Aggregate Demand and Aggregate Supply

1. A fall in the value of the dollar against other currencies makes U.S. final goods and services cheaper to foreigners even though the U.S. aggregate price level stays the same. As a result, foreigners demand more American aggregate output. Your study partner says that this represents a movement down the aggregate demand curve because foreigners are demanding more in response to a lower price. You, however, insist that this represents a rightward shift of the aggregate demand curve. Who is right? Explain.

1. You are right. When a fall in the value of the dollar against other currencies makes U.S. final goods and services cheaper to foreigners, this represents a shift of the aggregate demand curve. Although foreigners may be demanding more U.S. goods because the price of those goods in their own currency is lower, there is no change in the U.S. aggregate price level. From the U.S. perspective, there is an increase in aggregate output demanded at any given aggregate price level.

2. Your study partner is confused by the upward-sloping short-run aggregate supply curve and the vertical long-run aggregate supply curve. How would you explain this?

2. The short-run aggregate supply curve slopes upward because nominal wages are sticky in the short run. Nominal wages are fixed by either formal contracts or informal agreements in the short run. So, as the aggregate price level falls and nominal wages remain the same, production costs will not fall by the same proportion as the aggregate price level. This will reduce profit per unit of output, leading producers to reduce output in the short run. Similarly, as the aggregate price level rises, production costs will not rise by the same proportion because nominal wages will remain fixed in the short run. Profit per unit of output will increase, leading producers to increase output in the short run. So there is a positive relationship between the aggregate price level and the quantity of aggregate output producers are willing to supply in the short run because nominal wages are sticky. However, in the long run, nominal wages can and will be renegotiated. Nominal wages will change along with the aggregate price level. As the aggregate price level rises, production costs will rise by the same proportion. When the aggregate price level and production costs rise by the same percentage, every unit of output that had been profitable to produce before the price rise is still profitable, and every unit of output that had been unprofitable to produce before the price rise is still unprofitable. So aggregate output does not change. In the long run, when nominal wages are perfectly flexible, an increase or decrease in the aggregate price level will not change the quantity of aggregate output produced. So the long-run aggregate supply curve is vertical.
3. Suppose that in Wageland all workers sign annual wage contracts each year on January 1. No matter what happens to prices of final goods and services during the year, all workers earn the wage specified in their annual contract. This year, prices of final goods and services fall unexpectedly after the contracts are signed. Answer the following questions using a diagram and assume that the economy starts at potential output.

a. In the short run, how will the quantity of aggregate output supplied respond to the fall in prices?

b. What will happen when firms and workers renegotiate their wages?

3. a. In the short run, the prices of final goods and services in Wageland fall unexpectedly but nominal wages don’t change; they are fixed in the short run by the annual contract. So firms earn a lower profit per unit and reduce output. In the accompanying diagram, Wageland moves along \( \text{SRAS}_1 \) from point \( A \) on January 1 to point \( B \) after the fall in prices.

b. When firms and workers renegotiate their wages, nominal wages will decrease, shifting the short-run aggregate supply curve in the accompanying diagram rightward from \( \text{SRAS}_1 \) to a curve such as \( \text{SRAS}_2 \).

4. In each of the following cases, in the short run, determine whether the events cause a shift of a curve or a movement along a curve. Determine which curve is involved and the direction of the change.

a. As a result of an increase in the value of the dollar in relation to other currencies, American producers now pay less in dollar terms for foreign steel, a major commodity used in production.
b. An increase in the quantity of money by the Federal Reserve increases the quantity of money that people wish to lend, lowering interest rates.

c. Greater union activity leads to higher nominal wages.

d. A fall in the aggregate price level increases the purchasing power of households' and firms' money holdings. As a result, they borrow less and lend more.

4. a. As the value of the dollar in terms of other currencies increases and American producers pay less in dollar terms for foreign steel, producers’ profit per unit increases and they are willing to supply a greater quantity of aggregate output at any given aggregate price level. The short-run aggregate supply curve will shift to the right.

b. As the Federal Reserve increases the quantity of money, households and firms have more money, which they are willing to lend out, and interest rates fall. The lower interest rates will increase investment spending and consumer spending, leading to a greater quantity of aggregate output demanded at any given aggregate price level. The aggregate demand curve will shift to the right.

c. If unions are able to negotiate higher nominal wages for a large portion of the workforce, this will increase production costs and reduce profit per unit at any given aggregate price level. The short-run aggregate supply curve will shift to the left.

d. As the aggregate price level falls and the purchasing power of households' and firms' money holdings increases, the public tries to reduce its money holdings by borrowing less and lending more. So interest rates fall, leading to a rise in both investment spending and consumer spending. This is the interest rate effect of a change in the aggregate price level, represented as a movement down along the aggregate demand curve.

5. The economy is at point A in the accompanying diagram. Suppose that the aggregate price level rises from $P_1$ to $P_2$. How will aggregate supply adjust in the short run and in the long run to the increase in the aggregate price level? Illustrate with a diagram.
5. In the short run, as the aggregate price level rises from $P_1$ to $P_2$, nominal wages will not change. So profit per unit will rise, leading to an increase in production from $Y_1$ to $Y_2$. The economy will move from point A to point B in the accompanying diagram. In the long run, however, nominal wages will be renegotiated upward in reaction to low unemployment at $Y_2$. As nominal wages increase, the short-run aggregate supply curve will shift leftward from SRAS$_1$ to a position such as SRAS$_2$. The exact position of SRAS$_2$ depends on factors such as the aggregate demand curve.

6. Suppose that all households hold all their wealth in assets that automatically rise in value when the aggregate price level rises (an example of this is what is called an “inflation-indexed bond”—a bond whose interest rate, among other things, changes one-for-one with the inflation rate). What happens to the wealth effect of a change in the aggregate price level as a result of this allocation of assets? What happens to the slope of the aggregate demand curve? Will it still slope downward? Explain.

6. If all households hold all their wealth in assets that automatically rise in value when the aggregate price level rises, this will eliminate the wealth effect of a change in the aggregate price level. The purchasing power of consumers’ wealth will not vary with a change in the aggregate price level, so there will be no change in consumer spending due to the change in the aggregate price level. The aggregate demand curve will still slope downward because of the interest rate effect of a change in the aggregate price level. As the aggregate price level rises, the purchasing power of households’ money holdings will decrease and they will be eager to borrow more and lend less, increasing interest rates. The increase in interest rates will discourage investment spending and consumer spending. The aggregate demand curve will be steeper because the wealth effect of a change in the aggregate price level has been eliminated. As prices rise, the amount of aggregate output demanded will fall by a smaller amount, an amount corresponding to the interest rate effect of a change in the aggregate price level.

7. Suppose that the economy is currently at potential output. Also suppose that you are an economic policy maker and that a college economics student asks you to rank, if possible, your most preferred to least preferred type of shock: positive demand shock, negative demand shock, positive supply shock, negative supply shock. How would you rank them and why?
7. The most preferred shock would be a positive supply shock. The economy would have higher aggregate output without the danger of inflation. The government would not need to respond with a change in policy. The least preferred shock would be a negative supply shock. The economy would experience stagflation. There would be lower aggregate output and higher inflation. There is no good policy remedy for a negative supply shock: policies to counteract the slump in aggregate output would worsen inflation, and policies to counteract inflation would further depress aggregate output. It is unclear how economic policy makers would rank positive and negative demand shocks. A positive demand shock brings a higher level of aggregate output but at a higher aggregate price level. A negative demand shock brings a lower level of aggregate output but at a lower aggregate price level. With either a positive or negative demand shock, policy makers could try to use either monetary or fiscal policy to lessen the effects of the shock.

8. Explain whether the following government policies affect the aggregate demand curve or the short-run aggregate supply curve and how.
   a. The government reduces the minimum nominal wage.
   b. The government increases Temporary Assistance to Needy Families (TANF) payments, government transfers to families with dependent children.
   c. To reduce the budget deficit, the government announces that households will pay much higher taxes beginning next year.
   d. The government reduces military spending.

8. a. If the government reduces the minimum nominal wage, it is similar to a fall in nominal wages. Aggregate supply will increase, and the short-run aggregate supply curve will shift to the right.
   b. If the government increases TANF, consumer spending will increase because disposable income increases (disposable income equals income plus government transfers, such as TANF payments, less taxes). Aggregate demand will increase, and the aggregate demand curve will shift to the right.
   c. If the government announces a large increase in taxes on households for next year, consumer spending will fall this year. Since households base their spending in part on their expectations about the future, the anticipated increase in taxes will lower their spending this year. There will be a decrease in aggregate demand, and the aggregate demand curve will shift to the left.
   d. If the government reduces military spending, this will decrease aggregate demand. The amount of aggregate output demanded at any given aggregate price level will fall, and the aggregate demand curve will shift to the left.

9. In Wageland, all workers sign an annual wage contract each year on January 1. In late January, a new computer operating system is introduced that increases labor productivity dramatically. Explain how Wageland will move from one short-run macroeconomic equilibrium to another. Illustrate with a diagram.
9. As labor productivity increases, producers will experience a reduction in production costs and profit per unit of output will increase. Producers will respond by increasing the quantity of aggregate output supplied at any given aggregate price level. The short-run aggregate supply curve will shift to the right. Beginning at short-run equilibrium, \( E_1 \), in the accompanying diagram, the short-run aggregate supply curve will shift from \( SRAS_1 \) to \( SRAS_2 \). The aggregate price level will fall, and real GDP will increase in the short run.

![Diagram showing aggregate supply and demand curves](image)

10. The Conference Board publishes the Consumer Confidence Index (CCI) every month based on a survey of 5,000 representative U.S. households. It is used by many economists to track the state of the economy. A press release by the Board on June 28, 2011, stated: "The Conference Board Consumer Confidence Index, which had declined in May, decreased again in June. The Index now stands at 58.5 (1985 = 100), down from 61.7 in May."

a. As an economist, is this news encouraging for economic growth?

b. Explain your answer to part a with the help of the AD–AS model. Draw a typical diagram showing two equilibrium points (\( E_1 \)) and (\( E_2 \)). Label the vertical axis "Aggregate price level" and the horizontal axis "Real GDP." Assume that all other major macroeconomic factors remain unchanged.

c. How should the government respond to this news? What are some policy measures that could be used to help neutralize the effect of falling consumer confidence?

**Solution**

10. a. No. Consumers base their spending on how confident they are about the income they will have in the future. Likewise, firms base their investment spending on what they expect conditions to be like in the future. If consumers become more optimistic, spending will rise, but if consumers become more pessimistic, spending will fall. A fall in the CCI indicated that consumers were more pessimistic in June 2011 than they had been in May 2011, and since the CCI had also declined in May, they were also more pessimistic in May 2011 than they had been in April 2011.
b. A fall in consumer confidence leads to a leftward shift of the aggregate demand curve. As shown in the accompanying diagram, other things equal, this will reduce real GDP from $Y_1$ to $Y_2$ and will reduce the aggregate price level from $P_1$ to $P_2$.

![Diagram showing aggregate demand and supply curves]

- **AD**
- **SRAS**
- **$E_1$**
- **$Y_1$**
- **$P_1$**
- **$Y_2$**
- **$P_2$**

Real GDP

Aggregate price level

$c$. The government could use expansionary monetary policy or fiscal policy to help remedy the situation. A tax break, an increase in government purchases of goods and services, or an increase in the money supply would help to improve economic performance.

11. There were two major shocks to the U.S. economy in 2007, leading to the severe recession of 2007–2009. One shock was related to oil prices; the other was the slump in the housing market. This question analyzes the effect of these two shocks on GDP using the AD-AS framework.

a. Draw typical aggregate demand and short-run aggregate supply curves. Label the horizontal axis “Real GDP” and the vertical axis “Aggregate price level.” Label the equilibrium point $E_1$, the equilibrium quantity $Y_1$, and equilibrium price $P_1$.

b. Data taken from the Department of Energy indicate that the average price of crude oil in the world increased from $54.63 per barrel on January 5, 2007, to $92.93 on December 28, 2007. Would an increase in oil prices cause a demand shock or a supply shock? Redraw the diagram from part a to illustrate the effect of this shock by shifting the appropriate curve.

c. The Housing Price Index, published by the Office of Federal Housing Enterprise Oversight, calculates that U.S. home prices fell by an average of 3.0% in the 12 months between January 2007 and January 2008. Would the fall in home prices cause a supply shock or demand shock? Redraw the diagram from part b to illustrate the effect of this shock by shifting the appropriate curve. Label the new equilibrium point $E_3$, the equilibrium quantity $Y_3$, and equilibrium price $P_3$.

d. Compare the equilibrium points $E_1$ and $E_3$ in your diagram for part c. What was the effect of the two shocks on real GDP and the aggregate price level (increase, decrease, or indeterminate)?

**Solution**

11. a. [Diagram showing adjustment of aggregate demand and short-run aggregate supply curves]
b. The rise in the price of oil usually causes a supply shock. The short-run aggregate supply (SRAS) curve shifts to the left, from SRAS₁ to SRAS₂. The economy settles at a new short-run macroeconomic equilibrium at E₂, with a higher aggregate price level, P₂, and lower real GDP, Y₂.

![Graph showing SRAS curve shifting from SRAS₁ to SRAS₂, leading to new equilibrium E₂ with higher P₂ and lower Y₂.]

c. The fall in home prices would cause a demand shock because of the wealth effect. The aggregate demand (AD) curve shifts leftward, from AD₁ to AD₂. The new aggregate price level, P₃, could either be equal to, above, or below P₁. The new level of real GDP, Y₃, is below the original level, Y₁.

![Graph showing AD curve shifting from AD₁ to AD₂, leading to new equilibrium E₁ with new price level P₃ and lower Y₃.]

d. The effect on the aggregate price level is indeterminate. As drawn in the diagram for part c, P₁ and P₃ coincide because the negative supply and demand shocks have exactly offsetting price effects. However, prices could either rise or fall when both a negative demand shock and a negative supply shock occur. The fall in real GDP is unambiguous because the two shocks reinforce their negative effects on GDP.

12. Using aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, explain the process by which each of the following economic events will move the economy from one long-run macroeconomic equilibrium to another. Illustrate with diagrams. In each case, what are the short-run and long-run effects on the aggregate price level and aggregate output?

a. There is a decrease in households’ wealth due to a decline in the stock market.

b. The government lowers taxes, leaving households with more disposable income, with no corresponding reduction in government purchases.

**Solution**

a. A decrease in households’ wealth will reduce consumer spending. Beginning at long-run macroeconomic equilibrium, E₁ in the accompanying diagram, the aggregate demand curve will shift from AD₁ to AD₂. In the short run, nominal wages are sticky, and the economy will be in short-run macroeconomic equilibrium at point E₂. The aggregate price level will be lower than at E₁, and aggregate output will be lower than potential output. The economy faces a recessionary gap. As wage
contracts are renegotiated, nominal wages will fall and the short-run aggregate supply curve will shift gradually to the right over time until it reaches SRAS₂ and intersects AD₂ at point E₃. At E₃, the economy is back at its potential output but at a much lower aggregate price level.

b. An increase in disposable income will increase consumer spending; at any given aggregate price level, the aggregate demand curve will shift to the right. Beginning at long-run macroeconomic equilibrium, E₁ in the accompanying diagram, the aggregate demand curve will shift from AD₁ to AD₂. In the short run, nominal wages are sticky, and the economy will be in short-run macroeconomic equilibrium at point E₂. The aggregate price level is higher than at E₁, and aggregate output will be higher than potential output. The economy faces an inflationary gap. As wage contracts are renegotiated, nominal wages will rise and the short-run aggregate supply curve will shift gradually to the left over time until it reaches SRAS₂ and intersects AD₂ at point E₃. At E₃, the economy is back at its potential output but at a much higher aggregate price level.

13. Using aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, explain the process by which each of the following government policies will move the economy from one long-run macroeconomic equilibrium to another. Illustrate with diagrams. In each case, what are the short-run and long-run effects on the aggregate price level and aggregate output?

a. There is an increase in taxes on households.
b. There is an increase in the quantity of money.
c. There is an increase in government spending.
13. a. An increase in taxes will decrease consumer spending by households. Beginning at $E_1$ in the accompanying diagram, the aggregate demand curve will shift leftward from $AD_1$ to $AD_2$. In the short run, nominal wages are sticky, and the economy will be in short-run macroeconomic equilibrium at point $E_2$. The aggregate price level is lower than at $E_1$, and aggregate output is lower than potential output. The economy faces a recessionary gap. As wage contracts are renegotiated, nominal wages will fall and the short-run aggregate supply curve will shift gradually to the right over time until it reaches $SRAS_2$ and intersects $AD_2$ at point $E_3$. At $E_3$, the economy is back at its potential output but at a much lower aggregate price level.

![Diagram showing aggregate demand and supply curves with E1, E2, and E3 points indicating recessionary and potential output levels.]

b. An increase in the quantity of money will encourage people to lend, lowering interest rates and increasing investment and consumer spending; at any given aggregate price level, the quantity of aggregate output demanded will be higher. Beginning at long-run macroeconomic equilibrium, $E_1$ in the accompanying diagram, the aggregate demand curve will shift from $AD_1$ to $AD_2$. In the short run, nominal wages are sticky, and the economy will be in short-run macroeconomic equilibrium at point $E_2$. The aggregate price level is higher than at $E_1$, and aggregate output is higher than potential output. The economy faces an inflationary gap. As wage contracts are renegotiated, nominal wages will rise and the short-run aggregate supply curve will shift gradually to the left over time until it reaches $SRAS_2$ and intersects $AD_2$ at point $E_3$. At $E_3$, the economy is back at its potential output but at a much higher aggregate price level.

![Diagram showing aggregate demand and supply curves with E1, E2, and E3 points indicating inflationary and potential output levels.]
c. An increase in government spending will increase aggregate demand; at any given aggregate price level, the quantity of aggregate output demanded will be higher. Beginning at long-run macroeconomic equilibrium, \( E_1 \) in the accompanying diagram, the aggregate demand curve will shift from \( AD_1 \) to \( AD_2 \). In the short run, nominal wages are sticky, and the economy will be in short-run macroeconomic equilibrium at point \( E_2 \). The aggregate price level is higher than at \( E_1 \), and aggregate output is higher than potential output. The economy faces an inflationary gap. As wage contracts are renegotiated, nominal wages will rise and the short-run aggregate supply curve will shift gradually to the left over time until it reaches \( SRAS_2 \) and intersects \( AD_2 \) at point \( E_3 \). At \( E_3 \), the economy is back at its potential output but at a much higher aggregate price level.

14. The economy is in short-run macroeconomic equilibrium at point \( E_1 \) in the accompanying diagram. Based on the diagram, answer the following questions.

a. Is the economy facing an inflationary or a recessionary gap?

b. What policies can the government implement that might bring the economy back to long-run macroeconomic equilibrium? Illustrate with a diagram.

c. If the government did not intervene to close this gap, would the economy return to long-run macroeconomic equilibrium? Explain and illustrate with a diagram.

d. What are the advantages and disadvantages of the government implementing policies to close the gap?
14. a. The economy is facing a recessionary gap because \( Y_1 \) is less than the potential output of the economy, \( Y_P \).

b. The government could use either fiscal policy (increases in government spending or reductions in taxes) or monetary policy (increases in the quantity of money in circulation to reduce the interest rate) to move the aggregate demand curve from \( AD_1 \) to \( AD_2 \) in the accompanying diagram. This will move the economy back to potential output, and the aggregate price level will rise from \( P_1 \) to \( P_2 \).

c. If the government did not intervene to close the recessionary gap, the economy would eventually self-correct and move back to potential output on its own. Due to unemployment, nominal wages will fall in the long run. The short-run aggregate supply curve will shift to the right, and eventually it will shift from \( SRAS_1 \) to \( SRAS_2 \) in the accompanying diagram. The economy will be back at potential output but at a lower aggregate price level.

d. If the government implements fiscal or monetary policies to move the economy back to long-run macroeconomic equilibrium, the recessionary gap might be eliminated faster than if the economy was left to adjust on its own. However, because policy makers aren’t perfectly informed and policy effects can be unpredictable, policies to close the recessionary gap can lead to greater macroeconomic instability. Furthermore, if the government uses fiscal or monetary policies, the price level will be higher than it will be if the economy is left to return to long-run macroeconomic equilibrium by itself. In addition, a policy that increases the budget deficit might lead to lower long-run growth through crowding out.
15. In the accompanying diagram, the economy is in long-run macroeconomic equilibrium at point $E_1$ when an oil shock shifts the short-run aggregate supply curve to $SRAS_2$. Based on the diagram, answer the following questions.

![Diagram](image)

a. How do the aggregate price level and aggregate output change in the short run as a result of the oil shock? What is this phenomenon known as?

b. What fiscal or monetary policies can the government use to address the effects of the supply shock? Use a diagram that shows the effect of policies chosen to address the change in real GDP. Use another diagram to show the effect of policies chosen to address the change in the aggregate price level.

c. Why do supply shocks present a dilemma for government policy makers?

Solution

15. a. As a result of the increase in the price of oil and the shift to the left of the short-run aggregate supply curve, real GDP decreases to $Y_2$ (and with it unemployment rises) and the aggregate price level increases to $P_2$ as shown in the accompanying diagram. This combined problem of inflation and unemployment is known as stagflation.

![Diagram](image)

b. The government can use fiscal and monetary policies to either increase real GDP or lower the aggregate price level, but not both. If the government increases government spending, decreases taxes, or increases the quantity of money in circulation, it can raise real GDP but it will also raise the aggregate price level. This is illustrated in the diagram accompanying part a by the rightward shift of $AD_1$ to $AD_2$. 
If the government decreases government spending, increases taxes, or decreases the quantity of money in circulation, it can lower the aggregate price level but it will also lower real GDP, worsening the recessionary gap. This is illustrated in the accompanying diagram by the leftward shift of $AD_1$ to $AD_3$.

c. The government cannot use fiscal and monetary policies to correct for the lower real GDP and higher aggregate price level simultaneously. It can only use policies to alleviate one problem but at the expense of making the other worse.

16. The late 1990s in the United States was characterized by substantial economic growth with low inflation; that is, real GDP increased with little, if any, increase in the aggregate price level. Explain this experience using aggregate demand and aggregate supply curves. Illustrate with a diagram.

16. Increases in both long-run and short-run aggregate supply, along with increases in aggregate demand, can explain how real GDP grew with little if any increase in the aggregate price level. The accompanying diagram shows how the economy could move from one long-run macroeconomic equilibrium, point $E_1$, to another, point $E_2$, with an increase in real GDP and no increase in the aggregate price level. This may explain the U.S. experience during the late 1990s. During this time, increases in productivity due to increasing use of information technology may have shifted the long-run and short-run aggregate supply curves; simultaneously, increases in stock values may have led to increases in consumer spending and a shift to the right of the aggregate demand curve.