

# Lecture 10:

## THE AD-AS MODEL

Reference: Chapter 8

### LEARNING OBJECTIVES

1. What determines the shape of the aggregate demand (AD) curve and what factors shift the entire curve.
2. What determines the shape of the aggregate supply (AS) curve, and what factors shift the entire curve.
3. How the equilibrium price level and real GDP are determined.
4. How the economy arrives at its long run equilibrium.
5. Equilibrium vs full-employment GDP.

## I. Introduction to AD-AS Model

A. AD-AS model is a variable price model. The aggregate expenditures model in Chapters 7 assumed constant prices.

B. AD-AS model provides insights on inflation, unemployment and economic growth.

II. Aggregate demand is a schedule that shows the various amounts of real domestic output that domestic and foreign buyers will desire to purchase at each possible price level.

A. The aggregate demand curve is shown in Figure 8-1.

1. Inverse relationship between price level and domestic output.
  
2. The explanation of the inverse relationship is not the same as for demand for a single product, which centered on substitution and income effects.
  - a. Substitution effect doesn't apply in the aggregate case, since there is no substitute for "everything."
  - b. Income effect also doesn't apply in the aggregate case, since income now varies with aggregate output.
  
3. What is the explanation of inverse relationship between price level and real output in aggregate demand?
  - a. Real balances effect:
  - b. Interest-rate effect:
  - c. Foreign trade effect:

## B. Determinants of AD:

“Other things” (besides price level) that can cause a shift or change in AD.

1. Changes in consumer spending, which can be caused by changes in several factors.
  - a. Consumer wealth
  - b. Consumer expectations
  - c. Household indebtedness
  - d. Taxes
2. Changes in investment spending, which can be caused by changes in several factors.
  - a. Real Interest rates

b. Expected returns, which are a function of

- Expected future business conditions
- Technology
- Degree of excess capacity
- Business taxes

3. Changes in government spending.

4. Changes in net export spending unrelated to price level, which may be caused by changes in other factors such as

- a. National income abroad
- b. Exchange Rates

III. Aggregate supply is a schedule or curve showing the level of real domestic output available at each possible price level.

A. AS in the long run, *which in macroeconomics is a period in which nominal wages (and other resource prices) have to fully adjust to changes in the price level*, is vertical at the economy's full-employment output (Fig 8-3).

1. The curve is vertical because in the long run resource prices adjust to changes in the price level, leaving no incentive for firms to change their output.

B. AS in the short run, a period in which nominal wages (and other resource prices) do NOT respond to changes in the price level, is upward sloping (Figure 8-4).

1. The lag between product prices and resource prices makes it profitable for firms to increase output when the price level rises.

2. Per-unit production costs underlie the short-run AS curve.

3. To the left of full-employment output, the curve is relatively flat. The relative abundance of idle inputs means that firms can increase output without substantial increases in production costs.

4. To the right of full-employment output the curve is relatively steep. Shortages of inputs and capacity limitations make it difficult to expand real output as the price level rises.
5. References to “aggregate supply” in the remainder of the lecture apply to the short-run curve unless otherwise noted.

C. Determinants of AS:

Determinants are the “other things” besides price level that cause changes or shifts in AS ( Figure 8-5).

1. A change in input prices, which can be caused by changes in several factors.
  - a. Domestic resource prices
  - b. Prices of imported resources
  - c. Market power in certain industries



2. Changes in productivity  
(productivity = real output / input)  
can cause changes in per-unit  
production cost  
(per-unit production cost = total input  
cost / units of output).

3. Change in legal-institutional  
environment, which can be caused  
by changes in other factors.

- a. Business taxes and/or subsidies
- b. Government regulation

#### IV. Equilibrium: Real Output and the Price Level

A. Equilibrium price and quantity are found where the aggregate demand and supply curves intersect. (Fig 8-6)

B. Increases in aggregate demand cause demand-pull inflation (Figure 8-7).

1. Increases in aggregate demand increase real output and create upward pressure on prices, especially when the economy operates at or above its full employment level of output.

2. The increase in aggregate demand from  $AD_1$  to  $AD_2$  is partly absorbed in inflation ( $P_1$  to  $P_2$ ) and real output increases only from  $GDP_f$  to  $GDP_2$ .

C. Decreases in AD:

If the price level is downwardly inflexible, a decrease in AD may lead the economy to a recession- idle production capacity, cyclical unemployment and negative GDP gap. (Fig 8-8)

Prices don't fall easily. Some of the reasons are:

1. Wage contracts are not flexible so businesses can't afford to reduce prices.
2. Employers are reluctant to cut wages because of impact on employee effort, etc. Employers seek to pay efficiency wages – wages that maximize work effort and productivity, minimizing cost.
3. Minimum wage laws keep wages above that level.
4. Because of menu costs firms are reluctant to change prices.
5. Fear of price wars keeps prices from being reduced.

E. Leftward shift in curve illustrates cost-push inflation (Figure 8-9). Output declines and negative GDP gap occurs.

2. Increases in AS: Growth, full employment and relative price stability. (Figure 8-10).

## V. From Short-Run to Long-Run AS

A. Definition: Short run and long run.

1. For macroeconomics the short run is a period in which wages (and other input prices) do not respond to price-level changes.

a. Workers may not be fully aware of the change in their real wages due to inflation (or deflation) and thus have not adjusted their labor supply decisions and wage demands accordingly.

b. Employees hired under fixed wage contracts must wait to renegotiate regardless of changes in the price level.

B. The short-run aggregate supply curve  $AS_1$ , is constructed with three assumptions. (see Figure 8-11a)

1. The initial price level is given at  $P_1$ .
2. Nominal wages have been established on the expectation that this specific price level will persist.
3. The price level is flexible both upward and downward.
4. The short-run AS is drawn by joining a3, a1 and a2.g

C. The long-run aggregate supply (Fig 8-11b) is a vertical line formed by joining long-run equilibrium points  $b_1, a_1, c_1$ .

D. The long-run equilibrium occurs at point a where aggregate demand intersects both the vertical long-run supply curve and the short-run supply curve at full employment output. (Fig 8-12)

V. Equilibrium versus Full-employment DP

A. A recessionary gap is the amount by which the equilibrium GDP falls short of full-employment GDP. (Fig. 8-13)

1. To eliminate the recessionary gap AD or AS has to be increased

B. An inflationary gap is the amount by which the equilibrium GDP exceeds the full-employment GDP. (Fig. 8-13)

1. To eliminate the inflationary gap AD or AS has to be decreased

## **V. LAST WORD: Why Is Unemployment in Europe So High?**

A. Several European economies have had high rates of unemployment in the past several years, even before their recessions.

1. In 2000: France, 9.3 percent; Italy, 10.4 percent; Germany, 7.8 percent; and Spain, 11.3
2. These rates compare to a 6.8 percent unemployment rate at the same time in Canada.

B. Reasons for high European unemployment rates:

1. High natural rates of unemployment exist due to frictional and structural unemployment. This results from government policies and union contracts, which increase the costs of hiring and reduce the cost of being unemployed.
  - a. High minimum wages exist.

- b. Generous welfare benefits exist for unemployed.
  - c. Restrictions against firings discourage employment.
  - d. Thirty to forty days of paid vacation and holidays boost the cost of hiring.
  
  - e. High worker absenteeism reduces productivity.
  - f. High employer cost of fringe benefits discourages hiring.
2. Deficient aggregate demand may also be a cause as shown in Figure 8-7b. European governments have feared inflation and have not undertaken expansionary monetary or fiscal policies. If they did, aggregate demand would expand, and unemployment rates might drop without inflation.



3. Conclusion: Economists in Europe are not sure whether aggregate demand is near full-employment (Figure 7-13a) or is below full employment.