University of Macerata
Economics - A.Y. 2022/2023
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AD-AS model

REF.
Chapter 19.B, pp. 377-385
Chapter 22.A and 22.B, pp.428-437
Chapter 29.A, pp. 589-594

ANALYSIS OF THE AGGREGATE DEMAND AND SUPPLY: OBJECTIVE

Changes in market supply and demand play an important role in explaining changes in prices and quantities in a given market.

Similarly, theory of aggregate demand and supply (formulated in the economy as a whole) aims to explain the main trends in aggregate production, employment and prices (inflation).

In particular, in the short term, changes in aggregate demand can exert a significant influence on the aggregate output, employment and prices (i.e., the business cycle) => **Keynesian theory**.

Business cycle: fluctuation of national product (GDP), income and employment in the short term; widespread expansion or contraction of most economic sectors.

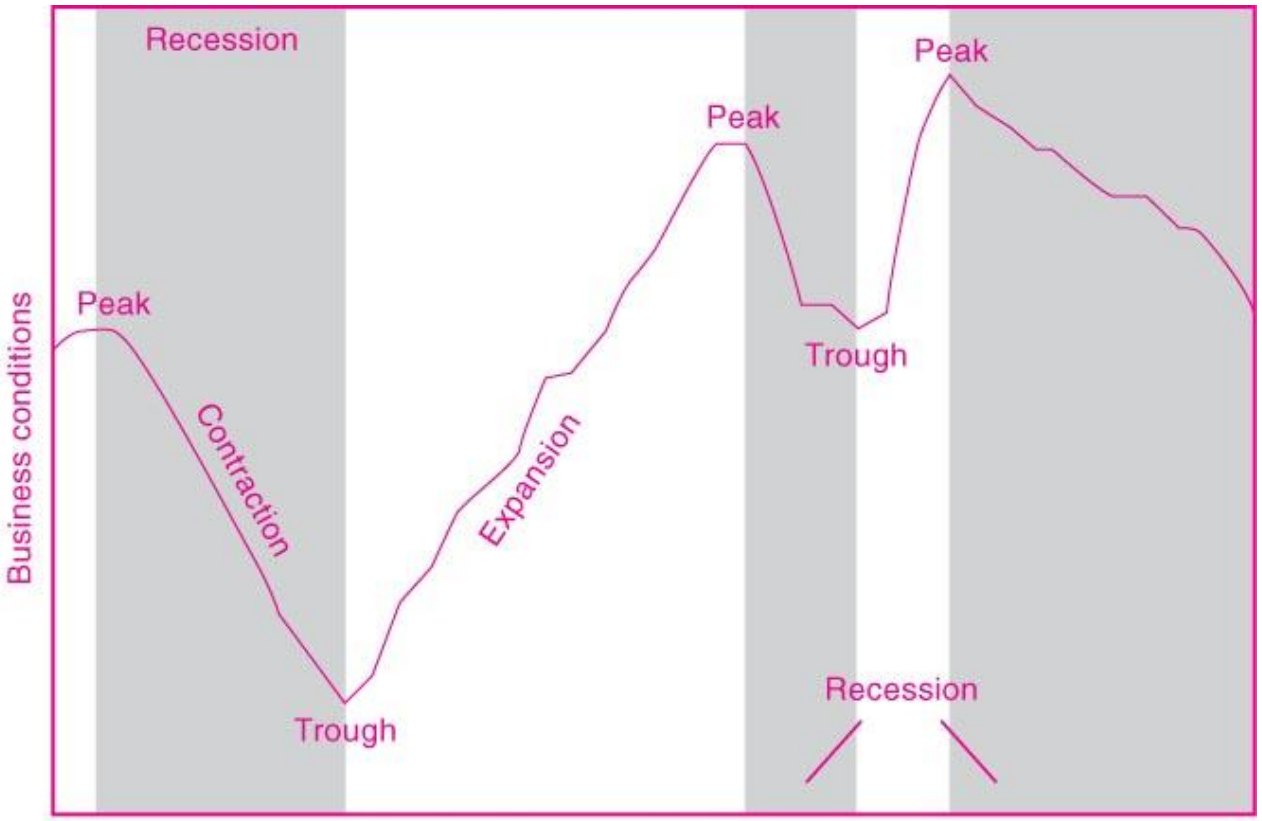


FIGURE 22-1. A Business Cycle, like the Year, Has Its Seasons

Business cycles are the irregular expansions and contractions in economic activity. (These are the actual monthly data on industrial production for a recent business-cycle period.)

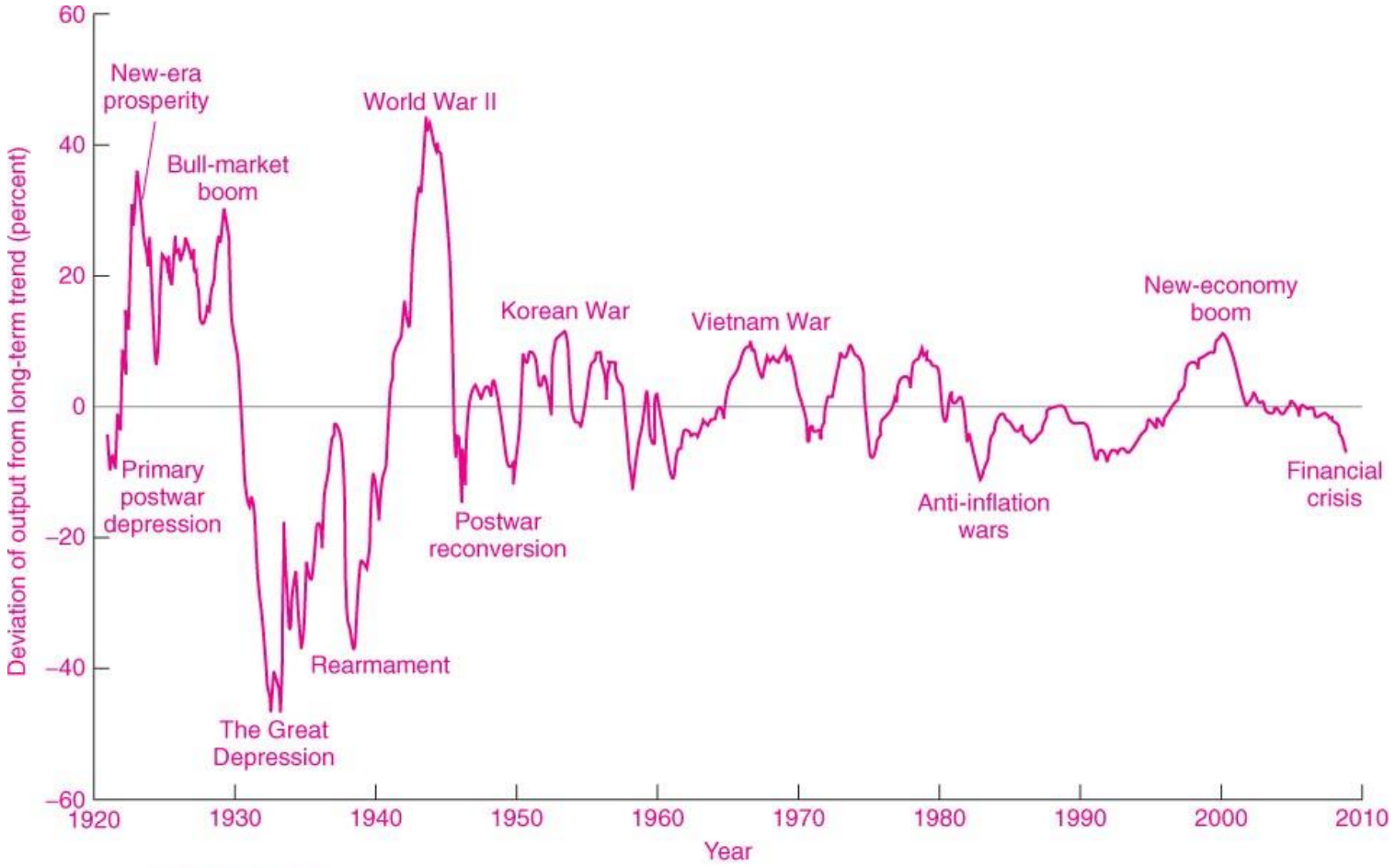


FIGURE 22-2. Business Activity since 1919

Industrial production has fluctuated irregularly around its long-run trend following variations in aggregate demand and supply. Can you detect a more stable economy in recent years?

Aggregate demand and business cycle

What happens in times of expansion:

- Consumption (aggregate demand) increases, while stocks of durable goods decrease
- Production (aggregate supply) increases and, subsequently, investments grow
- Employment increases
- As the output increases, there are pressures on consumer prices and inflation increases (the demand for raw materials is increasing and prices are rising)

Demand, supply and macroeconomic variables

To help explain the main trends in economic systems, it is possible to use the aggregate supply and demand model

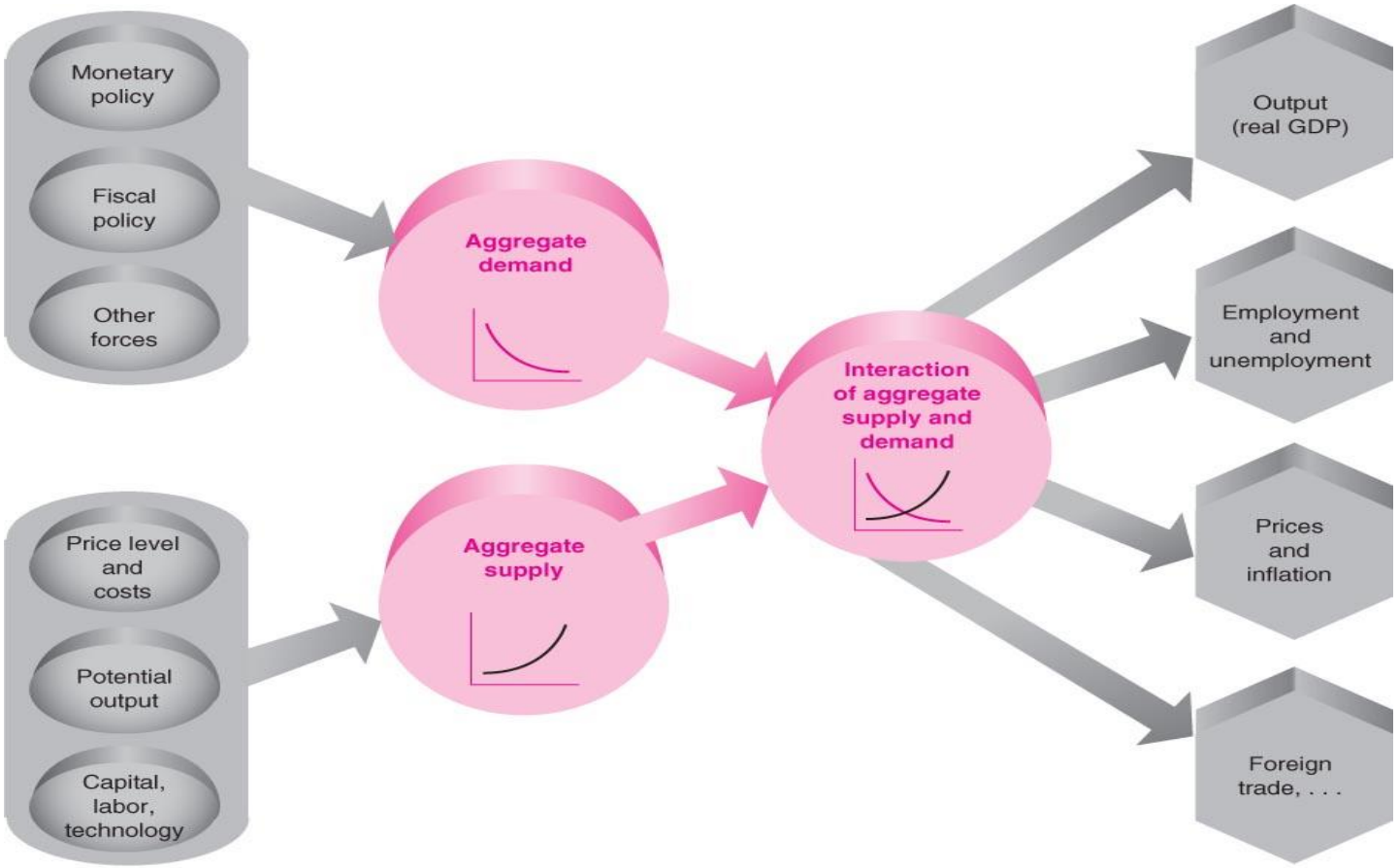


FIGURE 19-5. Aggregate Supply and Demand Determine the Major Macroeconomic Variables

EQUILIBRIUM BETWEEN DEMAND AND SUPPLY

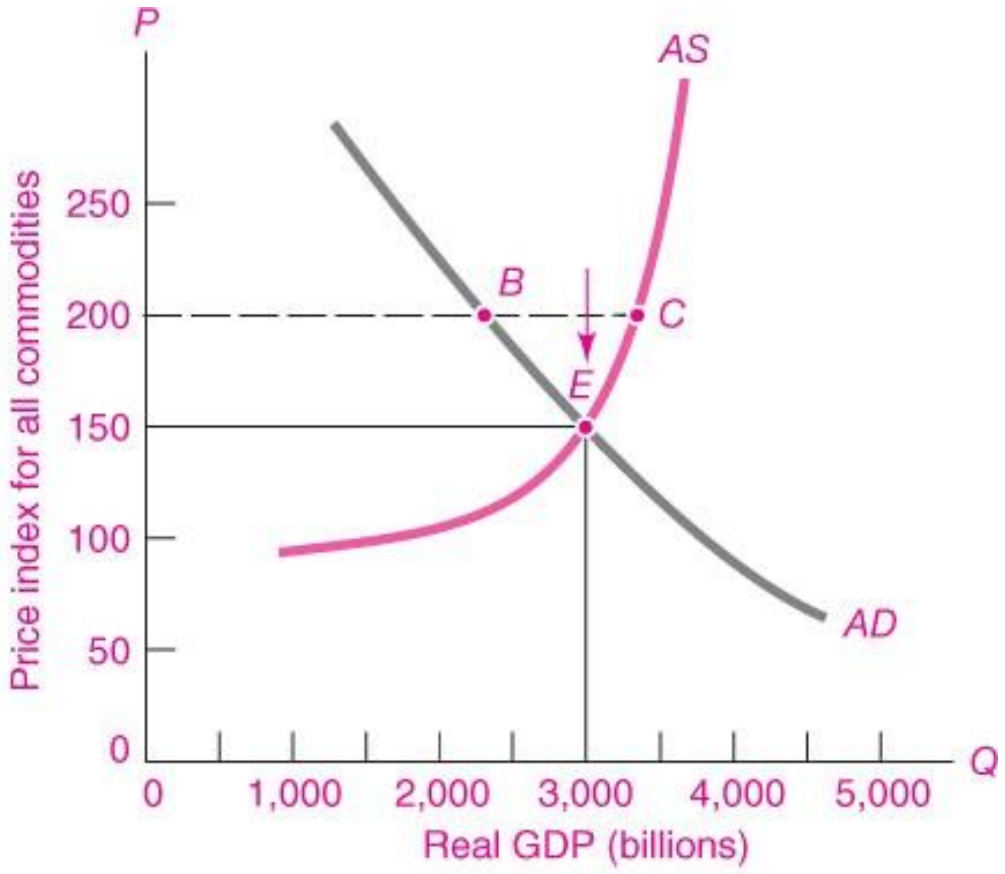


FIGURE 19-6. Aggregate Price and Output Are Determined by the Interaction of Aggregate Supply and Demand

The AD curve represents the quantity of total spending at different price levels, with other factors held constant. The AS curve shows what firms will produce and sell at different price levels, other things equal. National output and the overall price level are determined at the intersection of the aggregate demand and supply curves, at point E. This equilibrium occurs at an overall price level where firms willingly produce and sell what consumers and other demanders willingly buy.

Fluctuations (cycles) are induced by the AD

E.g. Increase in consumption or investments in times of war

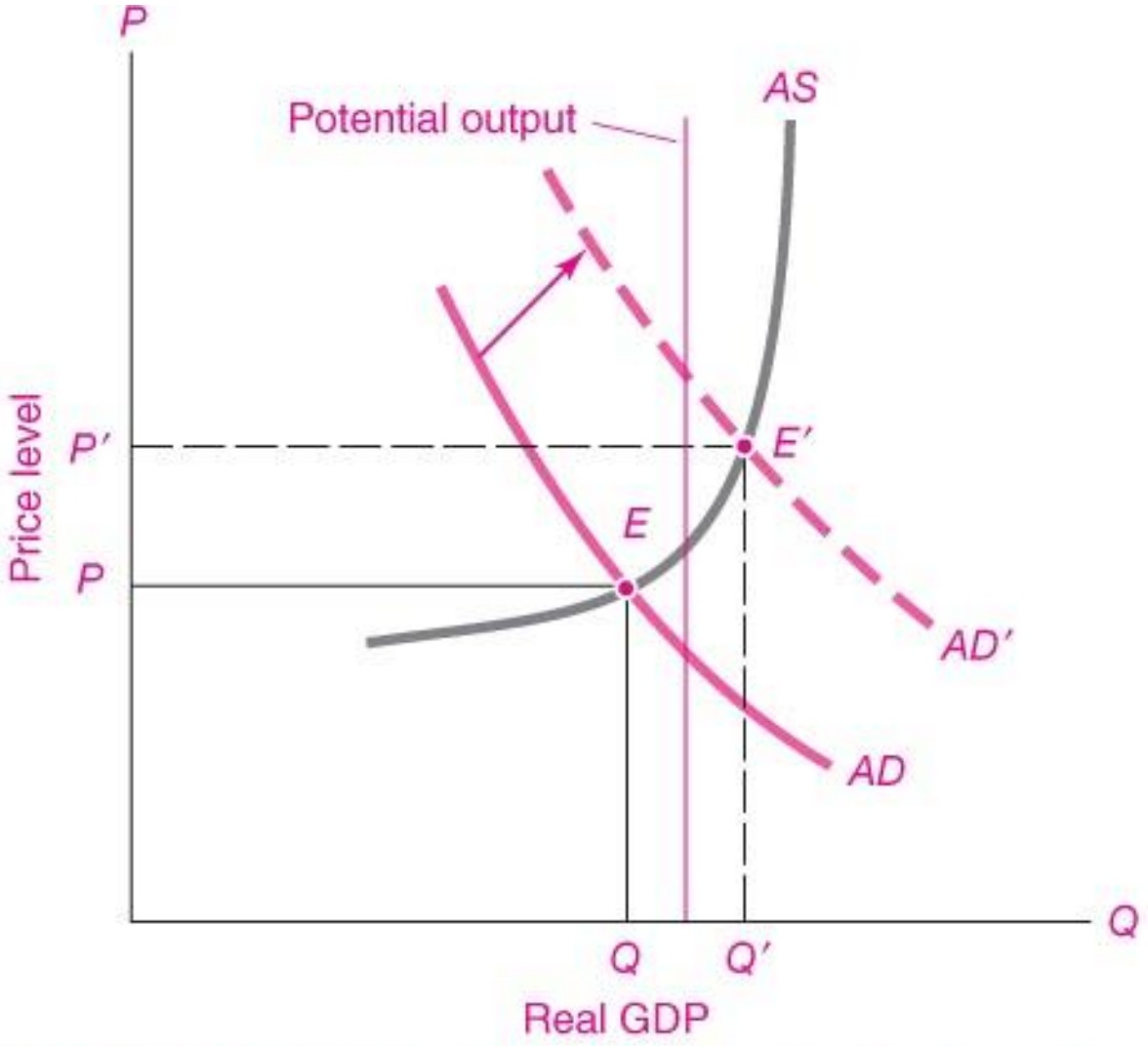


FIGURE 19-7. Wartime Boom Is Propelled by Increasing Aggregate Demand

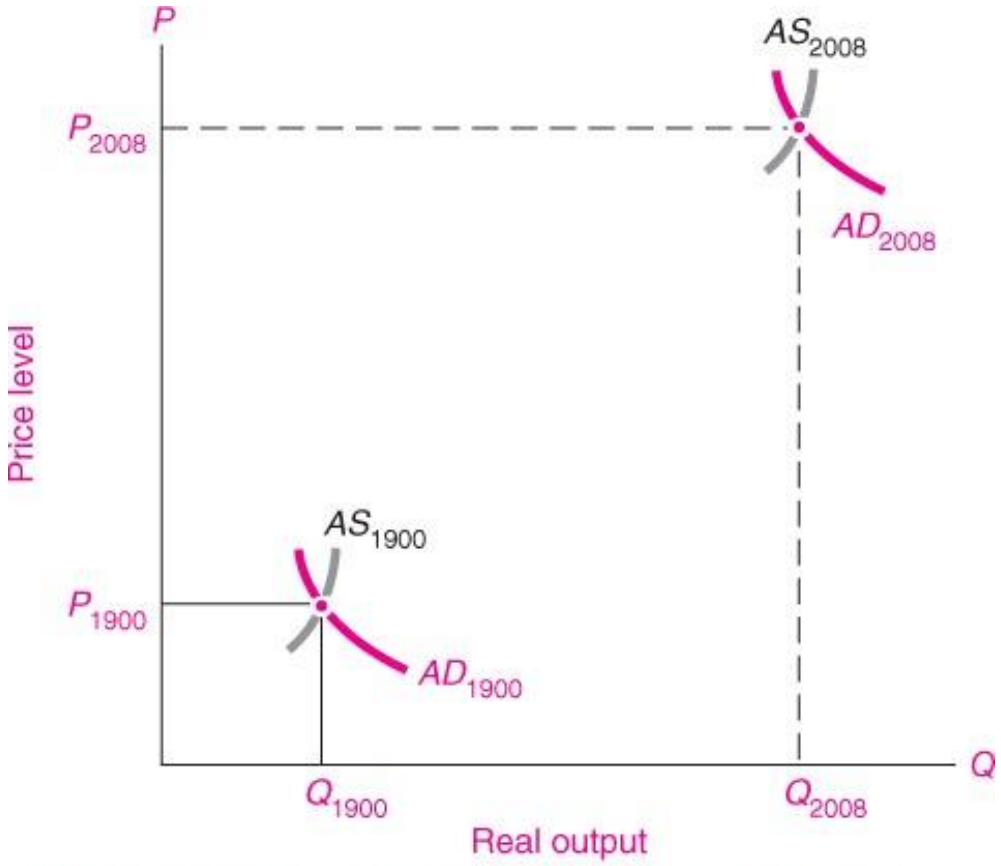
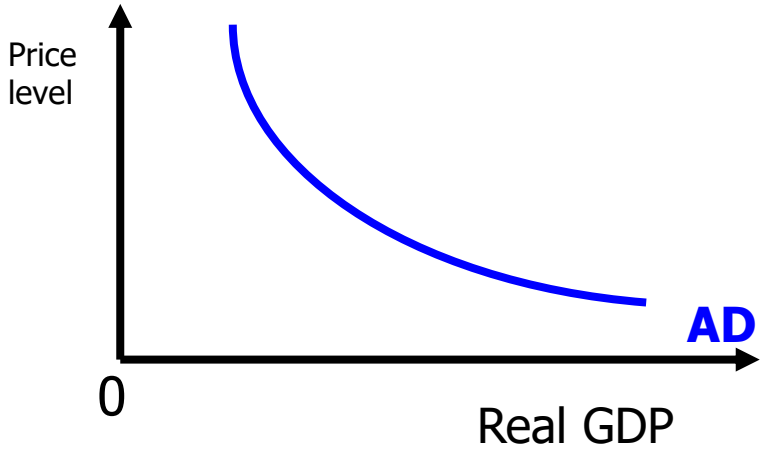


FIGURE 19-8. Growth in Potential Output Determines Long-Run Economic Performance

Over the twentieth century, increases in labor, capital, and efficiency led to a vast increase in the economy's productive potential, shifting aggregate supply far to the right. In the long run, aggregate supply is the primary determinant of output growth.

The Aggregate Demand and all its components

To better understand the causes of economic cycles, it is necessary to deepen the study of AD and AS



Aggregate demand (or **AD**) is the total or aggregate quantity of output that is willingly bought at a given level of prices, other things held constant. AD is the desired spending in all product sectors: consumption, private domestic investment, government purchases of goods and services, and net exports.

- Households (consumption, **C**)
- Enterprises (private domestic investment, **I**)
- Government (government purchases of goods and services, **G**)
- Foreign countries (net exports, **E-M**)

Components of Aggregate Demand

The variation of the AD is a central point of Keynesian theory

DA = C+I+G+X

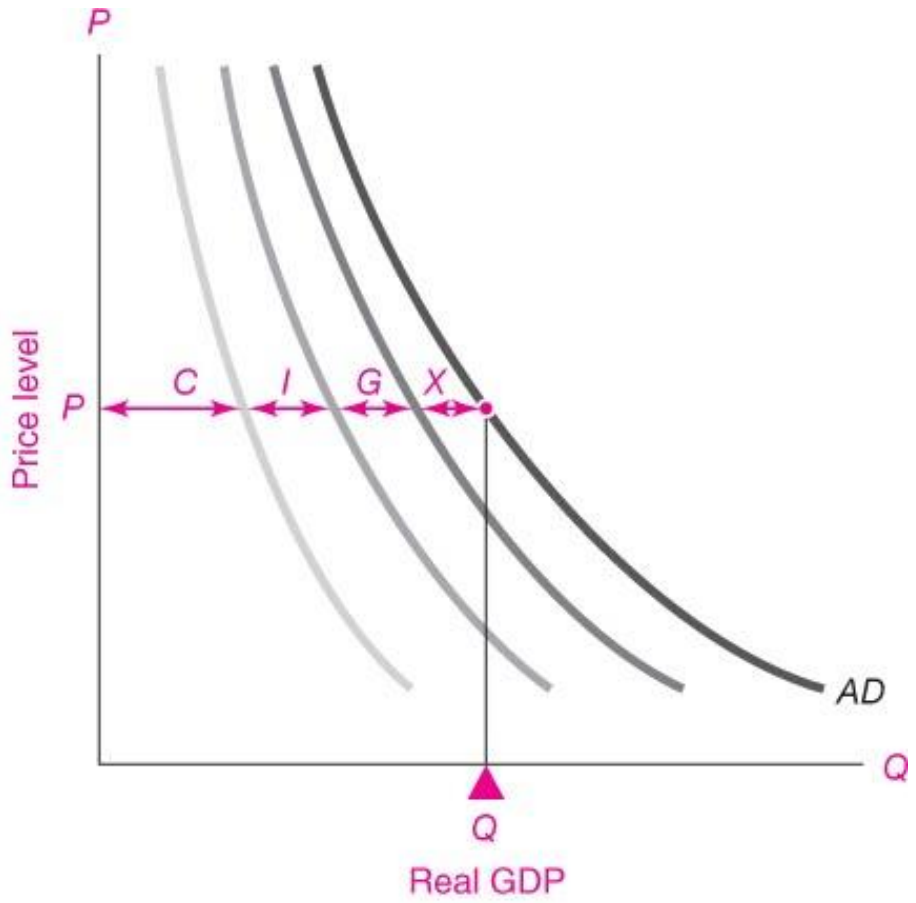


FIGURE 22-3. Components of Aggregate Demand

Aggregate Demand

Movements along and shifts of the aggregate demand

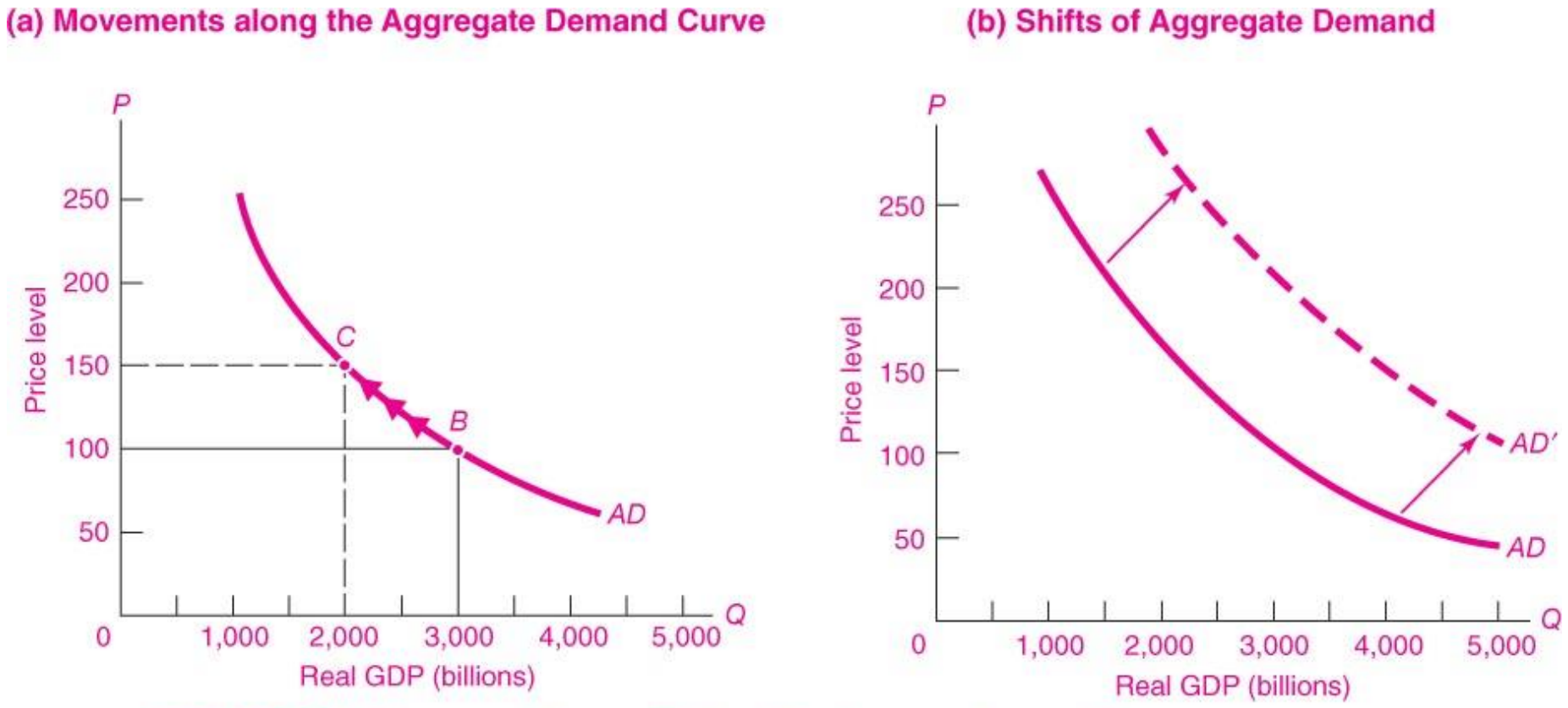


FIGURE 22-4. Movement along vs. Shifts of the Aggregate Demand Curve

Movements along the AD

If prices rise

(for any reason shifting the AS, e.g. increasing costs)

The purchasing power of the available currency decreases

(real income and real money supply decrease and interest rates increase)

C and I decrease

M increases

(foreign goods become more convenient)

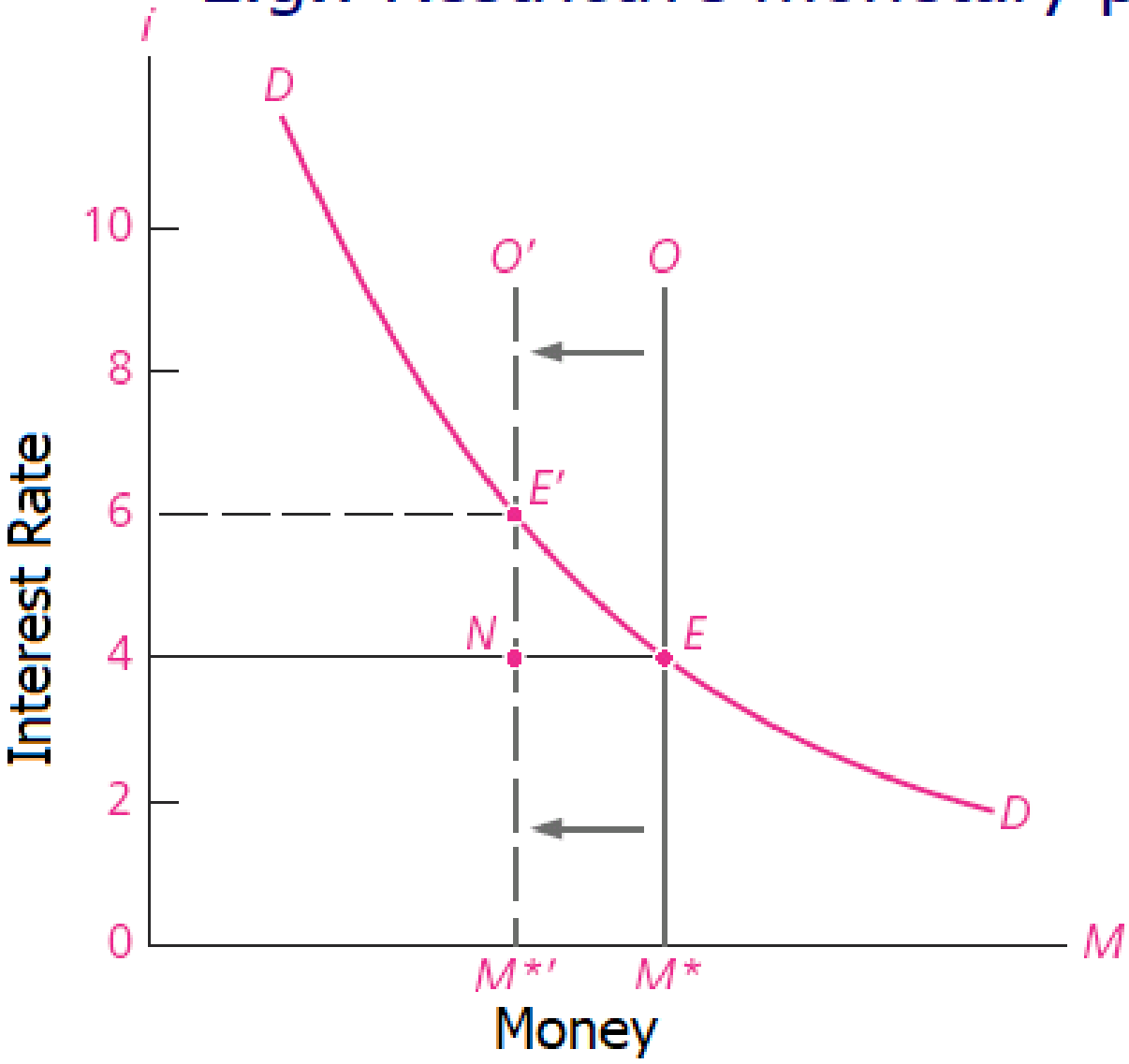
The quantity demanded decreases from point B to point C

Shifts of the aggregate demand

Variable	Impact on aggregate demand
Policy Variables	
Monetary policy	Monetary expansion may lower interest rates and loosen credit conditions, inducing higher levels of investment and consumption of durable goods. In an open economy, monetary policy also affects the exchange rate and net exports.
Fiscal policy	Increases in government purchases of goods and services directly increase spending; tax reductions or increases in transfers raise disposable income and induce higher consumption. Tax incentives like an investment tax credit can induce higher spending in a particular sector.
Exogenous Variables	
Foreign output	Output growth abroad leads to an increase in net exports.
Asset values	Rise in stock market increases household wealth and thereby increases consumption; also, higher stock prices lower the cost of capital and thereby increase business investment.
Advances in technology	Technological advances can open up new opportunities for business investment. Important examples have been the railroad, the automobile, and computers.
Other	Defeat of a socialist government stimulates foreign investment; peace breaks out, with an increase in world oil production, and lowers oil prices; good weather leads to lower food prices.

TABLE 22-1. Many Factors Can Increase Aggregate Demand and Shift out the *AD* Curve

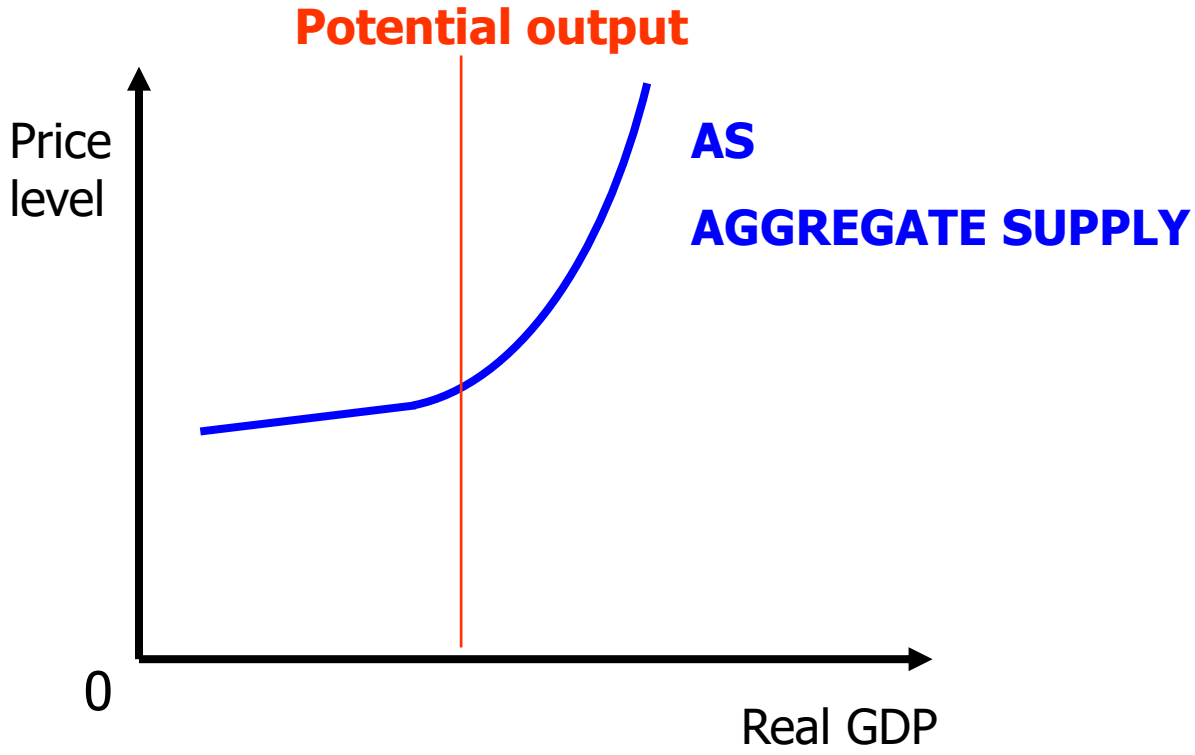
E.g.: Restrictive monetary policy



Shifts of the Aggregate Demand: Examples

- greater uncertainty (e.g., on job places available) leads to lower household consumption
- worsening of entrepreneurs' expectations reduces investments
- worsening of the foreign economy (international economic situation) reduces exports
- increase in taxes reduces consumption and investment, while other restrictive fiscal policy interventions reduce public expenditures
- increase in the cost of borrowing money (interest rates), due to a restrictive monetary policy reduces consumption and investment

Aggregate supply



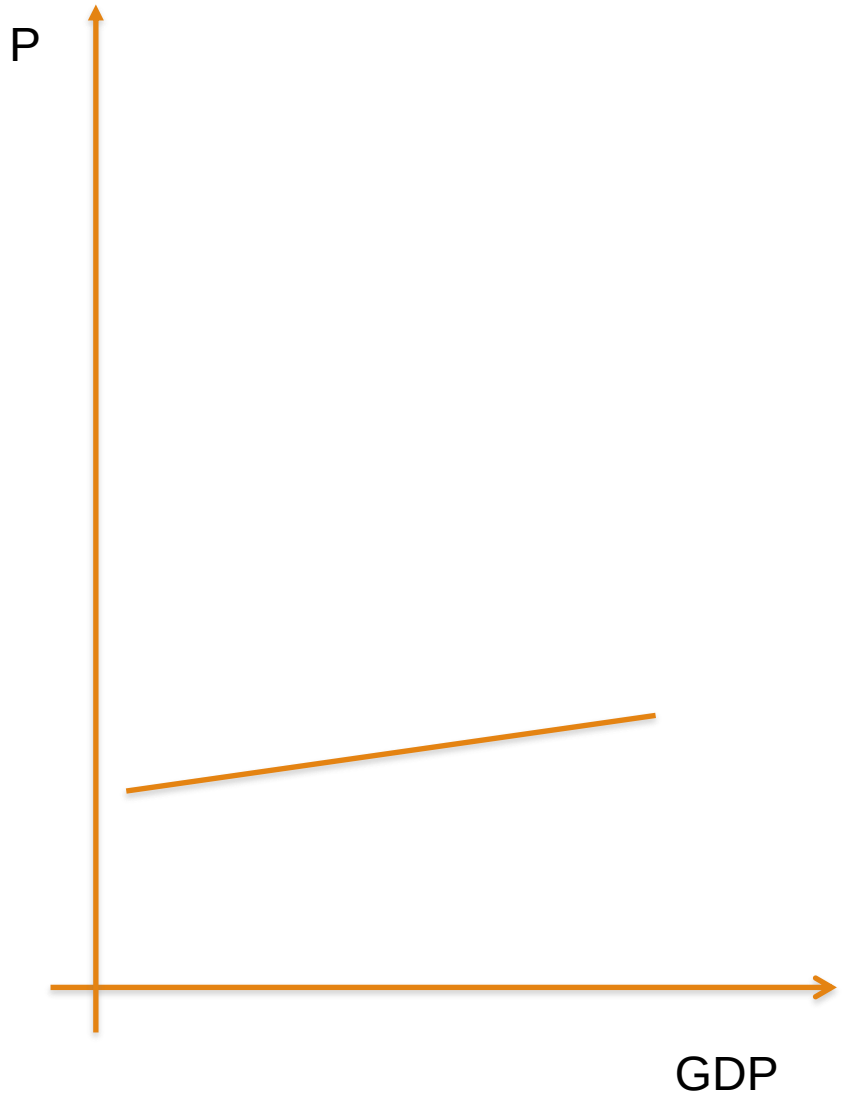
Aggregate supply describes the behavior of the production side of the economy. The aggregate supply curve, or AS curve, is the schedule showing the level of total national output that will be produced at each possible price level, other things held constant (with high prices companies would like to sell everything; with low prices companies have excess production capacity).

Shape of Aggregate supply

Comparison between:

- **Keynesians:** distinguish between short and long term. The AS curve is relatively flat (horizontal) in the short run: as the DA changes, prices change negligibly because many costs (e.g., wages) are not flexible in the short run. This implies the effectiveness of Keynesian policies (e.g. increase in aggregate demand).
- **Classical economists:** they only consider the long run (ie when all the prices of the factors of production can vary). The long-run AS curve is relatively vertical: markets are efficient, they respond automatically to changes in demand and prices always guarantee equilibrium: the economy is always close to full employment (when there is an excess of labor supply, there is wage cuts and the economy is close to potential GDP, without state intervention)

Short-Run Aggregate Supply (Keynesians)



In the **short run**, the supply curve has a positive slope: the higher the prices, the greater the quantity of goods produced.

Prices and wages are *sticky* (the adjustment is not immediate).

If DA increases, GDP grows and generates employment.

From Short-Run to Long-run Aggregate Supply (Classical)

In the long-run sticky prices and wages become unstuck (e.g. salary adjustment), so the long-run AS curve in is vertical and output is determined by potential output.

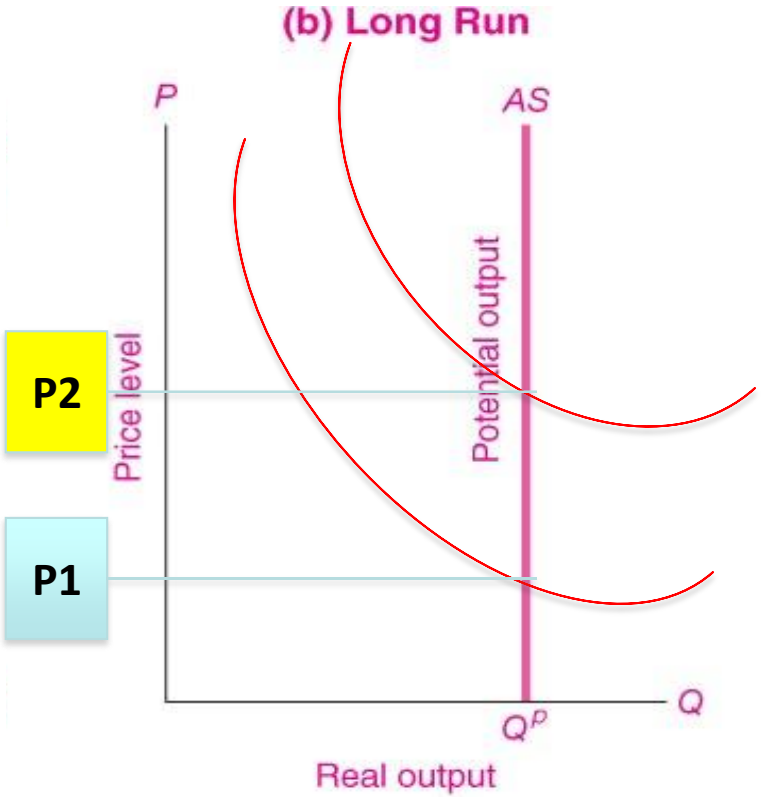
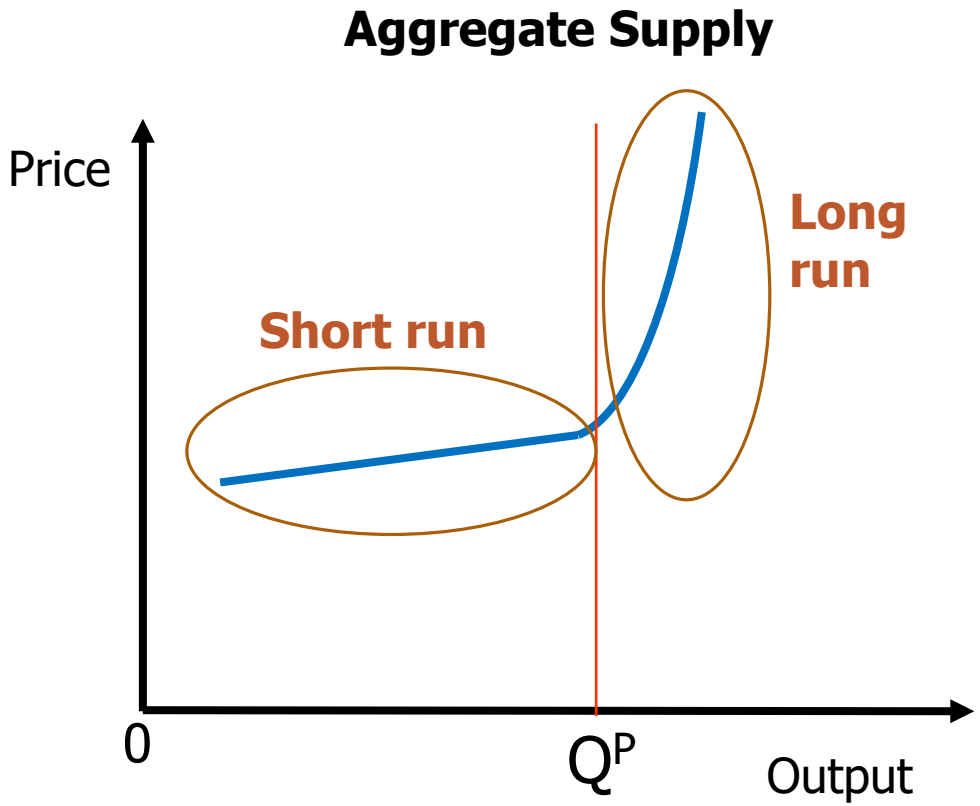


FIGURE 29-3. *AS* Is Upward-Sloping in the Short Run but Turns Vertical in the Long Run

Can you see why a Keynesian economist in the short run might desire to stabilize the economy through policies that change aggregate demand while a classical economist in the long run would concentrate primarily on increasing potential output?

Because in the long run we are exploiting all the productive potential and every change in aggregate demand is reflected in price changes, not in changes in real output. This implies the ineffectiveness of Keynesian policies (e.g., increase in aggregate demand) in the long run, when prices adjust (unless there is growth in potential output, which shifts AS to the right). Keynesian policies, on the other hand, are effective in the short term: when aggregate demand increases, real output increases.



The two views (Keynesian and Classical) can be unified by analyzing the convex shape of an aggregate supply curve. The initial part of the aggregate supply curve is compatible with the short-term situation. The supply curve is horizontal and the price level is essentially constant. Production capacity is still underutilized, in such circumstances an expansionary maneuver in demand produces real effects on production.

The final part of the supply curve, on the other hand, is compatible with the long-term view of the neoclassicals. The economy is approaching its full employment level (Q^p). The aggregate supply curve tends to be vertical. When the entire production capacity is used, the production system cannot satisfy a further increase in demand. In these circumstances, the increase in demand translates into an increase in the price of goods and factors of production.

Aggregate supply: determinants

What factors determine the aggregate supply?

In the short run, it is the demand that guides the equilibrium of the economic system (which can be influenced by fiscal and monetary policy). The intersection between supply and demand determines the general level of prices, which generates movements along the aggregate supply curve and changes the level of production.

In the long run, shifts in aggregate demand do not affect the quantities produced but only on prices: economic growth is linked to the position of the supply curve. The position of the AS depends on:

1. level of the **potential product** (quality and quantity of workforce, availability of factors, technical progress, etc ...)

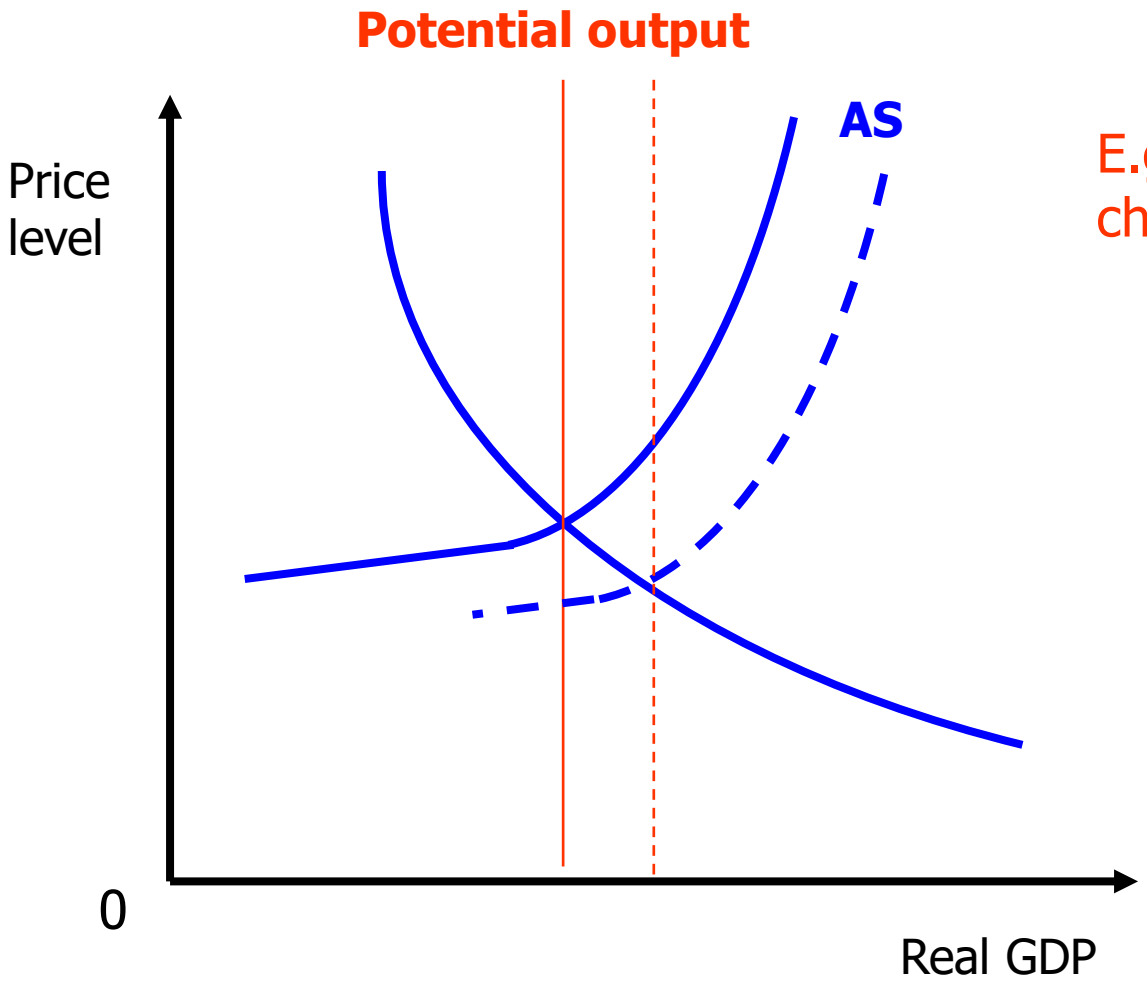
2. **production costs** (if production costs rise, companies produce goods only at higher prices)

Aggregate supply: determinants

Variable	Impact on aggregate supply
Potential output	
Inputs	Supplies of capital, labor, and natural resources are the important inputs. Potential output comes when employment of labor and other inputs is at the maximum sustainable level. Growth of inputs increases potential output and aggregate supply.
Technology and efficiency	Innovation, technological improvement, and increased efficiency increase the level of potential output and raise aggregate supply.
Production costs	
Wages	Lower wages lead to lower production costs; lower costs mean that quantity supplied will be higher at every price level for a given potential output.
Import prices	A decline in foreign prices or an appreciation in the exchange rate reduces import prices. This leads to lower production costs and raises aggregate supply.
Other input costs	Lower oil prices lower production costs and thereby raise aggregate supply.

TABLE 29-1. Aggregate Supply Depends upon Potential Output and Production Costs

In the long run, economic growth is due to increases in AS and potential output (remember the production-possibility frontier)



E.g. technological change and innovation

Shifts of the aggregate supply

How does the growth of potential output affect aggregate supply?

How do increases in production costs affect aggregate supply?

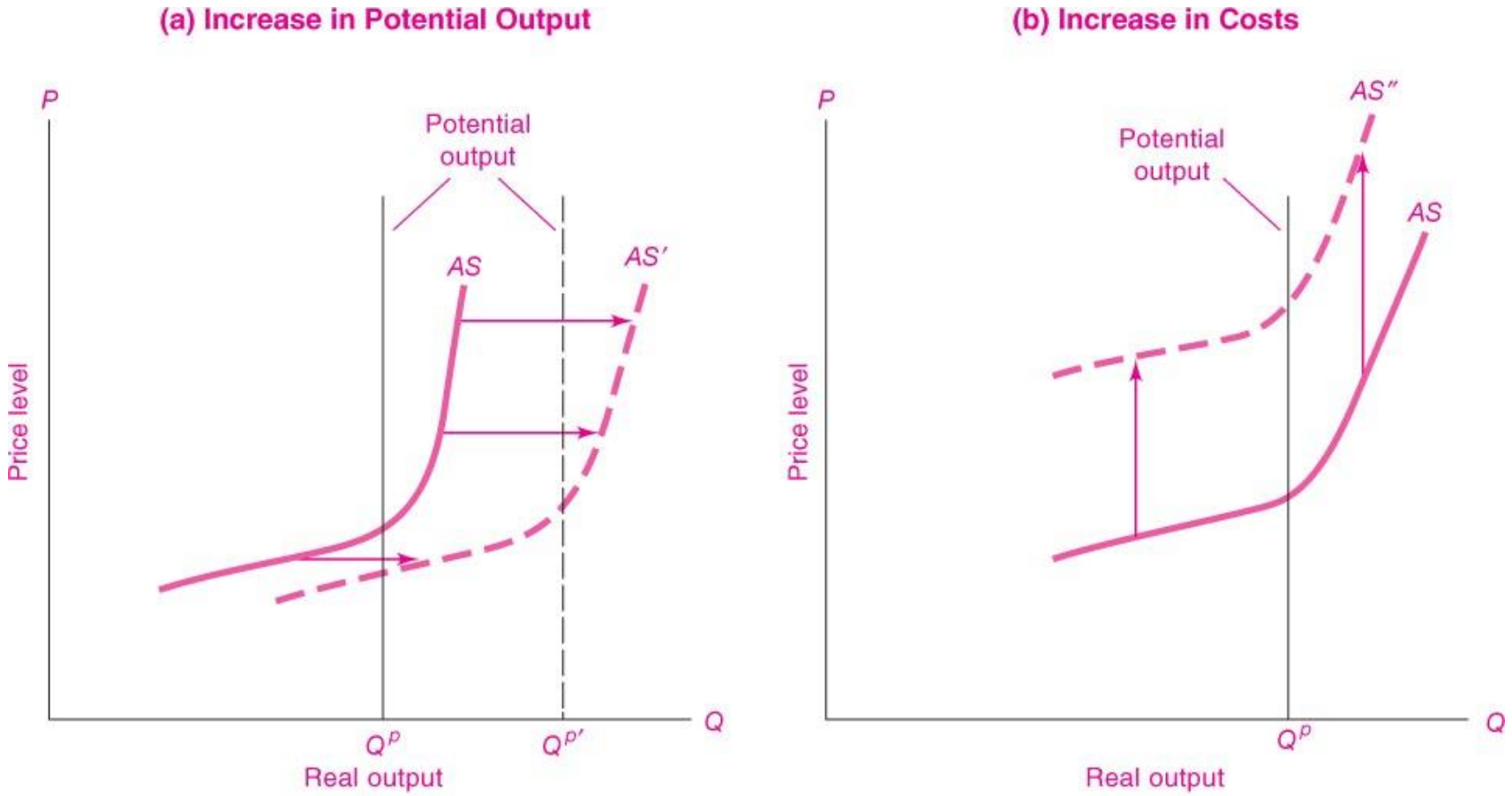


FIGURE 29-1. How Do Growth in Potential Output and Cost Increases Affect Aggregate Supply?

Potential output growth occurs without increasing production costs. The AS curve moves to the right, up to AS'.

If production costs rise, but the potential output remains unchanged, the AS curve shifts vertically upwards, to AS".

In Reality, Aggregate Supply Shifts Combine Cost Increases and Increased Potential Output

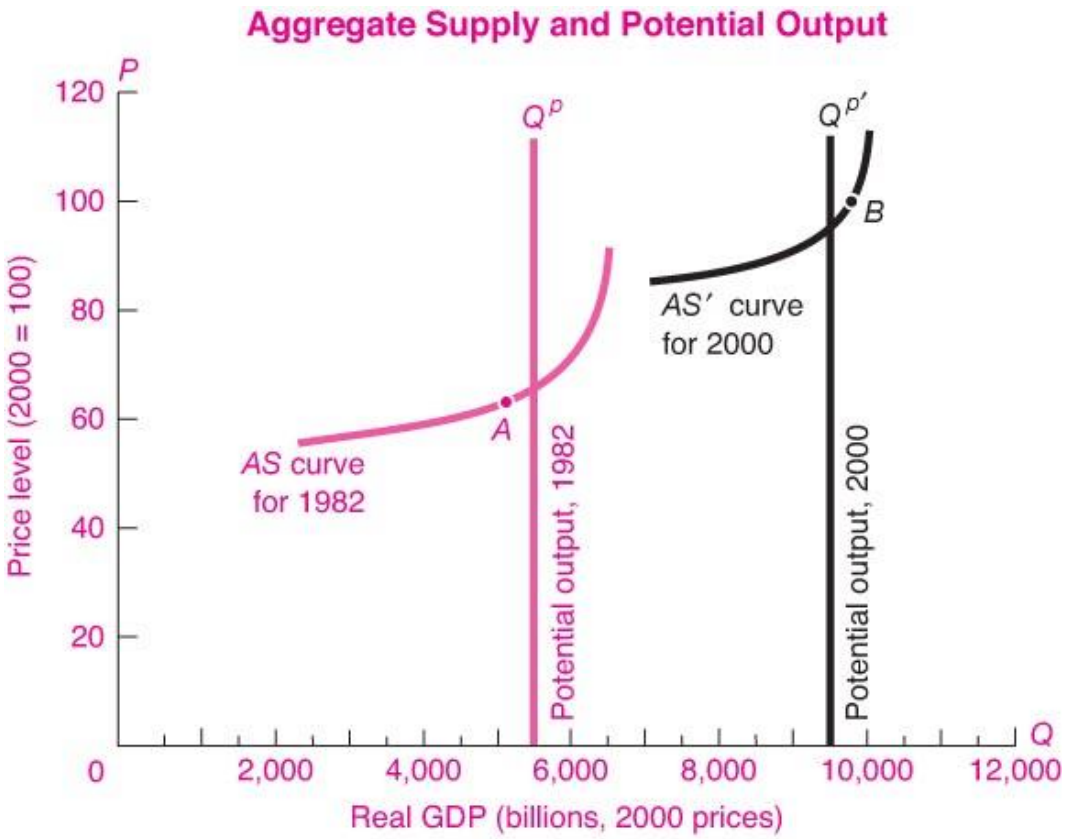


FIGURE 29-2. In Reality, Aggregate Supply Shifts Combine Cost Increases and Increased Potential Output

Between 1982 and 2000, potential output grew due to increases in capital and labor inputs along with technological improvements, shifting out the *AS* curve. At the same time, increases in production costs shifted up the *AS* curve. The net effect was to shift the *AS* curve upward and to the right.

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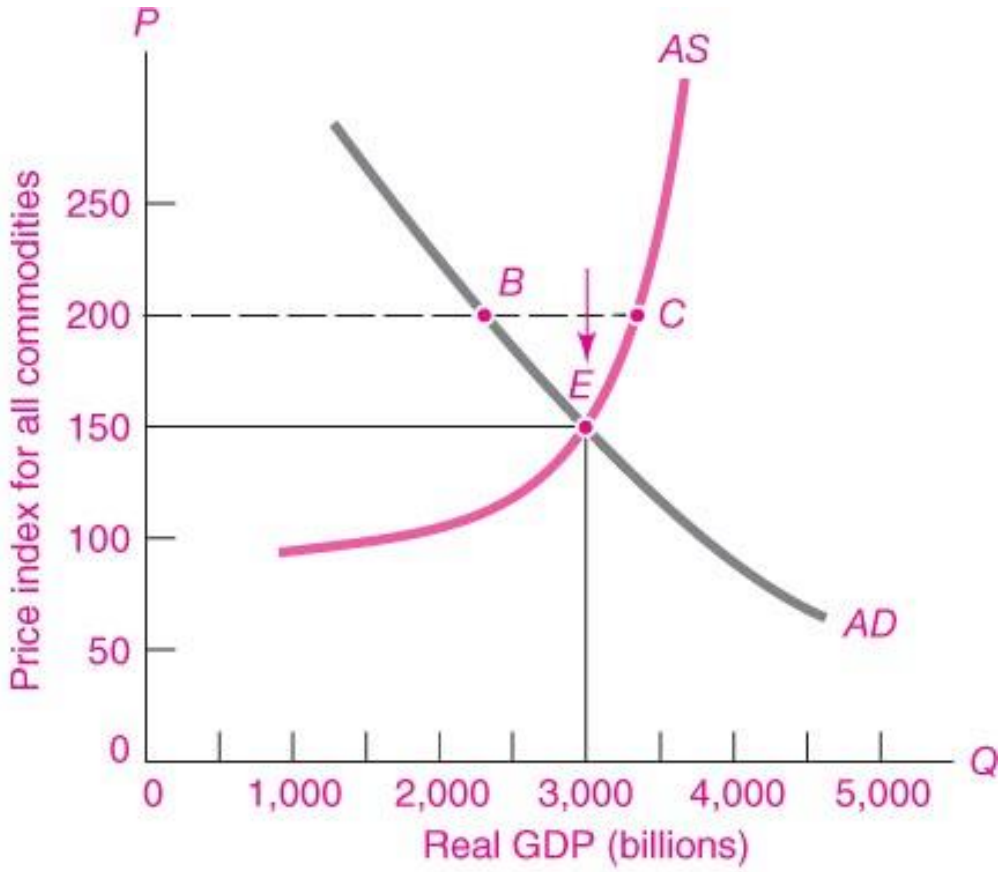

FIGURE 19-6. Aggregate Price and Output Are Determined by the Interaction of Aggregate Supply and Demand

In an economic system, the equilibrium is determined by the intersection between aggregate demand (AD) and aggregate supply (AS). Their meeting determines the equilibrium level of the outcome produced by the nation (real GDP) and the price level (price index).