

Microeconomics Exam 1 Notes

Economics

Study of how scarce productive resources are allocated among alternative uses and how the resulting commodities are distributed.

- **Land** - Natural resources
- **Labor** - Human resources
- **Capital** - Tools, equipment, and factories. Human Capital is the knowledge and skills of workers. Entrepreneurship is the ability to organize and manage the other factors of production.

Pitfalls to Economic Models

Post hoc ergo propter hoc

After this, therefore because of this

In other words, correlation does not imply causation.

Fallacy of composition

What is true for the individual is not necessarily true for the group.

Economic Statements

Positive Economic Statement

A statement that can be tested and validated. It is a statement of **fact**.

Normative Economic Statement

A statement that cannot be tested or validated. It is an **opinion**.

Ockham's Razor

The simplest explanation is usually the correct one.

Kiss - Keep it simple stupid

Opportunity Cost

The value of the next best alternative.

Example

Alexi and Tony own a food truck and output the following:

	Street Tacos	Cuban Sandwiches
Alexi	80	20
Tony	100	30

What is the Opportunity Cost for a street taco?

Alexi:

$$\frac{20 \text{ Cuban Sandwiches}}{80 \text{ Street Tacos}} = \frac{1}{4} \text{ Cuban Sandwiches per Street Taco}$$

Tony:

$$\frac{30 \text{ Cuban Sandwiches}}{100 \text{ Street Tacos}} = \frac{3}{10} \text{ Cuban Sandwiches per Street Taco}$$

Alexi has a lower opportunity cost for a street taco, and thus the **comparative advantage**.

Inflation

Ways to measure inflation:

- **Consumer Price Index (CPI)** - Measures the change in the price of a basket of goods and services purchased by a typical household.
- **Personal Consumption Expenditures (PCE)** - Like the CPI, but it is a broader measure of the goods and services purchased by households.
- **GDP Deflator** - Measures the change in the price of all goods and services produced in the economy.

Inflation Rate from CPI

$$\text{Inflation Rate} = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100$$

- **Headline Inflation** - The inflation rate calculated using the CPI.
- **Core Inflation** - The inflation rate calculated using the CPI, but excluding food and energy prices.

Production Possibilities Frontier

Assumptions

- Only two goods can be produced:
 - **Consumer Goods** - Goods produced for consumption by households.
 - **Capital Goods** - Goods produced for consumption by businesses.

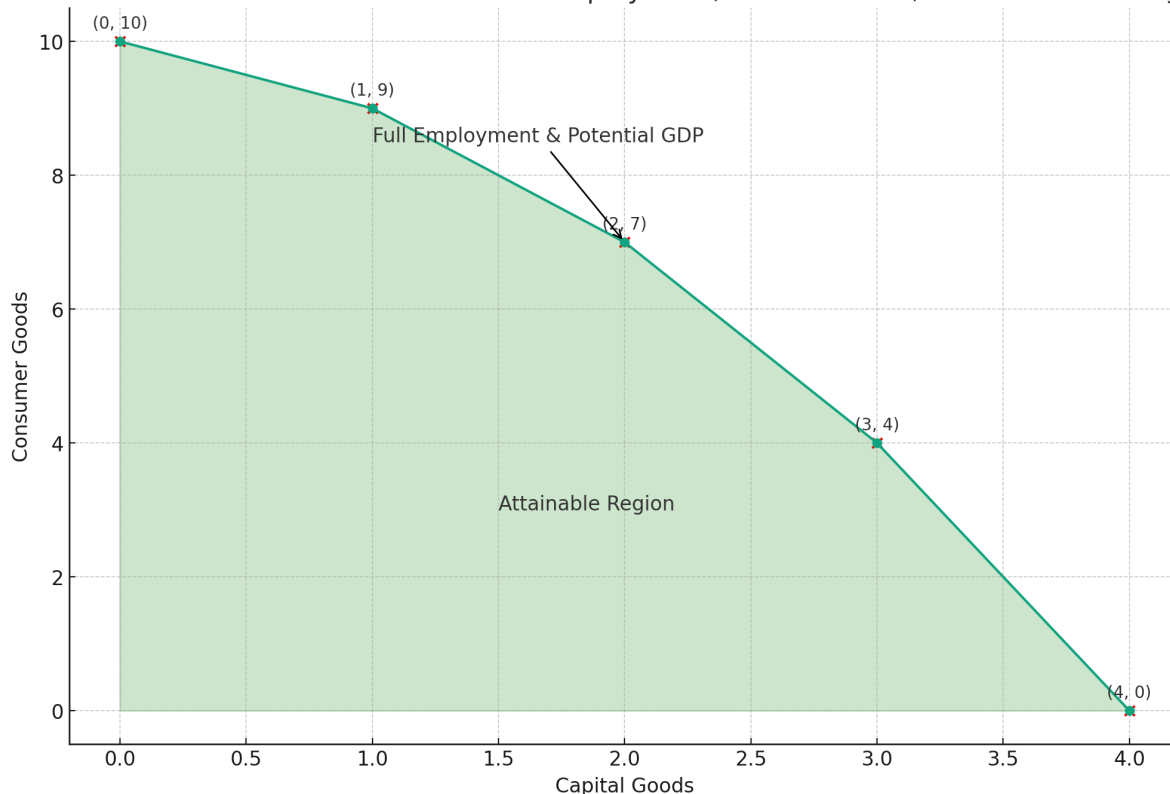
- The economy is operating at full employment and efficiently
- Fixed resources
- Constant technology level

Production Possibilities Curve

Take the following data:

Capital Goods	Consumer Goods	Opportunity Cost of Capital Goods
0	10	-
1	9	1
2	7	2
3	4	3
4	0	4

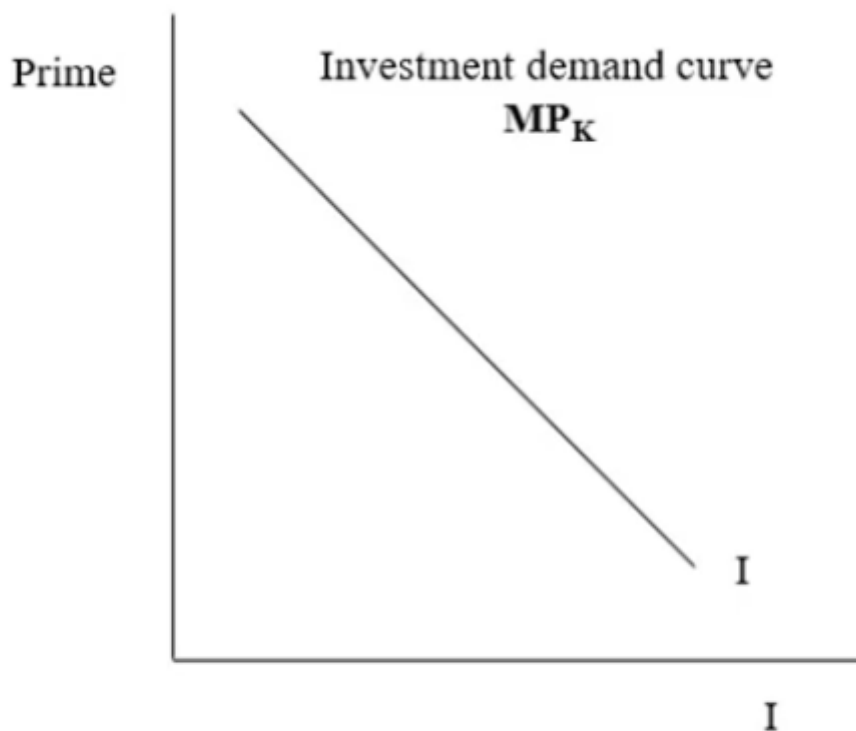
Production Possibilities Curve with Full Employment, Potential GDP, and Attainable Region



- **Productive Efficiency** - The economy is producing at a point on the PPC. On the curve.
- **Allocative Efficiency** - The economy is producing at the point on the PPC that is most desired by society.

Law of Increasing Opportunity Cost - As more of a good is produced, the opportunity cost of producing that good increases.

Private Non-Residential Fixed Investment



$$\text{PNFI}_t = f(\text{Prime}_{t-1})$$

$$\text{PNFI} = b + m \times \text{Prime}$$

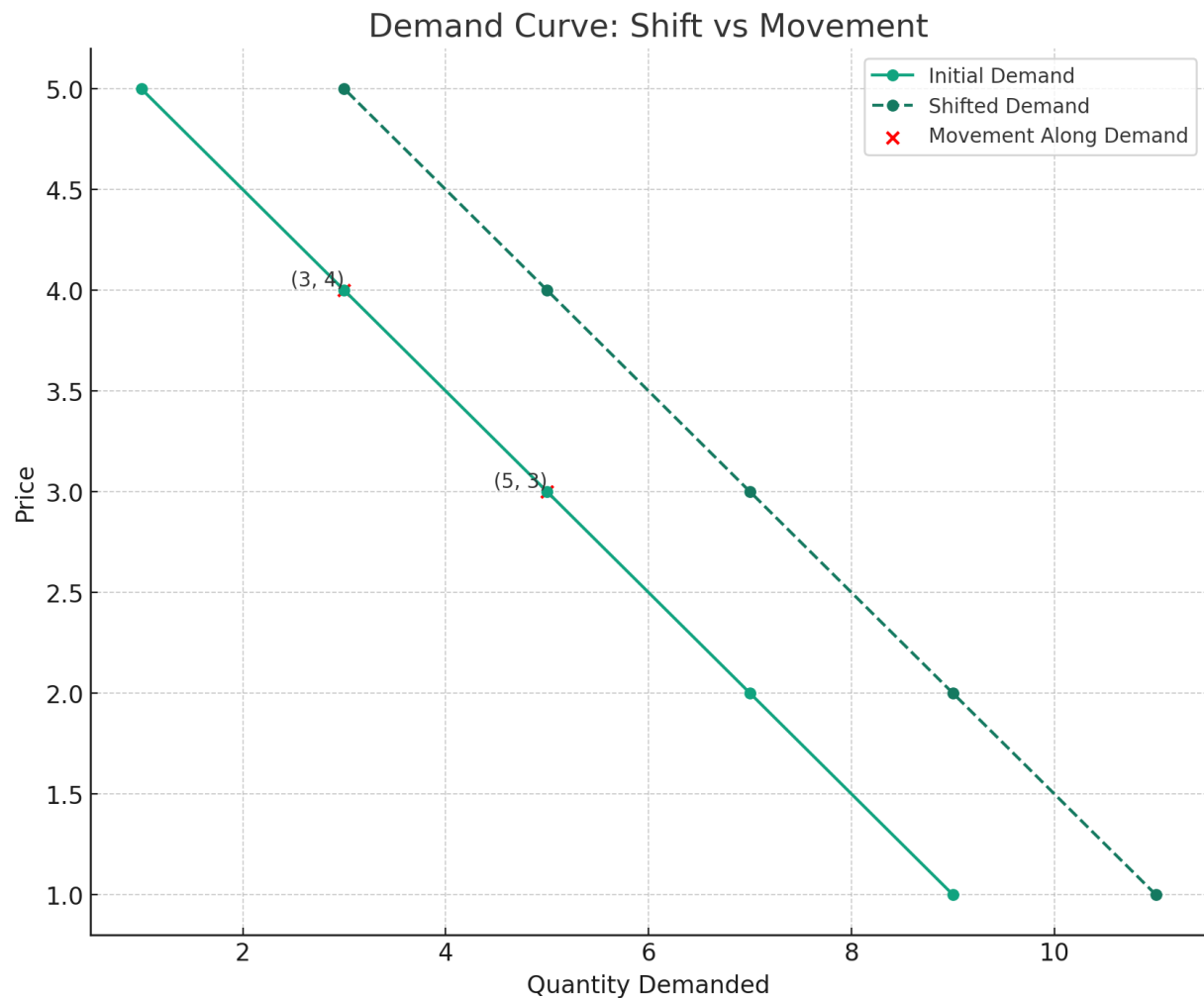
- **PNFI** is the amount of money invested in the economy (billions of dollars)
- **Prime** is the prime interest rate (%) (the rate banks charge their best customers)
- **b** is the y-intercept (the amount of money invested in the economy when the prime interest rate is 0%)
- **m** is the slope (the change in the amount of money invested in the economy when the prime interest rate increases by 1%) Should be negative.

Is model statistically significant?

- $|t| > 2$ - Statistically significant
- $P < 0.05$ - Statistically significant
- **C.I. does not include 0** - Statistically significant
- R^2 - The percentage of the variation in the dependent variable that is explained by the independent variable.
- **Standard Error** - The average distance between the actual data points and the regression line.

Supply and Demand

Demand

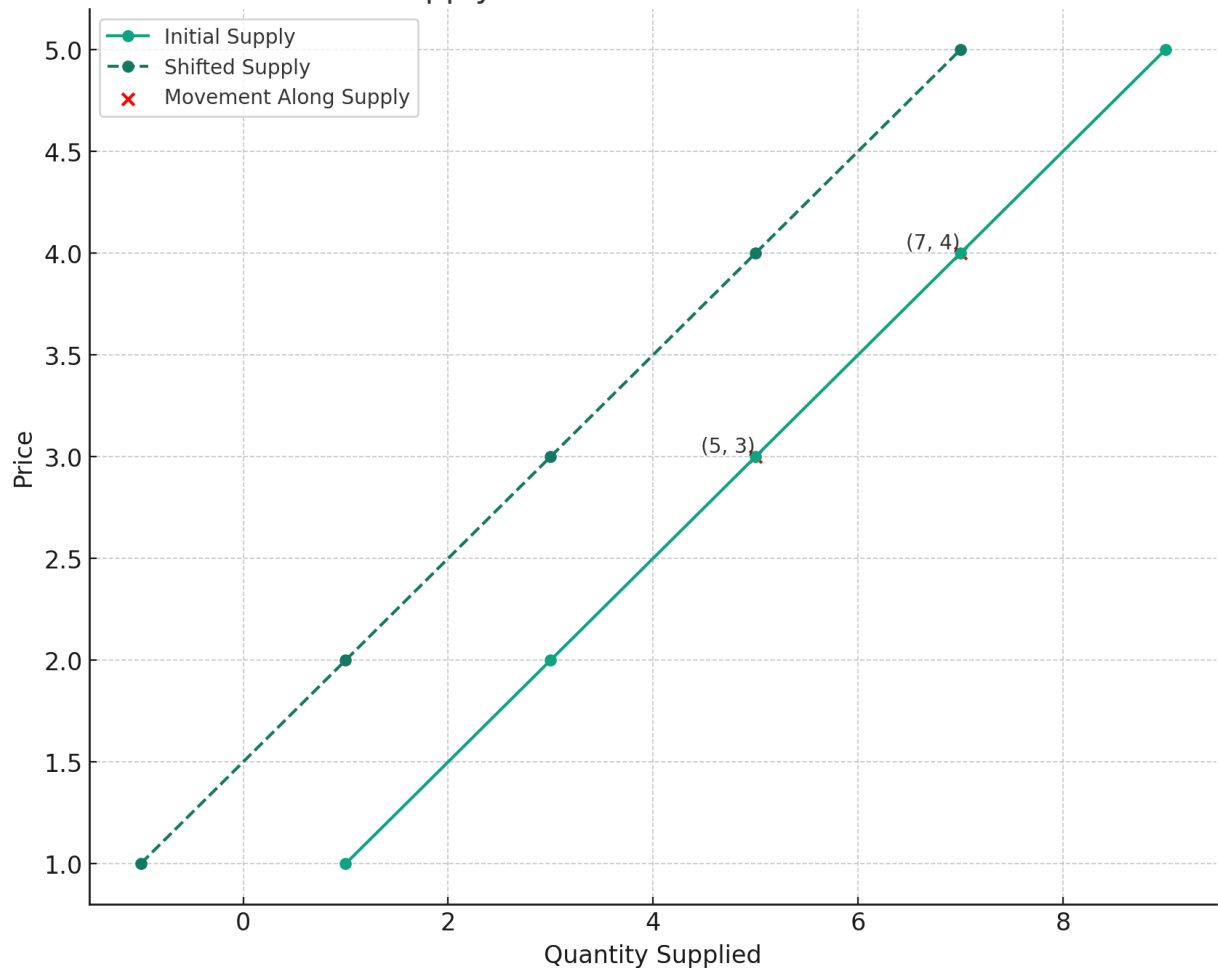


Shifters

- **Income** - Increase of income shifts the demand curve to the **right**.
- **Price of Related Goods** - Increase in the price of a substitute shifts the demand curve to the **right**. Increase in the price of a complement shifts the demand curve to the **left**.

Supply

Supply Curve: Shift vs Movement



Shifters

- **Input Prices** - Increase in input prices shifts the supply curve to the **left**.
- **Technology** - Increase in technology shifts the supply curve to the **right**.

Surplus

Consumer Surplus - The difference between the maximum price a consumer is willing to pay and the price they actually pay.

Producer Surplus - The difference between the minimum price a producer is willing to accept and the price they actually receive.

Choke Price - The price at which the quantity demanded equals zero.

Example

Given:

$$Q_d = 152 - 20P$$

$$Q_s = -4 + 188P$$

Find C_S and P_S .

$$152 - 20P = -4 + 188P$$

$$156 = 208P$$

$$P_e = 0.75$$

$$Q_e = 152 - 20(0.75) = 137$$

Find the maximum price a consumer is willing to pay:

$$152 - 20P = 0$$

$$P_{max} = 7.6$$

Find the minimum price a producer is willing to accept (choke price):

$$-4 + 188P = 0$$

$$P_{min} = 0.0213$$

Find the consumer surplus:

$$C_S = \frac{1}{2}(7.6 - 0.75)(137) = 469$$

We get this equation by taking the area of a triangle with base Q_e and height P_{max} .

Find the producer surplus:

$$P_S = \frac{1}{2}(0.75 - 0.0213)(137) = 51$$

Price Controls

Price Ceiling

A maximum price that can be charged for a good or service. (set by the government)

Example

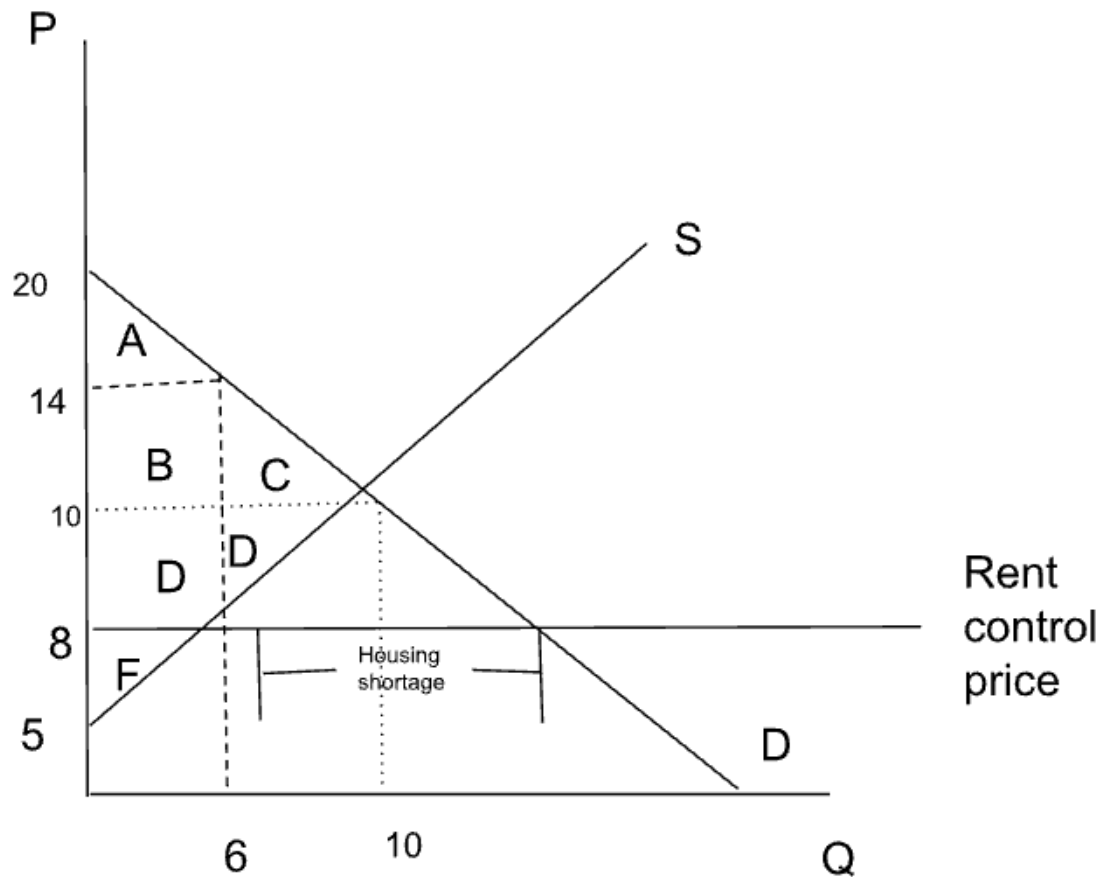
Given:

$$Q_d = 20 - P$$

$$Q_s = 2P - 10$$

If a price ceiling of \$8 is set, how is producer and consumer surplus affected?

Rent Control



Step 1: Find choke prices

$$\begin{aligned}
 20 - P &= 0 \\
 P_{\max, \text{demanded}} &= 20 \\
 2P - 10 &= 0 \\
 P_{\min, \text{supplied}} &= 5
 \end{aligned}$$

Step 2: Q_s and Q_d after price ceiling

$$Q_s = 2(8) - 10 = 6$$

$$\begin{aligned}
 6 &= 20 - P \\
 P &= 14
 \end{aligned}$$

This is the price that consumers would have been willing to pay at that supply level.

Step 3: Find new consumer and producer surplus

$$\begin{aligned}
 C_{S,a} &= \frac{1}{2}(20 - 14)(6) = 18 \\
 C_{S,b,d} &= (14 - 8) * 6 = 36 \\
 C_S &= 18 + 36 = 54
 \end{aligned}$$

$$P_S = \frac{1}{2}(8 - 5)(6) = 9$$

Elasticity

Elasticity - A measure of the responsiveness of one variable to changes in another variable.

- Price Elasticity of Demand
- Price Elasticity of Supply
- Income Elasticity of Demand
- Cross-Price Elasticity of Demand

We will focus on Price Elasticity of Demand.

$$\epsilon = \frac{\% \Delta Q}{\% \Delta P}$$

- If $\epsilon > 1$ then demand is elastic.
- If $\epsilon = 1$ then demand is unit elastic.
- If $\epsilon < 1$ then demand is inelastic.

Example

$$Q_d = 286 - 20P$$

P	Q_d	ϵ_d
6	166	-0.72
7	146	-0.96
8	126	-1.27

How did we get ϵ_d ?

$$\epsilon_d = \frac{\% \Delta Q}{\% \Delta P}$$

$$\% \Delta Q = \frac{Q_2 - Q_1}{Q_1}$$

$$\% \Delta Q = \frac{146 - 166}{166} = -0.12$$

$$\% \Delta P = \frac{P_2 - P_1}{P_1}$$

$$\% \Delta P = \frac{7 - 6}{6} = 0.167$$

$$\epsilon_d = \frac{-0.12}{0.167} = -0.72$$

What affects elasticity?

- Number of substitutes
- Price relative to income
- Necessities vs luxuries
- Time allowed for adjustment to change in price

Cross Price Elasticity of Demand

The responsiveness of the quantity demanded of one good to changes in the price of another good.

$$\epsilon_{xy} = \frac{\% \Delta Q_x}{\% \Delta P_y}$$

- If $\epsilon_{xy} > 0$ then the goods are **substitutes**.
- If $\epsilon_{xy} < 0$ then the goods are **complements**.

Income Elasticity of Demand

The responsiveness of the quantity demanded to changes in income.

$$\epsilon_I = \frac{\% \Delta Q}{\% \Delta I}$$

- If $\epsilon_I > 0$ then the good is a **normal good**.
- If $\epsilon_I < 0$ then the good is an **inferior good**.

Other Important Concepts / Terms

- **Recession** - Two consecutive quarters of negative GDP growth.
- **Depression** - A severe recession (10% or more decline in GDP).
- **Ceteris Paribus** - All other things held constant.
- **Marginal Cost** - The additional cost of producing one more unit of output.
- **Laissez-Faire** - The government should not interfere with the economy. (Adam Smith)
- **Command Economy** - The government should control the economy. (Karl Marx)