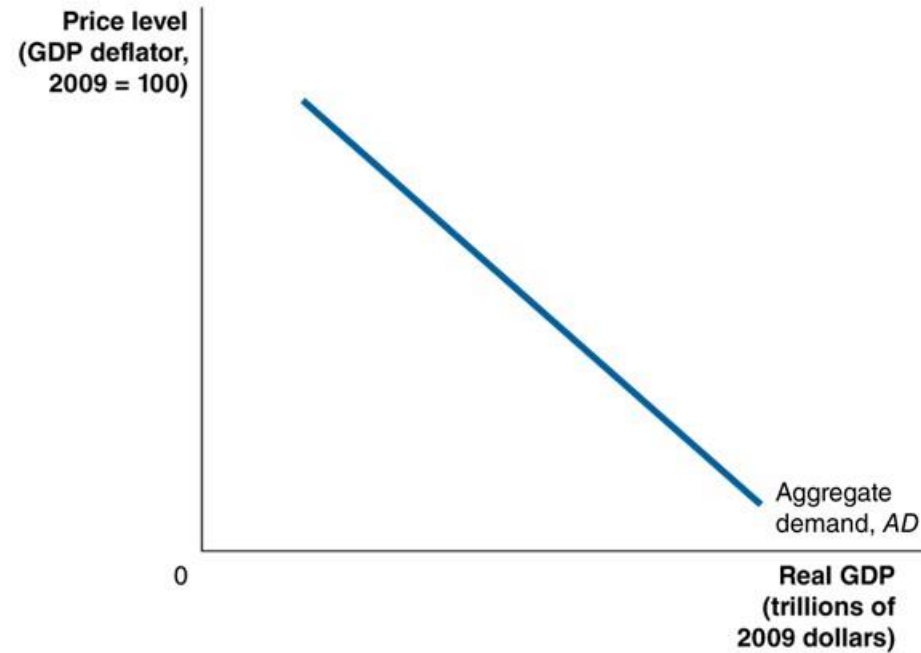


Aggregate Demand and Aggregate Supply

A review

Aggregate Demand



Aggregate demand (AD) curve: A curve that shows the relationship between the price level and the quantity of real GDP demanded by households, firms, and the government (both inside and outside of the country).

Aggregate Demand

It is determined by real GDP. Real GDP (Y) has four components:

- Consumption (C)
- Investment (I)
- Government purchases (G)
- Net exports (NX)

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

Most of the variables (C , I , & NX) are determined by the price level; government purchases (G) is an exception and normally determined by the decisions of policymakers.

Aggregate Demand



There are several channels that prices can use to affect real GDP and aggregate demand (AD). They are:

- The Wealth Effect
- The Interest-rate Effect
- The International-trade Effect

The Wealth Effect

The way a change in the price level affects consumption (C)

- While income affects household consumption the most, but wealth does as well.
- Some household wealth is held in *nominal assets*, so as price levels rise, the real value of household wealth declines. This results in less consumption. (Example: Price of oranges goes up; you cannot buy as many oranges as before assuming your wealth has not changed.)
- Implication: higher price level leads to lower consumption.

The Interest-rate Effect

The way a change in the price level affects investment (I)

- As prices rise, households & firms need more money to finance their buying and selling.
- Households & firms can borrow & withdraw funds from banks and/or they can sell financial assets such as bonds. They do this to have more funds available.
- With this though, there is an increase in the demand for money. This causes the interest rate (the price/cost of holding money) to increase and this discourages firm investment.
- Implication: higher price level leads to lower investment.

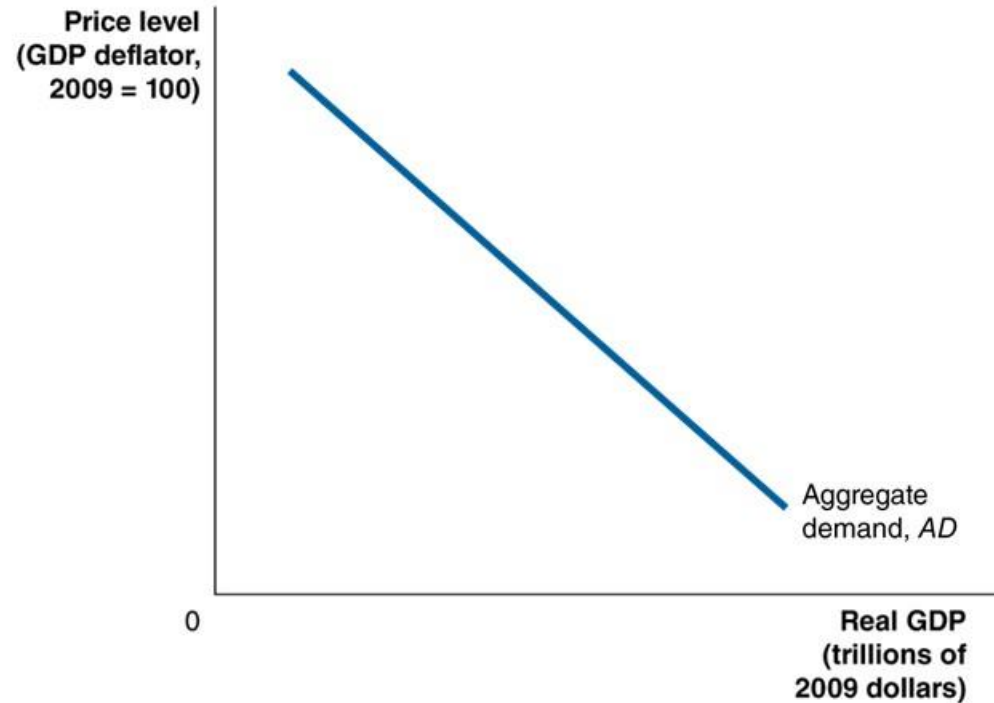
The International-trade Effect



The way a change in the price level affects net exports (NX)

- When domestic price levels increase, domestic exports become more expensive and imports become relatively cheaper.
- Fewer exports and more imports means net exports falls.
- Implication: higher price level leads to lower net exports.

Aggregate Demand



All three effects show that higher price levels lead to lower values of consumption, investment, and net exports (three of the four components of real GDP). This means that the aggregate demand curve slopes downward.

Shifts of the Aggregate Demand Curve vs. Movements along It

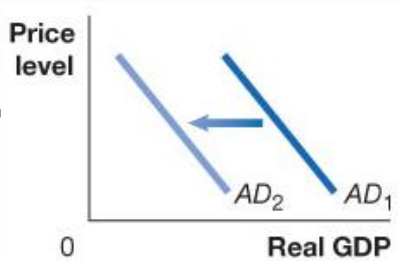
The aggregate demand curve shows the relationship between the price level and real GDP demanded, *holding everything else constant*.

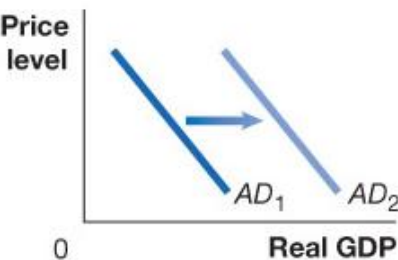
- A movement along the *AD* curve will occur when the price level changes and the change in prices is *not* caused by a component of real GDP changing.
- A shift of the *AD* curve will occur when some component (C, I, G, & NX) of real GDP changes; for example, a change in government purchases.

Variables That Shift the Aggregate Demand Curve

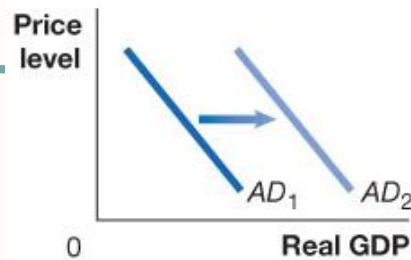
1. **Monetary policy**: The actions the Federal Reserve takes to manage the money supply and interest rates to pursue macroeconomic policy objectives.
2. **Fiscal policy**: Changes in federal taxes and purchases that are intended to achieve macroeconomic policy objectives.
3. **Households' or Firms' attitudes about the economy**: Their optimism (or pessimism) about the future increases (or decreases) consumption and/or investment.
4. **Foreign incomes**: If theirs rise more slowly than ours, their imports of our goods fall; if ours rise more slowly, *our* imports fall. If our *exchange rate* (the value of the \$US) rises, our exports become more expensive, so foreigners buy less of them (and we buy more imports, also) and vice versa.

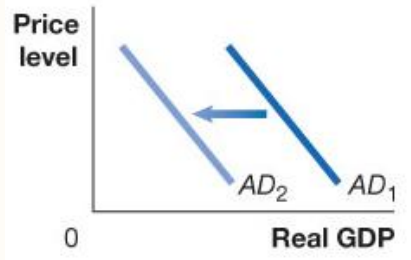
Variables That Shift the Aggregate Demand Curve: Monetary Policy

An increase in ...	shifts the aggregate demand curve ...	because ...
interest rates	 <p>The graph shows a coordinate system with 'Price level' on the vertical axis and 'Real GDP' on the horizontal axis. The origin is marked with '0'. Two downward-sloping lines represent aggregate demand curves: a darker blue line labeled AD_1 and a lighter blue line labeled AD_2. A horizontal arrow points from AD_1 to AD_2, indicating a leftward shift.</p>	higher interest rates raise the cost to households and firms of borrowing, reducing consumption and investment spending.

A decrease in ...	shifts the aggregate demand curve ...	because ...
interest rates	 <p>The graph shows a coordinate system with 'Price level' on the vertical axis and 'Real GDP' on the horizontal axis. The origin is marked with '0'. Two downward-sloping lines represent aggregate demand curves: a darker blue line labeled AD_1 and a lighter blue line labeled AD_2. A horizontal arrow points from AD_1 to AD_2, indicating a rightward shift.</p>	lower interest rates lower the cost to households and firms of borrowing, increasing consumption and investment spending.

Variables That Shift the Aggregate Demand Curve: Fiscal Policy - Government Purchases

An increase in ...	shifts the aggregate demand curve ...	because ...
government purchases	 <p>The graph shows a coordinate system with 'Price level' on the vertical axis and 'Real GDP' on the horizontal axis. The origin is marked with '0'. Two downward-sloping lines represent aggregate demand curves: a darker blue line labeled AD_1 and a lighter blue line labeled AD_2. A horizontal arrow points from AD_1 to AD_2, indicating a rightward shift.</p>	government purchases are a component of aggregate demand. (If G increases, then Y does as well since $Y = C + I + G + NX$).

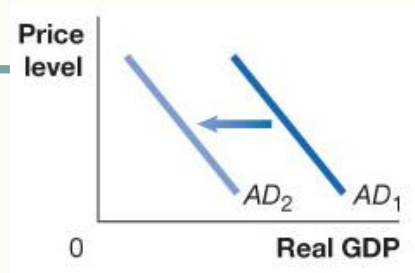
A decrease in ...	shifts the aggregate demand curve ...	because ...
government purchases	 <p>The graph shows a coordinate system with 'Price level' on the vertical axis and 'Real GDP' on the horizontal axis. The origin is marked with '0'. Two downward-sloping lines represent aggregate demand curves: a darker blue line labeled AD_1 and a lighter blue line labeled AD_2. A horizontal arrow points from AD_1 to AD_2, indicating a leftward shift.</p>	government purchases are a component of aggregate demand. (If G decreases, then Y does as well since $Y = C + I + G + NX$).

Variables That Shift the Aggregate Demand Curve: Fiscal Policy - Personal Income Taxes

An increase in ...
personal income taxes

**shifts the aggregate
demand curve ...**

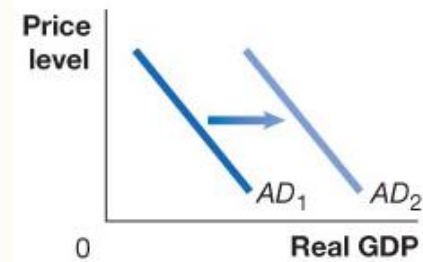
because ...
personal income decreases and
consumption does as well.



A decrease in ...
personal income taxes

**shifts the aggregate
demand curve ...**

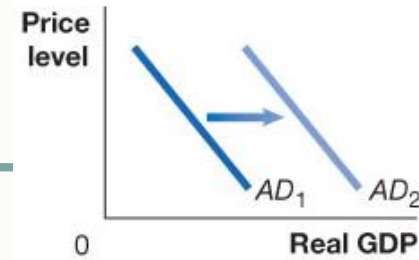
because ...
personal income increases and
consumption does as well.



NOTE: The government can also alter its *level of government purchases*. It could also alter *business taxes*, affecting the level of investment spending.

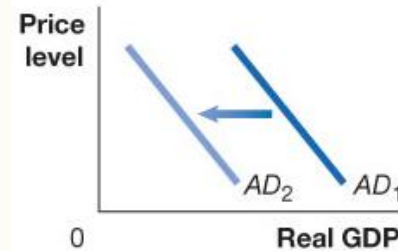
Variables That Shift the Aggregate Demand Curve: Fiscal Policy – Attitudes of Households and Firms

households expect their future incomes to rise and/or firms expect their future profitability of investment spending to rise



consumption spending and the residential investment component of investment spending increase and/or overall investment spending increases.

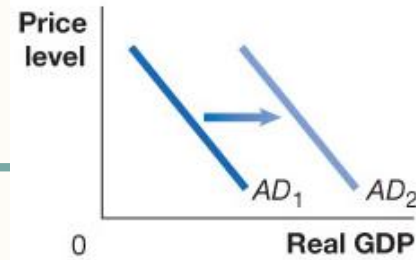
households expect their future incomes to fall and/or firms expect their future profitability of investment spending to fall



consumption spending and the residential investment component of investment spending decreases and/or overall investment spending decreases.

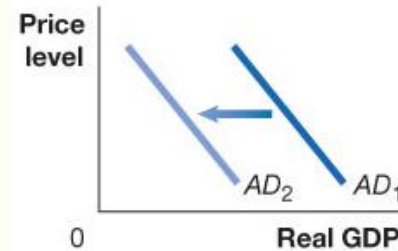
Variables That Shift the Aggregate Demand Curve: Foreign Incomes

the growth rate of domestic GDP relative to the growth rate of foreign GDP decreases and/or the exchange rate (the value of the dollar) relative to foreign currencies decreases



exports will increase faster than imports, increasing net exports and/or exports will rise and imports will fall, increasing net exports.

the growth rate of domestic GDP relative to the growth rate of foreign GDP increases and/or the exchange rate (the value of the dollar) relative to foreign currencies increases



imports will increase faster than exports, reducing net exports and/or imports will rise and exports will fall, decreasing net exports.

Aggregate Supply

Aggregate supply refers to the quantity of goods and services that firms are willing and able to supply.

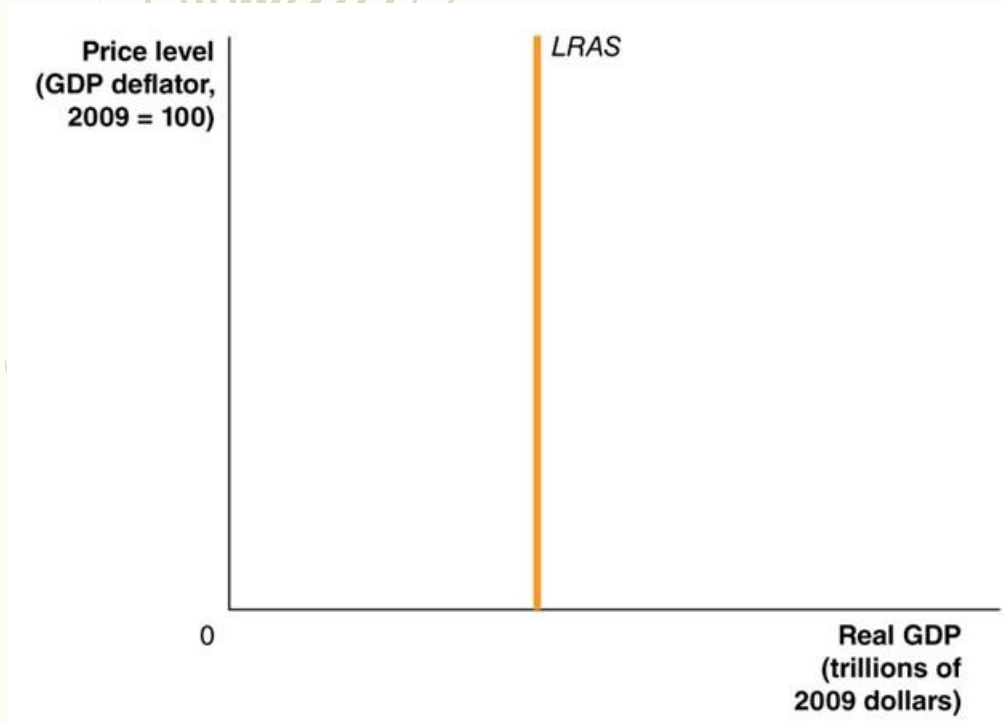
The relationship between this quantity and the price level is different in the long and short run.

So we will have two curves:

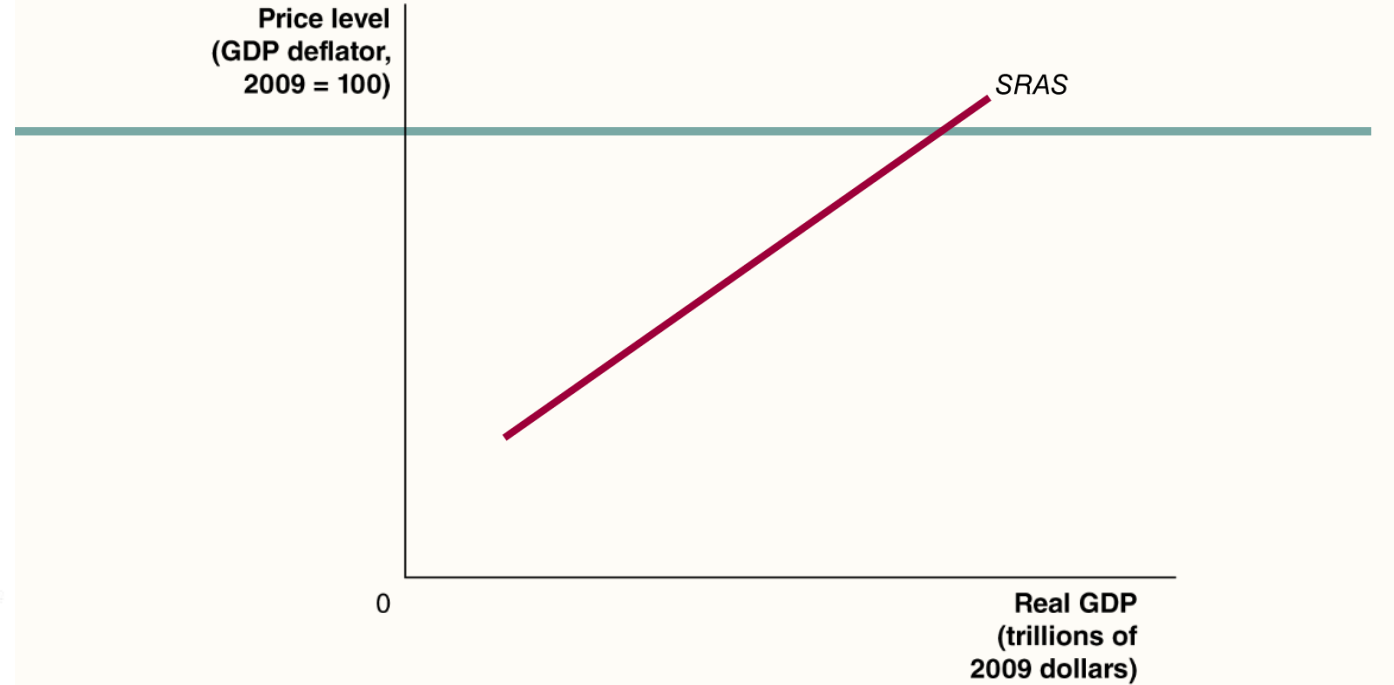
- **Long-run aggregate supply (LRAS) curve:** A curve that shows the relationship in the long run between the price level and the quantity of real GDP supplied.
- **Short-run aggregate supply (SRAS) curve:** A curve that shows the relationship between the price level and the quantity of goods and services firms are willing to supply, holding constant all other variables that affect the willingness of firms to supply goods and services.

Aggregate Supply

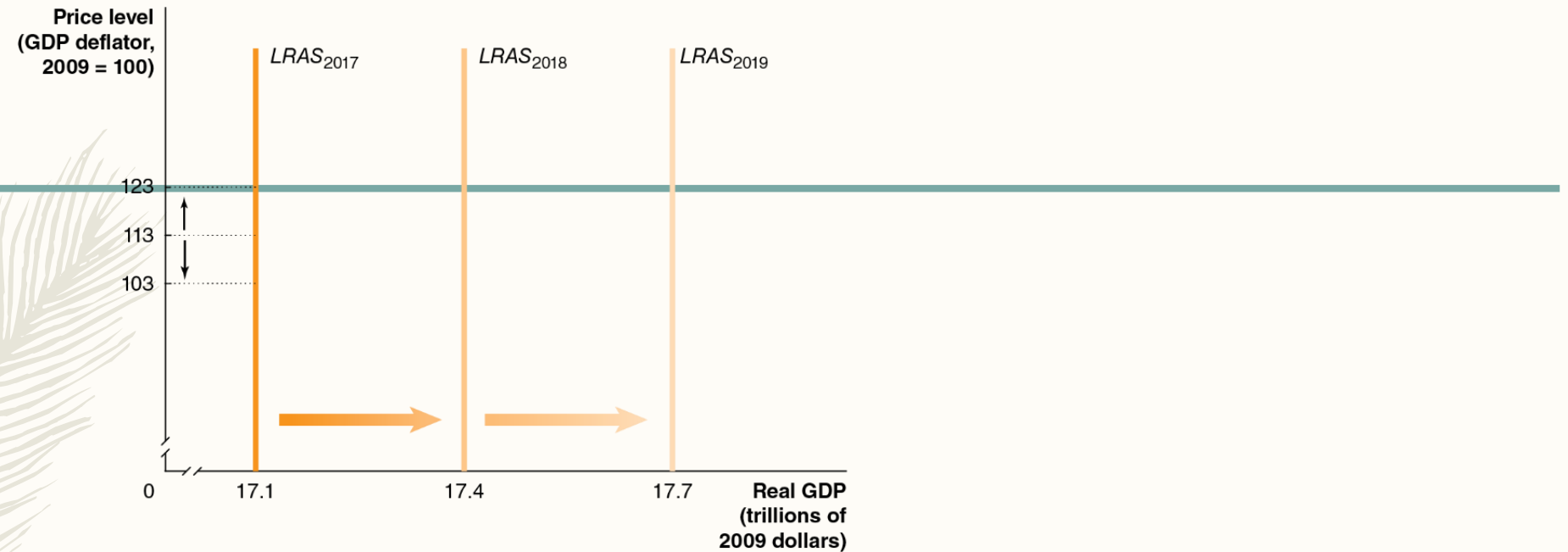
Long-run Aggregate Supply Curve



Short-run Aggregate Supply Curve



Long-run Aggregate Supply



In the long run, the level of real GDP is determined by the number of workers, the level of technology, and the capital stock (factories, machinery, etc.).

None of these elements are affected by the price level, so LRAS does not depend on the price level; it is a vertical line.

LRAS occurs at the level of potential or full-employment GDP, which typically advances each year.

NOTE: In theory it could decrease, but this would be highly unusual for a developed economy.

Short-run Aggregate Supply

The SRAS is upward-sloping. Why?

- As prices of final goods and services rise, prices of inputs—such as the wages of workers or the price of natural resources—rise more slowly.
- A secondary reason is that some firms are slow to adjust their prices when the price level rises or falls.

Economists tend to believe that some firms and workers fail to accurately predict changes in the price level. This gives three potential explanations for why the SRAS curve is upward-sloping:

- Contracts make some wages and prices “sticky”.
- Firms are often slow to adjust wages.
- Menu costs make some prices sticky.

Short-run Aggregate Supply: Contracts

- Contracts make some wages and prices “sticky.” Prices and wages are said to be “sticky” when they do not respond quickly to changes in demand or supply.
- Some firms and workers fail to predict price level changes, and hence do not correctly build them into long-term contracts.

Short-run Aggregate Supply: Wage Adjustment

- Firms are often slow to adjust wages
- Salary reviews typically only happen annually.
- Also, firms dislike cutting wages—it's bad for morale.

Short-run Aggregate Supply: Menu Costs

- Firms have **menu costs**: the costs to firms of changing prices.
- A small “optimal” change in price may not be worth the hassle for a firm to perform.

Shifts of the Short-run Aggregate Supply Curve vs. Movements along It

The short-run aggregate supply curve describes the relationship between the price level and the quantity of goods and services firms are willing to supply, holding constant all other variables that affect the willingness of firms to supply goods and services.

- A change in the price level not caused by factors that would otherwise affect short-run aggregate supply results in a movement along a stationary SRAS curve.
- But some factors (labor force, capital stock, productivity, expected future price level, workers & firms adjusting to incorrect estimations of price level, & supply shocks) cause the SRAS curve to shift.

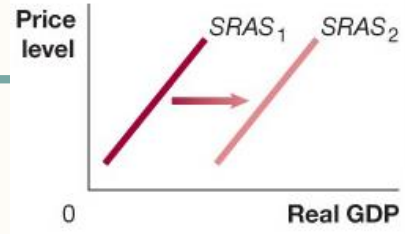


Variables That Shift the SRAS Curve: Labor force or Capital Stock

An increase in ...
the labor force or the capital
stock

**shifts the short-run aggregate
supply curve ...**

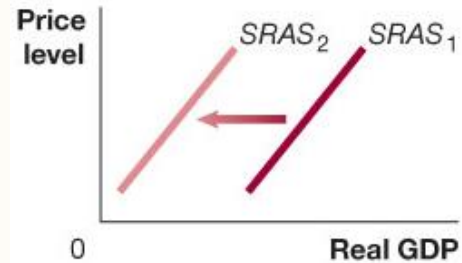
because ...
more output can be produced
at every price level.



An decrease in ...
the labor force or the capital
stock

**shifts the short-run aggregate
supply curve ...**

because ...
less output can be produced
at every price level.

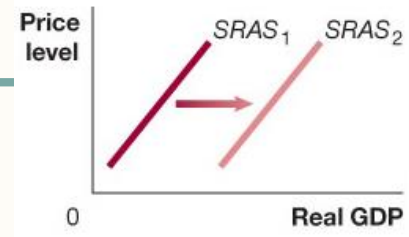


Variables That Shift the SRAS Curve: Productivity

An increase in ...
productivity

**shifts the short-run aggregate
supply curve ...**

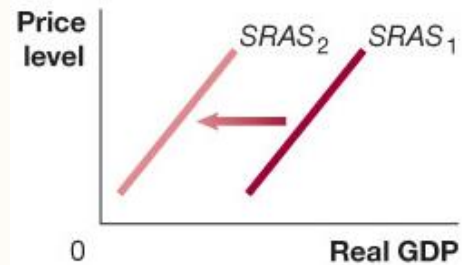
because ...
costs of producing output fall.



An decrease in ...
productivity

**shifts the short-run aggregate
supply curve ...**

because ...
costs of producing output
increases.



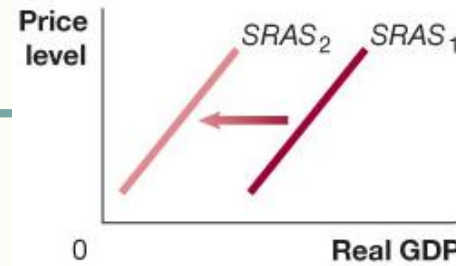
Variables That Shift the SRAS Curve: Expected Future Price Level

An increase in ...
the expected future price
level

**shifts the short-run aggregate
supply curve ...**

because ...

workers and firms increase
wages and prices.

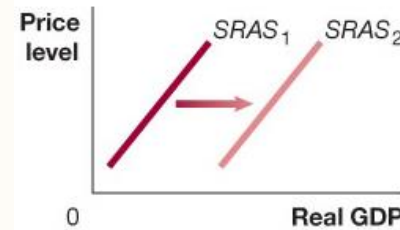


An decrease in ...
the expected future price
level

**shifts the short-run aggregate
supply curve ...**

because ...

workers and firms decrease
wages and prices.

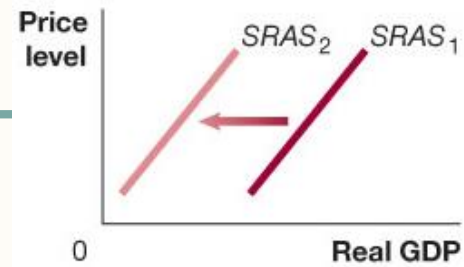


Variables That Shift the SRAS Curve: Workers & Firms adjusting to incorrect estimation of price level

An increase in ...

workers and firms adjusting to having previously underestimated the price level

shifts the short-run aggregate supply curve ...



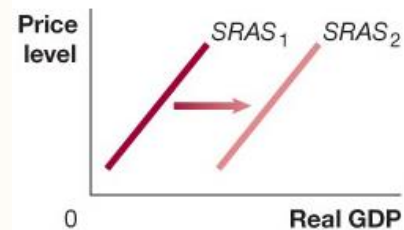
because ...

workers and firms increase wages and prices.

An decrease in ...

workers and firms adjusting to having previously overestimated the price level (rare)

shifts the short-run aggregate supply curve ...



because ...

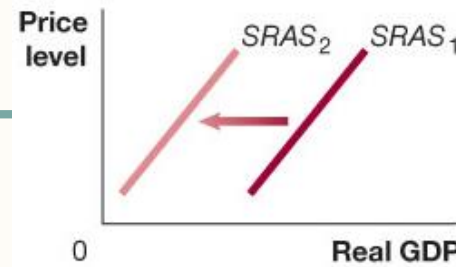
workers and firms decrease wages and prices.

Variables That Shift the SRAS Curve: Supply shocks

An increase in ...
the expected price of an
important natural resource

**shifts the short-run aggregate
supply curve ...**

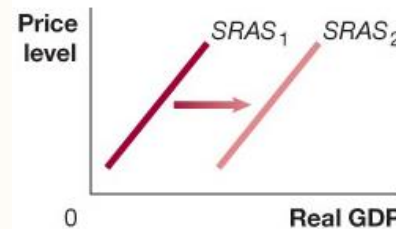
because ...
costs of producing output
rise.



An decrease in ...
the expected price of an
important natural resource
(rare)

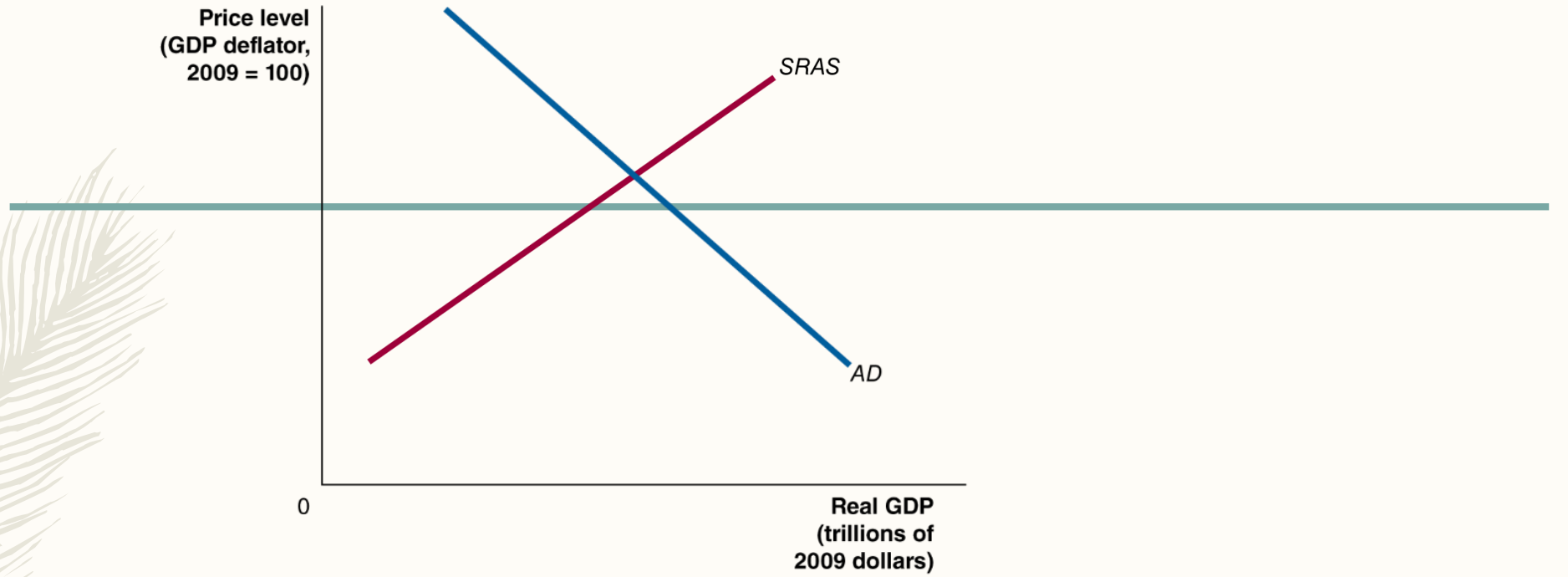
**shifts the short-run aggregate
supply curve ...**

because ...
costs of producing output fall.



Short-run Equilibrium

Price level
(GDP deflator,
2009 = 100)



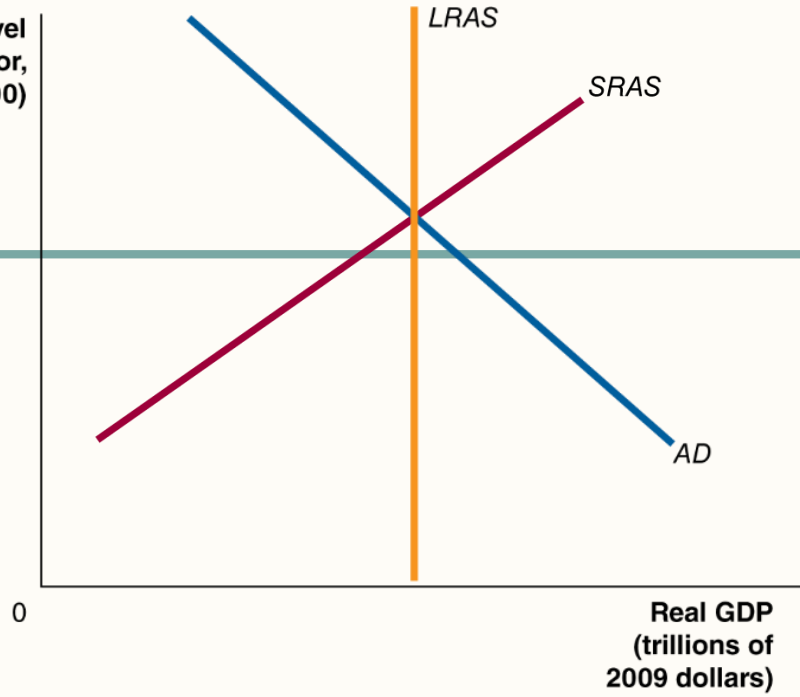
0

Real GDP
(trillions of
2009 dollars)



Long-run Equilibrium

Price level
(GDP deflator,
2009 = 100)

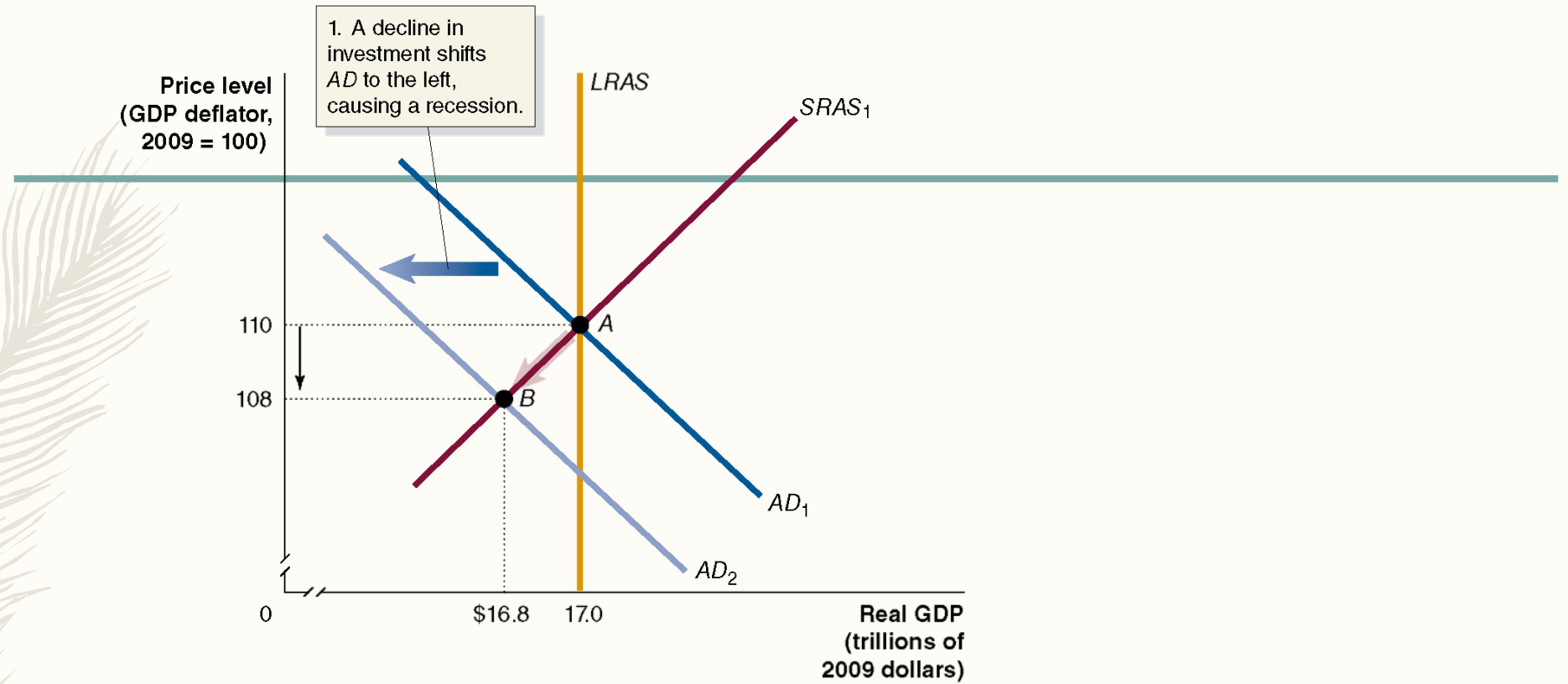


0

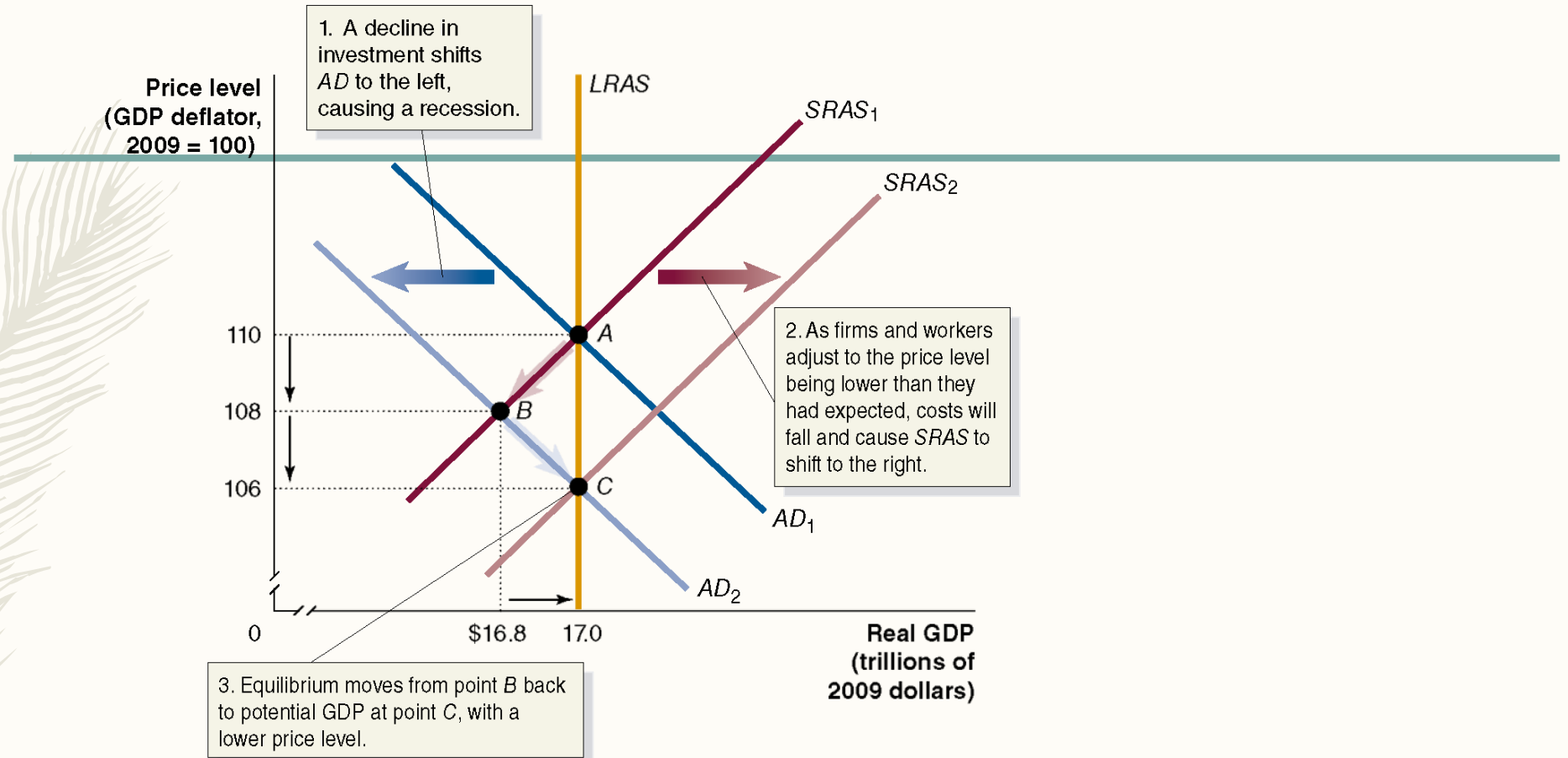
Real GDP
(trillions of
2009 dollars)



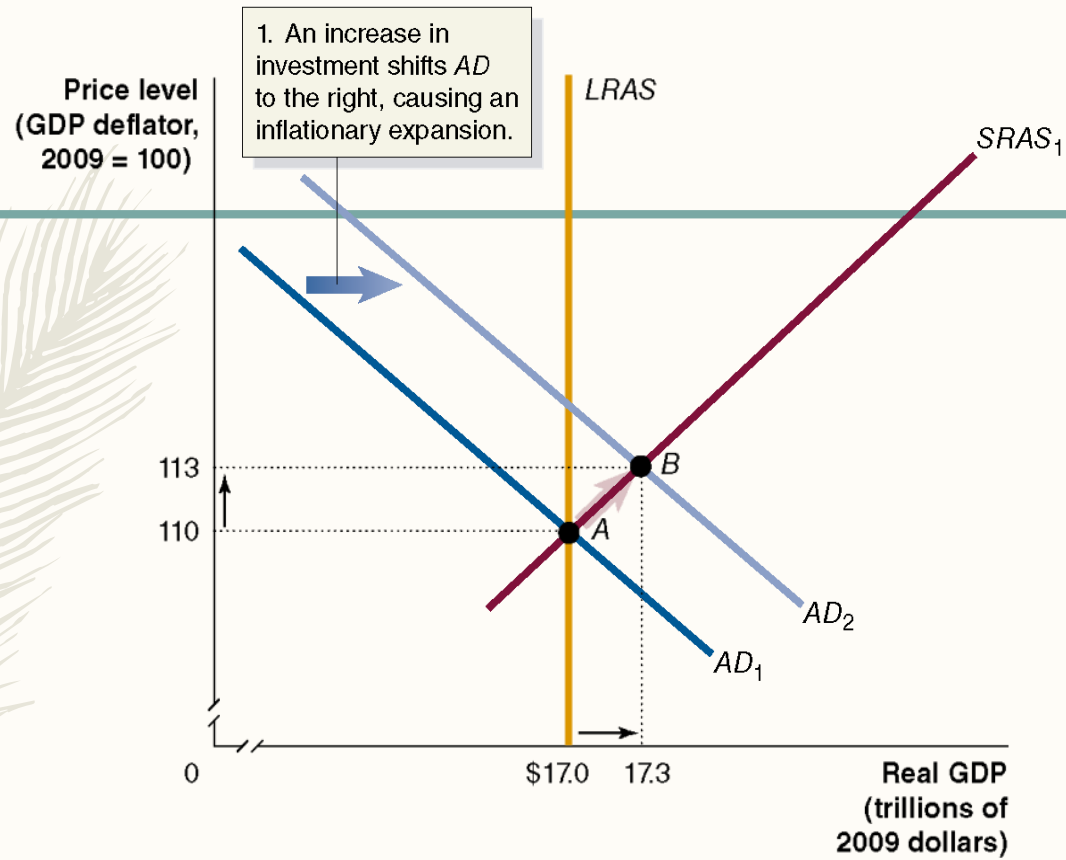
Short-Run Effects of a Decrease in Aggregate Demand



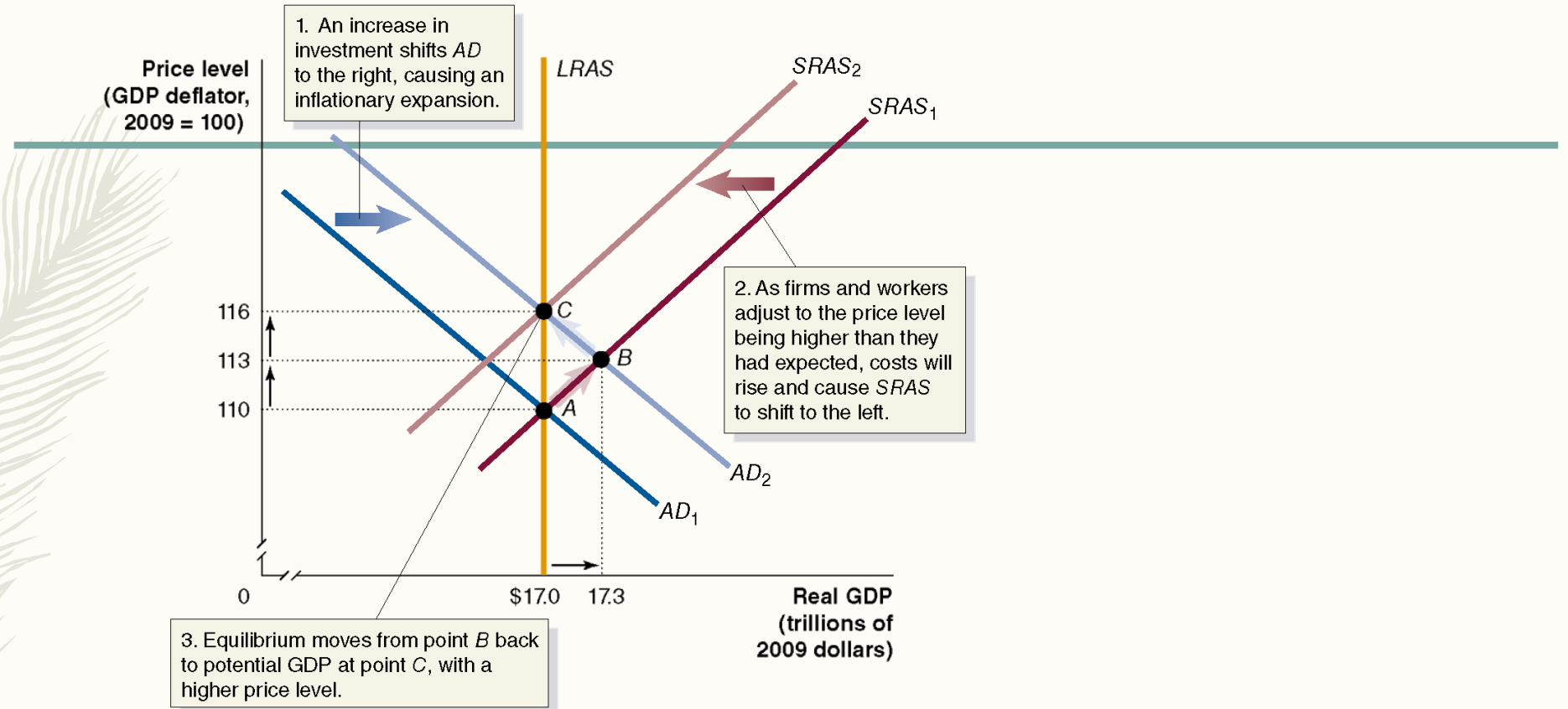
Short-Run and Long-Run Effects of a Decrease in Aggregate Demand



Short-Run Effects of a Increase in Aggregate Demand

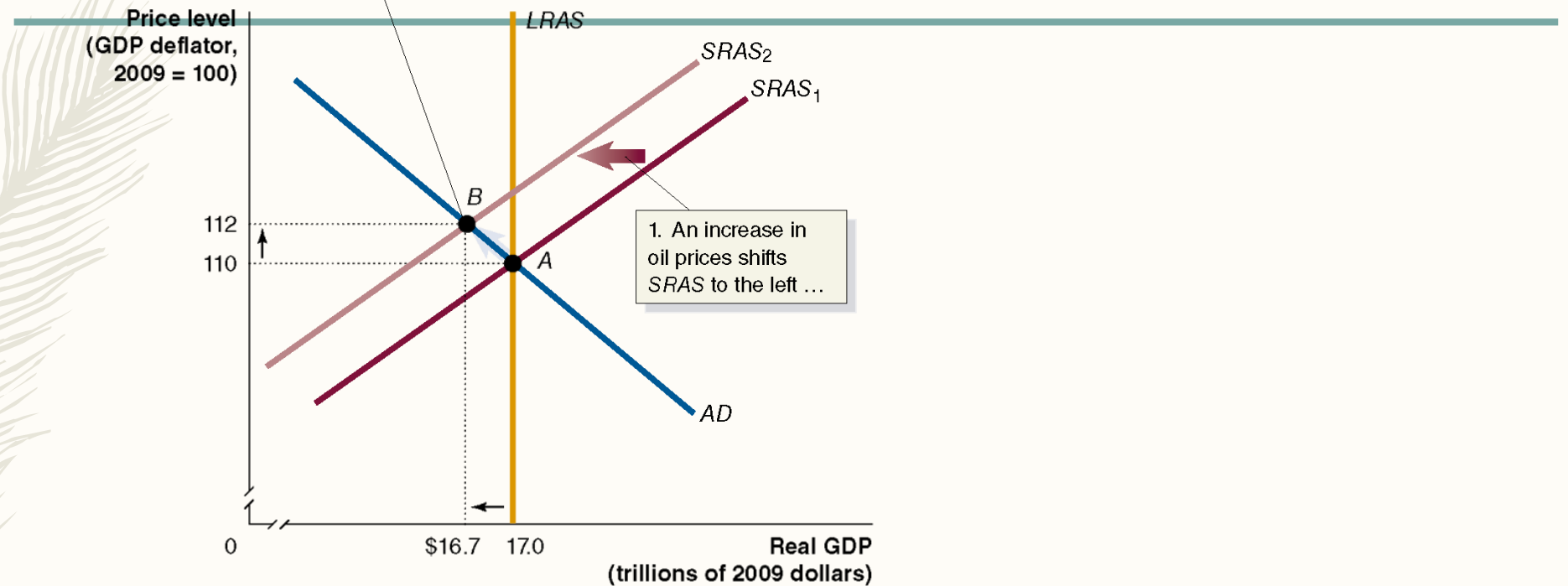


Short-Run and Long-Run Effects of a Increase in Aggregate Demand



Short-Run Effects of a Negative Supply Shock (stagflation)

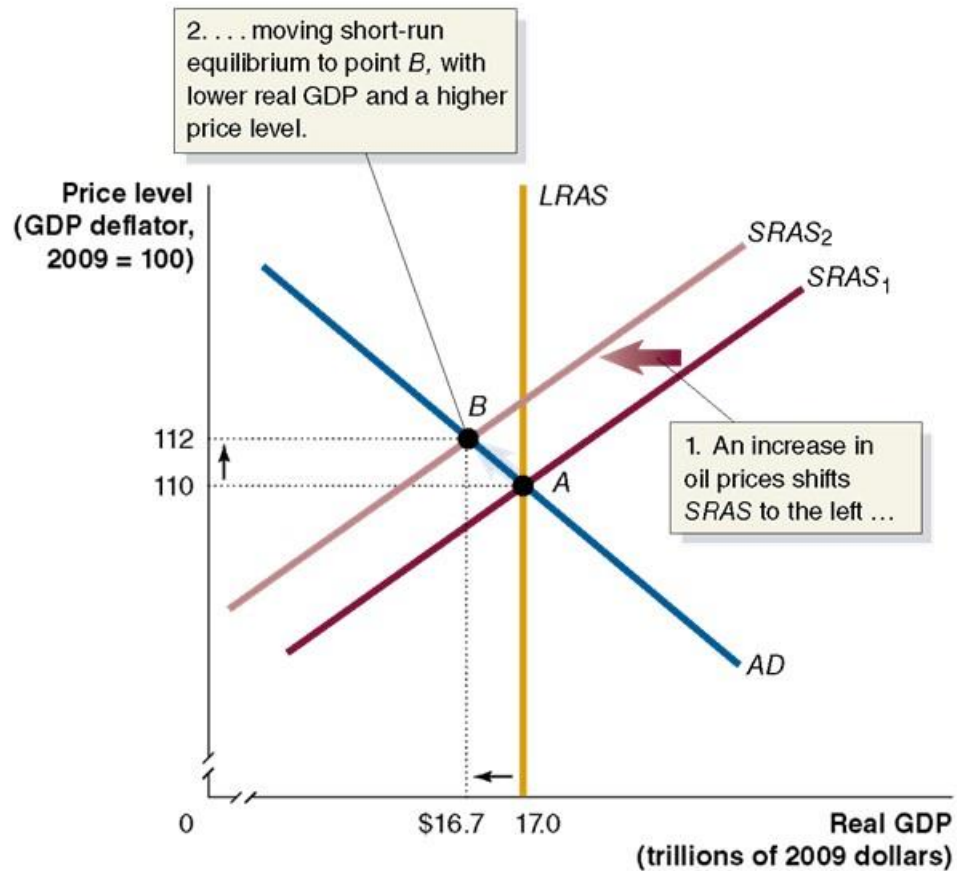
2. . . . moving short-run equilibrium to point *B*, with lower real GDP and a higher price level.



1. An increase in oil prices shifts SRAS to the left ...

Short-run and Long-run Effects of a Negative Supply Shock (stagflation)

Short-run Effect



Long-run Effect

