

# EC132.02

# Principles of Macroeconomics

Boston College

Tuesday, April 30

# Announcements and Reminders

Aplia homework on the first part of Ch 30, The Classical Theory of Inflation, due this Thursday, May 2, at 9am.

Aplia questions on Ch 33, Aggregate Supply and Aggregate Demand, are just for practice.

Final exam: Friday, May 10, 12:30 – 2:00pm.

Last names beginning with:

A or B: Higgins 263

C through S: Devlin 008

T through Z: Lyons 202

# Final Exam Topics

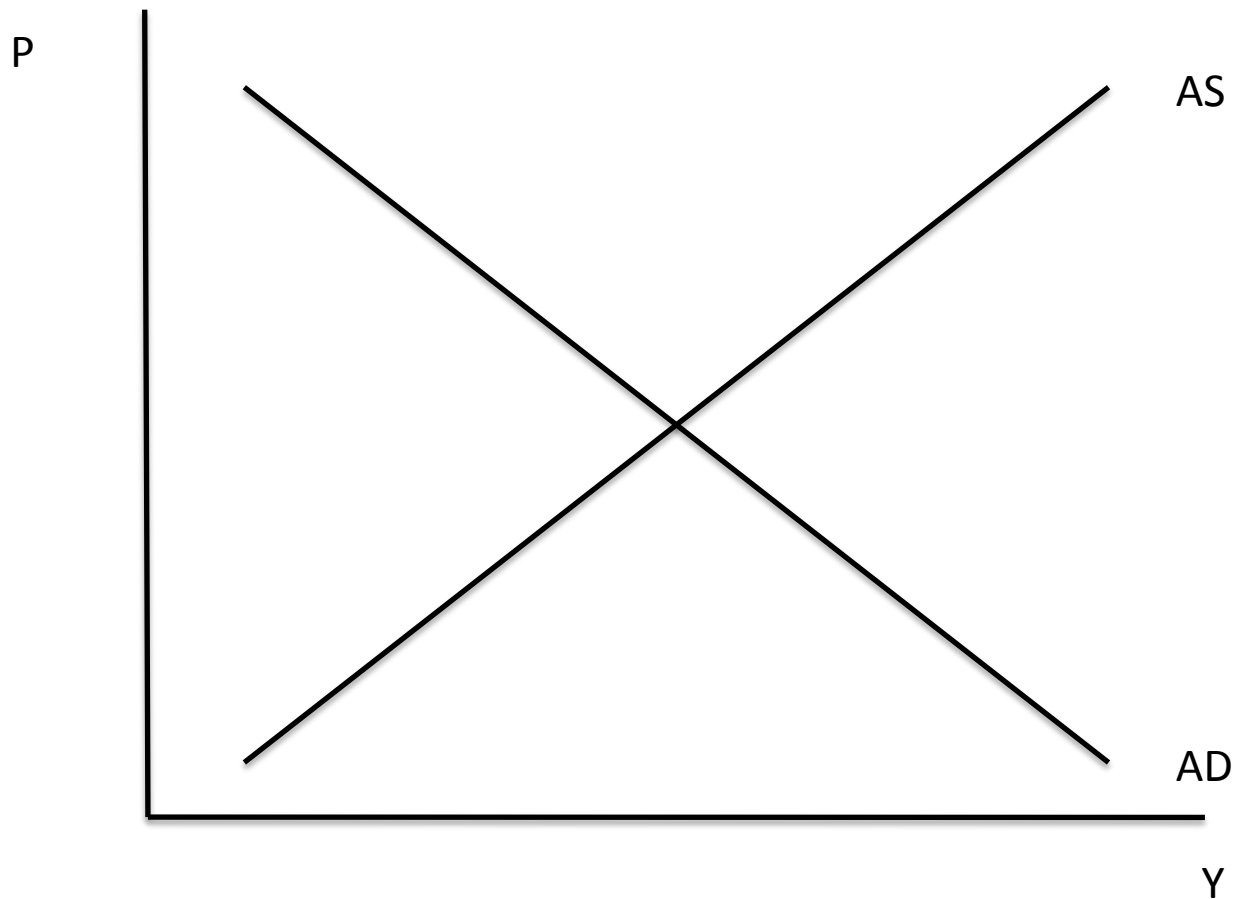
Closed book exam, between 6 and 12 questions (short-answer, with multiple parts) covering:

1. Banks and the Money Supply
  2. The Fed's Tools of Monetary Control
  3. The Federal Funds Rate
  4. Banking and Financial Crises
  5. The Classical Theory of Inflation
- } Mankiw, Ch 29
- } Notes, Ch 29
- } Mankiw, Ch 30

# Ch 33 Aggregate Demand and Supply

1. Three Key Facts About Economic Fluctuations ✓
2. Explaining Short-Run Fluctuations ✓
3. The Aggregate Demand Curve ←
4. The Aggregate Supply Curve
5. Two Causes of Aggregate Fluctuations

# Aggregate Demand and Supply



The aggregate demand and aggregate supply curves relate changes in the aggregate quantities of goods supplied and demanded to the economy-wide price level  $P$ .

# The Aggregate Demand Curve

$$Y = C + I + G + NX$$

Some of the wealth that individuals hold is in nominal form: money in their wallets or in the bank.

When the price level falls, the real value of this wealth increases.

Through this **wealth effect**, a fall in the price level leads to an increase in the quantity of goods demanded by consumers.

And through this same wealth effect, a rise in the price level leads to a decrease in the quantity of goods demanded by consumers.

# The Aggregate Demand Curve

$$Y = C + I + G + NX$$

When the price level falls, the real value of each consumer's money holdings rises.

Some consumers will use the additional wealth to buy more consumption goods (the wealth effect).

But others will use the additional wealth to buy more bonds. And as they do, the interest rate will fall.

Through this **interest rate effect**, a fall in the price level leads to an increase in the quantity of investment goods demanded by firms.

And through the same interest rate effect, a rise in the price level leads to a decrease in the quantity of investment goods demanded by firms.

The interest rate effect can also impact on consumer's purchases on durable goods.

# The Aggregate Demand Curve

$$Y = C + I + G + NX$$

When the price level falls, the real value of each consumer's money holdings rises. Some consumers will use the additional wealth to buy more consumption goods (the wealth effect). But others will use the additional wealth to buy more bonds. And as they do, the interest rate will fall (the interest rate effect).

But when interest rates on US bonds fall, international bond traders will sell US bonds, trade their US dollars for foreign currencies, and buy foreign bonds.

As they sell US dollars, the dollar depreciates, that is, its value in terms of foreign currencies falls.



# The Aggregate Demand Curve

$$Y = C + I + G + NX$$

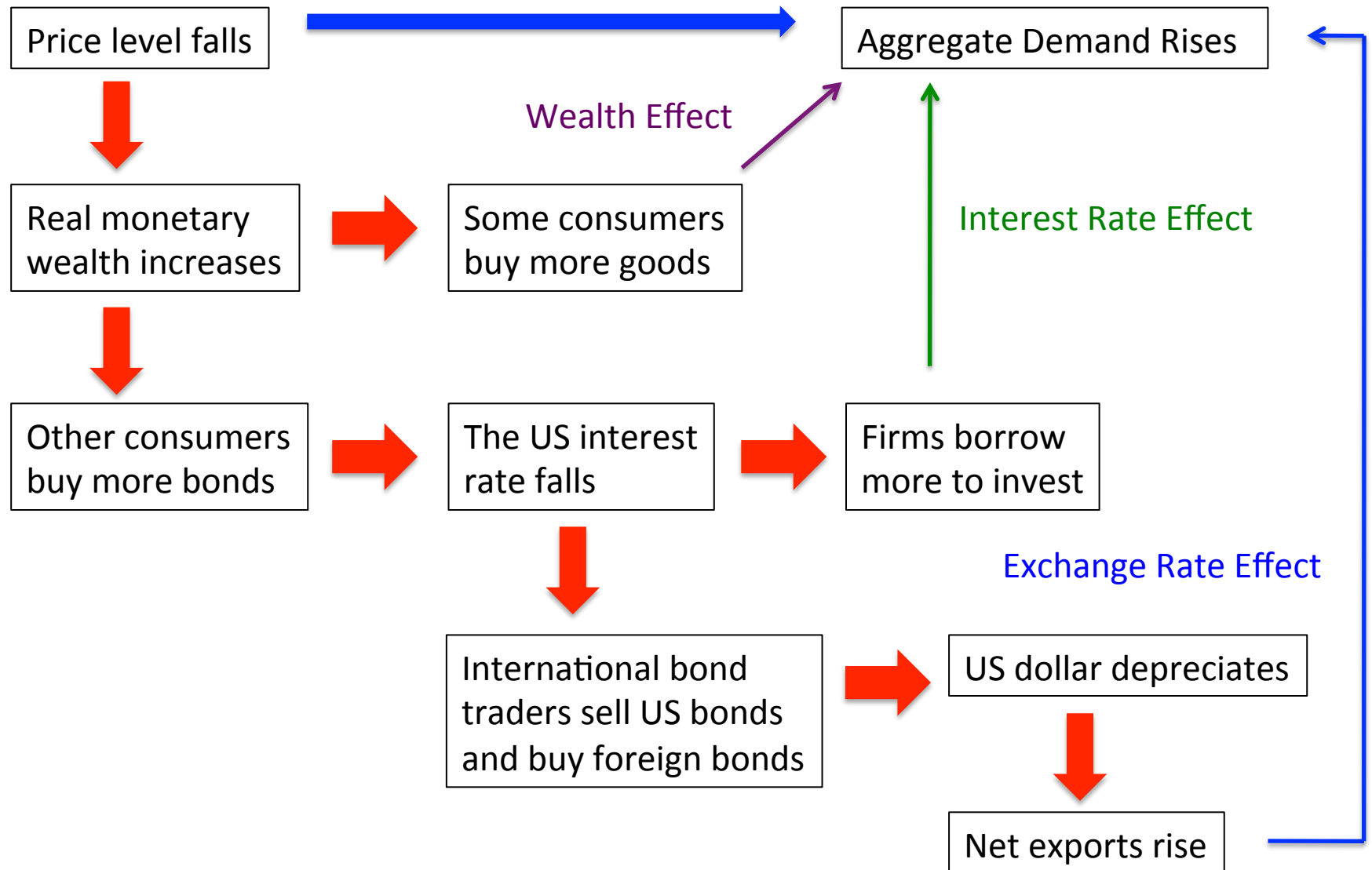
When the US dollars depreciates, its value in terms of foreign currencies falls.

As a result, US goods become cheaper to foreign customers: exports rise.

Through this **exchange rate effect**, a decline in the price level leads to an increase in net exports.

And through the same exchange rate effect, a rise in the price level leads to a decrease in net exports.

# The Aggregate Demand Curve



# Shifts in Aggregate Demand

The national income accounting identity

$$Y = C + I + G + NX$$

suggests that the aggregate demand curve will shift when the quantity of goods and services demanded by consumers (C), firms (I), the government (G) or foreigners (NX) **at any given price level** changes.

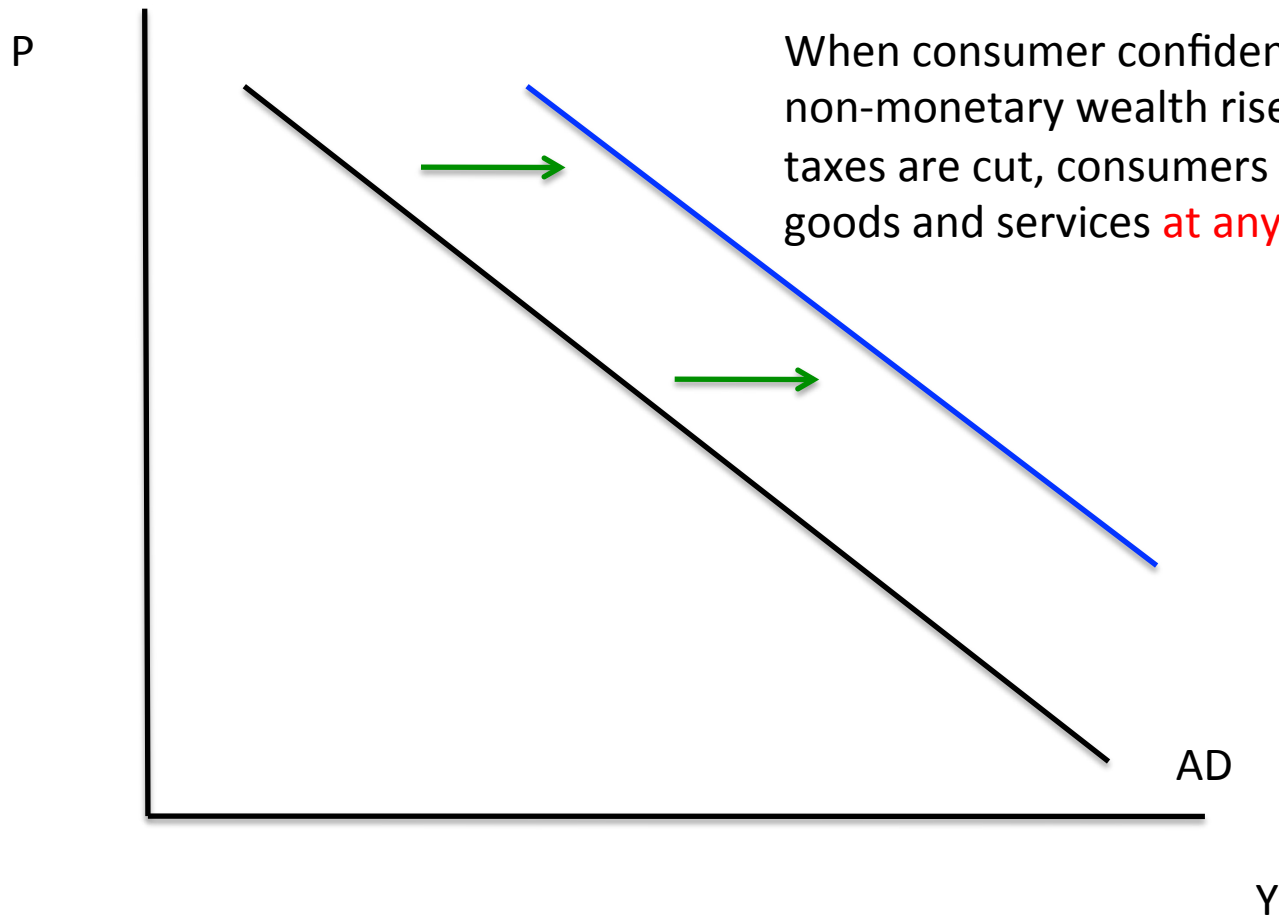
# Shifts in Aggregate Demand

$$Y = C + I + G + NX$$

The aggregate demand curve shifts to the right when:

- Consumers become more optimistic.
- Nonmonetary wealth (stock market or real estate prices) rises.
- The government cuts personal tax rates.

# Shifts in Aggregate Demand



When consumer confidence or non-monetary wealth rises, or when taxes are cut, consumers demand more goods and services **at any given price level**.

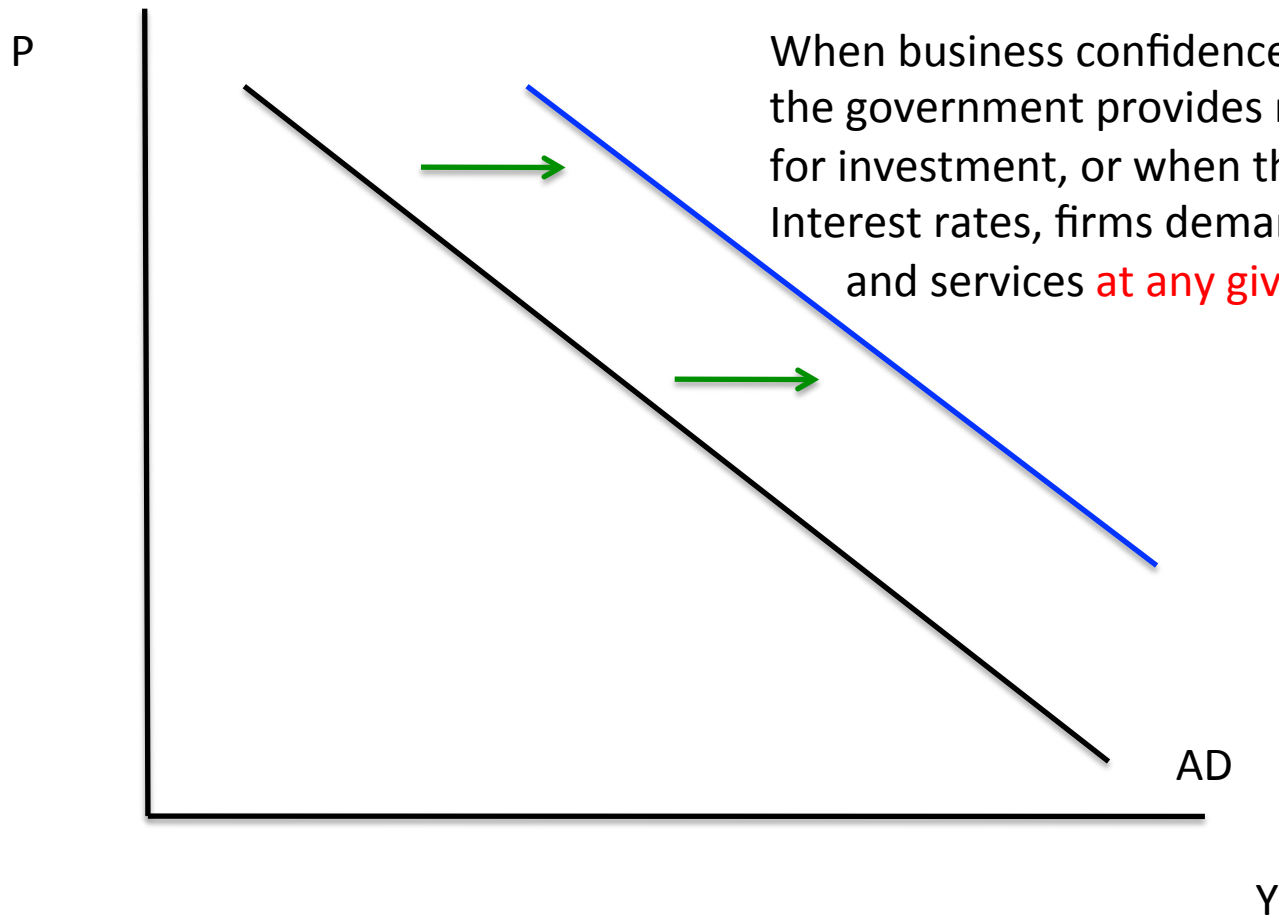
# Shifts in Aggregate Demand

$$Y = C + I + G + NX$$

The aggregate demand curve shifts to the right when:

- Firms become more optimistic.
- The government provides investment tax incentives.
- The Fed “eases” monetary policy, reducing interest rates.

# Shifts in Aggregate Demand



# Shifts in Aggregate Demand

$$Y = C + I + G + NX$$

The aggregate demand curve shifts to the right when:

- A “fiscal stimulus” package raises government purchases.



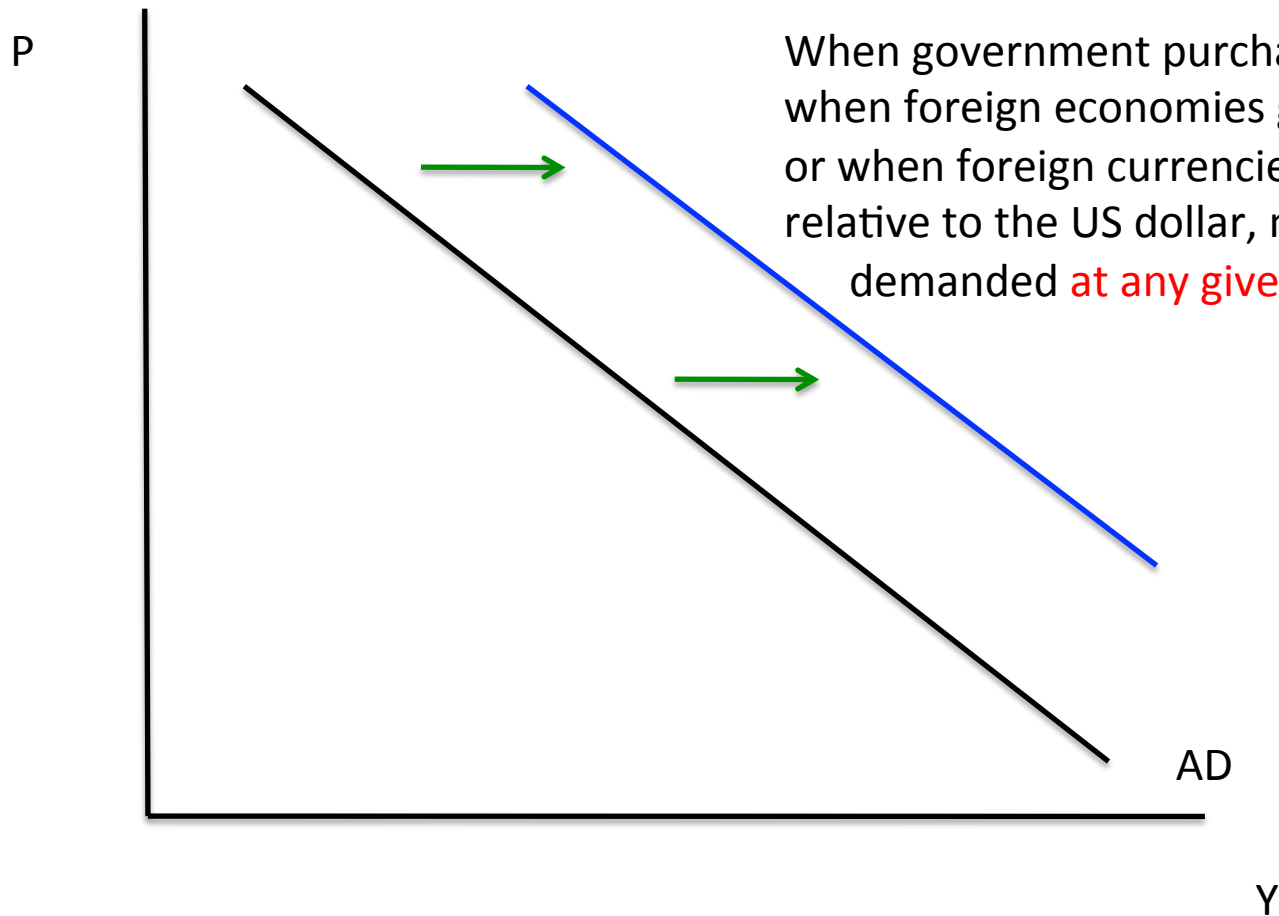
# Shifts in Aggregate Demand

$$Y = C + I + G + NX$$

The aggregate demand curve shifts to the right when:

- Foreign economies grow more quickly, boosting foreign demand for US goods.
- Foreign currencies appreciate relative to the US dollar, making US goods cheaper for foreigners.

# Shifts in Aggregate Demand



When government purchases increase, when foreign economies grow more rapidly, or when foreign currencies appreciate relative to the US dollar, more US goods are demanded **at any given price level**.

# The Aggregate Supply Curve

Unlike the aggregate demand curve, which always slopes down, the aggregate supply curve describes a relationship between output and the price level that depends crucially on the time horizon considered.

In the long run, the aggregate supply curve is vertical.

In the short run, the aggregate supply curve slopes upward.

# Long-Run Aggregate Supply

In the long run, the aggregate supply curve is vertical.

In the long run, an economy's production depends on:

- The number of workers.
- The amount of physical capital per worker.
- The amount of human capital per worker.
- The availability of natural resources per worker.
- The stock of technological knowledge.

None of these determinants of production depends on the money supply, the price level, or any other nominal variable (in the long run, money is neutral).

# Long-Run Aggregate Supply

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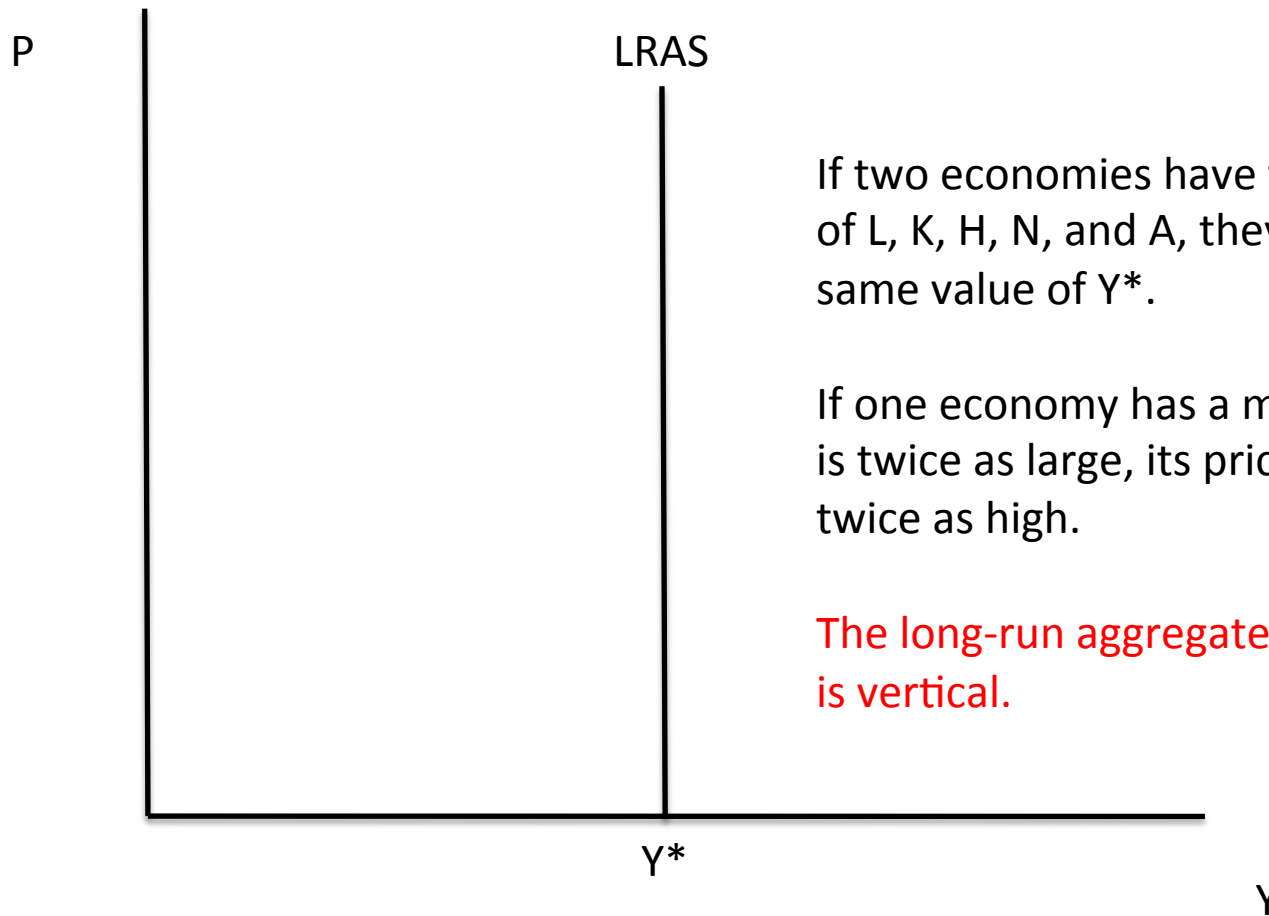
$Y^*$  denotes potential output, full employment output, or the natural rate of output.

It is determined by the number of workers, the stocks of physical and human capital per worker, natural resources per worker, and the stock of technological knowledge.

$Y^*$

Y

# Long-Run Aggregate Supply

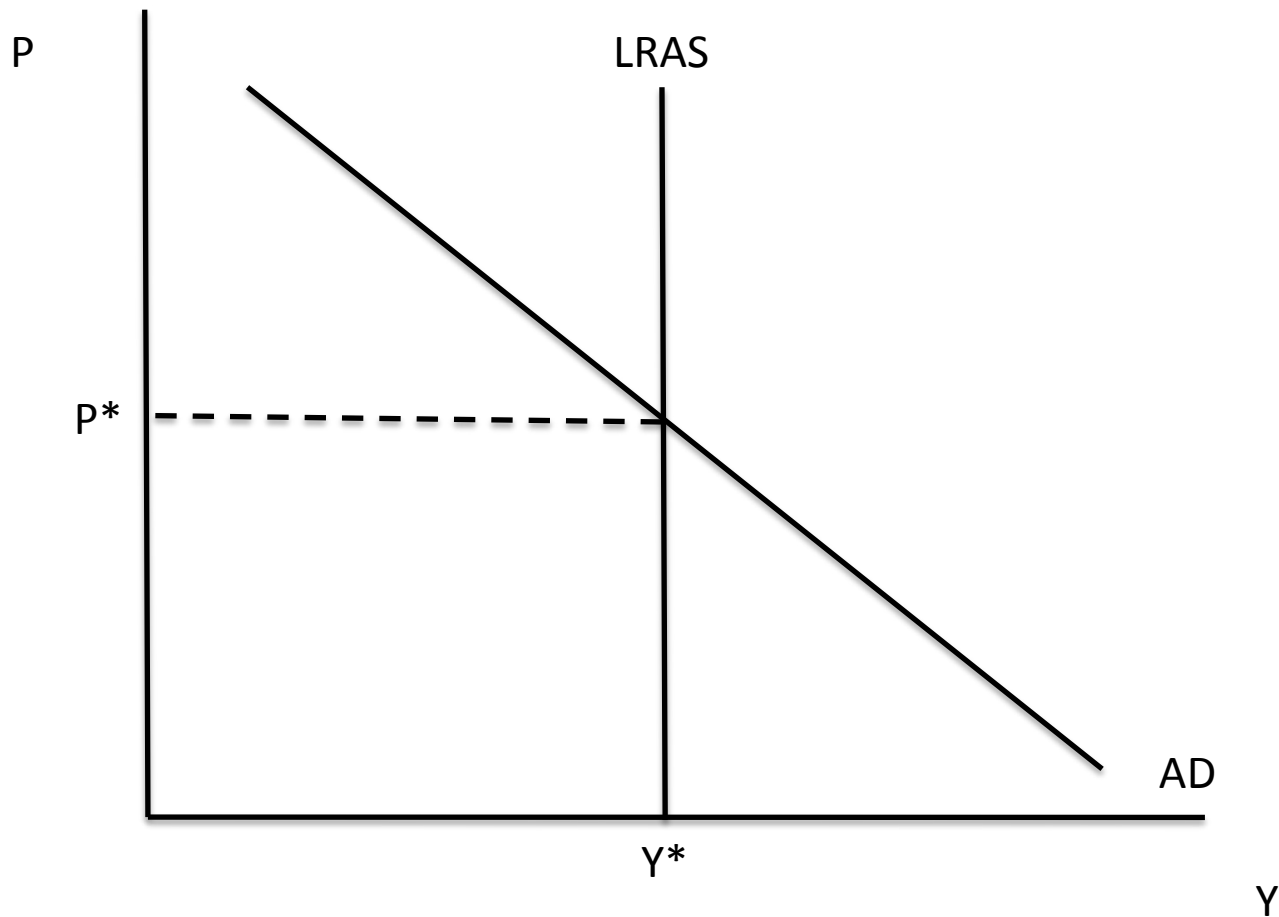


# Shifts in LR Aggregate Supply

Anything that causes  $Y^*$  to change will shift the aggregate supply curve:

- Growth in the labor force (number of workers).
- Changes in the natural rate of unemployment.
- Physical capital accumulation.
- Human capital accumulation.
- Discoveries or depletion of natural resources.
- Advances in technological knowledge.

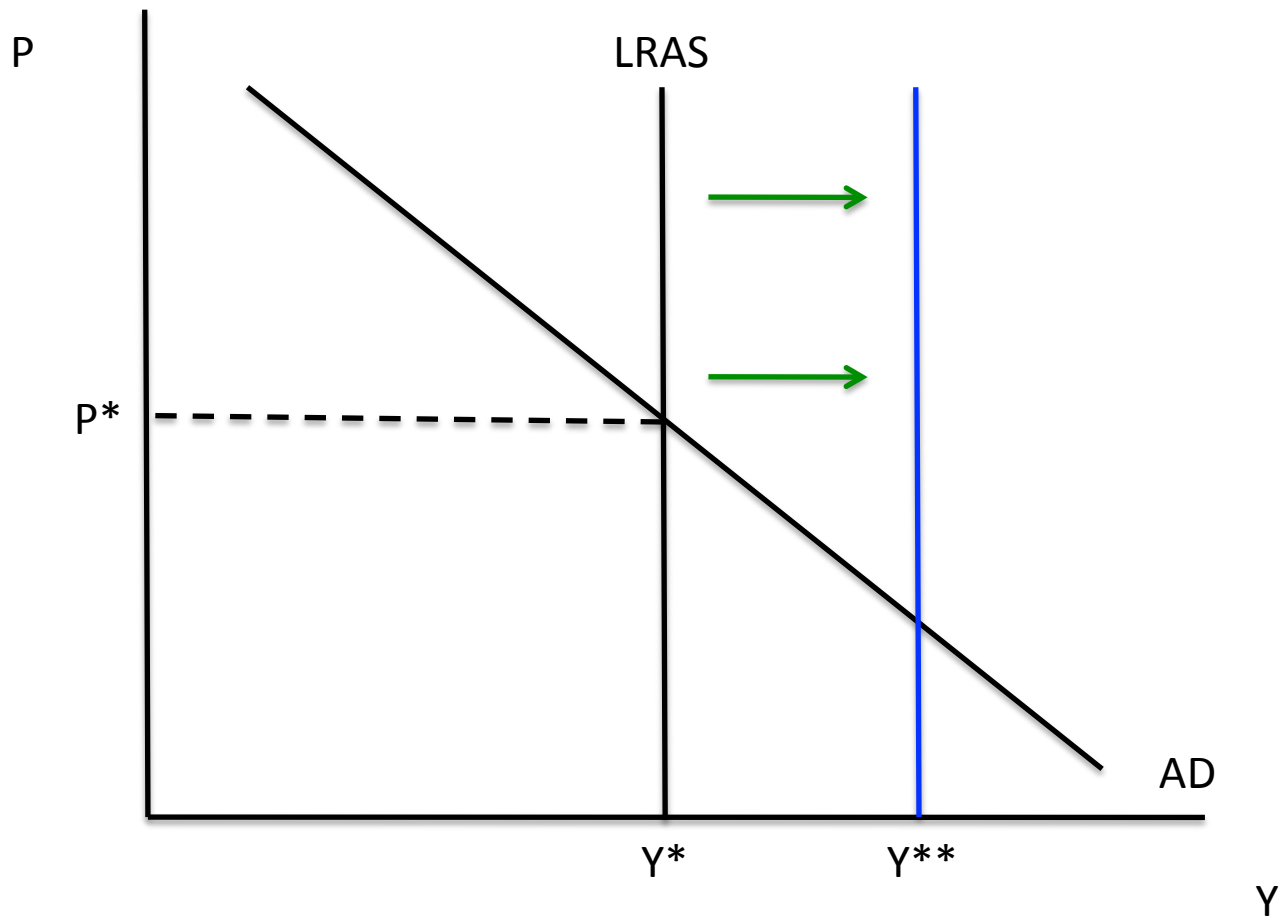
# Long-Run Growth and Inflation



In an initial long-run equilibrium, output is at its natural rate  $Y^*$  and the price level equals  $P^*$ .

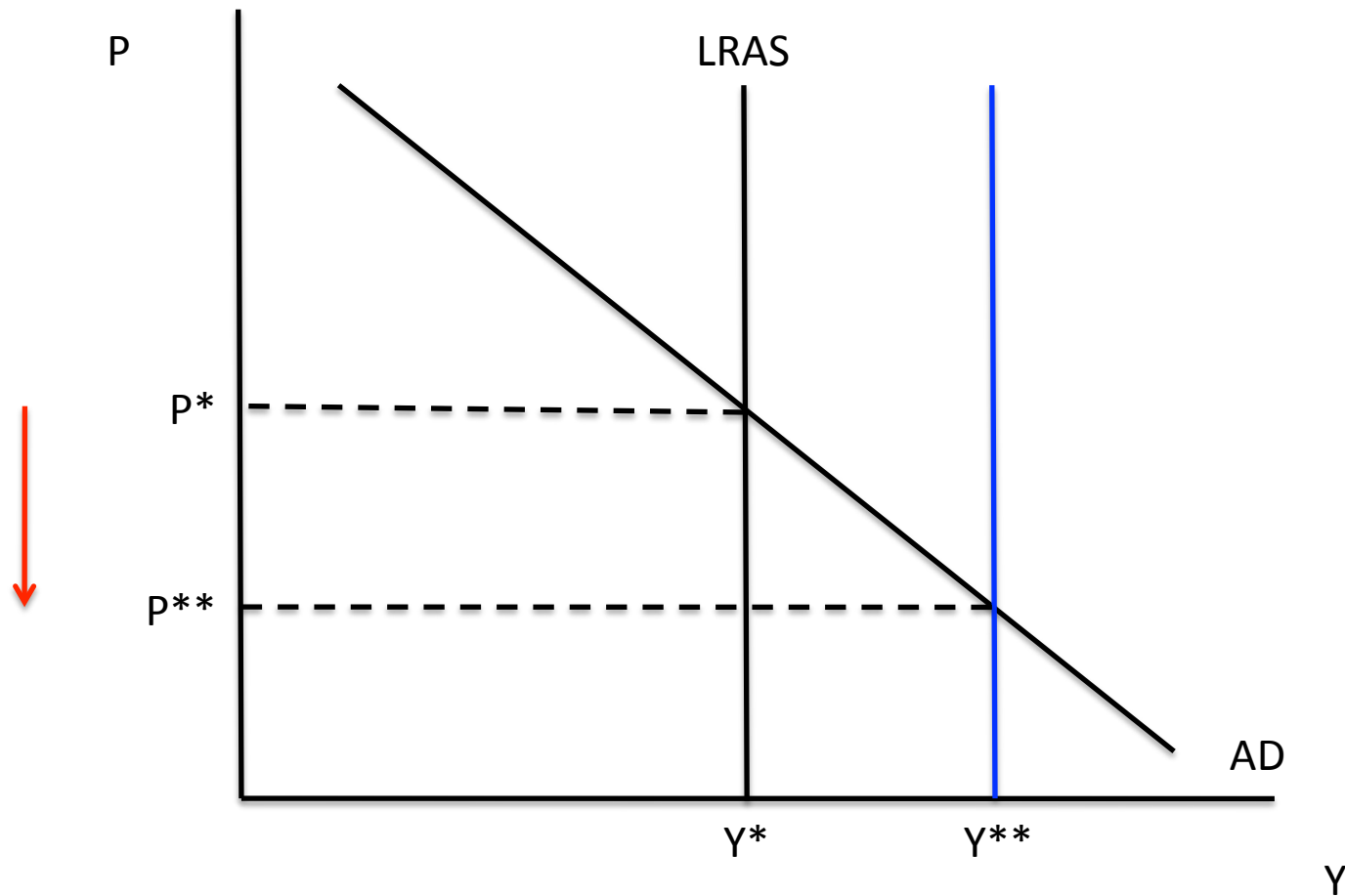


# Long-Run Growth and Inflation



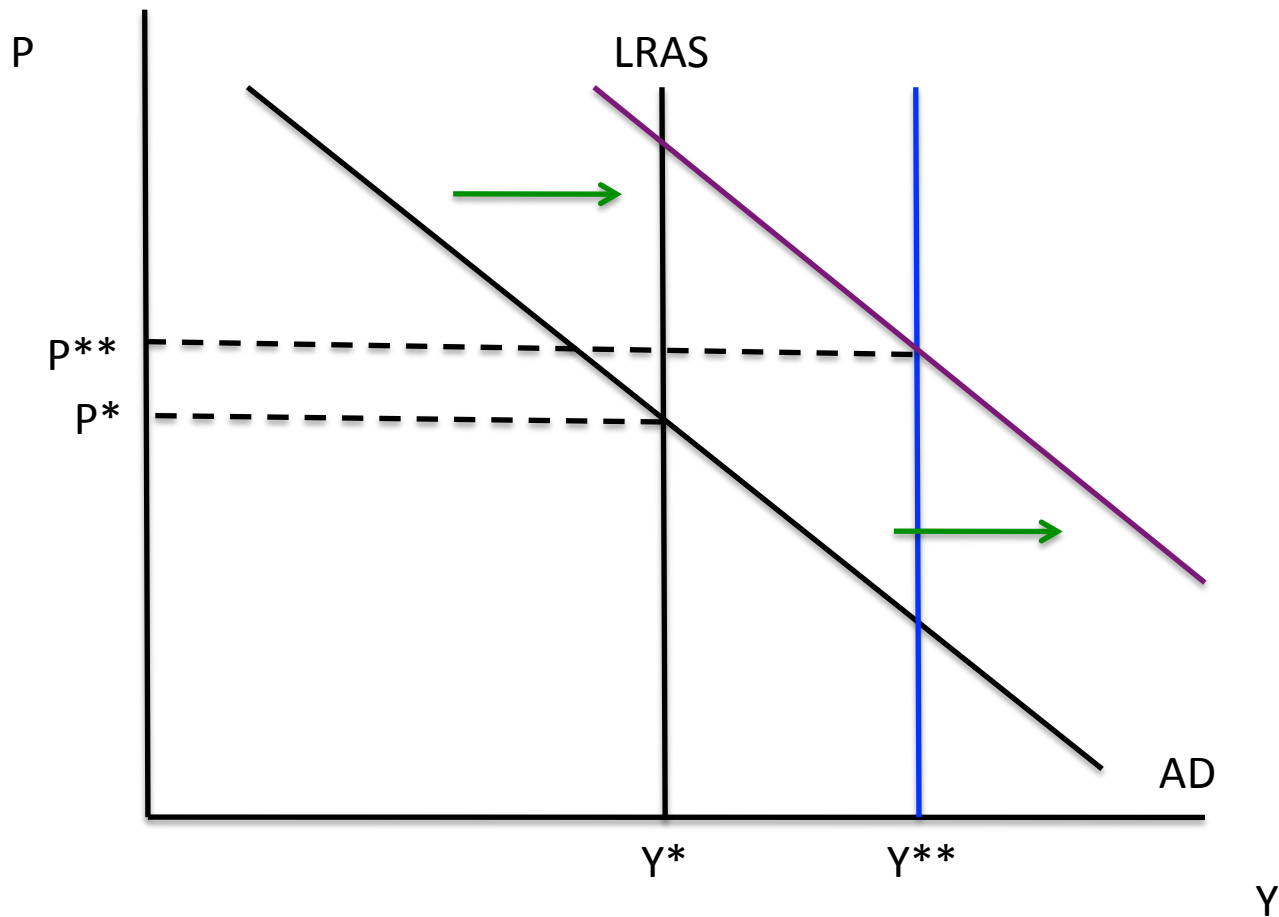
Suppose that physical and human capital accumulation or technological progress increase output to  $Y^{**}$ .

# Long-Run Growth and Inflation



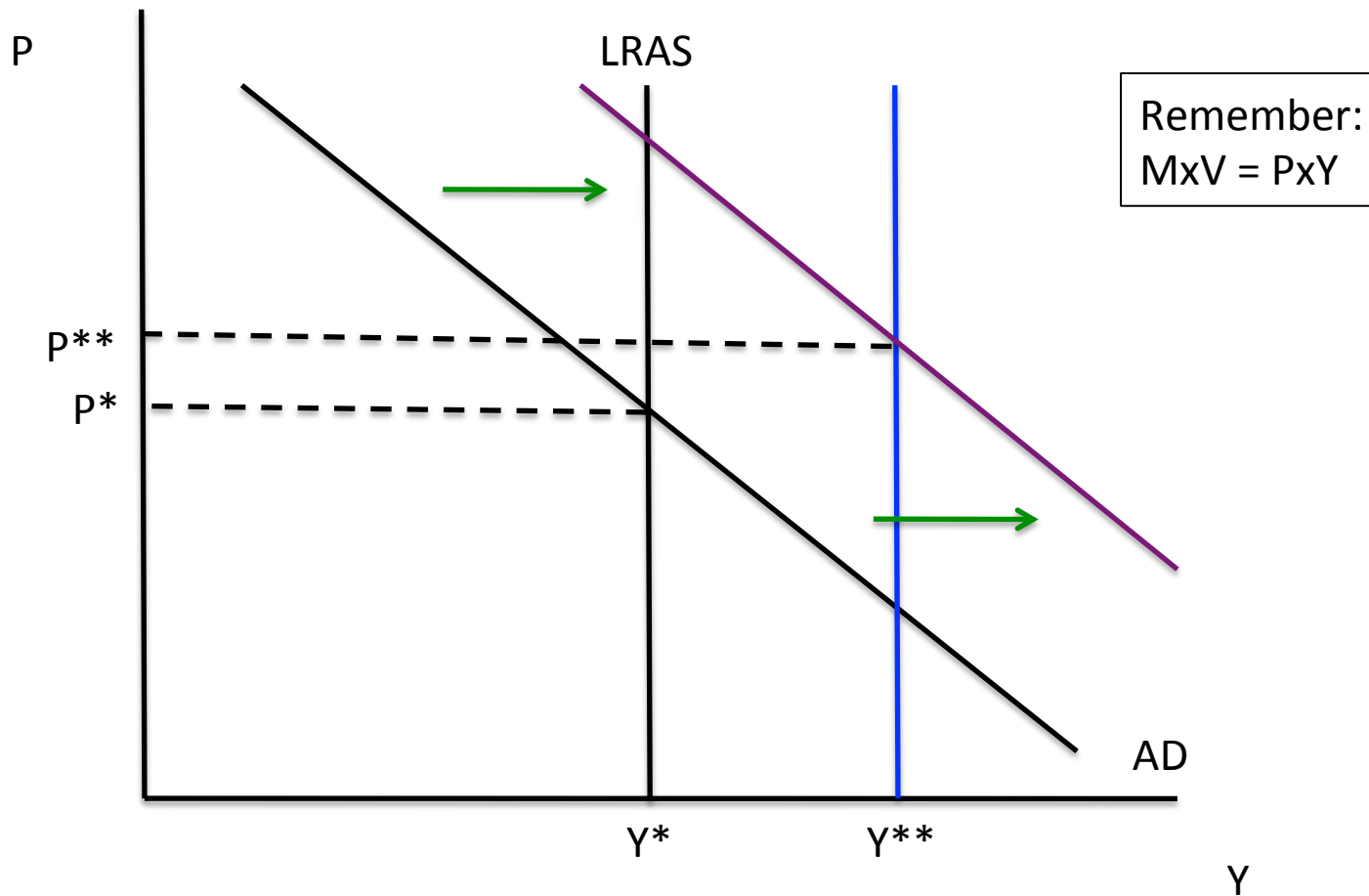
If the Federal Reserve keeps the money supply constant, the process of long-run growth will lead to a falling price level, that is, to deflation.

# Long-Run Growth and Inflation



But if the Federal Reserve allows the money supply to grow, that shifts the AD curve to the right as well, so that the price level will rise, that is, the economy will experience inflation instead.

# Long-Run Growth and Inflation



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# Short-Run Aggregate Supply

Although most economists believe that the long-run aggregate supply curve is vertical, most also believe that **in the short run, the aggregate supply curve slopes up.**

Why would the amount of goods and services that firms are willing to produce **rise** when the **price level rises**?

# Short-Run Aggregate Supply

Instead of linking output supplied directly to the price level, macroeconomists' stories about short-run aggregate supply:

Say that actual output supplied  $Y$  rises above the natural rate  $Y^*$  when the price level  $P$  turns out to be higher than what people had expected  $P^E$ .

And that actual output supplied  $Y$  falls below the natural rate  $Y^*$  when the price level  $P$  turns out to be lower than what people had expected  $P^E$ .

# Short-Run Aggregate Supply

All of these stories imply a short-run supply relationship of the form

$$Y = Y^* + a(P - P^E)$$

with  $a > 0$ .

Then, “the long run” can be viewed as a time period after which the actual price level  $P$  returns to the level that is expected  $P^E$ , so that  $Y = Y^*$ .

# Short-Run Aggregate Supply

All of these stories imply a short-run aggregate supply relationship of the form

$$Y = Y^* + a(P - P^E)$$

with  $a > 0$ .

1. Sticky Wage Theory
2. Sticky Price Theory