

# Chapter 3

**This is Macroeconomics**

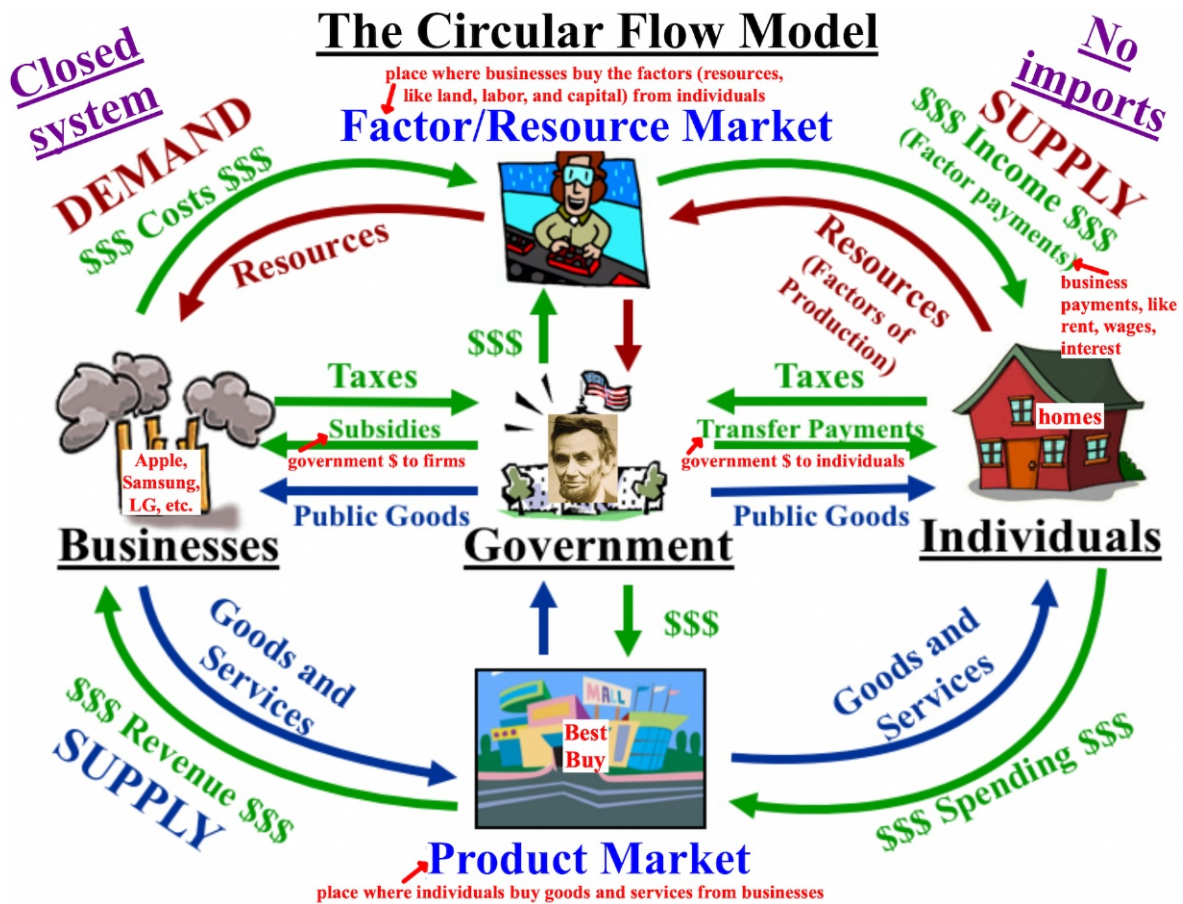
## **Macroeconomics: The Big Picture**

1. this chapter is about **macroeconomics**, which focuses on the economy as a whole, every firm/business and every market in one country
2. macroeconomics focuses on a country's money supply, aggregate demand (AD), aggregate supply (AS), and gross domestic product (GDP)
3. aggregate demand is the total demand for good and services in a country
4. aggregate supply is the total supply of goods and services in a country

**Moi**

### **Introduction (cont.)**

1. a country's money supply is the total amount of currency (coin and paper money) and deposits in banks in a country
2. currency and checking are designated as **M1** and are considered **demand deposits** (currency that you deposit into a bank account from which you can withdraw "on demand"- at any time without any advance notice to the bank; which is **liquidity**)



please take out  
your multiple  
choice practice;  
go to #8

### **The Circular Flow Model- Questions**

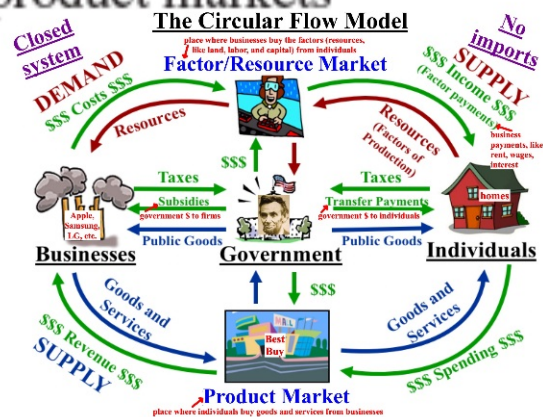
8. The circular-flow model indicates that final goods are produced by (goods bought by consumers)
- (A) firms and sold in the factor markets
  - (B) firms and sold in the product markets
  - (C) firms and sold in the resource markets
  - (D) households and sold in the factor markets
  - (E) households and sold in the product markets



## The Circular Flow Model- Questions

8. The circular-flow model indicates that final goods are produced by  
(goods bought by consumers)

- (A) firms and sold in the factor markets
- ☒ (B) firms and sold in the product markets
- (C) firms and sold in the resource markets
- (D) households and sold in the factor markets
- (E) households and sold in the product markets



### **The Circular Flow Model- Questions**

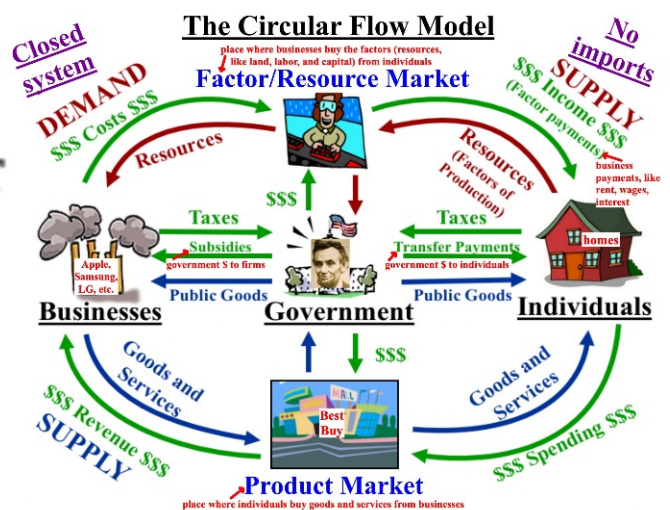
12. In the circular flow diagram of a market economy, which of the following supplies the factors of production?

- (A) The business sector
- (B) The government
- (C) The household sector
- (D) Financial sector
- (E) The foreign sector

## The Circular Flow Model- Questions

12. In the circular flow diagram of a market economy, which of the following supplies the factors of production?

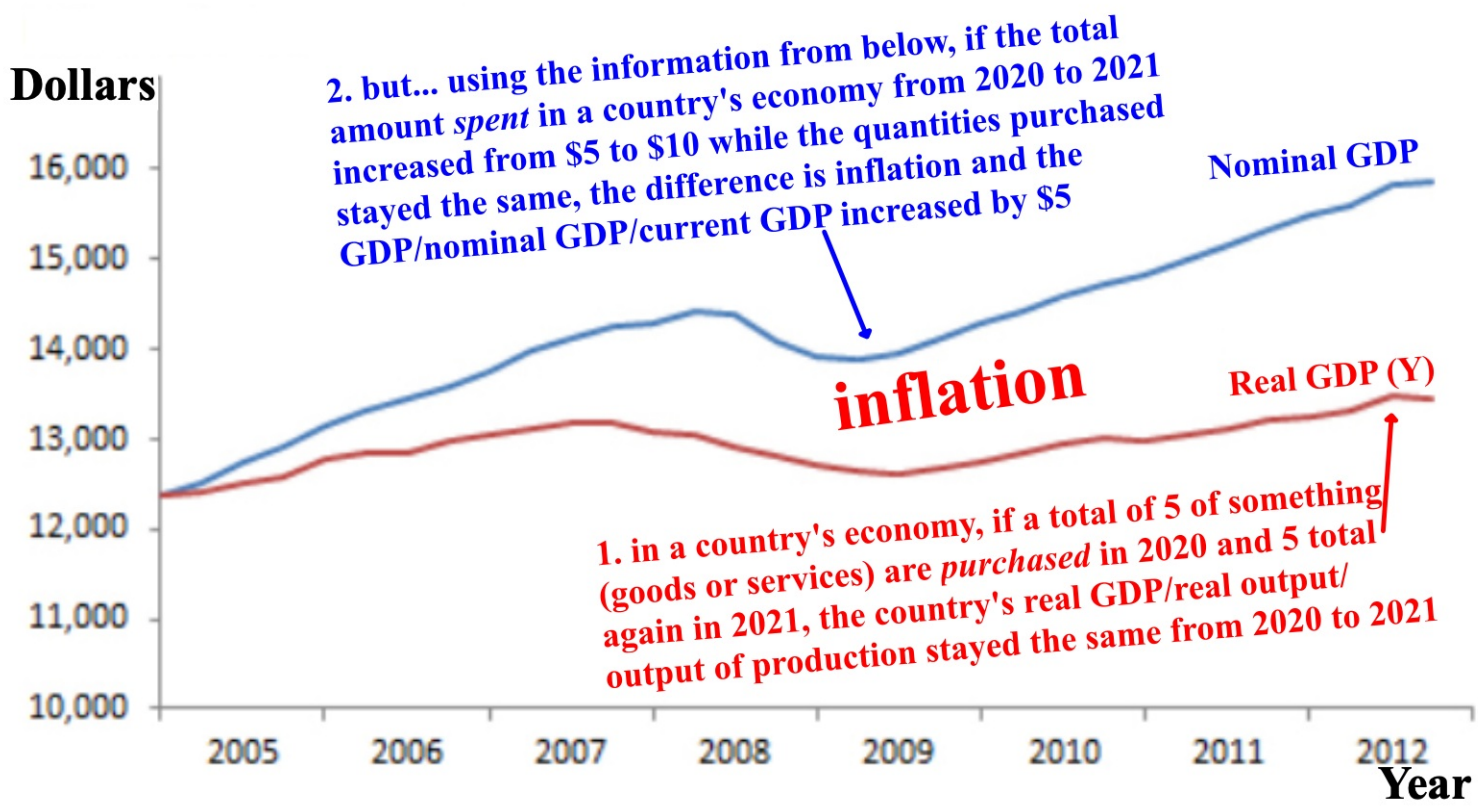
- (A) The business sector
- (B) The government
- ☒ (C) The household sector
- (D) Financial sector
- (E) The foreign sector



## **Real GDP vs. Nominal GDP**

1. **GDP** (gross domestic product), also called **nominal GDP** or **current GDP** is the total value of all new goods and services produced in an economy during a specified period of time with the change on the price level (PL) (inflation or deflation) included in the total
  - A. GDP includes spending by consumers (C) + business investments (I) + the government (G) +/- net exports (X) (exports-imports)
2. **inflation** is the percentage increase in the average price level of all goods and services from one year to the next
3. because the quantities of goods and services as well as their prices (P) change over time, economists use **real gross domestic product (real GDP or Y)**, also called **real output** or **output of production**, to calculate economic growth from year to year
4. real GDP only calculates changes in quantities purchased from year to year, not the changes in prices

**Real GDP vs. Nominal GDP (cont.)**



## **Real GDP vs. Nominal GDP (cont.)**

1. real GDP (Y) is a country's GDP that is adjusted to take into account a change in the price level (PL) (inflation or deflation) from year to year

macro  
formulas  
#2 and #3

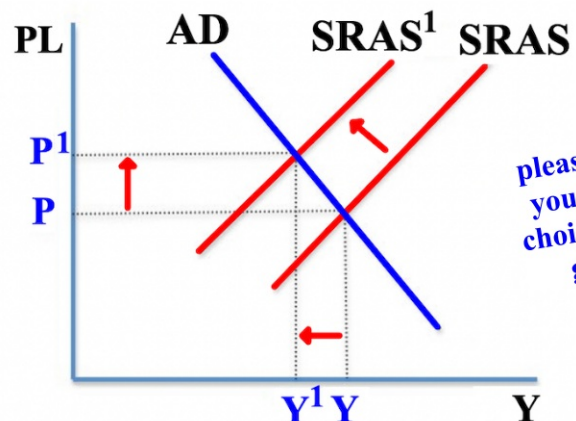
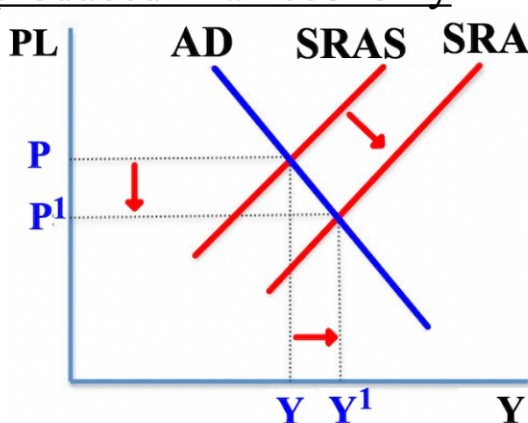
nominal GDP = consumer consumption (C)  
+ business investments (I)  
+ government spending/expenditures (G)  
+/- net exports (exports-imports) (X)

real GDP = nominal GDP +/- change in the price level (inflation or deflation)



## Real GDP vs. Nominal GDP (cont.)

1. decreases or increases in a country's money supply doesn't change real output
2. an increase in short-run aggregate supply (SRAS) (the total supply of goods and services in a country in the short-run) increases real output (real GDP (Y)), as does an initial decrease in workers' wages (left graph)
3. a decrease in short-run aggregate supply, a recession, or a depression, decreases real output (real GDP (Y)) (right graph)
4. the **price level** is the measurement of current prices of goods and services produced in an economy



*please take out  
your multiple  
choice practice;  
go to #23*

**Real GDP vs. Nominal GDP- Questions**

23. The value of which of the following would be included in the United States gross domestic product?
- (A) Time spent volunteering at a local hospital
  - (B) A United States savings bond received as a birthday gift
  - (C) A movie ticket purchased at a local theater
  - (D) A new handbag made in Italy by a United States firm
  - (E) A used car sold at the same price paid for it

### Real GDP vs. Nominal GDP- Questions

23. The value of which of the following would be included in the United States gross domestic product?

- (A) Time spent volunteering at a local hospital
- (B) A United States savings bond received as a birthday gift
- ☒ (C) A movie ticket purchased at a local theater
- (D) A new handbag made in Italy by a United States firm
- (E) A used car sold at the same price paid for it

GDP= new goods or services produced or bought during a time period (year)

## **Real GDP vs. Nominal GDP- Questions**

13. The table below shows a country's macroeconomic data in 2013.

Consumption spending	\$175 billion
Individual income taxes	\$32 billion
Private investment spending (also called business investment)	\$30 billion
Corporate taxes	\$25 billion
Exports	\$75 billion
Government purchases	\$40 billion
Imports	\$100 billion

The country's gross domestic product is

- (A) \$220 billion
- (B) \$282 billion
- (C) \$304 billion
- (D) \$309 billion
- (E) \$347 billion

**Real GDP vs. Nominal GDP- Questions**

13. The table below shows a country's macroeconomic data in 2013.

Consumption spending	<b>C</b> \$175 billion
Individual income taxes	\$32 billion
Private investment spending (also called business investment)	<b>I</b> \$30 billion
Corporate taxes	\$25 billion
Exports <b>X- (e-i)</b>	\$75 billion
Government purchases	<b>G</b> \$40 billion
Imports <b>X= (e-i)</b>	\$100 billion

The country's gross domestic product is

- ☒ (A) \$220 billion
- (B) \$282 billion
- (C) \$304 billion
- (D) \$309 billion
- (E) \$347 billion

consumers (C) +  
businesses (I) + the  
government (G) +/- net  
exports (X): (exports-  
imports)

C: \$175b  
I: 30b  
G: + 40b  
\$245b

e: \$ 75b  
i: - 100b  
-\$ 25b

\$245b  
- 25b  
\$220b

### **Real GDP vs. Nominal GDP- Questions**





57. Which of the following necessarily occurs during an economic recession? (has to)

- (A) Cost-push inflation decreases.
- (B) Real gross domestic product decreases.
- (C) Cyclical unemployment decreases.
- (D) Demand-pull inflation increases.
- (E) Nominal wages increase.



## Real GDP vs. Nominal GDP- Questions

57. Which of the following necessarily occurs during an economic recession? (has to)

- (A) Cost-push inflation decreases.  when the costs of inputs (resources) pushes inflation up- this doesn't have to occur
- ☒ (B) Real gross domestic product decreases.  when demand in an economy pushes inflation up- this doesn't have to occur
- (C) Cyclical unemployment decreases.
- (D) Demand-pull inflation increases.  when demand in an economy pushes inflation up- this doesn't have to occur
- (E) Nominal wages increase.  an increase in wages wouldn't occur during a depression





### **Real GDP vs. Nominal GDP- Questions**

58. Which of the following will cause an increase in real output in the short run?  
(less than 1 year)

- (A) A decrease in productivity
- (B) A decrease in wages
- (C) A decrease in government expenditure
- (D) An increase in reserve requirements
- (E) An increase in the discount rate

## Real GDP vs. Nominal GDP- Questions

58. Which of the following will cause an increase in real output in the short run?  
(less than 1 year)

- (A) A decrease in productivity  a decrease in an economy's production will decrease real GDP
- ☒ (B) A decrease in wages  a decrease in an economy's government spending will decrease real GDP
- (C) A decrease in government expenditure
- (D) An increase in reserve requirements  this would require banks to keep more money in reserve; less to lend
- (E) An increase in the discount rate  this would make banks charge each other more to borrow money from each other; less to lend

### Real GDP vs. Nominal GDP- Questions

60. An increase in the money supply will affect the price level and real gross domestic product (GDP) in which of the following ways in the long run?

(4-5 years)

<u>Price Level</u>	<u>Real GDP</u>
(A) Decrease	No change
(B) Increase	Decrease
(C) Increase	No change
(D) Decrease	Increase
(E) No change	No change

### Real GDP vs. Nominal GDP- Questions

60. An increase in the money supply will affect the price level and real gross domestic product (GDP) in which of the following ways in the long run?

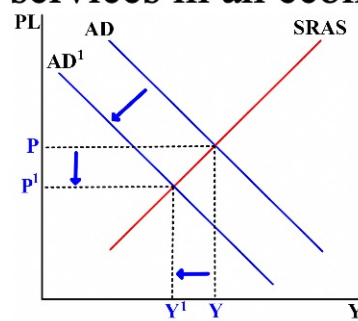
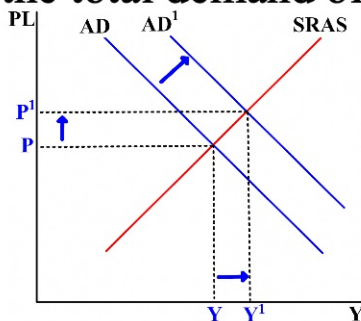
(4-5 years)

<u>Price Level</u>	<u>Real GDP</u>
(A) Decrease	No change
(B) Increase	Decrease
<input checked="" type="radio"/> (C) Increase	No change
(D) Decrease	Increase
(E) No change	No change

an increase in the amount of money in an economy will cause prices to increase but not necessarily change the real GDP

## Aggregate Demand and Economic Fluctuations

1. because the focus in macroeconomics is on the total quantity demanded ( $Q_d$ ) for all goods and services in the economy and not just one industry, like when we learned about quantity demanded ( $Q_d$ ) in microeconomics, we use the term **aggregate demand (AD)**
  - A. aggregate demand is the total amount that consumers (C), businesses (I), the government (G), net exports (X) spend on all goods and services in an economy
2. aggregate demand is real GDP ( $Y$ ) ( $AD = \text{real GDP } (Y)$ )
3. aggregate demand AD is referred to as a demand-side policy because it deals with the total demand of goods and services in an economy





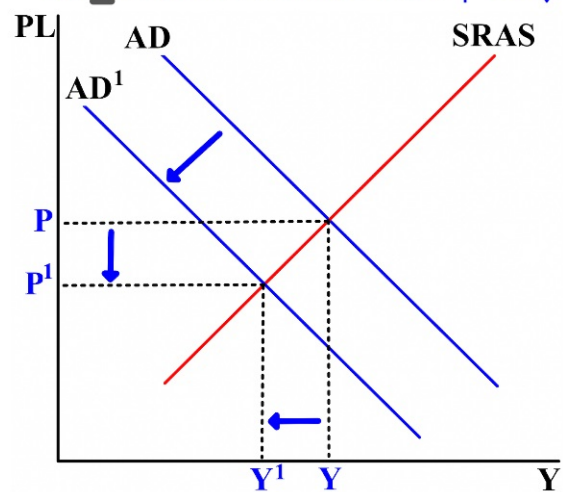
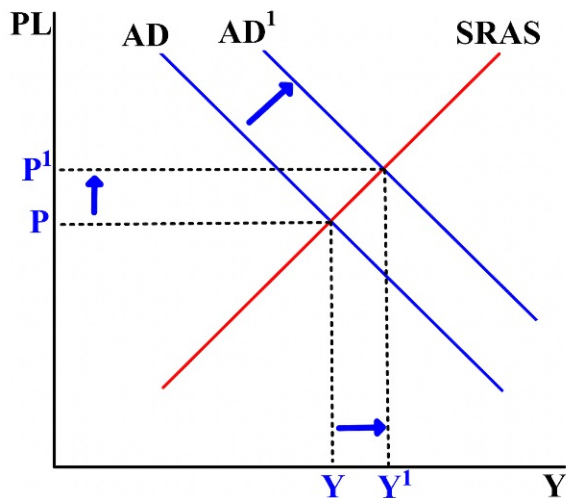
## Aggregate Demand and Economic Fluctuations (cont.)

1. changes in government purchases, monetary policy by the FED, fiscal policy by the government, foreign demand for U.S. exports, taxes, and consumer confidence can cause aggregate demand (AD) to increase (left graph) or decrease (right graph)

**C  
I  
T**

### Variables that impact AD

1. C, G, or X spending  $\uparrow$  or  $\downarrow$
2. inflation  $\uparrow$  or  $\downarrow$
3. taxes on consumers  $\uparrow$  or  $\downarrow$



### **Aggregate Demand and Economic Fluctuations- Questions**

43. An increase in consumer confidence will result in which of the following in the short run?
- (A) A rightward shift of the long-run aggregate supply curve
  - (B) A rightward shift of the short-run aggregate supply curve
  - (C) A leftward shift of the short-run aggregate supply curve
  - (D) A rightward shift of the aggregate demand curve
  - (E) A leftward shift of the aggregate demand curve

### Aggregate Demand and Economic Fluctuations- Questions

43. An increase in consumer confidence will result in which of the following in the short run?

- (A) A rightward shift of the long-run aggregate supply curve
  - (B) A rightward shift of the short-run aggregate supply curve
  - (C) A leftward shift of the short-run aggregate supply curve
  - ☒ (D) A rightward shift of the aggregate demand curve
  - (E) A leftward shift of the aggregate demand curve
- most likely, but only in the long-run
- consumer confidence would enhance the economy, thus shift aggregate demand to the right

### **Aggregate Demand and Economic Fluctuations- Questions**

35. Following a decrease in aggregate demand, an increase in unemployment will result if
- (A) prices increase and real wages decrease
  - (B) the aggregate supply curve is vertical
  - (C) prices and wages quickly adjust to equilibrium levels
  - (D) short-run aggregate supply also increases
  - (E) prices and nominal wages are slow to adjust in the short run

## Aggregate Demand and Economic Fluctuations- Questions

35. Following a decrease in aggregate demand, an increase in unemployment will result if

- (A) prices increase and real wages decrease
- (B) the aggregate supply curve is vertical
- (C) prices and wages quickly adjust to equilibrium levels
- (D) short-run aggregate supply also increases
- ☒ (E) prices and nominal wages are slow to adjust in the short run

with a decrease in aggregate demand  
prices would decrease

this would be a  
long-run  
aggregate  
supply curve

not relevant

SRAS would  
decrease if  
AD  
decreased

### **Aggregate Demand and Economic Fluctuations- Questions**

12. An increase in the price of a key input will cause the aggregate demand curve and the short-run aggregate supply curve to change in which of the following ways?

Aggregate  
Demand Curve

Aggregate  
Supply Curve

- (A) Shift to the right
- (B) Shift to the left
- (C) Shift to the left
- (D) No change
- (E) No change

- Shift to the right
- Shift to the left
- No change
- Shift to the left
- Shift to the right



## Aggregate Demand and Economic Fluctuations- Questions

12. An increase in the price of a key input will cause the aggregate demand curve and the short-run aggregate supply curve to change in which of the following ways?


### Aggregate Demand Curve

- (A) Shift to the right
- (B) Shift to the left
- (C) Shift to the left
- ☒ (D) No change
- (E) No change

### Aggregate Supply Curve

- Shift to the right
- Shift to the left
- No change
- Shift to the left
- Shift to the right

an increases in  
an input  
(resource or  
factor of  
productions)  
decreases  
supply



### **Aggregate Demand and Economic Fluctuations- Questions**

41. An unanticipated decrease in aggregate demand will most likely cause the unemployment rate and the inflation rate to change in which of the following ways?

Unemployment <u>Rate</u>	Inflation <u>Rate</u>
(A) Increase	Increase
(B) Increase	Decrease
(C) Increase	No change
(D) Decrease	Increase
(E) Decrease	Decrease

### Aggregate Demand and Economic Fluctuations- Questions

41. An unanticipated decrease in aggregate demand will most likely cause the unemployment rate and the inflation rate to change in which of the following ways?

Unemployment  
Rate

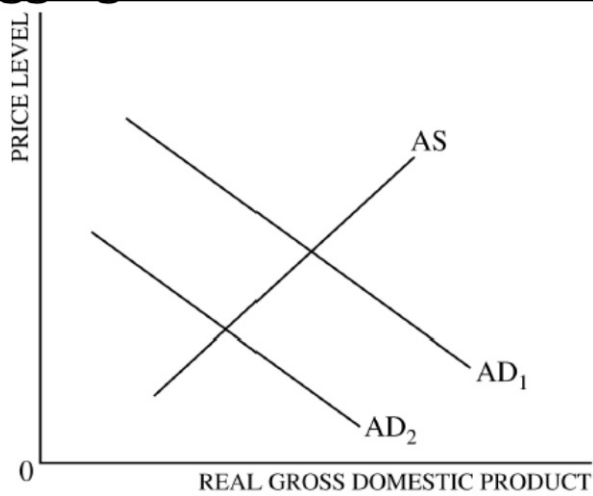
- (A) Increase
- ☒ (B) Increase
- (C) Increase
- (D) Decrease
- (E) Decrease

Inflation  
Rate

- Increase
- Decrease
- No change
- Increase
- Decrease

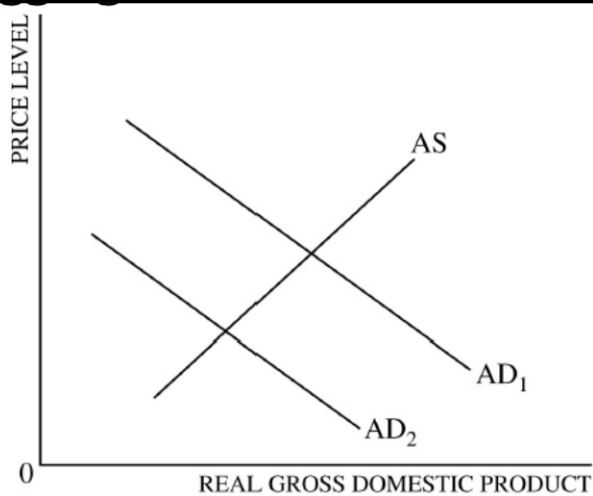
unemployment  
will definitely  
increase and  
since  
employment and  
demand are  
down, prices will  
fall

## **Aggregate Demand and Economic Fluctuations- Questions**



17. The graph above shows two aggregate demand curves,  $AD_1$  and  $AD_2$ , and an aggregate supply curve,  $AS$ . The shift in the aggregate demand curve from  $AD_1$  to  $AD_2$  could be caused by
- (A) a decrease in taxes
  - (B) a decrease in the money supply
  - (C) an increase in government spending
  - (D) an increase in consumption spending
  - (E) an increase in the price level

## Aggregate Demand and Economic Fluctuations- Questions



17. The graph above shows two aggregate demand curves,  $AD_1$  and  $AD_2$ , and an aggregate supply curve,  $AS$ . The shift in the aggregate demand curve from  $AD_1$  to  $AD_2$  could be caused by

- (A) a decrease in taxes
  - ☒ (B) a decrease in the money supply
  - (C) an increase in government spending
  - (D) an increase in consumption spending
  - (E) an increase in the price level
- these would increase aggregate demand
- shifts occur for every reason except a price change

### **Aggregate Demand and Economic Fluctuations- Questions**

60. Which of the following will shift the aggregate demand curve to the right?
- (A) A report that corporate earnings were lower than expected
  - (B) An increase in interest rates caused by a tightening of monetary policy
  - (C) Increased imports caused by appreciation of the dollar
  - (D) Increased spending by businesses on computers
  - (E) An increase in the government's budget surplus

## Aggregate Demand and Economic Fluctuations- Questions

60. Which of the following will shift the aggregate demand curve to the right?

(A) A report that corporate earnings were lower than expected

this will shift aggregate demand to the left

(B) An increase in interest rates caused by a tightening of monetary policy

this will shift

(C) Increased imports caused by appreciation of the dollar

increased imports occur because aggregate demand has already led to price increases

☒ (D) Increased spending by businesses on computers

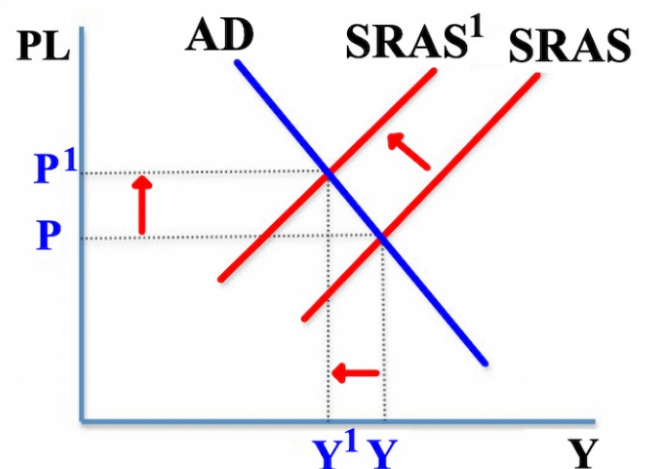
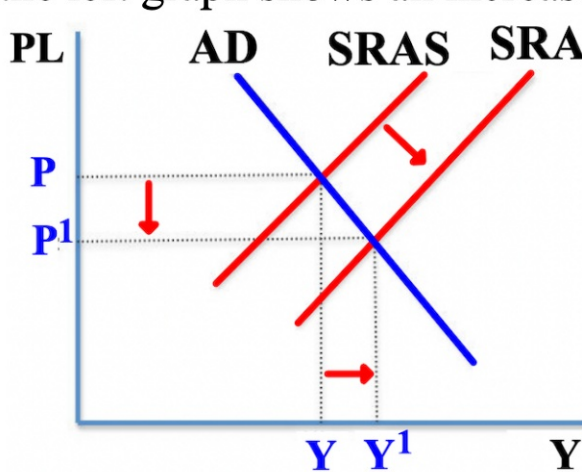
(E) An increase in the government's budget surplus

only if the surplus is spent will aggregate demand shift right



## Short-Term Economic Growth

1. the potential GDP of an economy is best calculated by the total of what it makes or can service, its aggregate supply (AS)
2. there are two types of aggregate supply
  - A. **short-run aggregate supply (SRAS)** is all of the goods and services produced in the short-run (SR) (up to one year out) by all of the firms in an economy using the available labor, capital, and technology
3. the left graph shows an increase in SRAS, the left a decrease

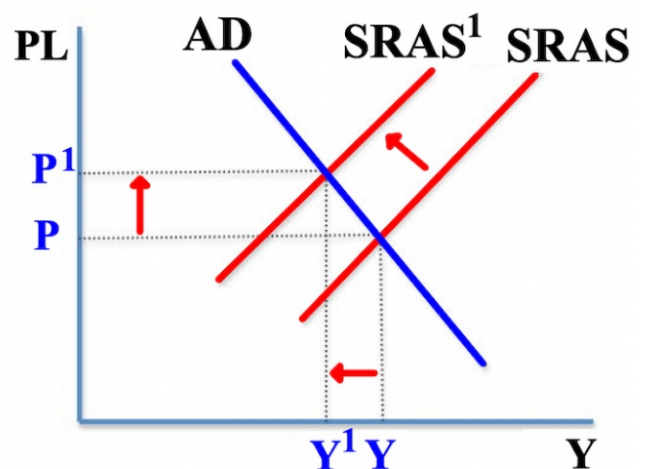
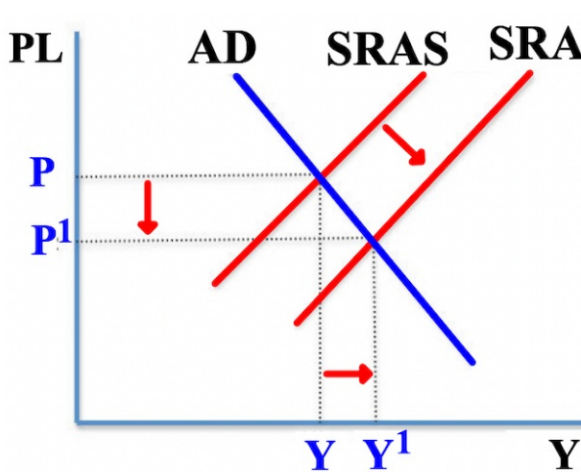


## Short-Term Economic Growth (cont.)

### Variables that impact SRAS

P  
I  
S  
T

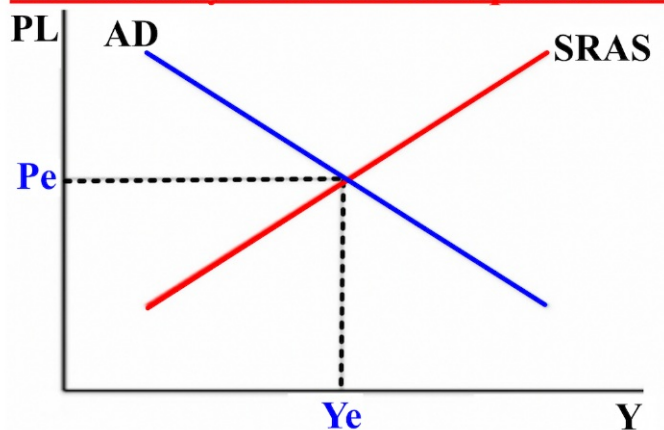
1. production resources/factors/input costs- the costs of wages, salaries, healthcare, materials, technology, facilities, etc. (anything that is needed for production) ↓ or ↑
2. inflation expectations ↓ or ↑
3. subsidies (payments by governments) to producers ↓ or ↑
4. taxes on producers by the government ↓ or ↑



## Short-Term Economic Growth (cont.)

1. when the level of short-run aggregate supply (SRAS) is the same as aggregated demand (AD), short-run equilibrium occurs
  - A. **short-run equilibrium** is a state where short-run aggregate supply (SRAS) equals aggregate demand in the short-run (less than one year)
2. the **equilibrium price level ( $P_e$ )** and **equilibrium output level ( $Y_e$ )** are the price level and output where the quantity of goods supplied ( $Q_s$ ) is equal to the quantity of goods demanded ( $Q_d$ )

### An economy in short-run equilibrium



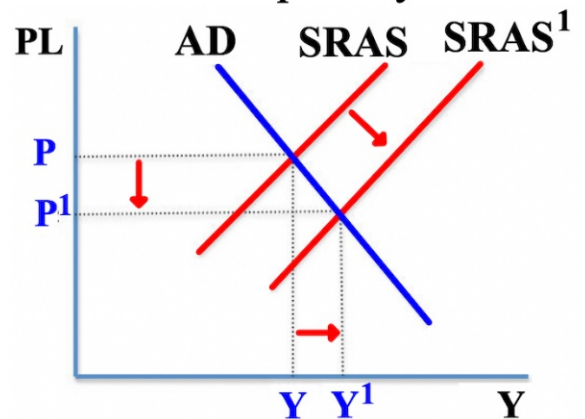
please take out  
your multiple  
choice practice;  
go to #3

## Short-Term Economic Growth (cont.)

1. the short-run aggregate supply (SRAS) curve shifts right (increases) if the stock (worth) of physical capital (trucks, factories) or human capital (workers) increases
2. a decrease in production costs increase SRAS but decreases the price level
3. an increase in SRAS will lead to increases in income and possibly, in the long-run, less unemployment
4. unanticipated increases in SRAS can cause hyperinflation because the excess supply will decrease price levels which will increase quantity demanded

### Variables that impact SRAS

- P**  
**I**  
**S**  
**T**
1. production resources/factors/input costs- the costs of wages, salaries, healthcare, materials, technology, facilities, etc. (*anything* that is needed for production) ↓ or ↑
  2. inflation expectations ↓ or ↑
  3. subsidies (payments by governments) to producers ↓ or ↑
  4. taxes on producers by the government ↓ or ↑

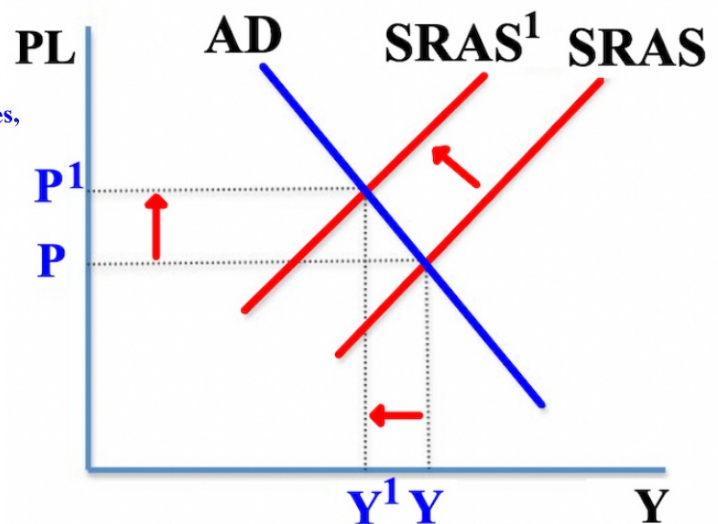


## Short-Term Economic Growth (cont.)

1. the short-run aggregate supply (SRAS) curve shifts left (decreases) if labor (workers) productivity decreases or if production costs increase

### Variables that impact SRAS

- P**  
**I**  
**S**  
**T**
1. production resources/factors/input costs- the costs of wages, salaries, healthcare, materials, technology, facilities, etc. (*anything* that is needed for production) ↓ or ↑
  2. inflation expectations ↓ or ↑
  3. subsidies (payments by governments) to producers ↓ or ↑
  4. taxes on producers by the government ↓ or ↑





### **Short-Term Economic Growth- Questions**

3. A rightward shift in the short-run aggregate supply curve will occur when
- (A) exports exceed imports
  - (B) the money supply increases
  - (C) the prices of imported raw materials increase
  - (D) the stock of physical capital <sup>(worth)</sup> increases
  - (E) unions have negotiated a wage increase for their members

### Short-Term Economic Growth- Questions

3. A rightward shift in the short-run aggregate supply curve will occur when

- (A) exports exceed imports ← this means you are buying more from other countries compared to your own
- (B) the money supply increases ← not something that impacts SRAS
- (C) the prices of imported raw materials <sup>de</sup> increase
- ☒ (D) the stock of physical capital <sup>(worth)</sup> increases
- (E) unions have negotiated a wage <sup>de</sup> increase for their members

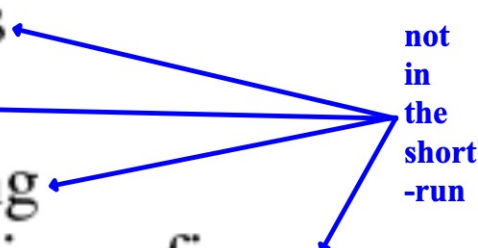


### **Short-Term Economic Growth- Questions**

40. An increase in which of the following is most likely to cause the short-run aggregate supply curve to shift to the left?
- (A) Consumers' incomes
  - (B) The money supply
  - (C) Government spending
  - (D) The optimism of business firms
  - (E) The per unit cost of production

### Short-Term Economic Growth- Questions

40. An increase in which of the following is most likely to cause the short-run aggregate supply curve to shift to the left?

- (A) Consumers' incomes
  - (B) The money supply
  - (C) Government spending
  - (D) The optimism of business firms
  - ☒ (E) The per unit cost of production
- 
- not  
in  
the  
short  
-run

**Short-Term Economic Growth- Questions**

10. If a reduction in aggregate supply is followed by an increase in aggregate demand, which of the following will definitely occur?
- (A) Output will increase.
  - (B) Output will decrease.
  - (C) Output will not change.
  - (D) The price level will increase.
  - (E) The price level will decrease.

### Short-Term Economic Growth- Questions

10. If a reduction in aggregate supply is followed by an increase in aggregate demand, which of the following will definitely occur?

- (A) Output will increase. ← probably, but price definitely and first
- (B) Output will decrease. ← no way since demand is increasing
- (C) Output will not change. ← no way since demand is increasing
- ☒ (D) The price level will increase.
- (E) The price level will decrease. ← no way since demand is increasing

### **Short-Term Economic Growth- Questions**

21. With an upward-sloping short-run aggregate supply curve, an increase in government expenditure will most likely
- (A) reduce the price level
  - (B) reduce the level of nominal gross domestic product
  - (C) increase real gross domestic product
  - (D) shift the short-run aggregate supply curve to the right
  - (E) shift both the aggregate demand curve and the long-run aggregate supply curve to the left

### Short-Term Economic Growth- Questions

21. With an upward-sloping short-run aggregate supply curve, an increase in government expenditure will most likely

- (A) reduce the price level ← if government spending increases, prices will increase
- (B) reduce the level of nominal gross domestic product ← increased government spending increases real GDP
- ☒ (C) increase real gross domestic product
- (D) shift the short-run aggregate supply curve to the right ← aggregate demand and the long-run aggregate supply curve would shift to the right
- (E) shift both the aggregate demand curve and the long-run aggregate supply curve to the left

### **Short-Term Economic Growth- Questions**

48. A decrease in the prices of inputs will cause which of the following to occur in the short run?
- (A) An increase in the aggregate demand and an increase in the price level
  - (B) A decrease in the aggregate demand and an increase in the price level
  - (C) An increase in the short-run aggregate supply and a decrease in the price level
  - (D) An increase in the short-run aggregate supply and an increase in the price level
  - (E) A decrease in the short-run aggregate supply and a decrease in the price level



### Short-Term Economic Growth- Questions

48. A decrease in the prices of inputs will cause which of the following to occur in the short run?

- (A) An increase in the aggregate demand and an increase in the price level only in the long-run will this happen
- (B) A decrease in the aggregate demand and an increase in the price level only in the long-run will this happen, and aggregate demand will increase
- ☒ (C) An increase in the short-run aggregate supply and a decrease in the price level
- (D) An increase in the short-run aggregate supply and an increase in the price level yes, an increase in the SRAS, but a decrease in the price level (LR)
- (E) A decrease in the short-run aggregate supply and a decrease in the price level yes, a decrease in the price level (LR) but an increase in the SRAS

## The Velocity of Money

1. the **velocity of money** calculates how fast money is spent in an economy

macro  
formula  
#4

$$\frac{\begin{matrix} \$200 \\ \text{GDP now} \end{matrix}}{\begin{matrix} \text{starting money supply} \\ \$100 \end{matrix}} = \begin{matrix} 2 \\ \text{velocity of money} \end{matrix}$$

2. the velocity of money is an important part of an economy's GDP calculation
  3. a country's GDP cannot be controlled through the money supply alone
  4. if the money supply is increased in a country but its velocity decreases, GDP may stay the same or even decline
  5. an increase in the money supply causes price levels to rise (inflation)
  6. a decrease in the money supply first causes **disinflation** (when the rate of inflation slows down) which then leads to **deflation** (a declining inflation rate)
- A. think of how a cell phone charges... fast at first, then charges slower when nearing 100%, then loses charge when on

### **The Velocity of Money- Questions**

3. If nominal gross domestic product in a country is \$1,600 and the money supply is \$400, what is the velocity of money?
- (A) 400
  - (B) 10
  - (C) 4
  - (D) 2
  - (E) 0.5

### **The Velocity of Money- Questions**

3. If nominal gross domestic product in a country is \$1,600 and the money supply is \$400, what is the velocity of money?

(A) 400

(B) 10

☒ (C) 4

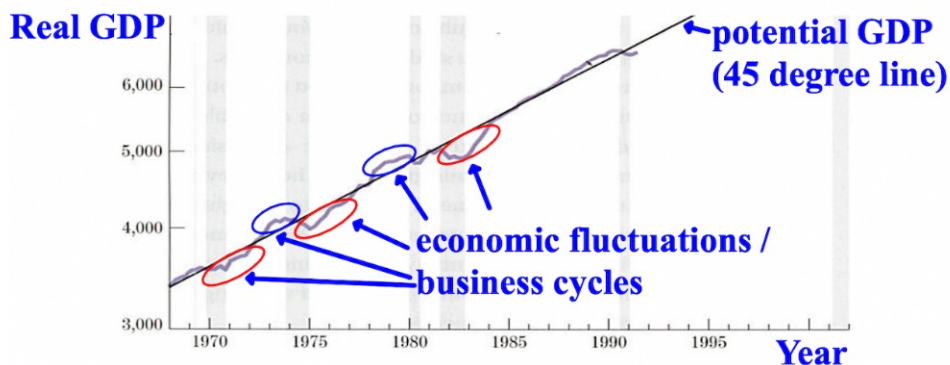
(D) 2

**velocity of money = GDP / starting money supply**

$$4 = \$1,600 / \$400$$

## Real GDP Over Time

1. when real GDP (Y) increases in an economy, it is called **economic growth**
2. real GDP per capita (per person) is the best indicator of economic growth
3. in the **short-run** (up to one year out), **economic fluctuations**, also called **business cycles**, occur, which are small increases or decreases in real GDP
4. sometimes real GDP fluctuates above or below **potential GDP** (where an economy should be)
  - A. if the economy is above potential GDP, the country's economy is in expansion/has inflation (blue ovals)
  - B. if it is below, economy is in a recession/in contraction (red ovals)

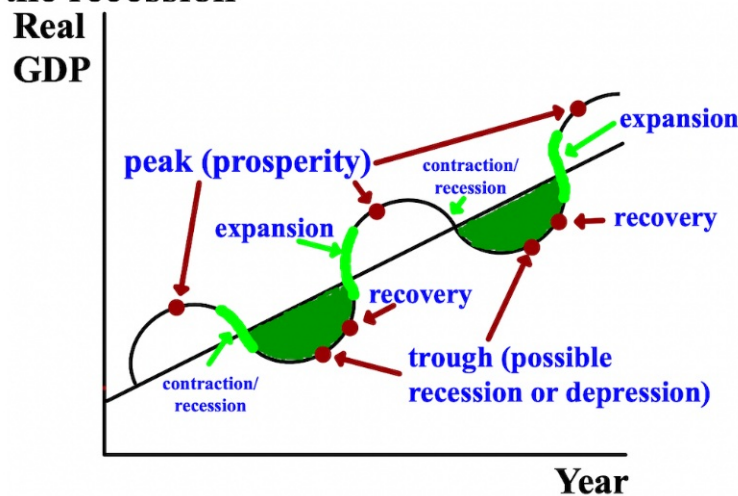


### **Real GDP Over Time (cont.)**

1. over time, increases and decreases in real GDP (Y) and economic fluctuations, or business cycles, occur
2. when real GDP falls, economists say that there is a **recession**
  - A. the decrease in real GDP must last at least six months (two quarters) before the decline is officially considered a recession
3. a **depression** is a huge recession

## Real GDP Over Time (cont.)

1. the highest point before the start of a recession is called the **peak**
2. the recession (contraction of the economy) comes next
3. the lowest point during the recession or depression is called the **trough**
4. the period between recessions, from the trough to the next peak, is called an **expansion**
5. the early part of the expansion is called a **recovery** because the economy is just recovering from the recession





**Real GDP Over Time- Questions**

20. Which of the following describes a typical business cycle in the correct sequence?
- (A) Peak, trough, recession, and expansion
  - (B) Peak, trough, expansion, and recession
  - (C) Peak, recession, trough, and expansion
  - (D) Peak, recession, expansion, and trough
  - (E) Peak, expansion, trough, and recession

### Real GDP Over Time- Questions

20. Which of the following describes a typical business cycle in the correct sequence?

- (A) Peak, trough, recession, and expansion
- (B) Peak, trough, expansion, and recession
- ☒ (C) Peak, recession, trough, and expansion
- (D) Peak, recession, expansion, and trough
- (E) Peak, expansion, trough, and recession

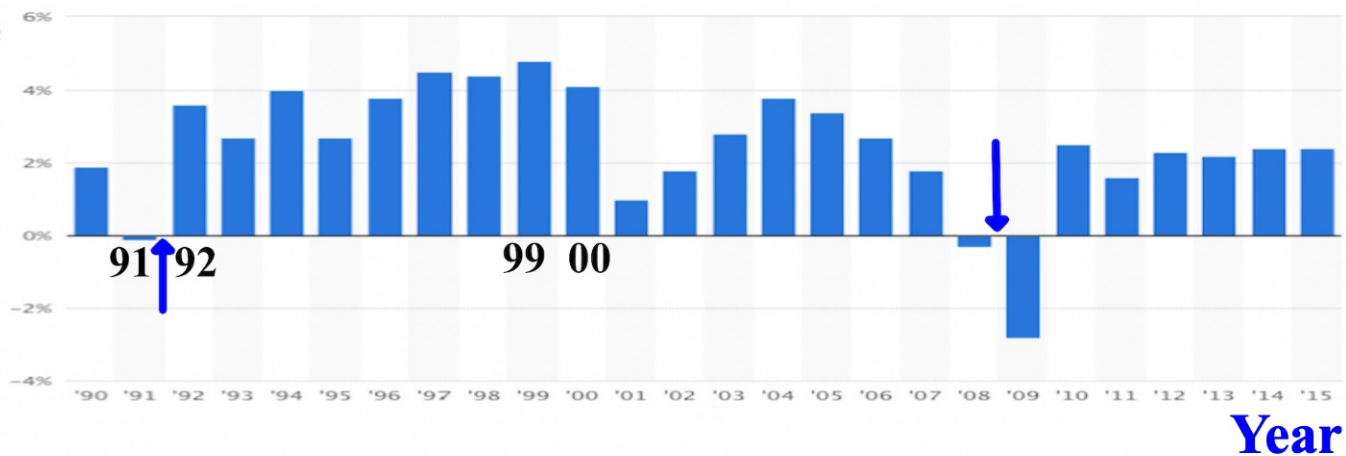
highest,  
decreasing,  
lowest,  
then  
increasing



## Graphing Real GDP

1. the graph shows the increase or decrease in real GDP (Y) from 1990 to 2015
  2. real GDP increased around 4.1% from 1991 to 1992
  3. real GDP decreased around -3% from 2008 to 2009
- A. the growth rate of real GDP can be a negative number

% Rate



## Macroeconomics Do-Now

1. If nominal GDP is increasing faster than real GDP is, what must be happening? inflation
2. If real GDP in 1773 was \$10 million and \$15 million in 1774, what was the percent growth?

"if/then"  $\frac{100\%}{10m} = \frac{150\%}{15m}$

or...  $\frac{\text{new-old}}{\text{old}} \times 100$

$\frac{\$15m - \$10m}{\$10m} = .5 \times 100 = 50\% \text{ growth rate}$

"Nooo..."

## A Year-to-Year Chain: Real GDP Growth Rate

1. let's calculate the real GDP growth rate between 2017-2019

2. we need to find the percentage increase or decrease

2017 Real GDP= \$100

2018 Real GDP= \$200

2019 Real GDP= \$300

The real GDP growth rate from 2017 to 2018 was:

and the real GDP growth rate from 2018 to 2019 was:

"if/then"

$$\frac{100\%}{\$100} \xrightarrow{+100\%} \boxed{200\%} \quad \$200$$

or...

"Nooo..."

$$\frac{\text{new-old}}{\text{old}} \times 100$$

$$\frac{\$200 - \$100}{\$100} \times 100$$

$$\frac{100\%}{\$200} \xrightarrow{+50\%} \boxed{150\%} \quad \$300$$

"if/then"

or...

$$\frac{\$300 - \$200}{\$200} \times 100$$

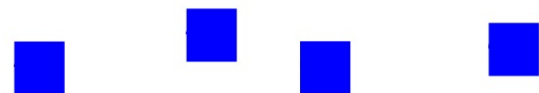
"Nooo..."

### **A Year-to-Year Chain: Real GDP Growth Rate (cont.)**

1. the annual growth rate from 2017 to 2019 was 75%:  $(100\% \text{ (growth from 2017-2018)} + 50\% \text{ (growth from 2018-2019)}) = 150\% / 2 = 75\%$
2. the growth rate is said to be in "chained 2017 dollars" for the three years from 2017 to 2019 because 2017 would be the **base** (the year the calculation started with)
3. the base year chosen must be a year where nominal and real GDP the same amount

**1. 2017 RGDP= \$10b, 2018 RGDP= \$12b, and 2019 RGDP= \$18b:**

**$20\% + 50\% = 70\% / 2 = 35\%$  annual growth rate**



*please take out  
your multiple  
choice practice;  
go to #36*

### **A Year-to-Year Chain: Real GDP Growth Rate- ?s**

<u>Period</u>	<u>Real Gross Domestic Product</u>	<u>Nominal Gross Domestic Product</u>
Year 1	\$100 billion	\$70 billion
Year 2	\$120 billion	\$120 billion
Year 3	\$130 billion	\$150 billion

36. Which of the following can be concluded from the data above?
- (A) The base year for the price index was year 1.
  - (B) The base year for the price index was year 3.
  - (C) The economy was producing higher-quality goods and services in years 2 and 3 than in year 1.
  - (D) The economy was experiencing inflation during years 2 and 3.
  - (E) The economy was experiencing deflation during years 1, 2, and 3.



## A Year-to-Year Chain: Real GDP Growth Rate- ?s

<u>Period</u>	<u>Real Gross Domestic Product</u>	<u>Nominal Gross Domestic Product</u>
Year 1	\$100 billion	\$70 billion
Year 2	\$120 billion	\$120 billion
Year 3	\$130 billion	\$150 billion

36. Which of the following can be concluded from the data above?

- (A) The base year for the price index was year ~~1~~
- (B) The base year for the price index was year ~~3~~
- (C) The economy was producing higher-quality goods and services in years 2 and 3 than in year 1. ← perhaps, but cannot be certain
- ☒ (D) The economy was experiencing inflation during years 2 and 3. ← real GDP went from \$120b to \$130b, but nominal increased more
- (E) The economy was experiencing ~~in~~ deflation during years 1, 2, and 3.

## **Economic Growth: The Uphill Climb**

1. **real income** is income adjusted for changes in prices (inflation or deflation)
  - A. if you earn \$100,000 a year, but inflation is at 10%, your real income is only \$90,000
2. a good measure of how individuals benefit from increases in real GDP (Y) is **real GDP per capita** (the average production per person in an economy)
3. the formula for real GDP per capita is:

macro  
formula  
#5

$$\text{real income per capita} = \frac{\text{country's real GDP}}{\text{country's population}}$$

- A. if a country's real GDP is \$1 billion and their population is 1 million, the country's real GDP per capita is \$1,000 (\$1 billion / \$1 million)
4. employee skills are critical for a high real GDP per capita
  - A. unskilled workers don't really help increase real GDP

## Economic Growth: The Uphill Climb (cont.)

1. the **annual growth rate of real GDP per capita** is the percentage increase in the real GDP per capita each year.
2. to calculate a country's percent change from one year to another, figure out the per capita for each year and then figure out the percentage change between the years
  - A. if the first year's per capita is \$1,000 and the second year's is \$1,099, the percent change is 9.9% ( $100\% \times \$1,099 / \$1,000 = 109.9\%$ , then  $109.9\% - 100\%$ ).

macro  
formula  
#5

"if/then"

$$\frac{100\%}{\$1,000} = \frac{109.9\%}{\$1,099} = 9.9\% \text{ increase}$$

or...

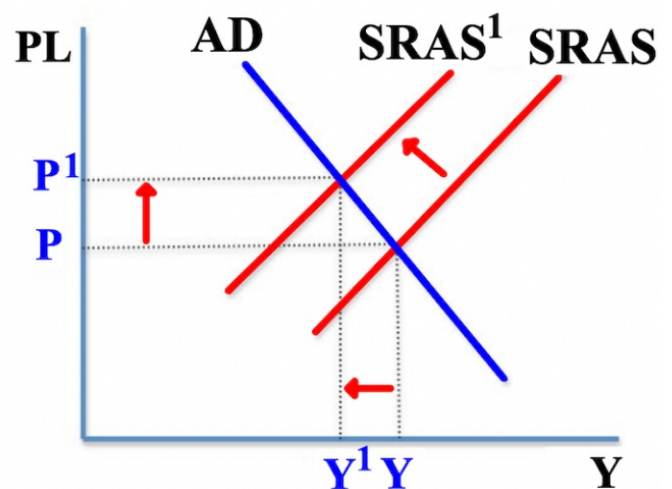
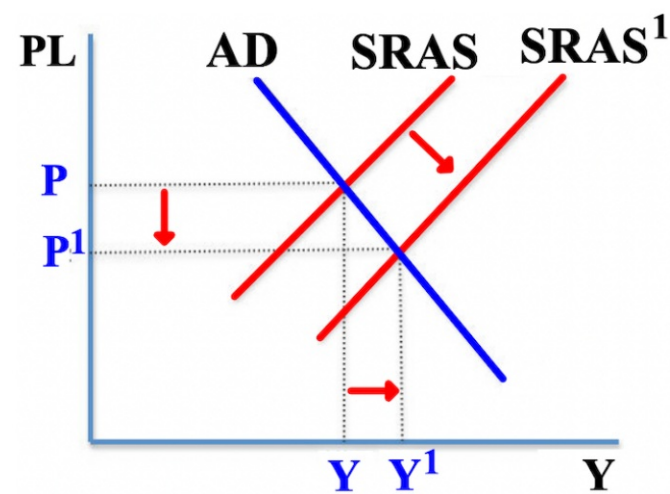
"Nooo..."

$$\frac{\overset{\text{new}}{1,099} - \overset{\text{old}}{1,000}}{\underset{\text{old}}{1,000}} \times 100 = 9.9\%$$

1. 1st yr. per capita= \$100 and 2nd yr. per capita= \$112    12% ann. growth rate    ■
2. 1st yr. per capita= \$200 and 2nd yr. per capita= \$220    10% ann. growth rate    ■

## **Economic Growth: The Uphill Climb (cont.)**

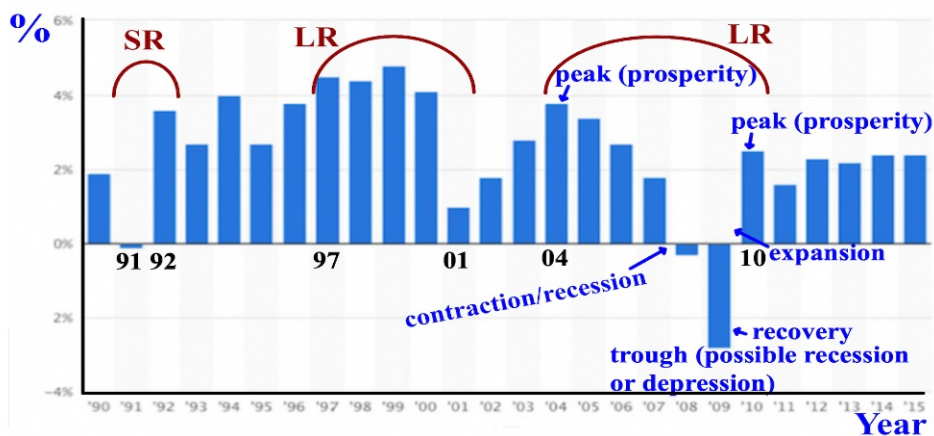
1. increased real GDP per capita (labor productivity) shifts short-run aggregate supply (SRAS) right (left graph) while a decrease shifts SRAS left (right graph)
2. an increase in quantity demanded ( $Q_d$ ) leads firms (businesses) to produce more to maximize their profit before quantity demanded decreases



## Economic Growth: The Uphill Climb (cont.)

1. the annual **short-run (SR) economic growth rate** is the percentage increase in real GDP (Y) from one year to the next
2. over time though, we look at the **long-run (LR) economic growth rate**, which looks at the growth of the economy from 4-5 years and beyond
3. the best way to promote long-run economic growth in a country is to take care of the unemployed and enhance technology, but education is key
  - A. raise workers' stock (value) and a country's economy will expand

### Short-run economic growth vs. long-run economic growth



please take out  
your multiple  
choice practice;  
go to #28

### **Economic Growth- Questions**

28. Increases in the real per capita income of a country are most closely associated with increases in which of the following?

- (A) The labor force (the number of workers)
- (B) The price level
- (C) The money supply
- (D) Productivity
- (E) Tax rates



## Economic Growth- Questions

28. Increases in the real per capita income of a country are most closely associated with increases in which of the following?

- (A) The labor force <sup>(the number of workers)</sup> ← the amount of people 16 and older and looking for work isn't relevant
- (B) The price level ← the average price of goods in an economy isn't relevant
- (C) The money supply ← the amount of money in an economy isn't relevant
- ☒ (D) Productivity
- (E) Tax rates ← not relevant



### **Economic Growth- Questions**

38. Country A's growth rate in per capita real gross domestic product (GDP) has been consistently higher than that of Country B. Which of the following factors can account for these differences in the per capita GDP growth rates?
- (A) Country B's government gives more investment tax credits.
  - (B) The labor force of Country A is becoming more skilled than the labor force of Country B.
  - (C) The natural rate of unemployment is higher in Country A.
  - (D) Country A's central bank is less effective at controlling the inflation rate.
  - (E) Although the populations of Countries A and B are the same, Country A has twice as many people who are retired.

## Economic Growth- Questions

38. Country A's growth rate in per capita real gross domestic product (GDP) has been consistently higher than that of Country B. Which of the following factors can account for these differences in the per capita GDP growth rates?

- (A) Country B's government gives more investment tax credits. ← maybe, but we don't know what Country A is giving
- (B) The labor force of Country A is becoming more skilled than the labor force of Country B.
- (C) The natural rate of unemployment is higher in Country A. ← the typical rate of unemployment doesn't matter, just productivity per person
- (D) Country A's central bank is less effective at controlling the inflation rate. ← we don't know
- (E) Although the populations of Countries A and B are the same, Country A has twice as many people who are retired. ← not relevant

### Economic Growth- Questions

9. Assuming no change in the nominal wage and a significant increase in human capital, the output per worker will (worker worth/ability/stock)
- (A) increase and the real wage will decrease
  - (B) increase and the real wage will increase
  - (C) decrease and the real wage will decrease
  - (D) decrease and the real wage will increase
  - (E) increase and the real wage will remain unchanged

## Economic Growth- Questions

9. Assuming no change in the nominal wage and a significant increase in human capital, the output per worker will

(worker worth/  
ability/stock)

(A) increase and the real wage will decrease

☒ (B) increase and the real wage will increase

(C) ~~decrease~~ and the real wage will decrease

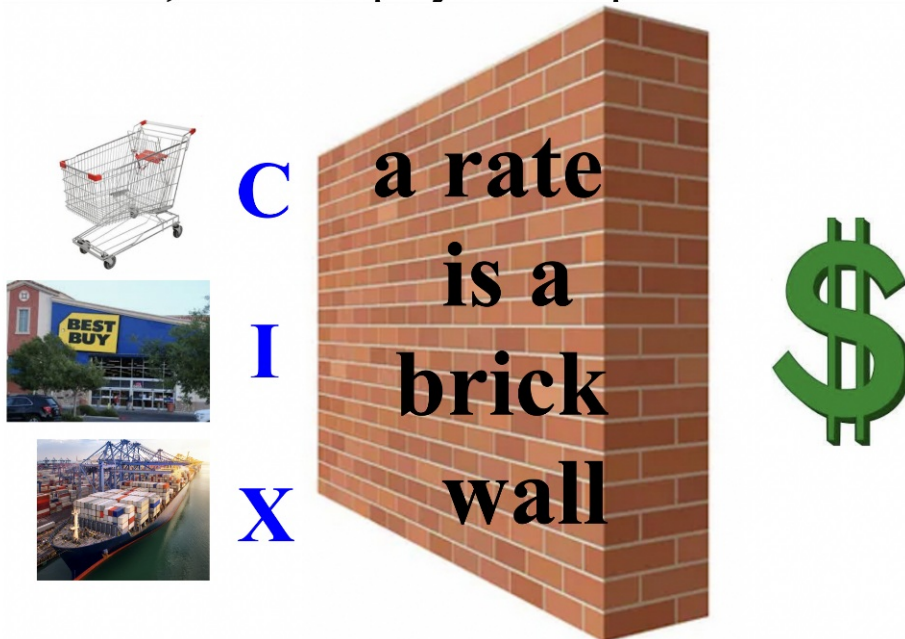
(D) ~~decrease~~ and the real wage will increase

(E) increase and the real wage will remain unchanged

workers  
will  
demand  
more \$  
(wage)  
since  
they are  
"enhanced"

## How Inflation and Interest Rates (Walls) Impact Real GDP (Y)

1. real GDP (Y) (spending by consumers (C) + businesses (I) + the government (G) +/- net exports (X) (exports-imports) impacts inflation rates (walls), interest rates, and unemployment over time
2. inflation, interest rates, and unemployment impact real GDP



1. A  
i.

## **Inflation and Real GDP (Y)**

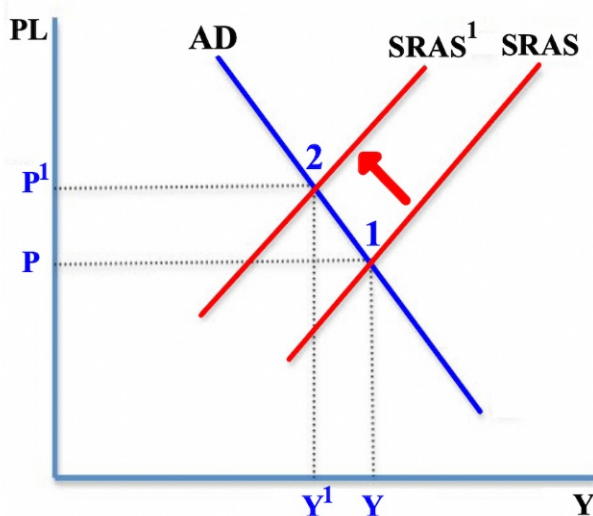
1. the **inflation rate** is the percentage increase in the average price level (PL) of all goods and services from one year to the next
  - A. the inflation rate is included in nominal GDP
2. the inflation rate directly impacts how much consumers (C), businesses, (I), and net exports (X) borrow and spend
  - A. if inflation (price levels) decreases, C, I, and X will borrow and spend more
  - B. if inflation (price levels) increases, C, I, and X will borrow and spend less
3. inflation occurs when nominal GDP grows quicker than real GDP; when price levels increase
4. an inflation rate of around 2% is the goal in America's economy
5. often the **expected rate of inflation** impacts consumer decisions
  - A. if prices are expected to go up, some will buy earlier rather than later, and vice versa



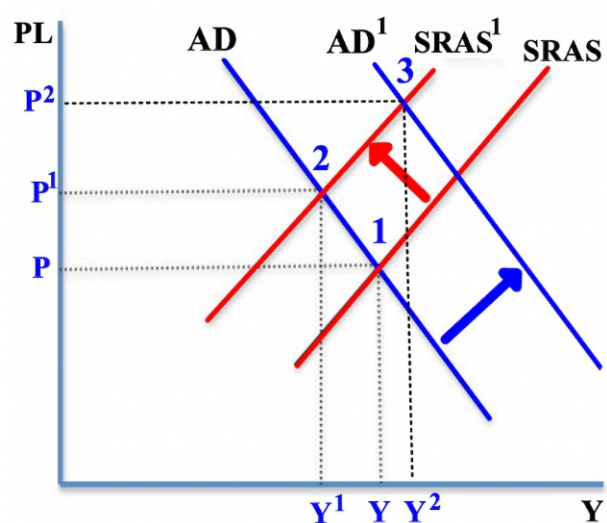
## Inflation and Real GDP (Y) (cont.)

1. **stagflation** is persistent high inflation combined with high unemployment and stagnant demand for goods in a country's economy
2. **demand-pull inflation** occurs when inflation is caused by an excess of aggregate demand (AD) vs. short-run aggregate supply, (SRAS), like after natural disasters occur

### Stagflation



### Demand-pull inflation





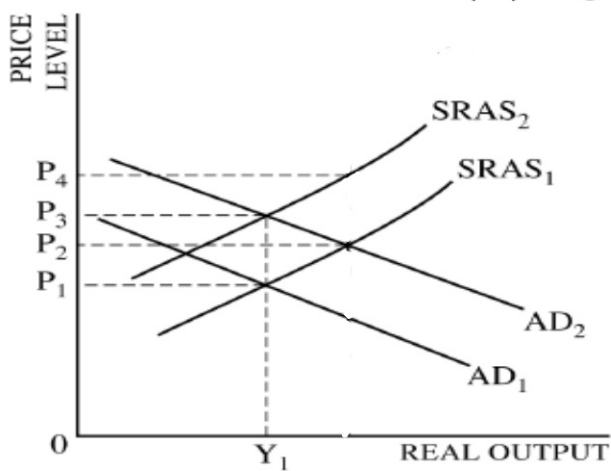
## **Inflation and Real GDP (Y) (cont.)**

1. a **sticky price** is a price for goods or services that does not respond immediately to changing economic conditions
2. sticky price situations can occur when business leaders make production and personnel decisions that do not create equilibrium in the market
  - A. if an economy is in expansion/has inflation, businesses should increase the prices for their goods and pay their employees more
  - B. if an economy is in contraction/recession, businesses should decrease the prices for their goods and pay their employees less

## **Inflation and Real GDP (Y) (cont.)**

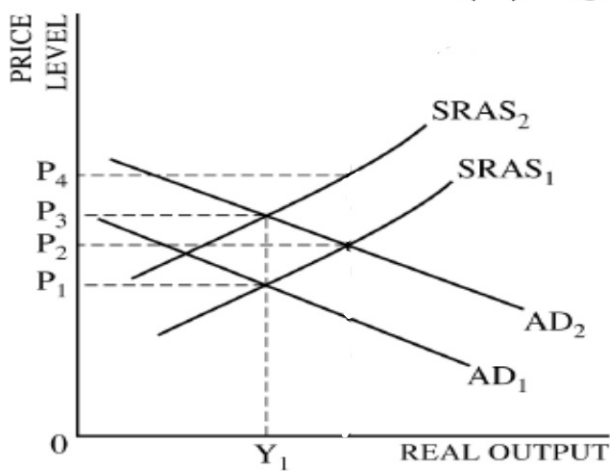
1. increases in real GDP (Y)/aggregate demand (AD) causes the inflation rate to increase
  - A. because of the increased aggregate demand, price levels (PL) increase over time
2. a rapid increase in a country's money supply creates **hyperinflation**, which explains why governments just can't print more money
  - A. higher inflation rates make your money decrease in value
3. **cost-push inflation** is inflation caused by an increase in prices of inputs like labor, resources, etc.
4. the increased price of the factors of production leads to a decreased short-run aggregate supply (SRAS) of the goods being made
  - A. when quantity supplied (QS) decreases, prices (P) increase, which is inflation

## Inflation and Real GDP (Y)- Questions



32. The graph above shows aggregate demand (AD) and short-run aggregate supply (SRAS) curves for an economy. Based on the graph, cost-push inflation is caused by a movement from
- (A)  $SRAS_1$  to  $SRAS_2$
  - (B)  $SRAS_2$  to  $SRAS_1$
  - (C)  $AD_1$  to  $AD_2$
  - (D)  $AD_2$  to  $AD_1$

## Inflation and Real GDP (Y)- Questions



32. The graph above shows aggregate demand (AD) and short-run aggregate supply (SRAS) curves for an economy. Based on the graph, cost-push inflation is caused by a movement from

☒ (A)  $SRAS_1$  to  $SRAS_2$   
 (B)  $SRAS_2$  to  $SRAS_1$  ← this would indicate deflation  
 (C)  $AD_1$  to  $AD_2$  ← cost-push is about the factors/resources  
 (D)  $AD_2$  to  $AD_1$  ← in production ( $AS$ ), not  $AD$



## **Interest Rates and Real GDP**

1. the **interest rate** is the amount lenders charge borrowers when they lend money
2. the interest rate is another key economic variable that is related to the growth and change in real GDP (Y) of a country's economy over time
3. interest rates directly impact how much consumers (C), businesses, (I), and net exports (X) borrow and spend
  - A. C, I, and X are very interest sensitive (sensitive to interest rates)
  - B. if interest rates decrease, C, I, and X will borrow and spend more
    - i. this usually leads to lower unemployment and possibly expansion because more is purchased and workers are hired, increasing an economy's money supply
  - C. if interest rates increase, C, I, and X will borrow and spend less
    - i. this usually leads to higher unemployment and possibly a recession because less is purchased and workers are laid off, decreasing an economy's money supply
- D. **fixed interest rates** don't change over time while flexible interest rates do

## Interest Rates and Real GDP (cont.)

1. the **nominal interest rate** is the interest rate on a loan, making no adjustments for inflation (a loan of 9%, including 5% inflation )
2. the **real interest rate** is the nominal interest rate minus the inflation rate (9% - 5% = 4%)

macro  
formulas  
#6 and #7

$$\begin{array}{r} 9\% \text{ (nominal interest rate)} \\ - 5\% \text{ (inflation rate)} \\ \hline 4\% \text{ (real interest rate)} \end{array}$$

real interest rate =  
nominal interest rate - the inflation rate or anticipated inflation rate

3. deficit spending by a country leads to an increase in interest rates because the money supply decreases making the remaining money more valuable/more expensive



## **Interest Rates and Real GDP (cont.)**

1. fluctuations in interest rates are directly connected to inflation and real GDP (Y)

- A. when inflation/price levels (PL) increase or are expected to increase, lenders charge C, I, and X a higher interest rate to cover the decrease or expected decrease in the value of money being paid back to them (higher prices = less purchasing power), and as C, I, and X borrow or spend less, the money supply decreases and real GDP/aggregate demand (AD) decreases which leads to a possibly of a recession/contraction in the economy
- B. when inflation/price levels (PL) decrease or are expected to decrease, lenders charge C, I, and X a lower interest rate because of the increase or expected increase in the value of money being paid back to them (lower prices = more purchasing power), and as C, I, and X borrow or spend more, the money supply increases and real GDP/aggregate demand (AD) increases which leads to expansion and inflation in the economy

## Macroeconomics Do-Now

**Please do this:**

- 1. A bank lends you \$50,000 at 4% fixed interest for your college costs, but inflation moves the interest rate to 6.5%. Is the bank the winner or are you the winner? Explain.**

**You are the winner because you got the loan  
for less than the current interest rate. :-)**

- 2. A bank lends you \$2,000,000 at 9% fixed interest for surgery, but the change in price levels moves the interest rate to 7%. Is the bank the winner or are you the winner? Explain.**

**You lose because you got the loan  
for more than the current interest rate**

*please take out  
your multiple  
choice practice;  
go to #59*

### **Interest Rates and Real GDP- Questions**

59. A lender will realize unexpected benefit when the

- (A) actual inflation rate is higher than the anticipated inflation rate
- (B) actual inflation rate is lower than the anticipated inflation rate
- (C) rate of interest is greater than the actual rate of inflation
- (D) rate of interest is less than the actual rate of inflation
- (E) rate of interest equals the actual rate of inflation

## Interest Rates and Real GDP- Questions

59. A lender will realize unexpected benefit when the

- (A) actual inflation rate is higher than the anticipated inflation rate
- ☒ (B) actual inflation rate is lower than the anticipated inflation rate
- (C) rate of interest is greater than the actual rate of inflation
- (D) rate of interest is less than the actual rate of inflation
- (E) rate of interest equals the actual rate of inflation

if the inflation rate is higher than expected then the rate people received when borrowing will benefit them and not the lender

we don't know what the anticipated inflation rate was, so we can't determine if the lender is benefiting or not

### **Interest Rates and Real GDP- Questions**

60. When purchasing her house, Ms. Jones took out a 15-year mortgage loan from a local bank at a fixed interest rate of 7 percent. The rate of expected inflation at the time was 3 percent. If the actual rate of inflation was 4.5 percent, which of the following is true?
- (A) The bank gained because the real rate of interest increased by 1.5%.
  - (B) The bank gained because the real rate of interest became 3.5%.
  - (C) The bank lost because the real rate of interest decreased by 1.5%.
  - (D) Ms. Jones gained because the nominal rate of interest increased by 1.5%.
  - (E) Ms. Jones lost because the nominal rate of interest became 3.5%.

## Interest Rates and Real GDP- Questions

60. When purchasing her house, Ms. Jones took out a 15-year mortgage loan from a local bank at a fixed interest rate of 7 percent. The rate of expected inflation at the time was 3 percent. If the actual rate of inflation was 4.5 percent, which of the following is true?

- (A) The bank gained because the real rate of interest increased by 1.5%. ← real rate decreased
- (B) The bank gained because the real rate of interest became 3.5%. ← no, the real interest rate became 8.5%
- (C) The bank lost because the real rate of interest decreased by 1.5%.
- ☒ (D) Ms. Jones gained because the nominal rate of interest increased by 1.5%.
- (E) Ms. Jones lost because the nominal rate of interest became 3.5%. ← can't be the nominal rate because the adjustment for expected inflation took place

## **Different Types of Interest Rates and Their Behavior**

1. the **federal funds rate** is the short-term interest rate banks charge other banks on overnight loans
  - A. this rate can be adjusted up or down by actions taken by the Federal Reserve (the "Fed") to expand or contract the economy
    - i. to increase the money supply and expand the economy, the government buys bonds from banks which increases the amount of money banks can loan and lowers the interest rate on the loans for C, I, and X
    - i. to decrease the money supply and contract the economy, the government sells bonds to banks which decreases the amount of money banks can loan raises the interest rate on the loans for C, I, and X
2. **bonds** (securities) are loans that people give to a company or government and the company or government promises to pay back in full with regular interest payments



## Unemployment, Inflation, Interest Rates, and real GDP/AD

How unemployment, inflation, and interest rates impact an economy's real GDP ( $Y$ )/aggregate demand ( $AD$ )

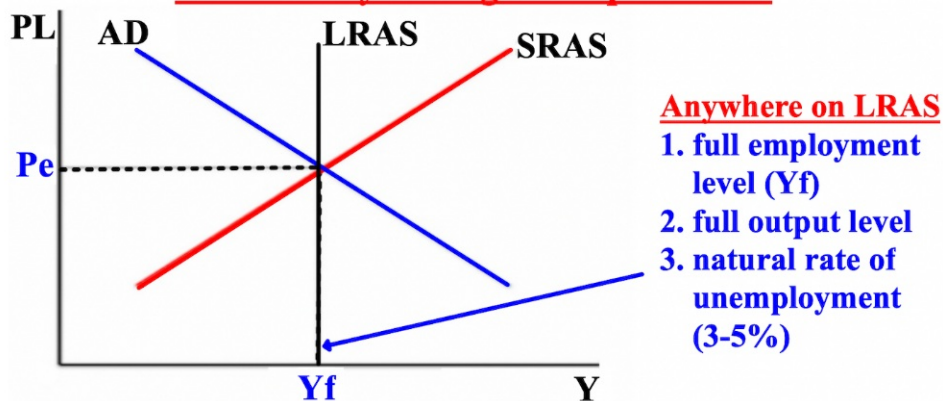
\*an  $\uparrow$  in aggregate demand ( $AD$ )/real GDP ( $Y$ )  $\Rightarrow$  the price level ( $PL$ )/inflation  $\uparrow \Rightarrow$  aggregate supply ( $AS$ )  $\uparrow \Rightarrow$  unemployment  $\downarrow \Rightarrow$  the federal funds rate  $\uparrow \Rightarrow$  the nominal then real interest rate to  $\uparrow \Rightarrow$  interest-sensitive spending/investment by  $C$ ,  $I$ , and  $X$  to  $\downarrow \Rightarrow$  a  $\downarrow$  in aggregate demand ( $AD$ )/real GDP ( $Y$ )

\*a  $\downarrow$  in aggregate demand ( $AD$ )/real GDP ( $Y$ )  $\Rightarrow$  the price level ( $PL$ )/inflation  $\downarrow \Rightarrow$  aggregate supply ( $AS$ )  $\downarrow \Rightarrow$  unemployment  $\uparrow \Rightarrow$  the federal funds rate  $\downarrow \Rightarrow$  the nominal then real interest rate to  $\downarrow \Rightarrow$  interest-sensitive spending/investment by  $C$ ,  $I$ , and  $X$  to  $\uparrow \Rightarrow$  an  $\uparrow$  in aggregate demand ( $AD$ )/real GDP ( $Y$ )

## Long-Term Economic Growth

1. the second type of aggregate supply (AS) is **long-run aggregate supply** (LRAS)
2. LRAS is all of the goods and services produced in the long-run (LR- four to five years out) by all of the firms in an economy using the available labor, capital, and technology
3. the long-run aggregate supply curve is determined by all of the factors of production since none are fixed in the long-run
4. long-run equilibrium is where real GDP (Y) equals potential GDP

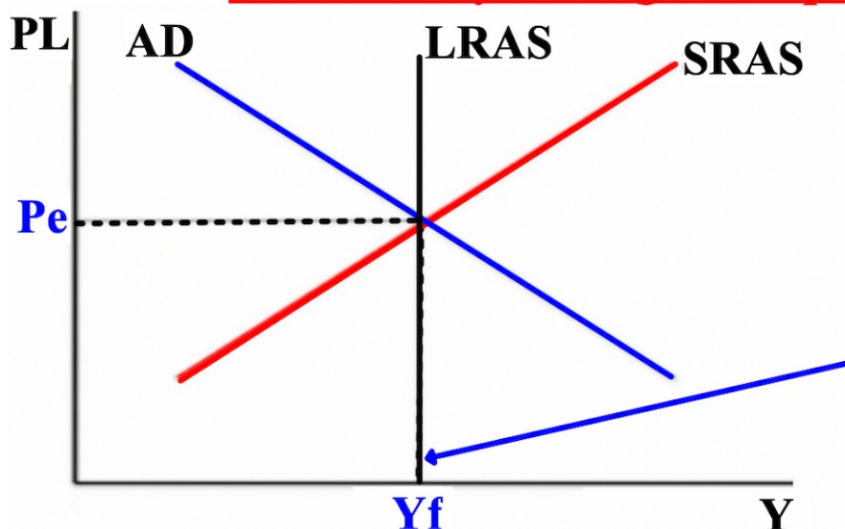
### An economy in long-run equilibrium



### Long-Term Economic Growth (cont.)

1. anywhere on the LRAS curve represents an economy where all inputs: land, labor and capital, are used to full efficiency
2. if there was an increase in investment, growth in size of a skilled labor force, an increase in consumer confidence in the economy, LRAS might shift to the right, an indicator of positive economic growth

#### An economy in long-run equilibrium



#### Anywhere on LRAS

1. full employment level ( $Y_f$ )
2. full output level
3. natural rate of unemployment (3-5%)

## **Long-Term Economic Growth (cont.)**

1. long-run aggregate supply (LRAS) can be impacted by changes in input or output costs, taxes, subsidies, government regulations, and the production of **capital goods** (goods created in order to produce other goods, like a robot for a car factory) and **consumer goods** (goods created for consumer purchase, like twinkies).
2. **labor** is the total number of hours that workers are available to work in producing real GDP
3. **capital** is the total number of factories, machines, computers, human workers, etc., available
4. **technology** is the total amount of know-how available