

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.

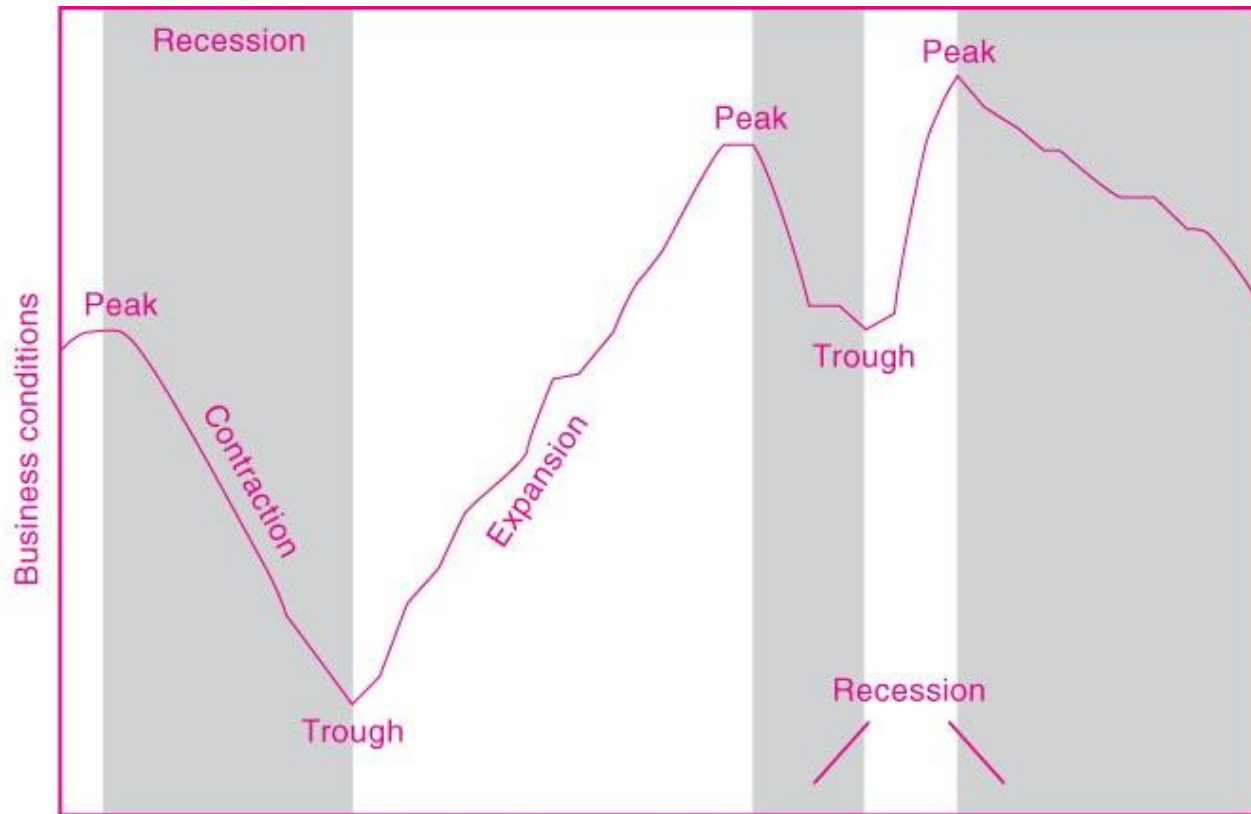


FIGURE 22-1. A Business Cycle, like the Year, Has Its Seasons

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.)

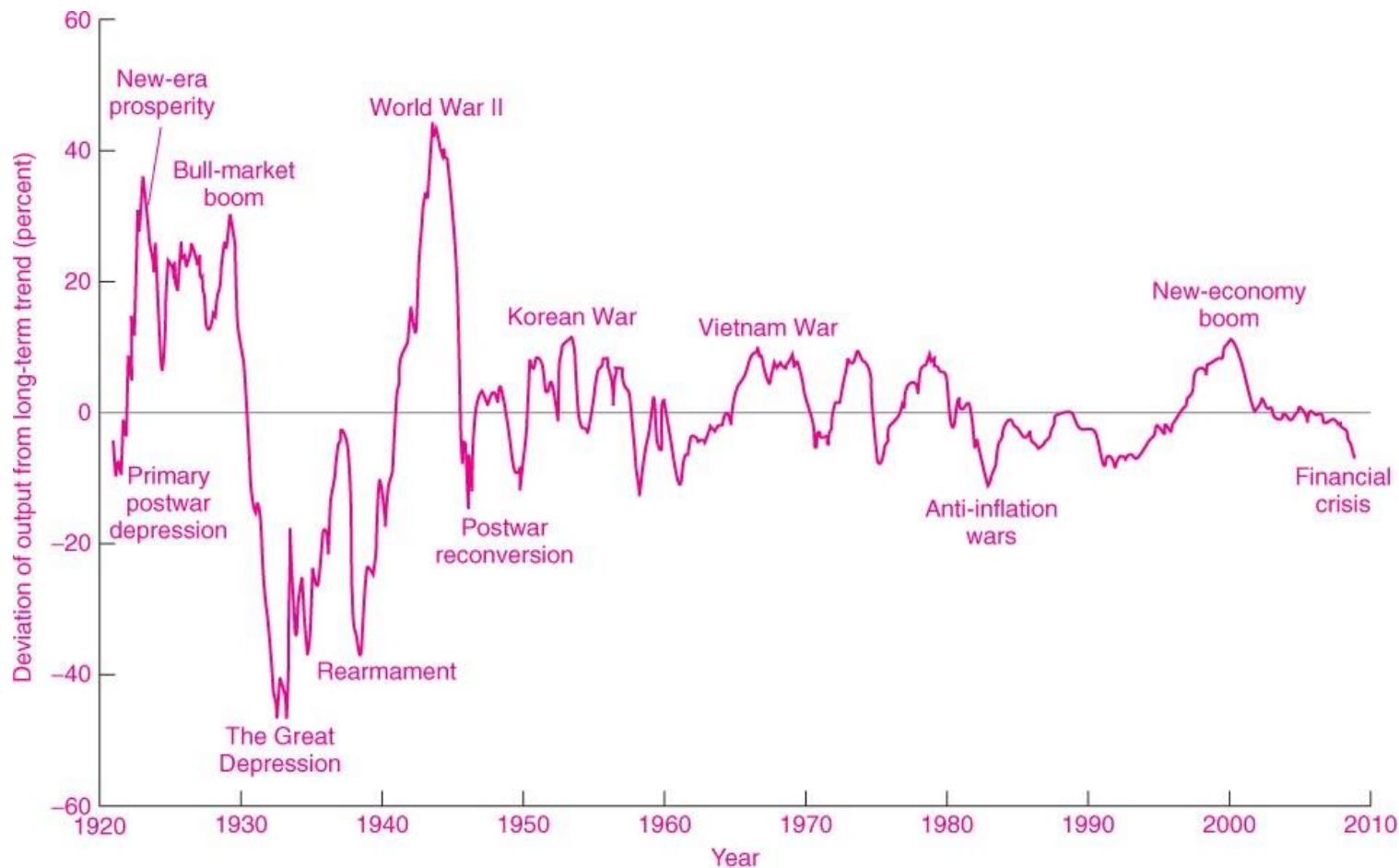


FIGURE 22-2. Business Activity since 1919

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

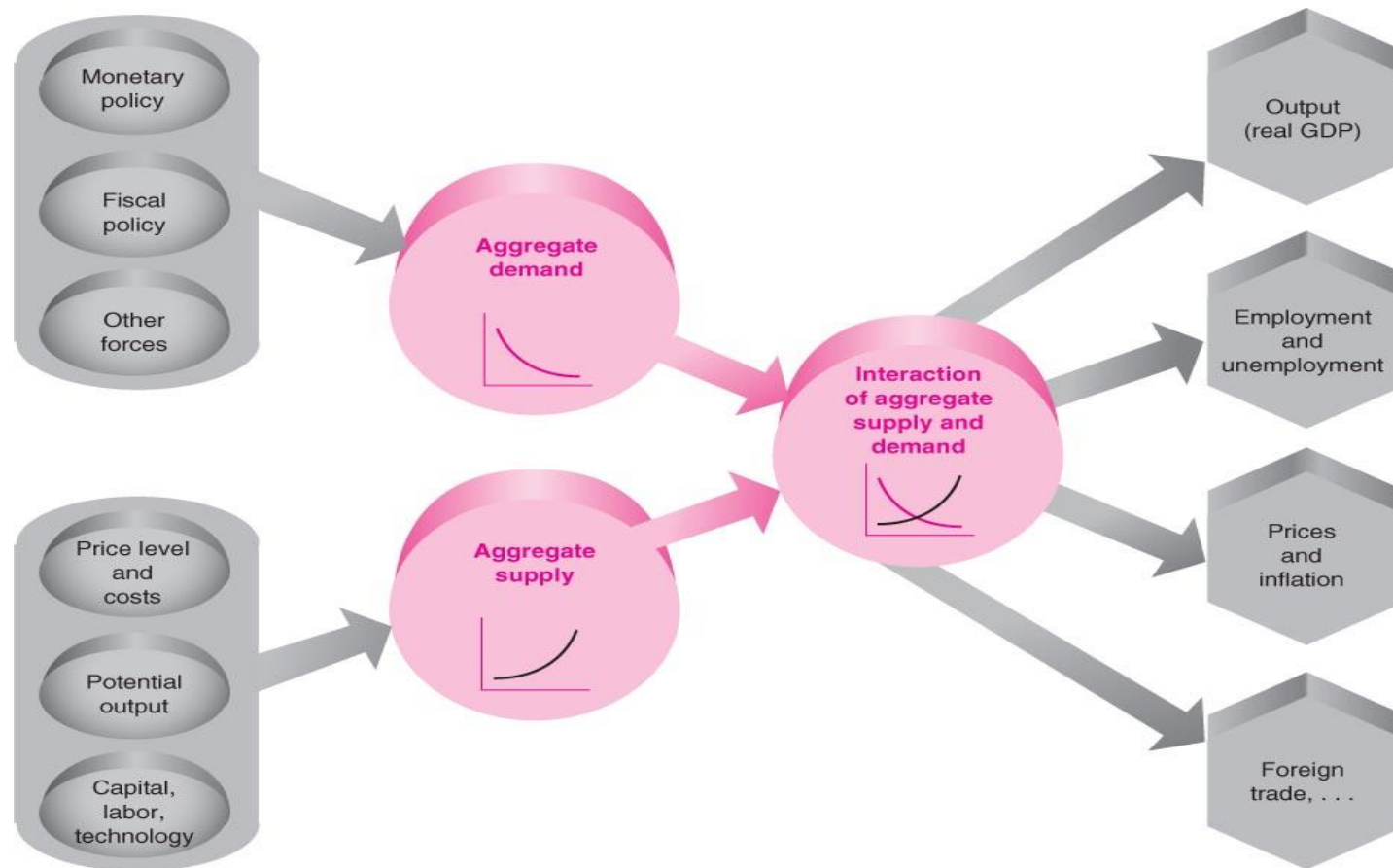


FIGURE 19-5. Aggregate Supply and Demand Determine the Major Macroeconomic Variables

EQUILIBRIUM BETWEEN DEMAND AND SUPPLY

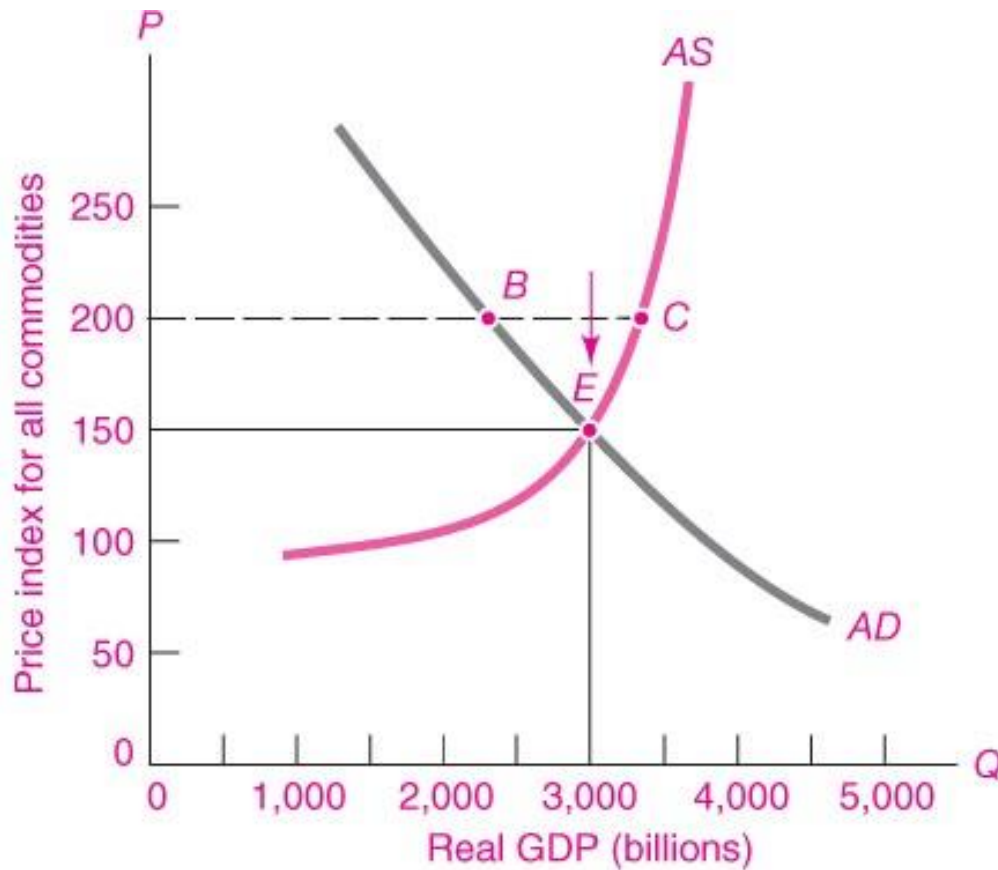


FIGURE 19-6. Aggregate Price and Output Are Determined by the Interaction of Aggregate Supply and Demand

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

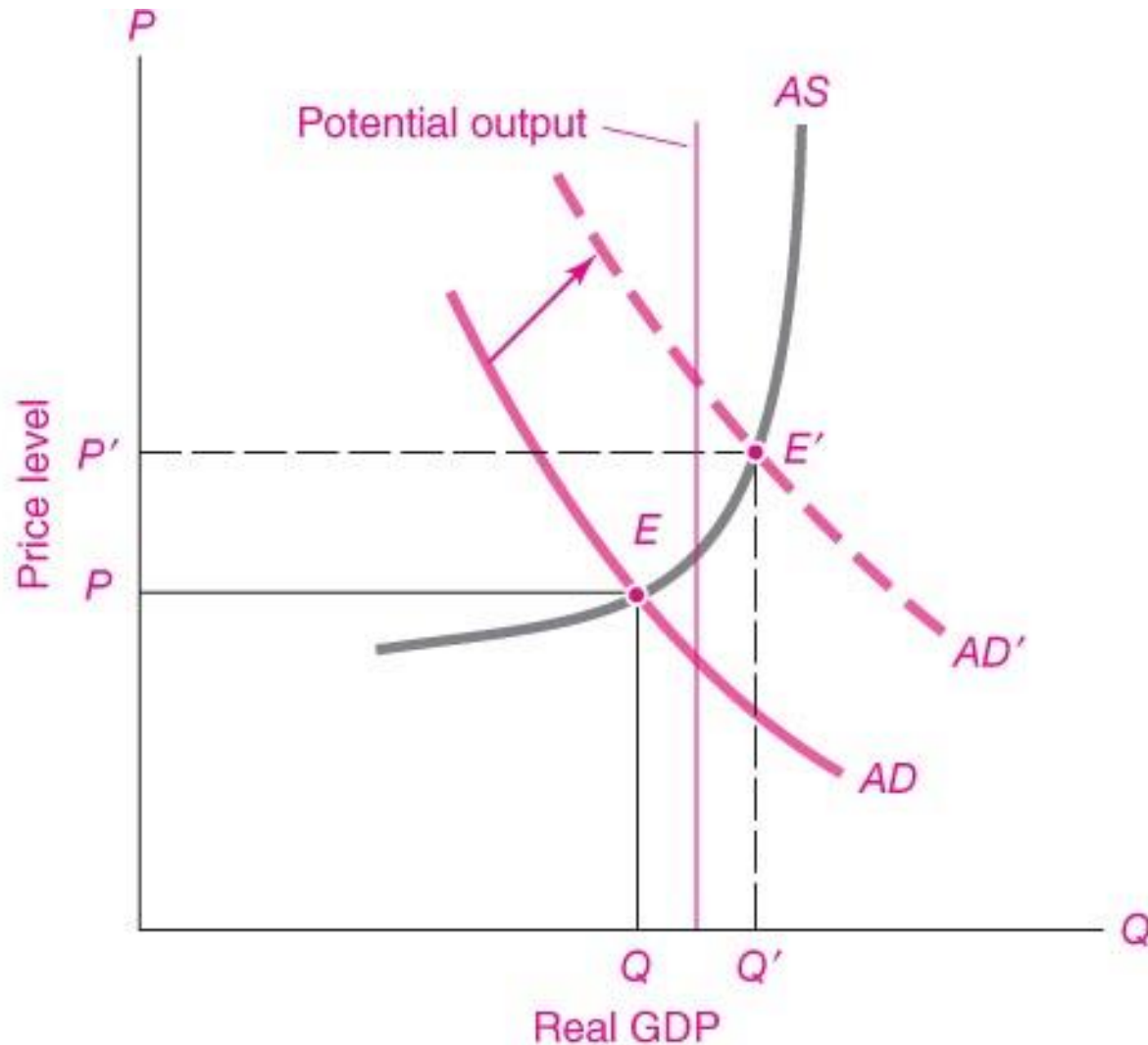


FIGURE 19-7. Wartime Boom Is Propelled by Increasing Aggregate Demand

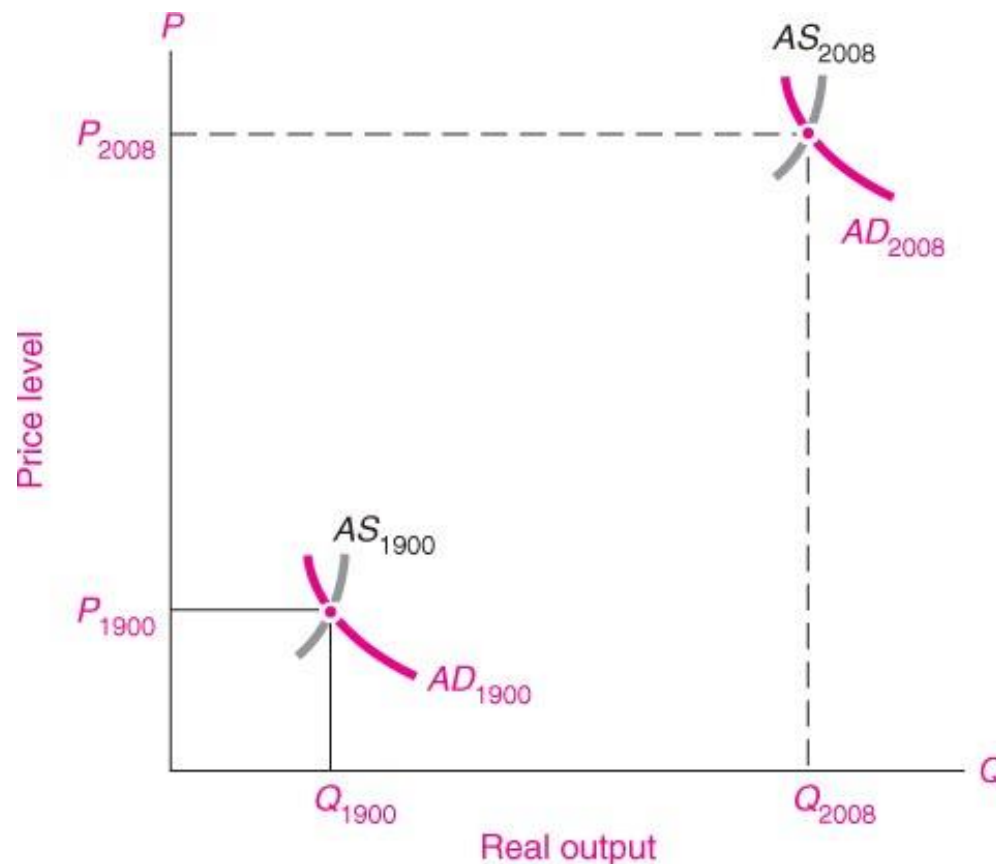
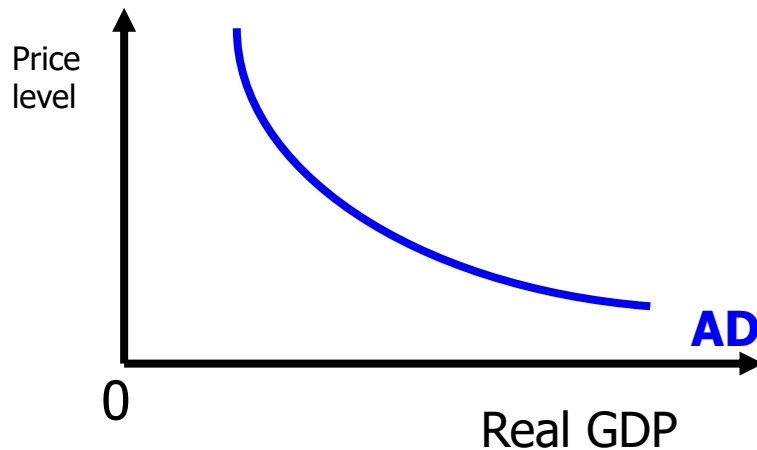


FIGURE 19-8. Growth in Potential Output Determines Long-Run Economic Performance

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

$$DA = C + I + G + X$$

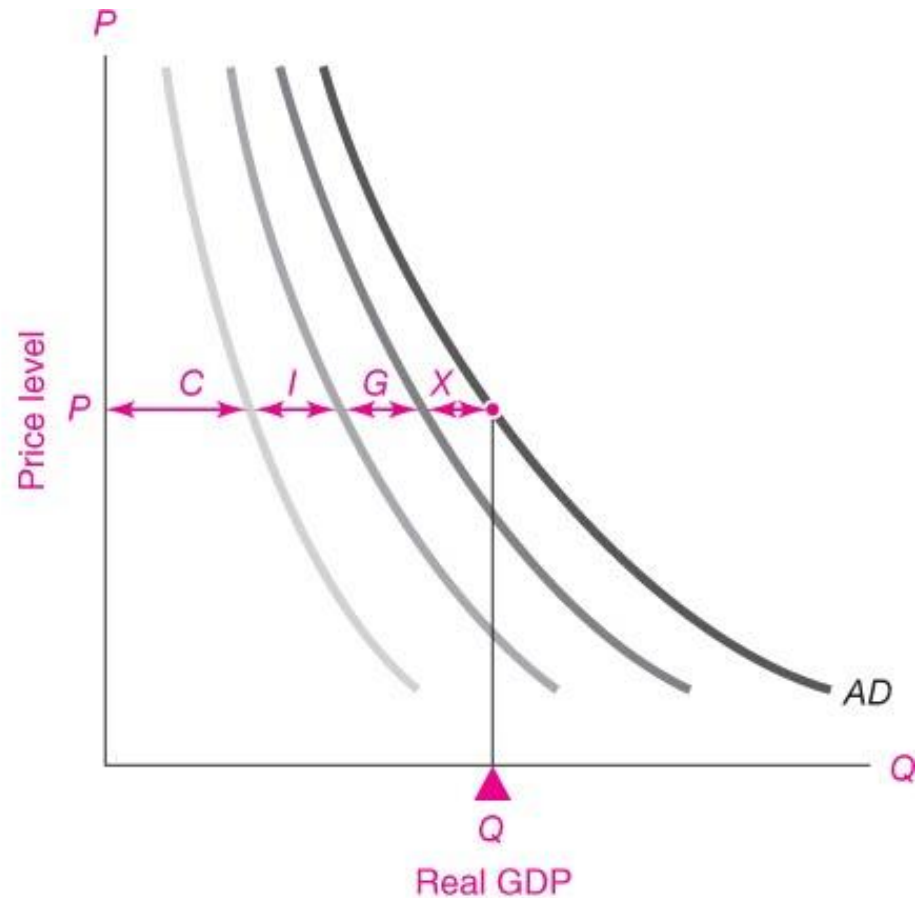
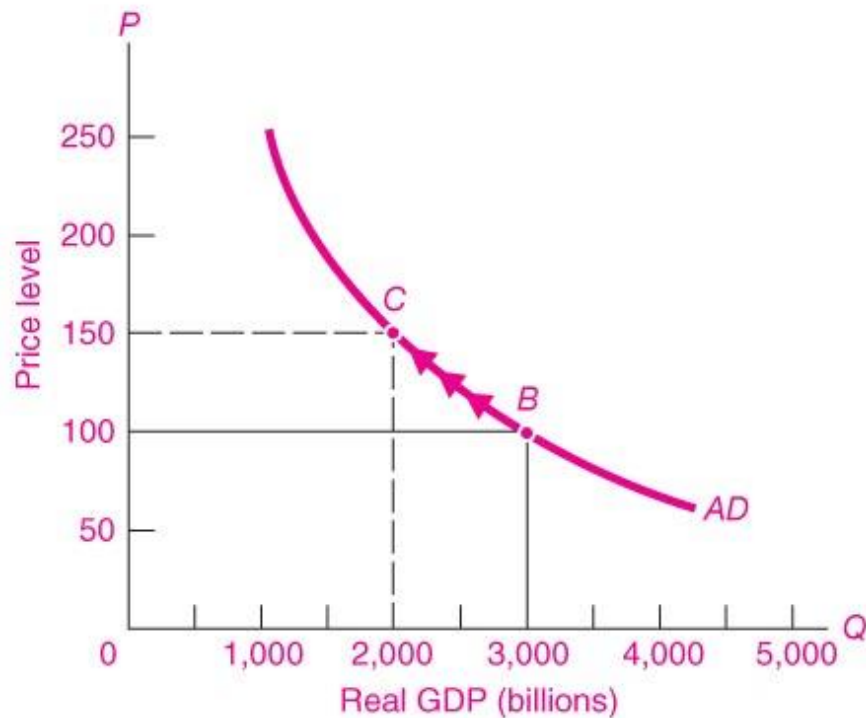


FIGURE 22-3. Components of Aggregate Demand

Aggregate Demand

Movements along and shifts of the aggregate demand

(a) Movements along the Aggregate Demand Curve



(b) Shifts of Aggregate Demand

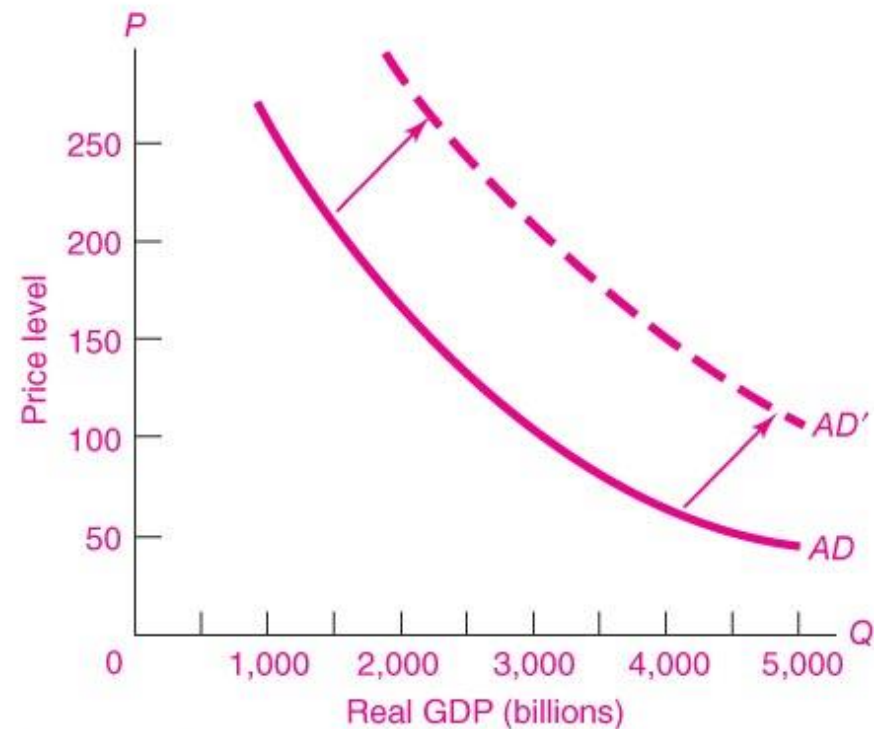


FIGURE 22-4. Movement along vs. Shifts of the Aggregate Demand Curve

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

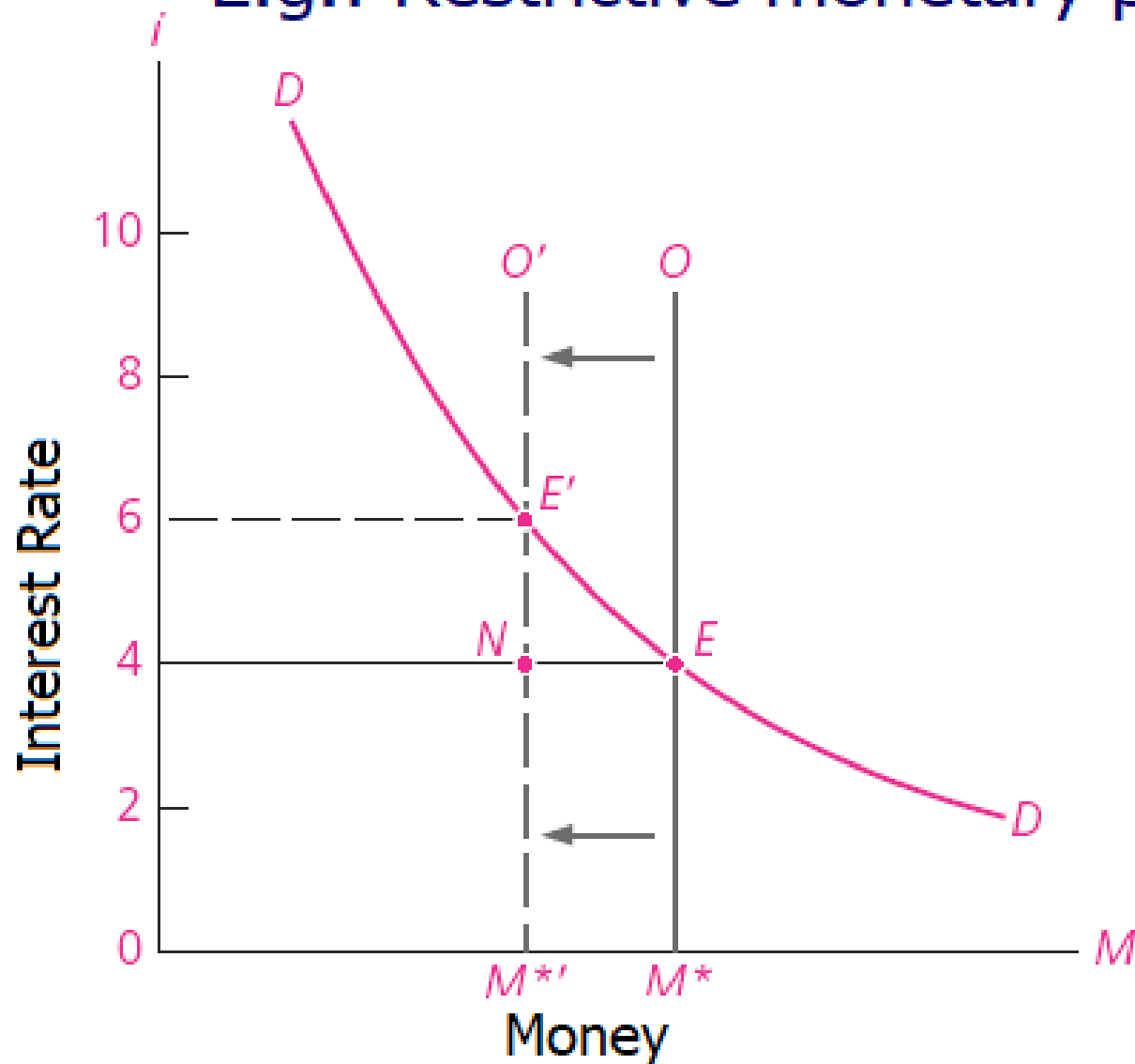
(foreign goods become more convenient)

**The quantity demanded
decreases from point B to point C**

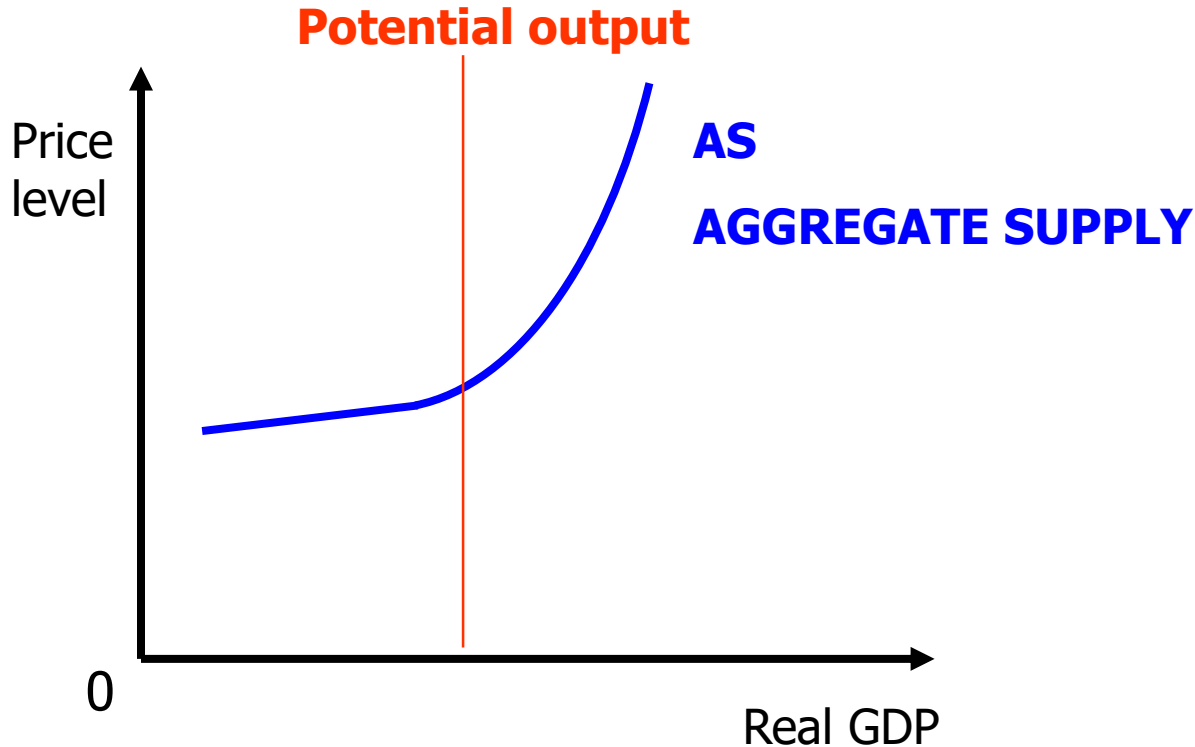
Shifts of the Aggregate Demand: Examples

- 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

E.g.: Restrictive monetary policy



Aggregate supply



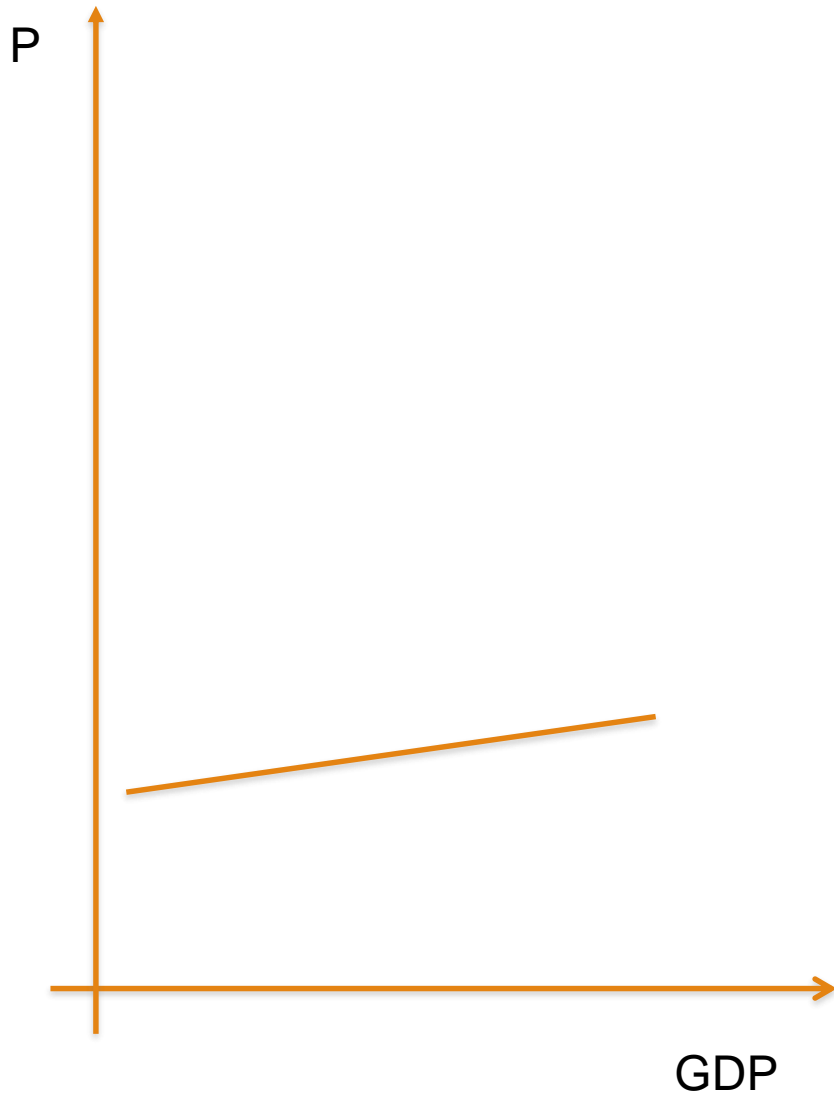
Aggregate supply describes the behavior of the production side of the economy. The aggregate supply curve, or AS curve, is the schedule showing the level of total national output that will be produced at each possible price level, other things held constant (with high prices companies would like to sell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

Shape of Aggregate supply

Two different shapes => short and long run

- **Keynesians (short run):** corresponds to a situation in which costs of productive factors (e.g., wages) are "sticky" (not flexible). In the short run wages are sticky because they level is negotiated for coming years through collective bargaining. This frictions entail that wages and production costs does not adjust to compensate excess/lack of demand productive factors and there could be an under/over exploitation of productive factors (i.e., the economy is far from the potential output). This situation is described by an AS curve relatively flat (horizontal), for which, e.g., the increasing in AD, despite entails a greater exploitation of productive factors, do not generate high pressures on enterprises to rise prices because the costs of production factors are generally sticky. This implies the effectiveness of Keynesian policies (e.g. increase in aggregate demand).
- **Classical economists (long run):** corresponds to a situation when all the costs of the factors of production can vary. Possibilities for wages and the costs of other productive factors to adjust on the bases of increasing or decreasing demand for goods and services entails (1) that enterprises need to change the prices of goods and services sold in the market according the variation of production costs. Moreover, the flexibility of wages entails (2) that the level of full employment is always reached following the wage adjustment. This situation is described by an AS curve relatively vertical: (1) markets are efficient, they respond automatically to changes in demand and prices; (2) the AS corresponds to the potential output as the economy is always close to full employment and the full exploitation of productive capacity (without state intervention).

Short-Run Aggregate Supply (Keynesians)



In the **short run**, the supply curve has a positive slope: as the quantities demanded increase, firms respond by raising prices (slightly), but (since they are far from potential output) they have unexploited production capacity and also react by increasing production. They do not need to significantly raise prices because in the short run the increasing exploitation of production factors does not imply an increase in production costs because they are "sticky" (e.g., the adjustment of wages is not immediate because it is subject to national collective bargaining).

If DA increases, GDP grows and generates employment.

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

In the **long run**, the supply curve is given by a vertical line, in which if the aggregate demand increases there is no increase in the quantities produced but only an increase in prices.

There is no friction: if the AD increases, wages and other costs are adjusted.

Output reaches the "natural" level (**potential output**).

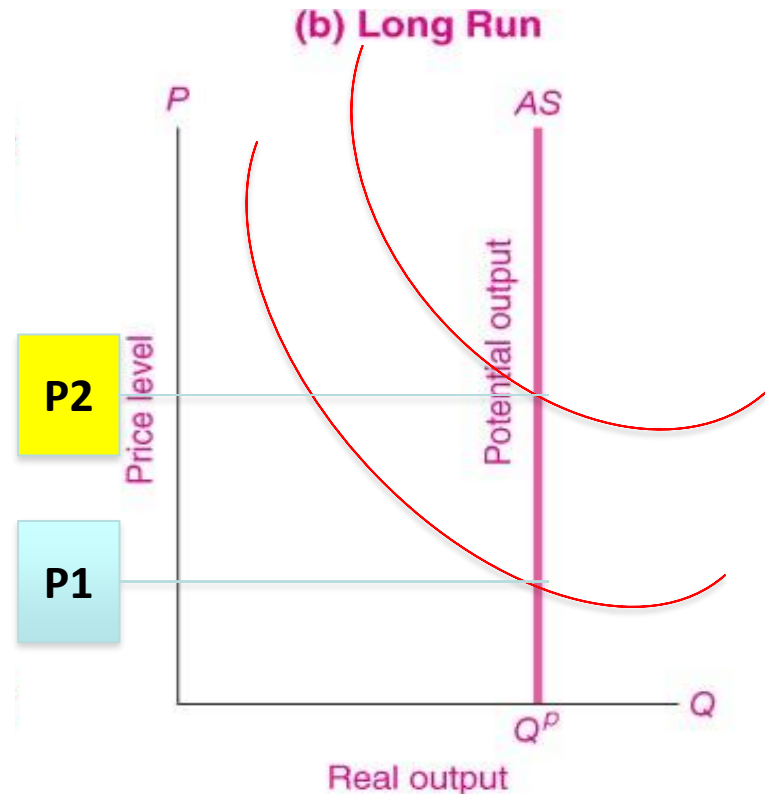
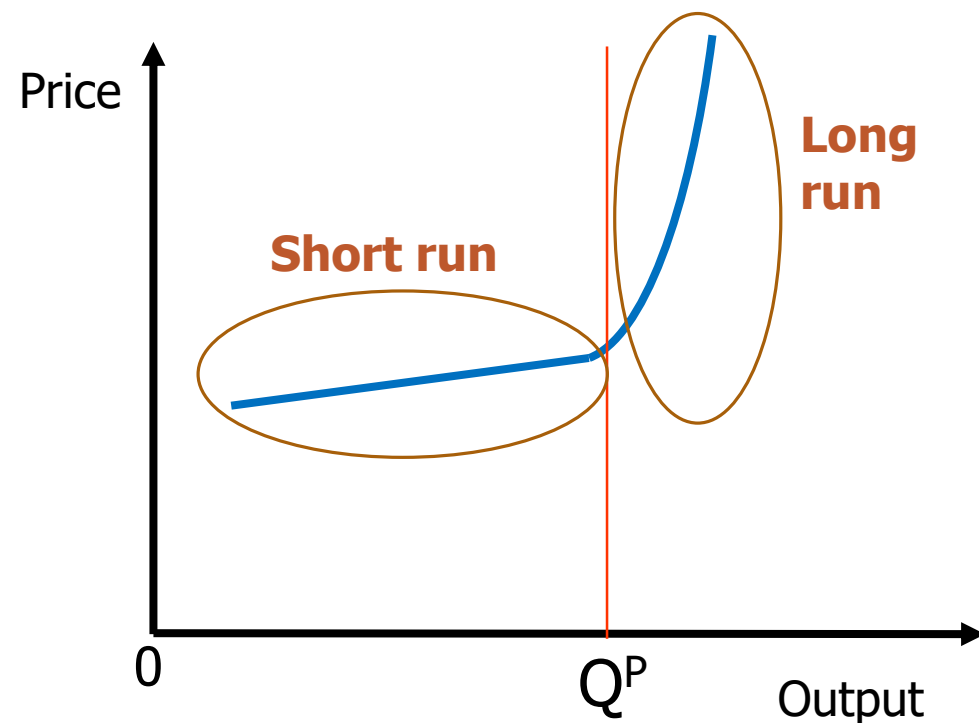


FIGURE 29-3. AS Is Upward-Sloping in the Short Run but Turns Vertical in the Long Run

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.

Aggregate Supply



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:

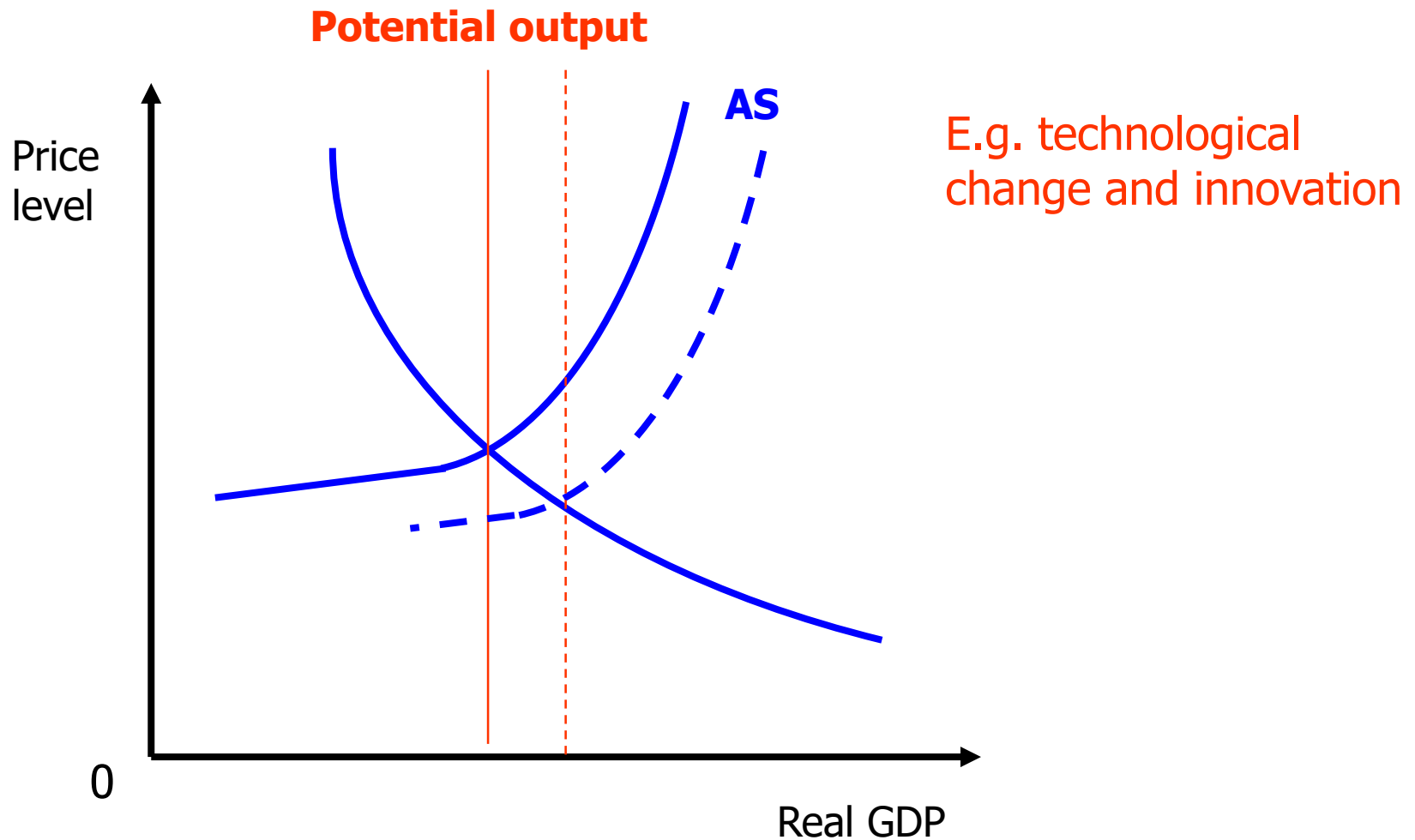
1. level of the **potential product** (quality and quantity of workforce, availability of factors, technical progress, etc ...)
2. **production costs** (if production costs rise, companies produce goods only at higher prices)

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

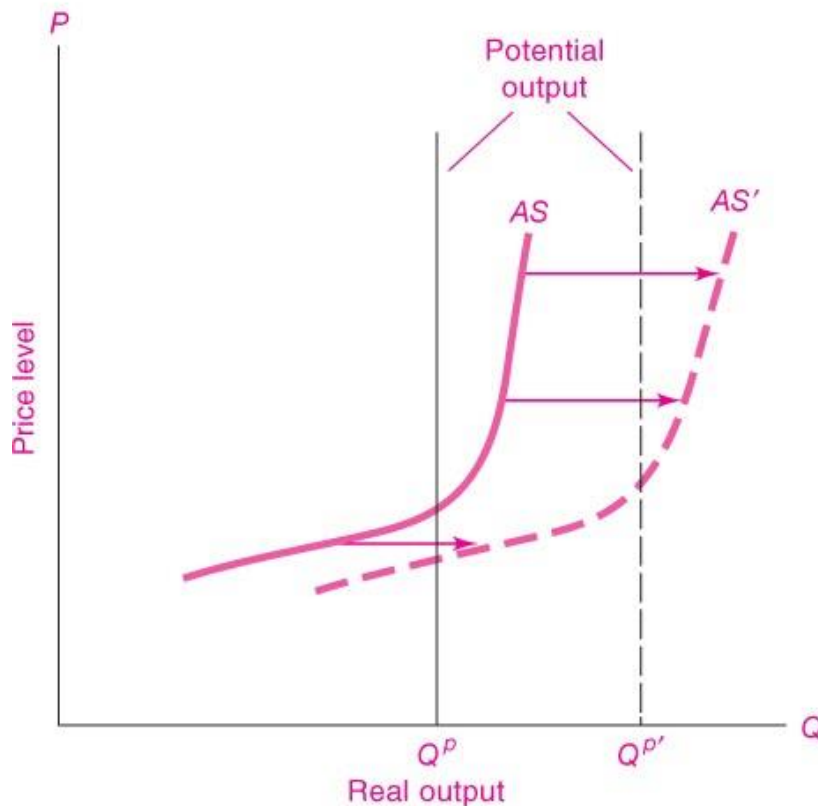
In the **long run**, **economic growth** is due to increases in **AS** and **potential output** (remember the production-possibility frontier)



Shifts of the aggregate supply

How does the growth of **potential output** affect aggregate supply?

(a) Increase in Potential Output



How do increases in **production costs** affect aggregate supply?

(b) Increase in Costs

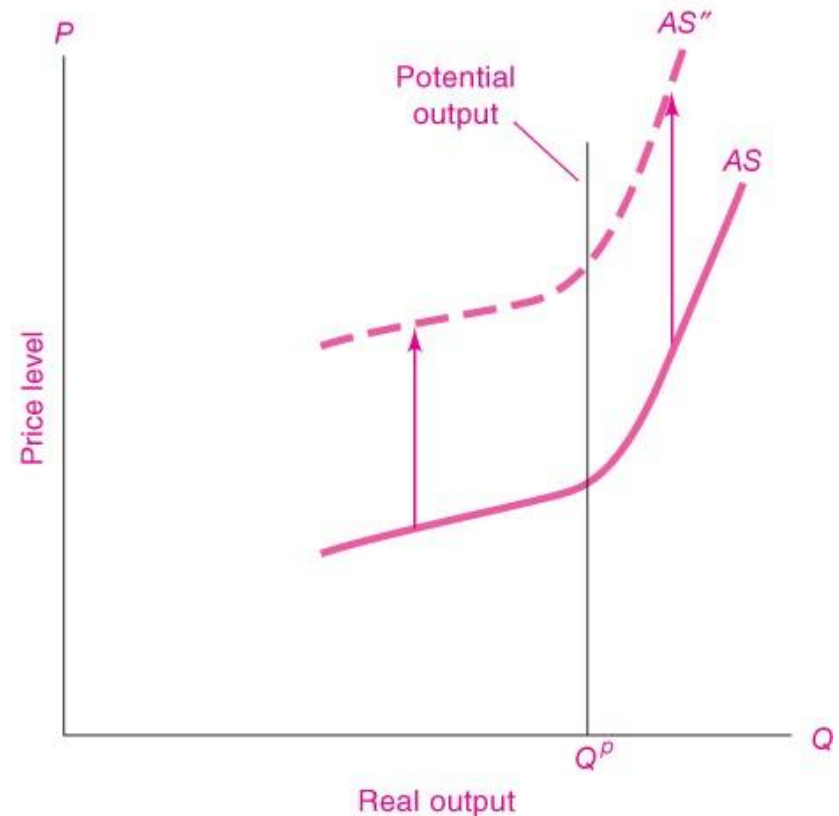


FIGURE 29-1. How Do Growth in Potential Output and Cost Increases Affect Aggregate Supply?

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

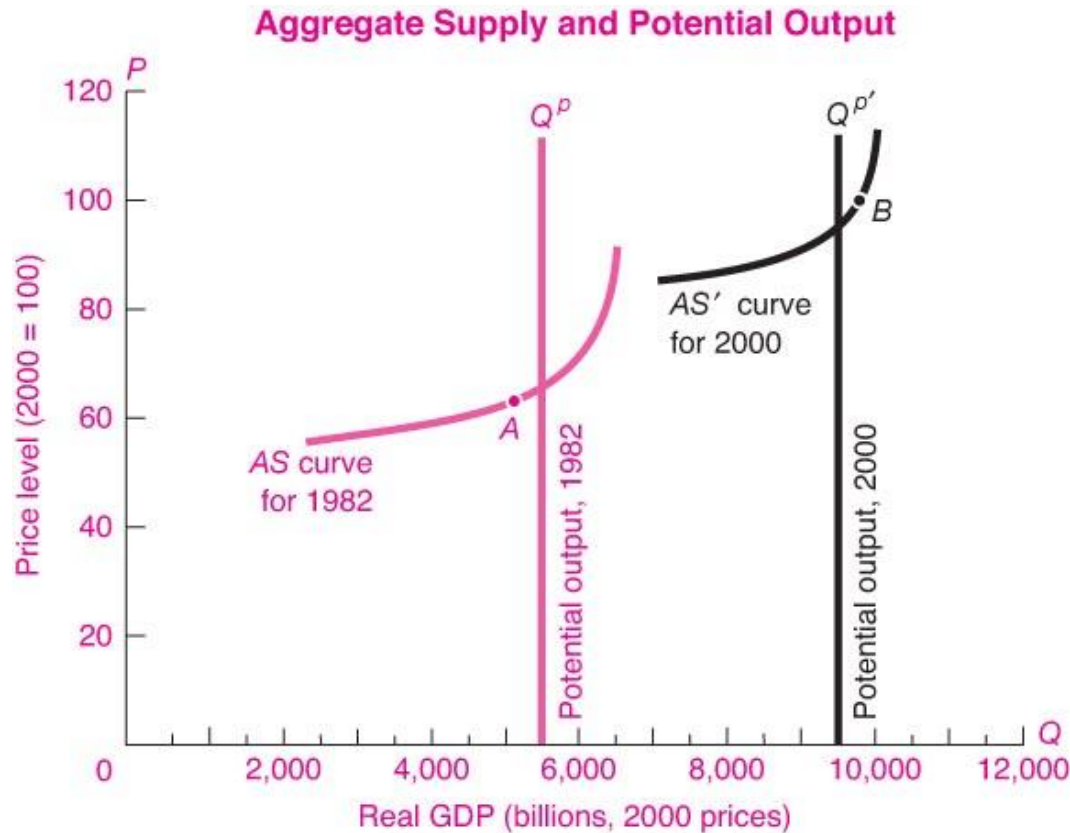


FIGURE 29-2. In Reality, Aggregate Supply Shifts Combine Cost Increases and Increased Potential Output

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.

To RECAP

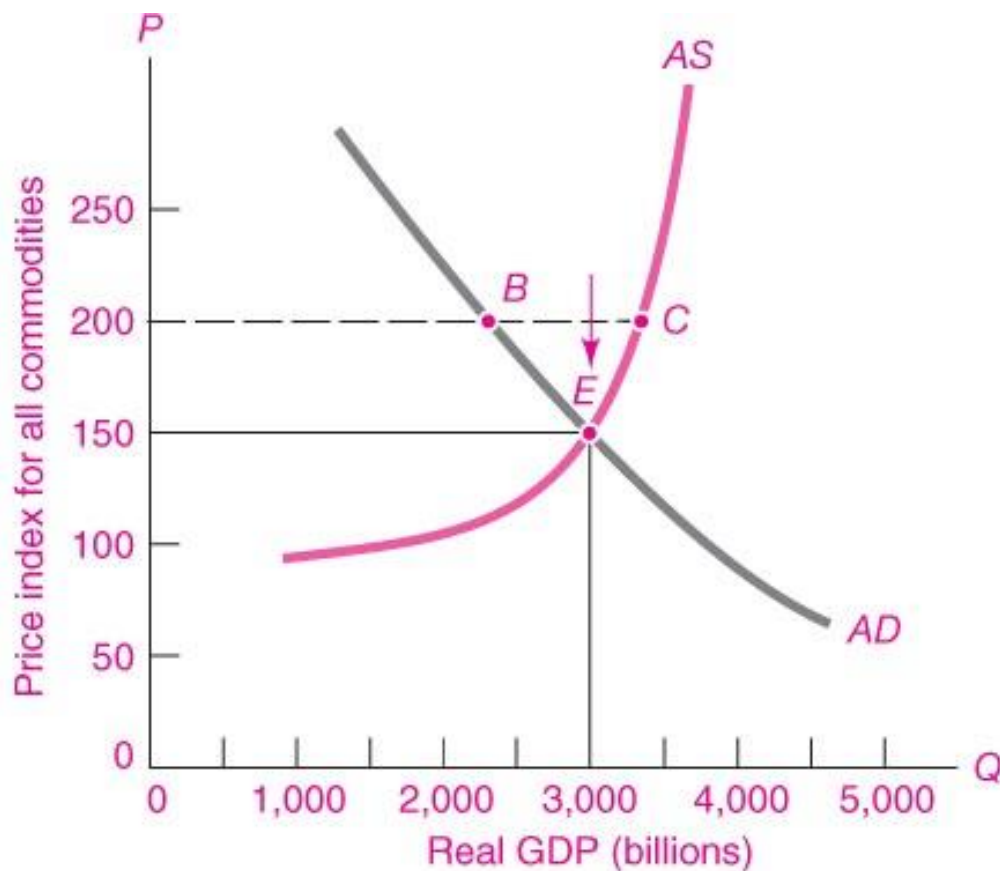


FIGURE 19-6. Aggregate Price and Output Are Determined by the Interaction of Aggregate Supply and Demand

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).