ECON 202 - MACROECONOMIC PRINCIPLES

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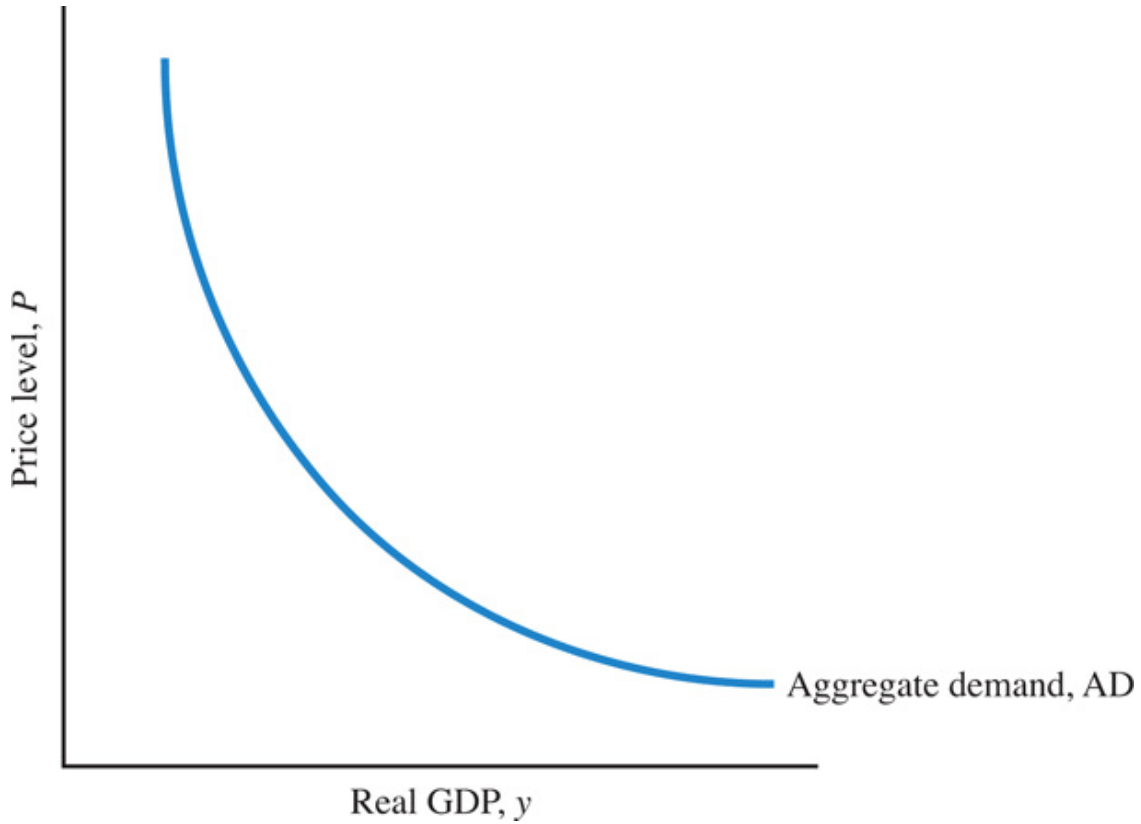
Chapter 9 - Aggregate Demand and Aggregate Supply

Aggregate Demand and Aggregate Supply - Topics

1. Explain the role sticky wages and prices play in economic fluctuations
2. List the determinants of aggregate demand
3. Distinguish between the short-run and long-run aggregate supply curves
4. Describe the adjustment process back to full employment

Aggregate Demand (AD)



- The aggregate demand curve slopes downward, indicating that the quantity of aggregate demand increases as the price level in the economy falls

Why is AD Downward Sloping

1. Wealth effect
2. Interest rate effect
3. The impact of foreign trade

What Shifts the AD Curve

- Money supply changes
- Changes in taxes
- Changes in government spending G
- Changes in HH, firm, or foreign demand
- Attention: changes in the price level do NOT shift the curve

Shifts in AD

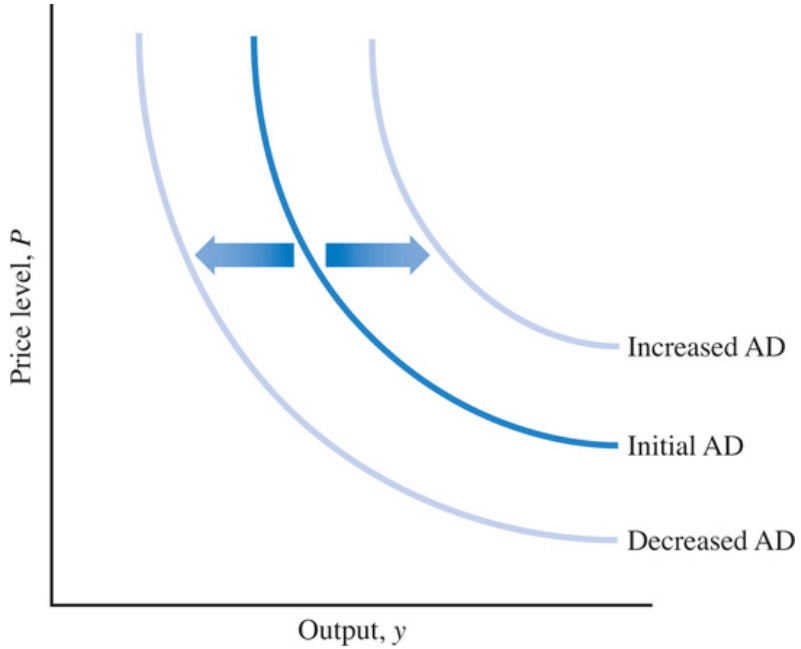
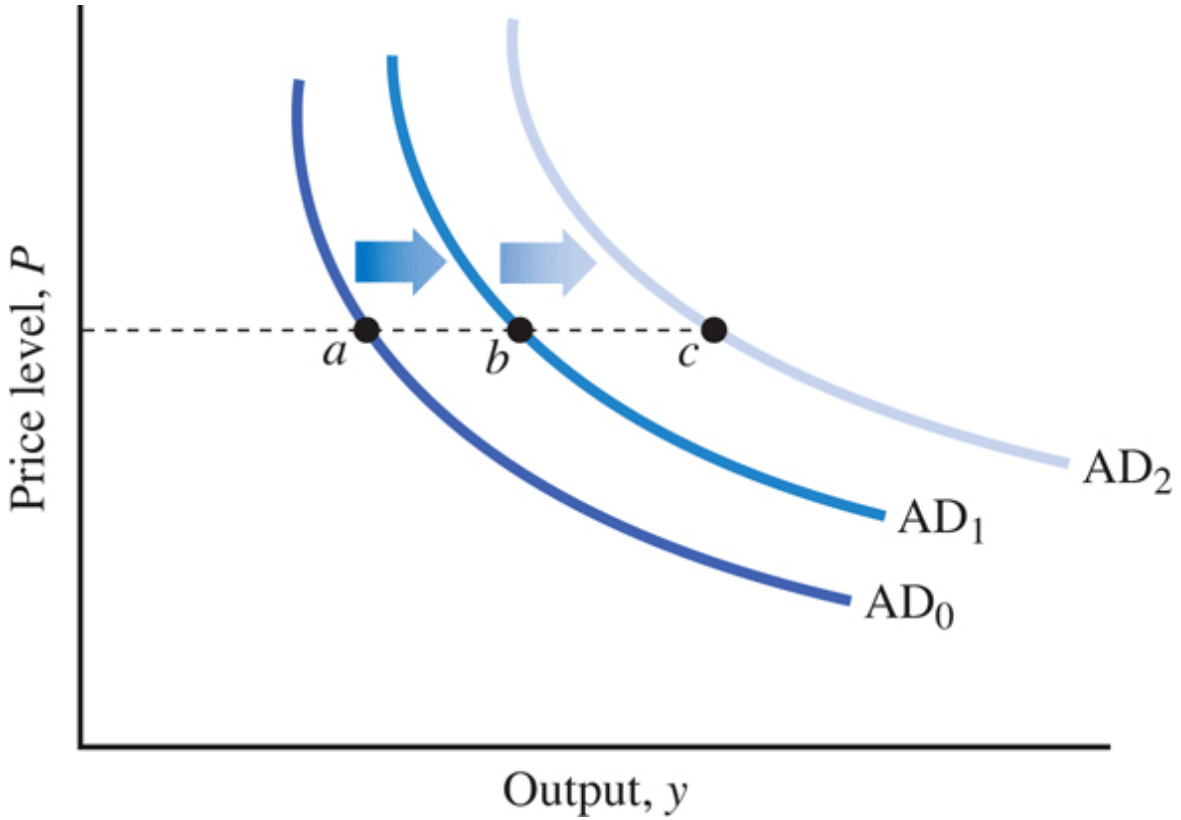


TABLE 9.1 Factors That Shift Aggregate Demand

Factors That Increase Aggregate Demand	Factors That Decrease Aggregate Demand
Decrease in taxes	Increase in taxes
Increase in government spending	Decrease in government spending
Increase in the money supply	Decrease in the money supply

Multiplier



Multiplier Mechanics

- The relationship between the level of income and consumption spending is called the consumption function:

$$C = C_a + b \times y$$

- C_a: autonomous consumption, or the amount of consumption spending that does not depend on the level of income
- $b \times y$: the part of consumption that depends on income:
  - b: marginal propensity to consume (MPC), or $MPC = \frac{\text{Additional Consumption}}{\text{Additional Income}}$
  - y: level of income in the economy
- Marginal propensity to save: $MPS = \frac{\text{Additional savings}}{\text{Additional Income}}$

Multiplier and MPC

TABLE 9.2 THE MULTIPLIER IN ACTION
The initial $10 million increase in aggregate demand will, through all the rounds of spending, eventually lead to a $25 million increase.

Round of Spending	Increase in Aggregate Demand (millions)	Increase in GDP and Income (millions)	Increase in Consumption (millions)
1	$10.00	$10.00	$6.00
2	6.00	6.00	3.60
3	3.60	3.60	2.16
4	2.16	2.16	1.30
.	.	.	.
Total	**$25.00**	**$25.00**	**$15.00**

Multiplier

- In this example the we have MPC =0.6
- So that after n years we have: $\$10 \times (0.6^0 + 0.6^1 + ... + 0.6^n)$
- If we play this infinitely often we have: $\$10 \times (0.6^0 + 0.6^1 + ... + 0.6^\infty)$
- which will be: $\$10 \times \frac{1}{1-0.6} = \$10 \times 2.5 = \$25$ in the long-run

Math Detail

- MPC is $0 < b < 1$, then

$$\sum_{i=0}^{n} b^i = b^0 + b^1 + b^2 + ... + b^n$$

and

$$b \times \sum_{i=0}^{n} b^i = b^1 + b^2 + ... + b^{n+1}$$

so that subtracting the second from the first expression we have

$$1 \times \sum_{i=0}^{n} b^i - b \times \sum_{i=0}^{n} b^i = b^0 - b^n$$

Math Detail (cont.)

and after collecting the sum we get

$$(1-b)\sum_{i=0}^{n} b^i = b^0 - b^n,$$

$$\rightarrow \sum_{i=0}^{n} b^i = \frac{b^0 - b^n}{1-b}.$$

We now let $n \rightarrow \infty$ and not that $b^0 = 1$ so that we have

$$lim_{n\rightarrow\infty} \sum_{i=0}^{n} b^i = \frac{1-b^\infty}{1-b} = \frac{1}{1-b},$$

because $lim_{n\rightarrow\infty} b^n = 0$ if $0 < b < 1$. So we now know that the infinity sum of b (or MPCs) is

$$b^0 + b^1 + b^2 + ... + b^\infty = \frac{1}{1-b},$$

which is the formula for the multiplier.

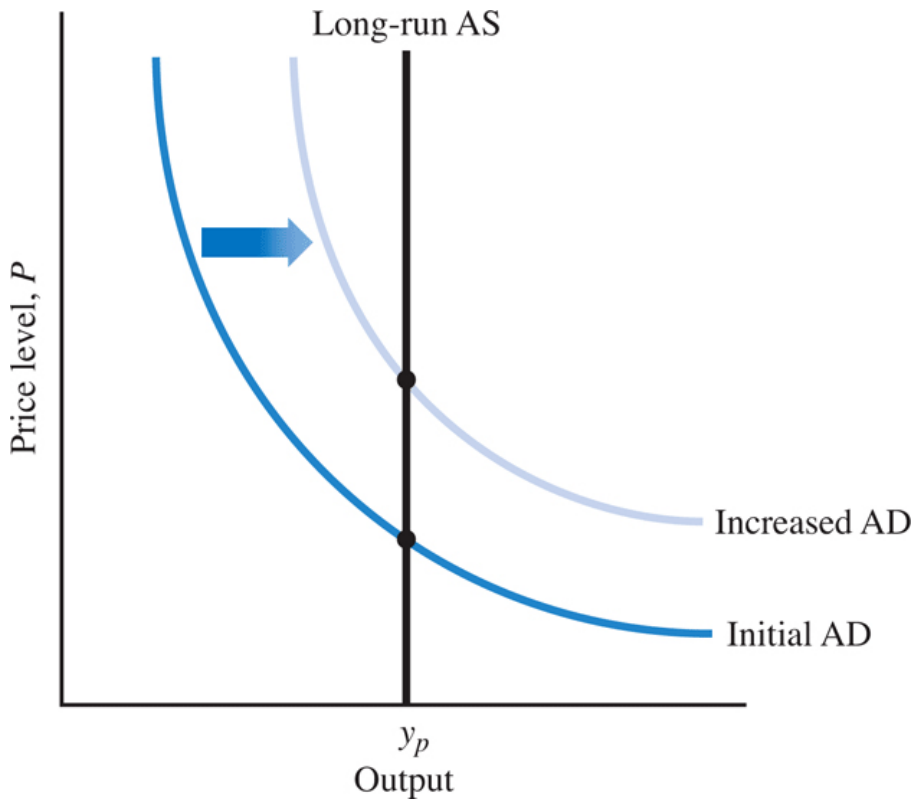
Aggregate Supply (AS)

- AS depicts relationship between the price level and the quantity of output supplied
- Long-run AS curve (classical AS)
- Short-run AS curve (Keynesian AS)
- Supply curve at full employment is:

$$Y^* = A^* \times F(K^*, L^*)$$

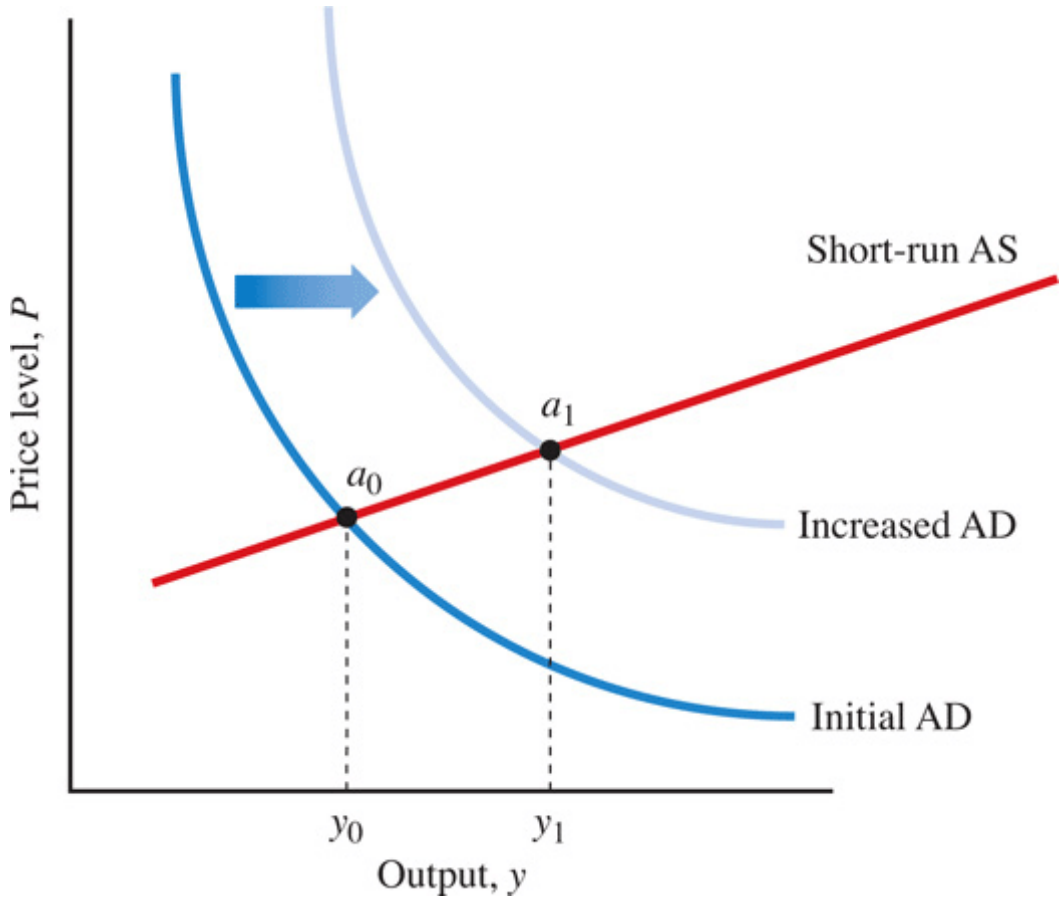
- Long-run supply is independent of prices and hence a vertical line
- Output depends solely on the supply factors—capital, labor—and the state of technology (TFP)

Aggregate Supply



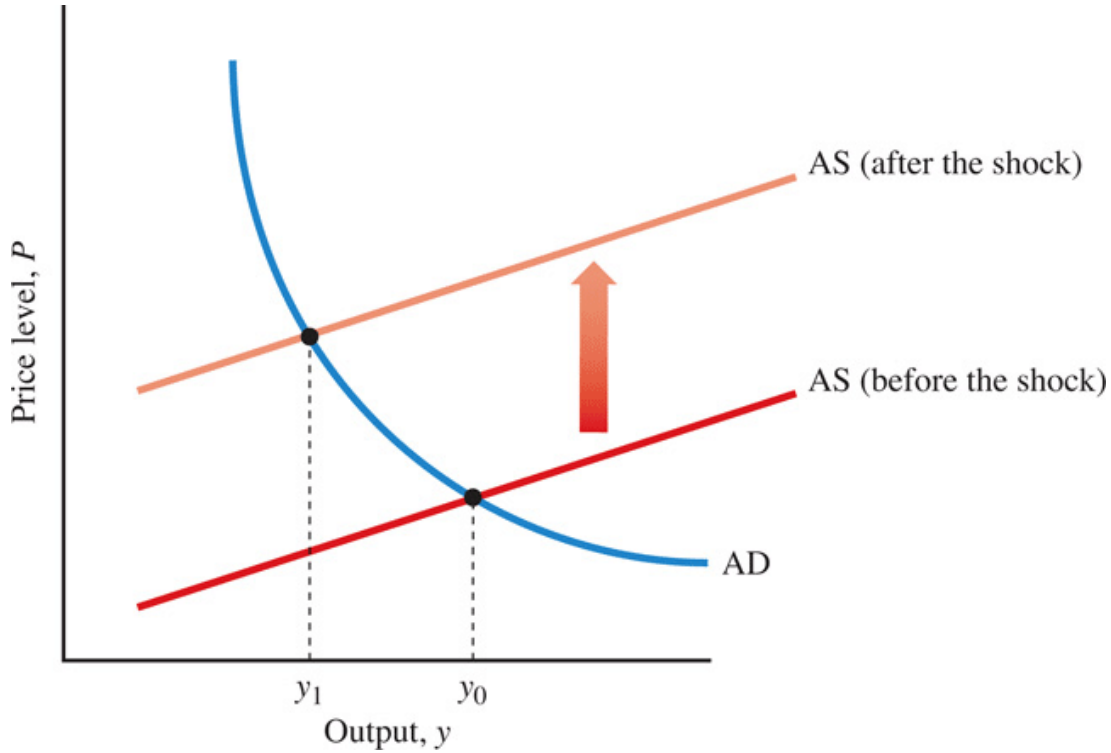
- Output Y* stays constant, only prices adjust.
- In the long run, output is determined solely by the supply of capital and the supply of labor, not the price level.

Short-Run AS

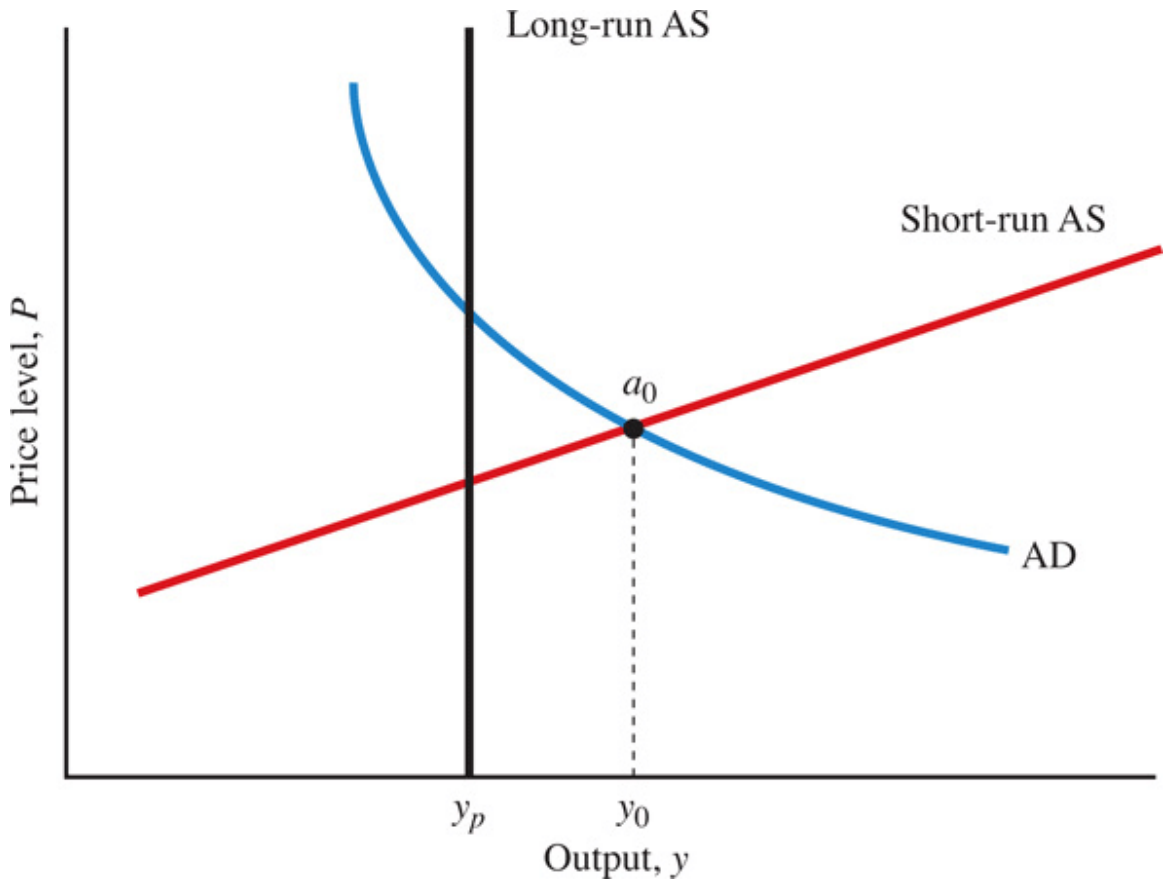


- With a short-run aggregate supply curve, shifts in aggregate demand lead to large changes in output but small changes in price

AS Shock


AS (after the shock)
AS (before the shock)
AD
Price level, P
y_1
y_0
Output, y

From Short-Run to Long-Run



From Short-Run to Long-Run