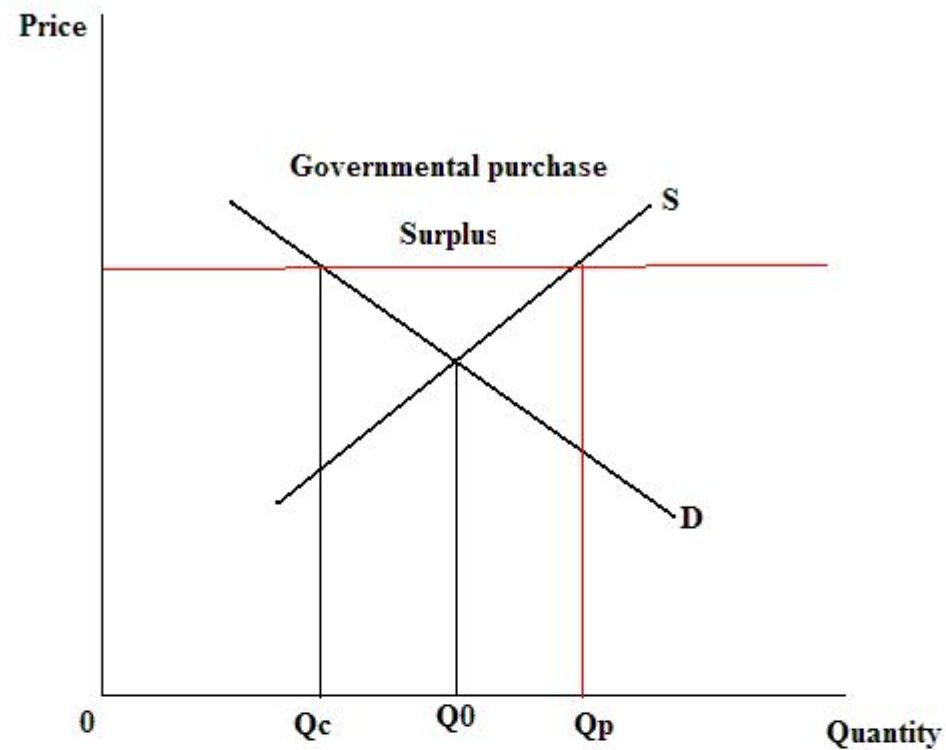
Tax



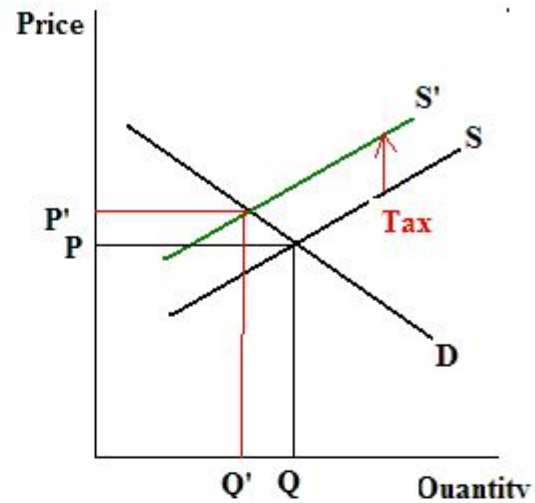
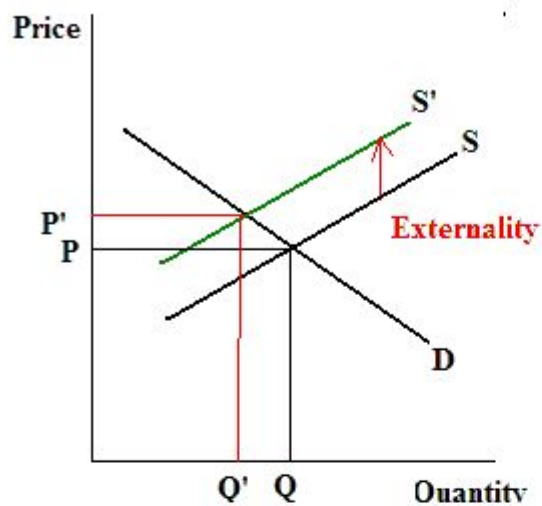
Price Ceiling



Government purchase



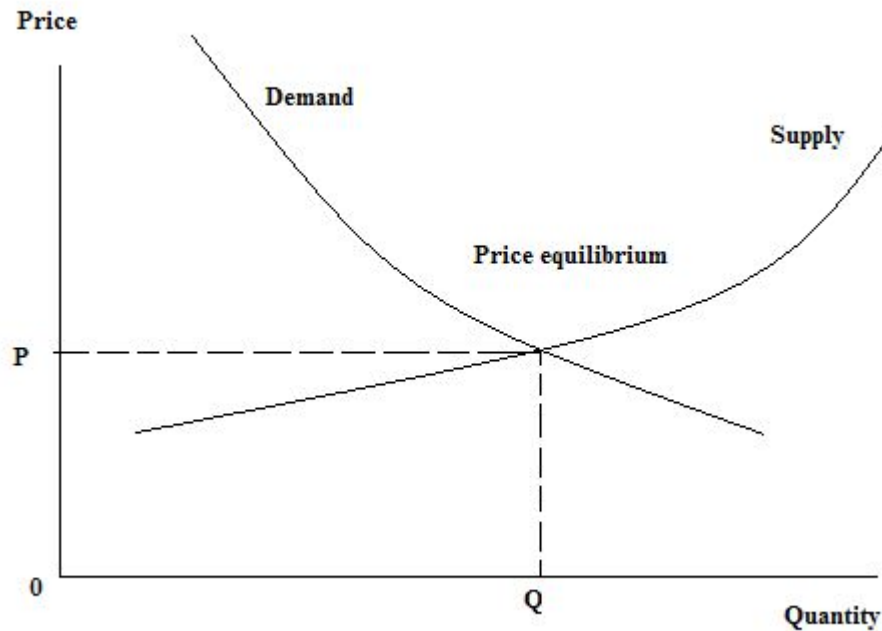
Emission trade ?



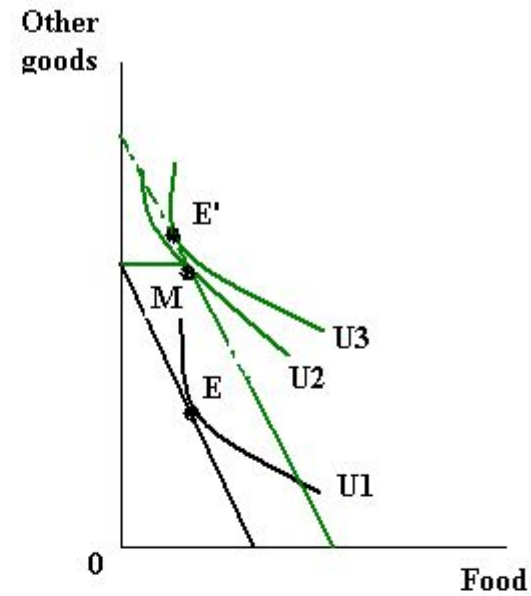
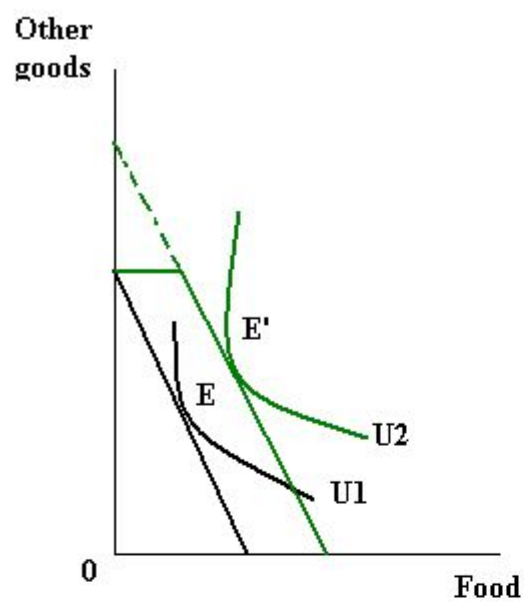
How is price made?

Why it is changed?

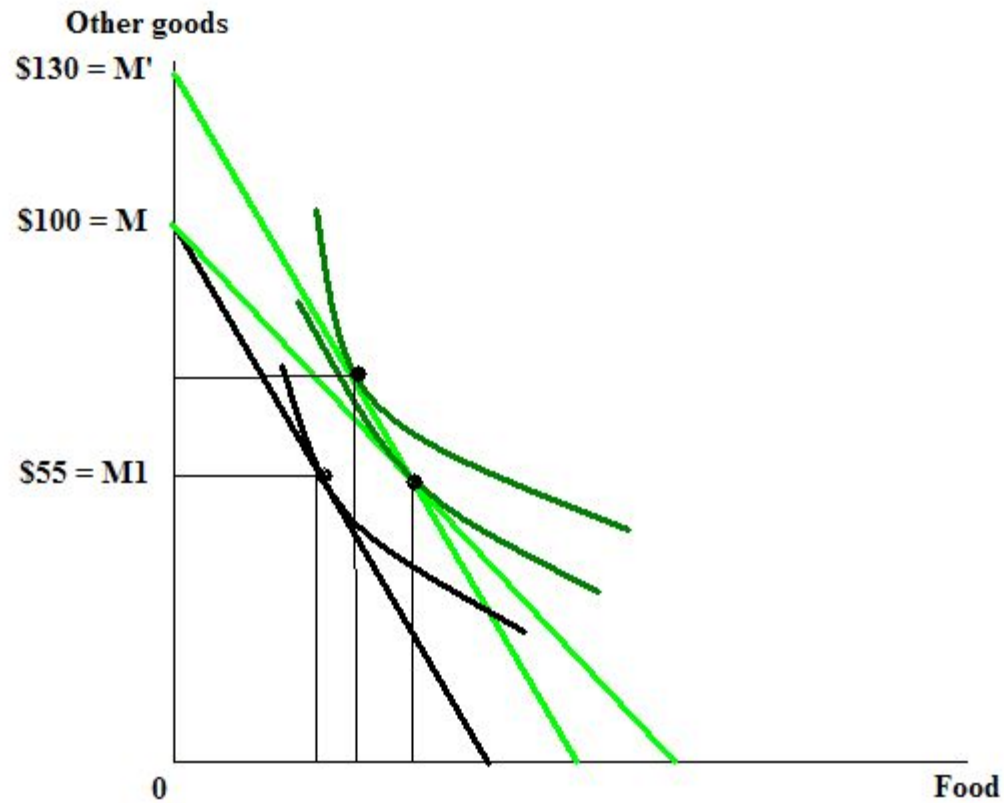
- In competitive market



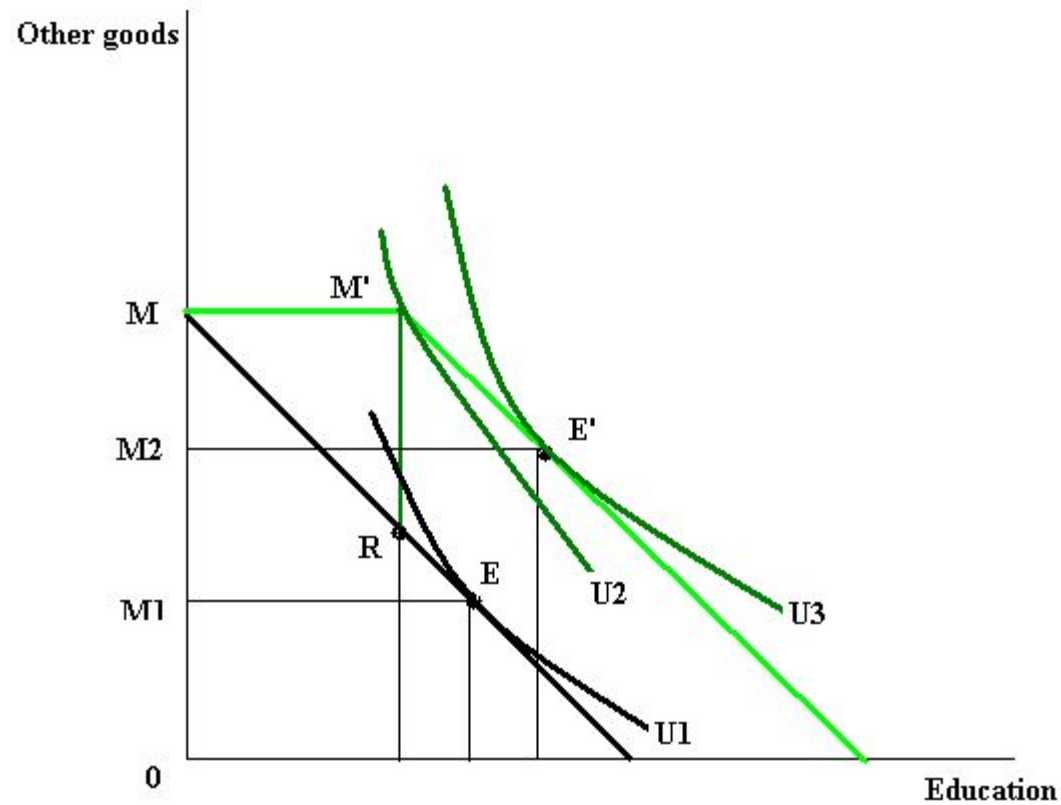
Effect of food stamp program on



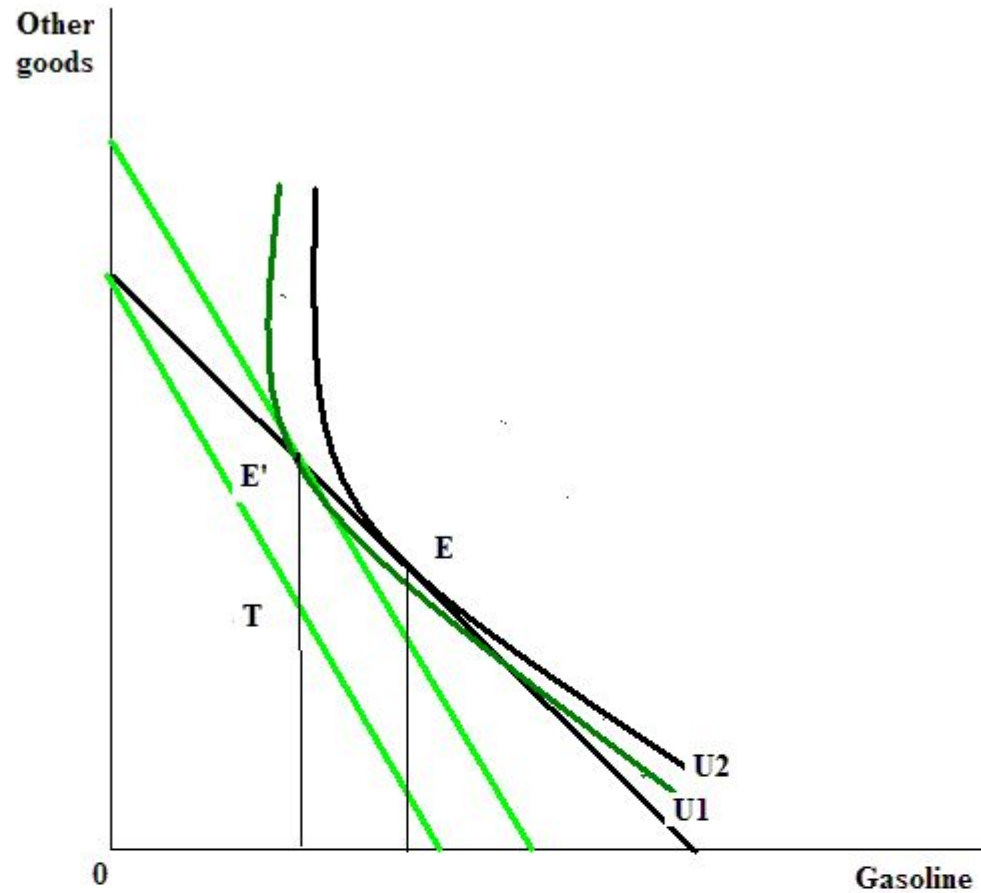
Excise subsidy vs. Lump-sum subsidy



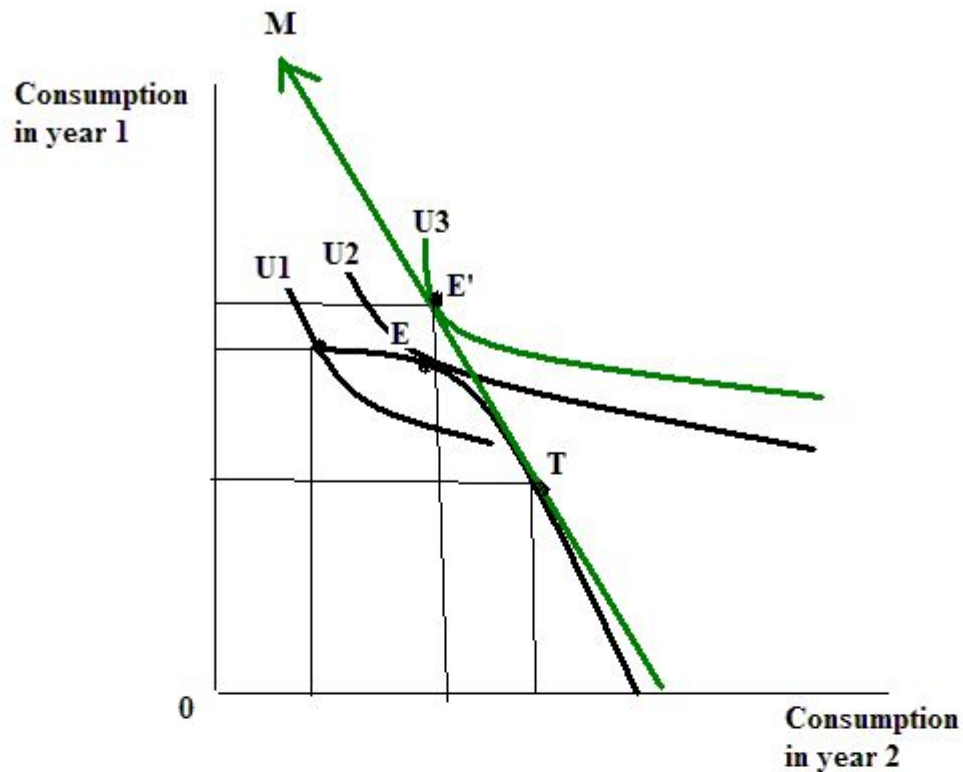
Fixed-quantity subsidy: Education



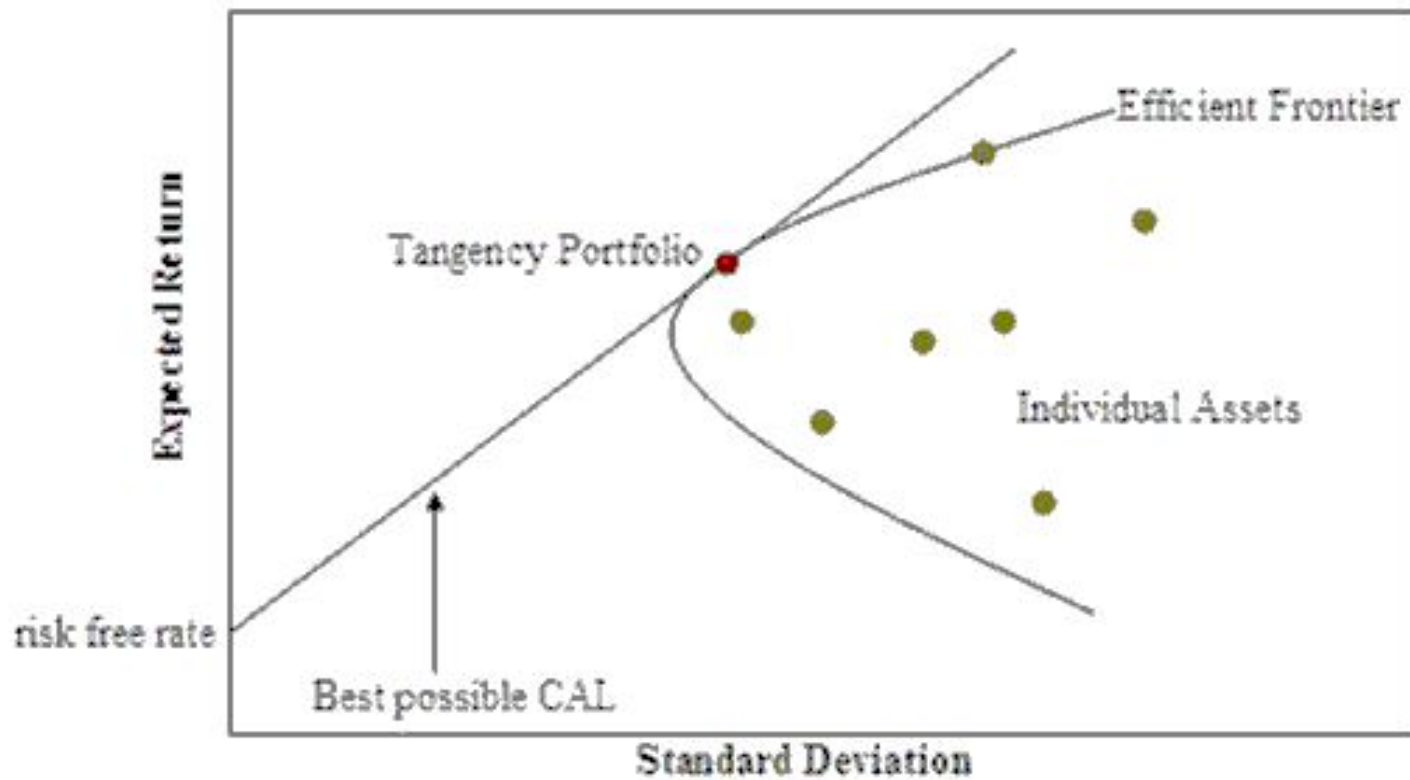
Tax and Rebate Program



Investment in education and borrowing



Investment risk



Homework 1

- Suppose the government policy of purchasing apples remains in effect, but consumer demand increases by 10 percent (consumers will purchase 10 percent more at each price than they did before).
- What will be the effects on
 - a. total apple output,
 - b. purchases by consumers,
 - c. purchases by government, and
 - d. the price of apples?

Homework 2

- Find the demand curves for each of 3 variables.

$$U = F^{\alpha} C^{\beta} S^{\gamma}$$

$$\alpha + \beta + \gamma = 1$$

Homework 3

Translate to Ukrainian language

- Governmental intervention
- Price ceiling
- Black market
- Rationing, Non price rationing
- Shortage
- Surplus