

# Macroeconomics

## Problem Set 1

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1. Consider an economy that produces Fish and Chicken. The following table contains the prices and quantities of these products:

	Year1		Year2	
	Quantity	Price	Quantity	Price
Fish	100	50,000	120	60,000
Chicken	500,000	100	400,000	200

(a) Nominal GDP in Year1 =

(b) Nominal GDP in Year2 =

(c) Growth rate of Nominal GDP =

(d) Real GDP in Year1 =

(e) Real GDP in Year2 =

(f) Growth rate of Real GDP =

(g) GDP Deflator in Year1 =

(h) GDP Deflator in Year2 =

2. (a) Consider the following:

Nominal GDP=\$14 trillion.

Real GDP=\$11 trillion.

GDP deflator =

(b) Consider the following:

GDP deflator=125.

Nominal GDP= \$15 trillion.

Real GDP=

3. (a) Consider the national income accounts identity:

GDP =\$5465.

Consumption spending=\$3657.

Investment spending= \$741.

Government spending = \$1098.

Net exports =

(b) Consider the national income accounts identity:

GDP =\$5465.

Consumption spending=\$3657.

Investment spending= \$741.

Net exports = -\$1910.

Government spending =

(c) Consider the national income accounts identity:

GDP =\$5465.

Consumption spending+Investment spending+Government spending =\$5496.

Exports = \$673.

Imports =

4. Determine the impact of these transactions on GDP in 2020:

- (a) The production of marijuana increases by 10%.
- (b) A chef cooks a pizza for his children at home.
- (c) A miller sells flour worth \$100,000 to Pizza Hut to prepare pizza.
- (d) The sale of the year 2021 calender printed in 2020.
- (e) The sale of a 2001 Jeep Cherokee worth \$10,000.
- (f) Ford adds cars worth \$2 million in inventory.
- (g) Ford sells cars from its inventory worth \$1 million.
- (h) A man pays \$1000 in rent for a one bed room apartment.
- (i) A man lives in his house that is worth \$500,000.
- (j) The wages of police officers and firefighters increased by 10%.
- (k) Increased hostility between unions and firms sparks labor strikes.
- (l) The discovery of a new way to grow a strain of wheat increases farm harvests.
- (m) Environmental law prohibits production means that emit large quantities of pollution.
- (n) Parents decrease their work hours to spend more time with their children.

5. Consider a Cobb-Douglas production function where K is capital, and L is labor:

$$Y = K^{\frac{1}{3}}L^{\frac{2}{3}}$$

$$A = 100$$

$$K = 100$$

$$L = 100$$

$$P = 10$$

(a) The marginal product of capital =

(b) Capital Rent =

(c) The marginal product of labor =

(d) Labor Wage =

6. Consider a Cobb-Douglas production Function with three factors of production: K is capital, L is low skilled labor, and H is high skilled labor:

$$Y = K^{\frac{1}{3}}L^{\frac{1}{3}}H^{\frac{1}{3}}$$

(a) The marginal product of low skilled labor MPL=

(b) The marginal product of high skilled labor MPH=

(c) The marginal product of capital MPK=

(d) The wage of low skilled labor =

(e) The wage of high skilled labor =

(f) The Skill Premium = the ratio of high skilled wage to low skilled wage =

7. Consider an economy described by the following equations:

$$Y = C + I + G$$

$$Y = 5000$$

$$G = 1000$$

$$T = 1000$$

$$C = 250 + 0.75(Y - T)$$

$$I = 1000 - 50r$$

(a) Private saving =

(b) Public saving =

(c) National saving =

(d) The interest rate =

8. If the consumption function is given by:

$$C = 500 + 0.5(Y - T)$$

$$Y = 6000$$

$$T = 200 + 0.2Y$$

Consumption spending =

9. If the investment function is given by:

$$I = 1000 - 30r$$

where  $r$  is the real interest rate. Assume the nominal interest rate = 10% and the inflation rate = 2%.

(a) Real interest rate =

(b) Investment spending =

10. Assume that consumers purchase 150 fish and 200 chicken. The prices of these items are:

	Price of Fish	Price of Chicken
Year1	2	4
Year2	3	5

- (a) The CPI in Year1 =
- (b) The CPI in Year2 =
- (c) The inflation rate =
- (d) Who is better off in terms of purchasing power: fish producers or chicken producers?
- (e) Who is worse off in terms of purchasing power: fish producers or chicken producers?

11. (a) Consider the following:

The velocity of money is constant.

The growth of real GDP = 5%.

The growth of money supply = 14%.

The nominal interest rate = 11%.

The inflation rate=

The real interest rate =

(b) Consider the following:

The money supply increases 12%.

Velocity of money decreases 4%.

The price level increases 5%.

The growth in real GDP=

(c) Consider the following:

The nominal interest rate =1%.

The inflation rate=5%.

The real interest rate =

12. Consider the following:

(a) The civilian population = 200 Mn.

Total employment = 143 Mn.

Total unemployment = 7 Mn.

The unemployment rate =

(b) The unemployment rate = 6%.

The number of unemployed = 188 Mn.

The labor force =

(c) The civilian population = 250 Mn.

Total employment = 145 Mn.

Total unemployment = 5 Mn.

The labor force participation rate =

13. Consider a country with a population of 2,450,375. In this country, 565,870 are in the military, in prisons, and institutionalized. The remainder are civilians. Out of the civilian population, 375,450 are not applying for jobs, and the remainder are in the labor force. Out of those in the labor force, 485,900 are unemployed.

(a) The non-civilian population =

(b) The civilian population =

(c) The labor force =

(d) Not in the labor force =

(e) The employed =

(f) The unemployed =

(g) The labor force participation rate =

(h) The unemployment rate =

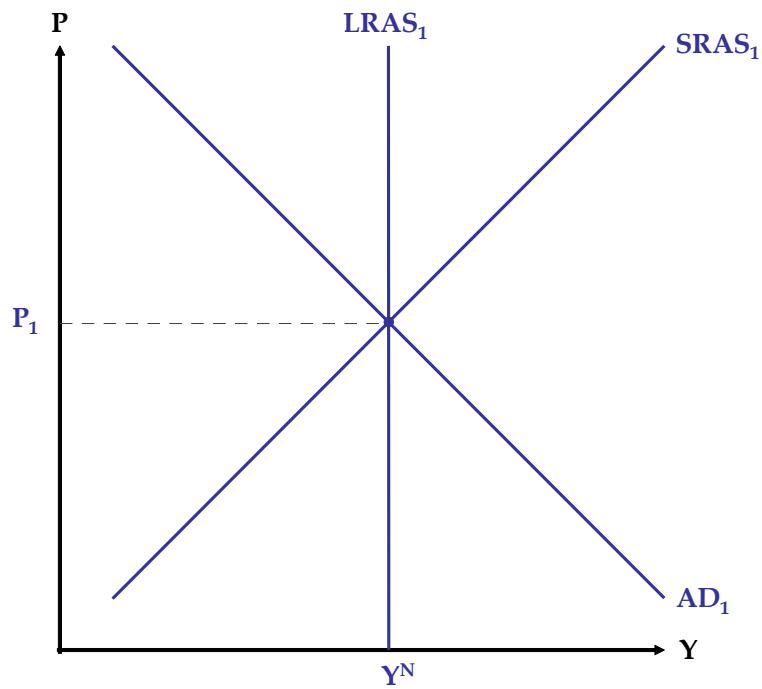
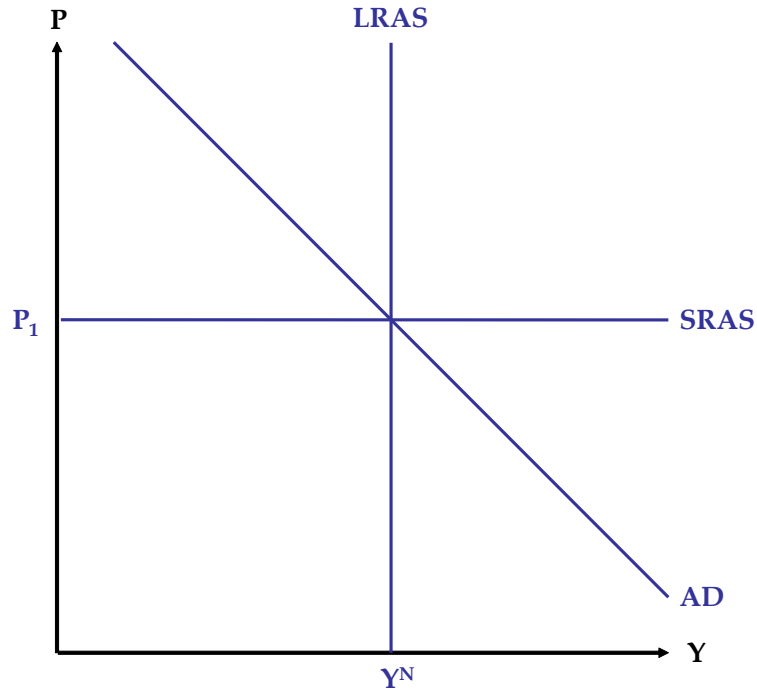
14. (a) If the job separation rate = 0.01, and the job finding rate = 0.09, the natural rate of unemployment =

(b) If the natural rate of unemployment rate = 0.1, the job separation rate = 0.02, the job finding rate =

(c) If the natural rate of unemployment rate = 0.125, the job finding rate = 0.56, the job separation rate =

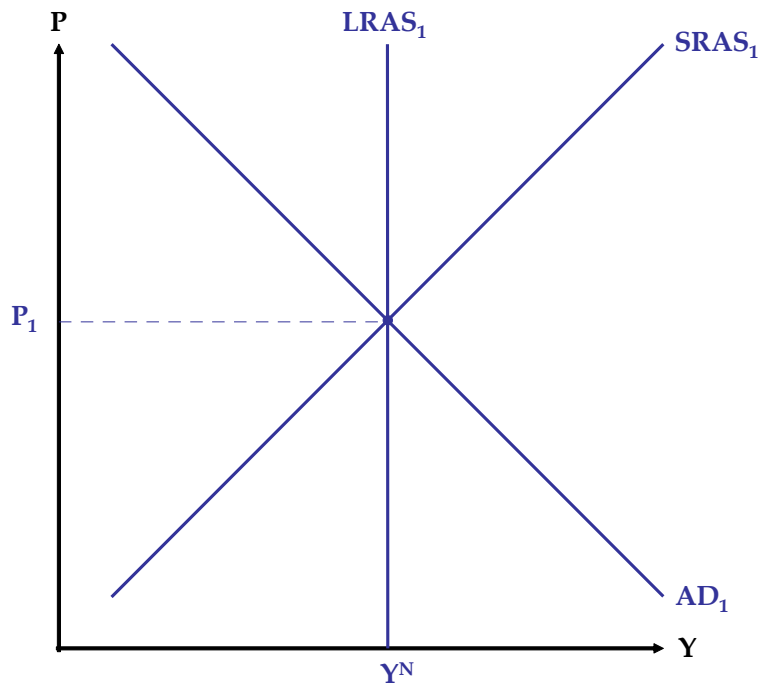
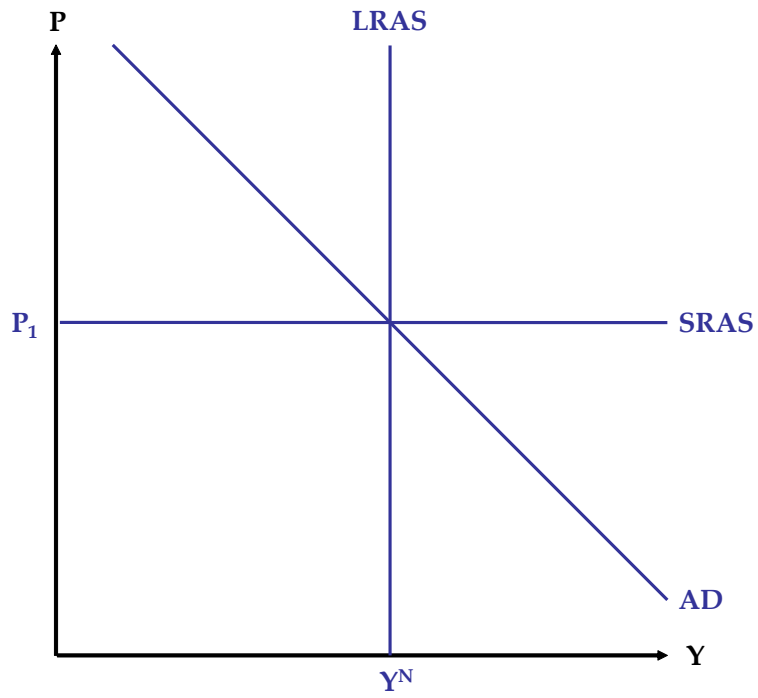
15. Use the aggregate demand and aggregate supply model to illustrate the impact in the short run and the long run of the following events:

(a) An increase in consumer confidence.

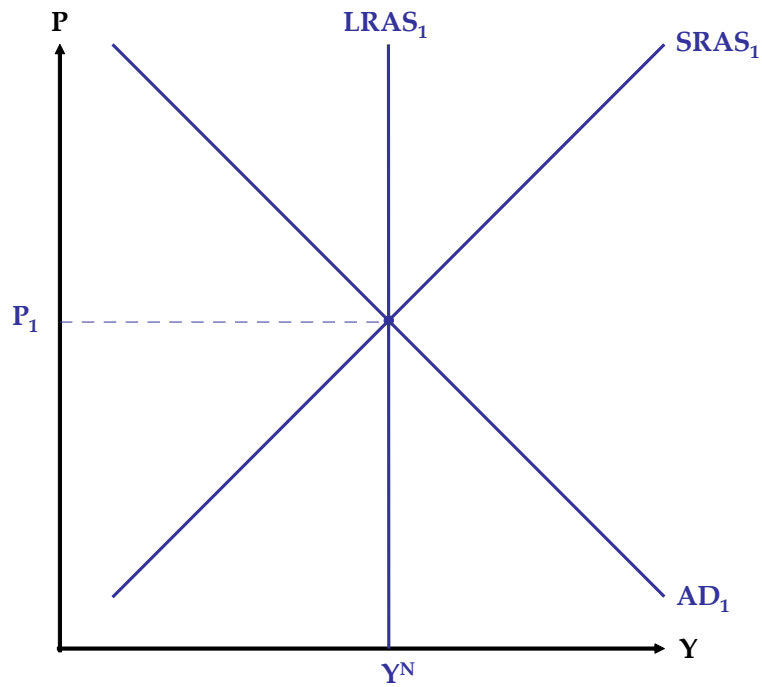
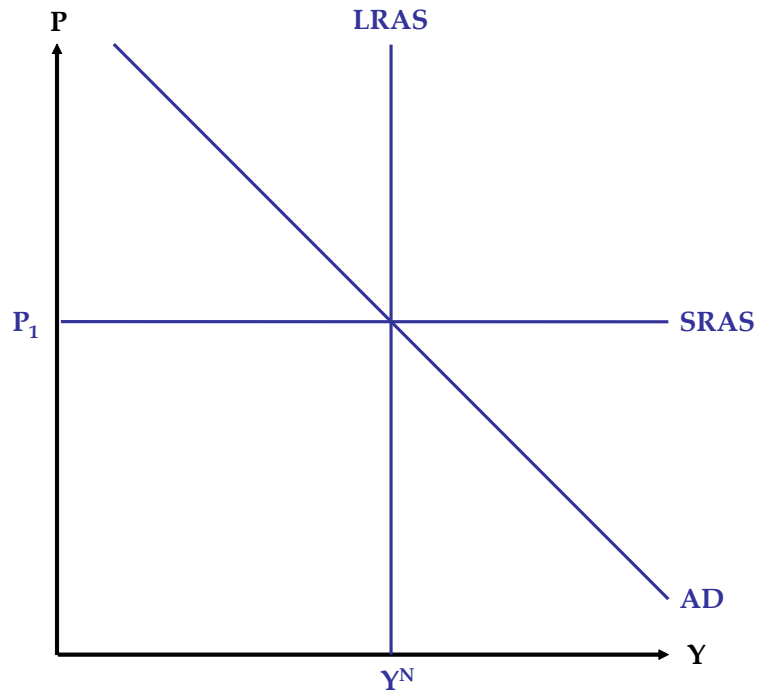




(b) A wall street stock market crash.

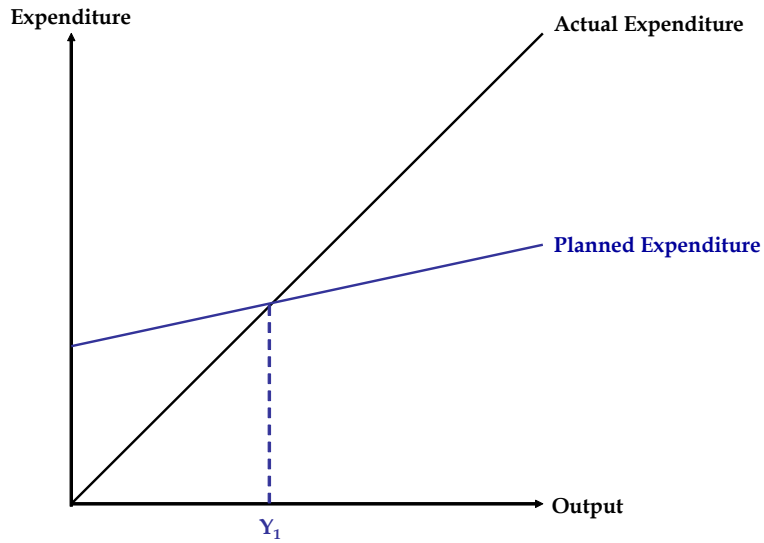


(c) Droughts in the Southeast and floods in the Midwest substantially cut food production in the United States.

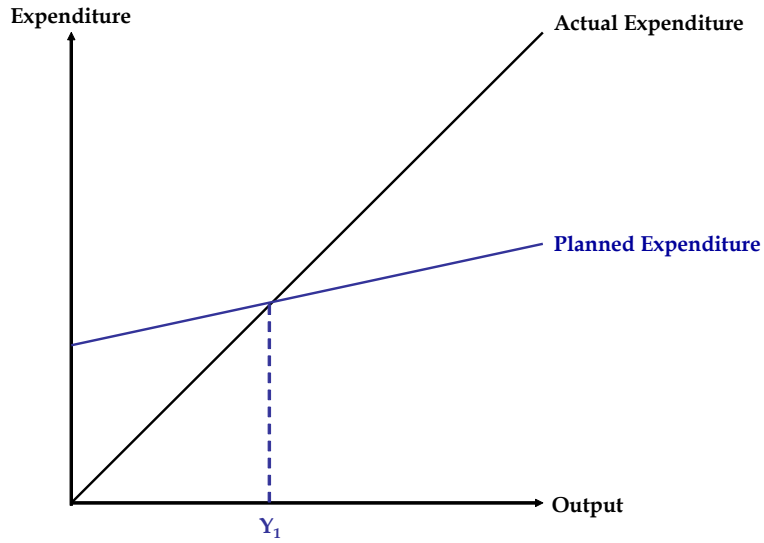


16. Use the Keynesian cross to predict the effect on GDP of:

(a) An increase in government spending.



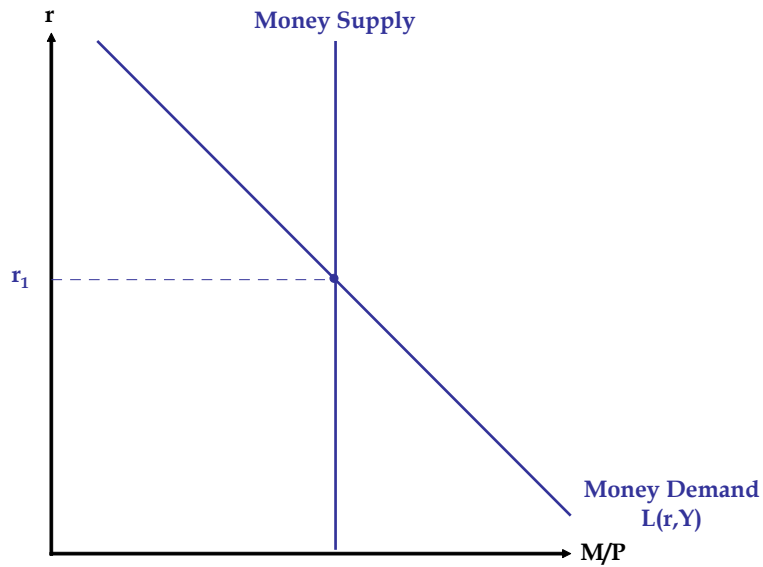
(b) An increase in taxes.



17. In the Keynesian cross model, if the  $MPC=0.75$ :

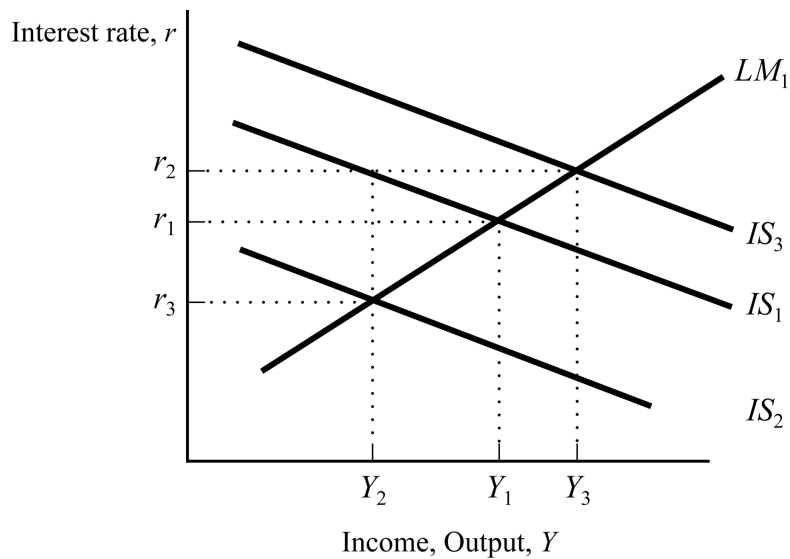
- (a) The government spending multiplier =
- (b) A \$1 billion increase in government spending, increases equilibrium income by
- (c) The taxes multiplier =
- (d) A \$1 billion decrease in taxes, increases equilibrium income by

18. Use the market for real money balances to determine the effect of the following events on the equilibrium interest rate:



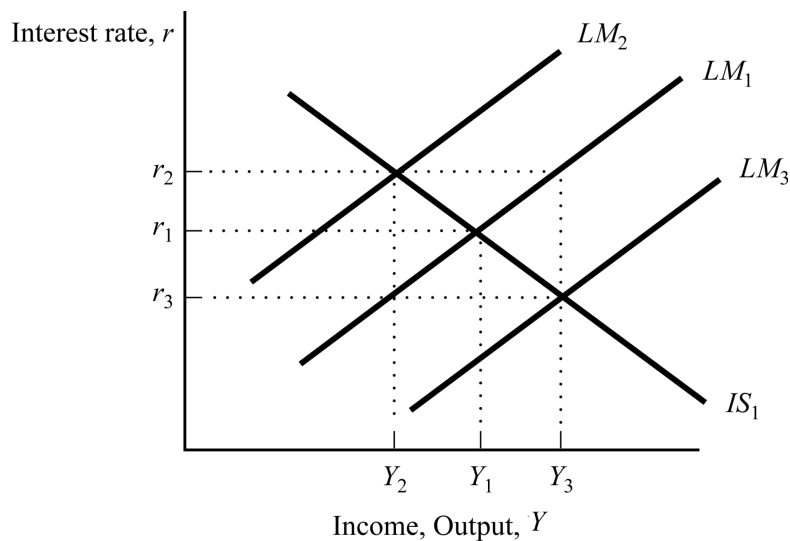
- (a) An increase in money supply.
- (b) A decrease in money supply.

19. Consider the following IS-LM graph. Starting from an equilibrium at interest rate  $r_1$  and income  $Y_1$ . Determine the new equilibrium after the following events:



- (a) A contractionary fiscal policy.
- (b) An expansionary fiscal policy

20. Consider the following IS-LM graph. Starting from an equilibrium at interest rate  $r_1$  and income  $Y_1$ . Determine the new equilibrium after the following events:



- (a) A contractionary monetary policy.
- (b) An expansionary monetary policy.