

Economics 101: Problem Set #8 Solutions

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April 25, 2025

Problem 1: AD and AS Analysis

Discussion Question #7 on p. 640 from the textbook:

Use shifts of the AD and AS curves to explain

- (a) the U.S. experience of strong economic growth, full employment, and price stability in the late 1990s and early 2000s, and
- (b) how a strong negative wealth effect from, say, a precipitous drop in house prices could cause a recession even though productivity is rising.

Solution

- (a) **Growth with Price Stability.** During the late 1990s–early 2000s, rapid technological innovation and productivity improvements shifted the aggregate supply curve (AS) to the right. At the same time, booming business investment and household confidence shifted aggregate demand (AD) rightward as well. Because the rightward shifts of AS and AD were roughly equal, output rose substantially (toward and beyond full-employment), but the price level remained stable.
- (b) **Negative Wealth Effect Recession.** A large fall in house prices reduces household wealth and thus consumption. This shifts the AD curve to the left. In the short run, output falls below potential (creating a recessionary gap) and the price level declines. Productivity growth (rightward shift of AS) may moderate the price drop, but the leftward AD shift is sufficient to cause a recession even if AS is improving.

Diagram 1(a): Growth with Price Stability

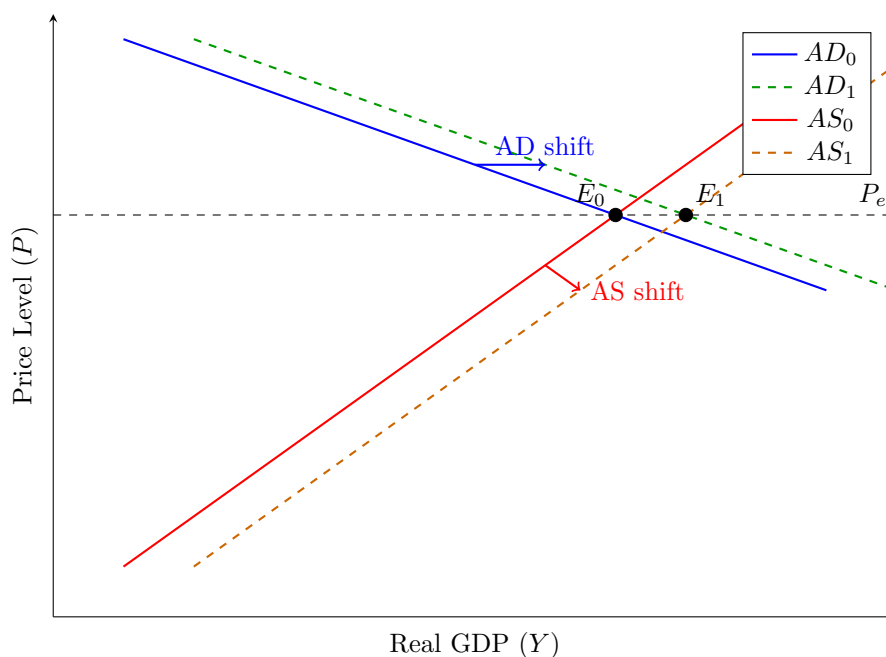
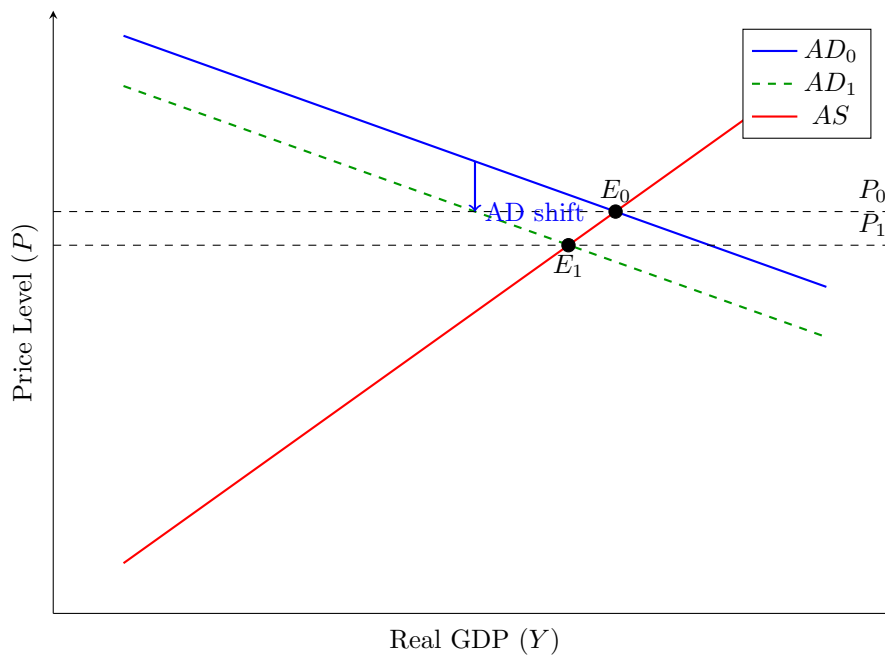


Diagram 1(b): Negative Wealth Effect Recession



Problem 2: The Case Study of Spain

In the attached article by Raphael Minder, Spain's government abandons austerity and cuts taxes in 2014–16 to boost demand. Answer the following:

(A) Illustrate on an AD–AS diagram the Spanish economy's 2014 output relative to full employment.

(B) The government wants to raise aggregate demand by €400 billion via lump-sum tax cuts. Given

$$a = 150, \quad b = 0.80, \quad T = 50, \quad I = 300, \quad G = 100, \quad X = 40, \quad M = 50,$$

by how much should taxes be cut?

(C) Show on your diagram the effects of this policy and explain.

(D) (Extra Credit) If AD increases by €400 billion, must equilibrium GDP also rise by €400 billion? True or False, and calculate the exact new output level.

Part A: Initial Equilibrium

Compute the autonomous intercept:

$$A_0 = a - bT + I + G + (X - M) = 150 - 0.8 \cdot 50 + 300 + 100 + (40 - 50) = 500.$$

Equilibrium output is

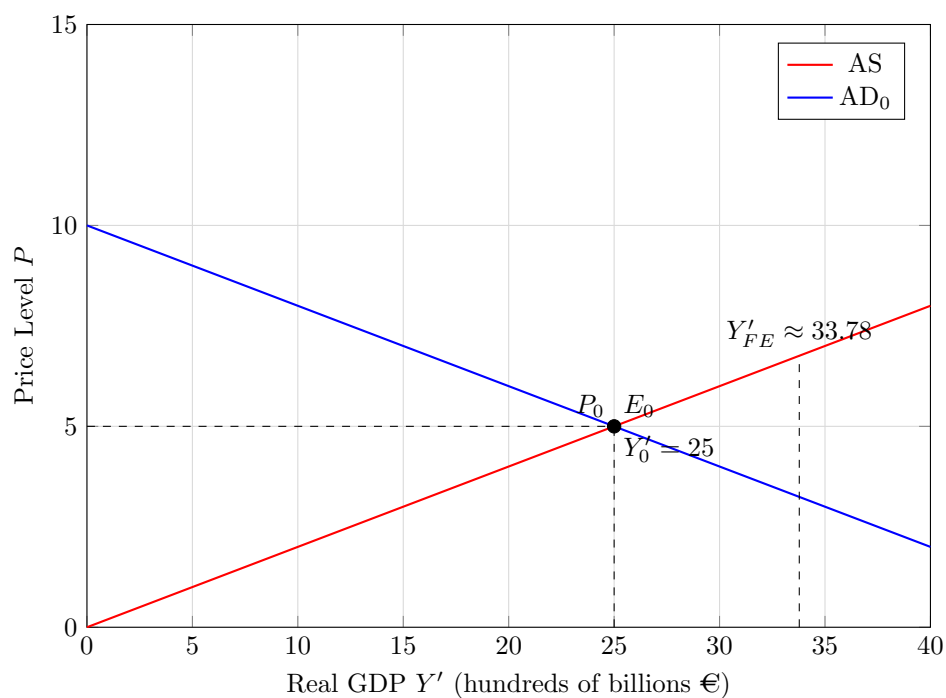
$$Y_0 = \frac{A_0}{1 - b} = \frac{500}{0.20} = 2500 \text{ billion } \text{€}.$$

If this is 74% of full-employment Y_{FE} , then

$$Y_0 = 0.74 Y_{FE} \implies Y_{FE} = \frac{2500}{0.74} \approx 3378.38 \text{ billion } \text{€}.$$

Define the scaled variable $Y' = Y/100$ (hundreds of billions):

$$Y'_0 = 25, \quad Y'_{FE} \approx 33.78.$$



Part B: Required Tax Cut

The tax multiplier is

$$m_T = -\frac{b}{1-b} = -\frac{0.80}{0.20} = -4.$$

To achieve $\Delta Y = +400$,

$$\Delta Y = m_T \Delta T \implies 400 = -4 \Delta T \implies \Delta T = -100.$$

A negative ΔT means a **tax cut of €100 billion**.

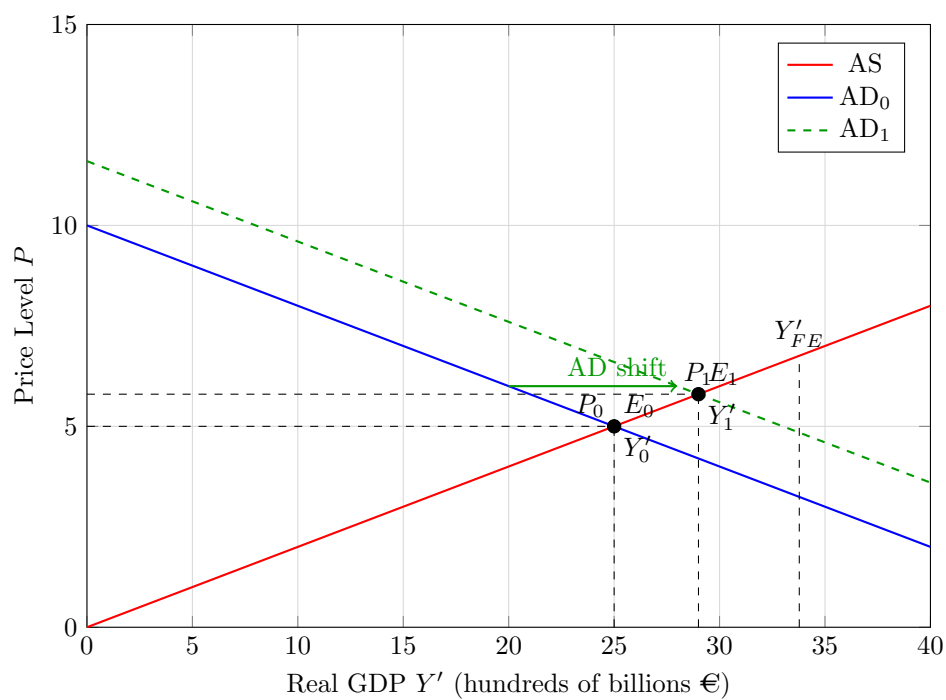
Part C: Effects on the Diagram

A €100 billion tax cut raises autonomous demand by

$$\Delta A = -b \Delta T = -0.8 \times (-100) = 80,$$

so $A_1 = 580$ and

$$Y_1 = \frac{580}{0.20} = 2900 \text{ billion €}, \quad Y'_1 = 29$$



Part D: Extra Credit

False. The spending multiplier for any autonomous AD change is

$$k = \frac{1}{1 - b} = 5,$$

so a direct €400 billion increase in AD yields

$$\Delta Y = k \times 400 = 5 \times 400 = 2000 \text{ billion } \text{€}.$$

Starting from $Y_0 = 2500$, the new equilibrium is

$$Y_1 = 2500 + 2000 = 4500 \text{ billion } \text{€} \quad (\text{or } Y'_1 = 45 \text{ on the graph}).$$