Aggregate Demand and Aggregate Supply

A Study Guide and Workbook Chapter for Principles of Macroeconomics

This chapter is designed as the bridge between the tools you have already learned, and the policy debates you will study next.

Chapter Roadmap

Section	Topic	What you should be able to do
1	Why AD-AS matters	Connects Real GDP, price level, unemployment, full employment, and economic growth in one model.
2	Aggregate Demand	Shows total planned spending on domestic output at different price levels.
3	Short-Run Aggregate Supply	Shows how business output responds to the price level when some input costs are sticky.
4	Long-Run Aggregate Supply	Shows potential real GDP at full employment, determined by real productive capacity.
5	Equilibrium and gaps	Shows whether the economy is at long-run equilibrium, in a recessionary gap, or in an inflationary gap.
6	Workbook practice	Requires you to identify the shock, shift the correct curve, and explain the effect on output, prices, and unemployment.

Student Focus: Do not memorize the graph as a picture. Learn to read it as a story. Every AD-AS graph asks the same question: what changed first, which curve shifted, where is the new equilibrium, and what does that mean for output, unemployment, and the price level?

Introduction: Why This Chapter Matters

The chapters before this one have been building the tools you need to understand the economy as a whole. You have studied Real GDP, unemployment, inflation, economic growth, spending, production, and the role of expectations. In this chapter, you bring those tools together in the aggregate demand and aggregate supply model. The AD-AS model is not just another graph. It is the central diagnostic model for the next part of the course.

When you look at an AD-AS graph, you are asking whether the economy is producing at its potential, whether unemployment is above or below its natural rate, whether inflationary pressure is building, and whether the economy is moving toward or away from long-run equilibrium. The model gives you a way to organize complicated events such as a collapse in consumer confidence, a surge in government spending, a rise in oil prices, a productivity improvement, or a banking crisis.

This chapter also prepares you for the policy chapters that follow. Keynesian, neoclassical, monetarist, Federal Reserve, and banking-system approaches do not begin with the same diagnosis, the same time horizon, or the same confidence in market self-correction. Before you can judge which policy response makes sense, you must first be able to identify the condition of the economy. The AD-AS model gives you that starting point.

A useful way to think about this chapter is simple: aggregate demand tells you how much spending is directed toward the economy's output; short-run aggregate supply tells you how much output firms are willing to produce at each price level; long-run aggregate supply tells you what the economy can sustainably produce when resources are fully employed. Where these ideas meet, you can analyze the macroeconomic condition of the economy.

Learning Objectives

- Explain why the aggregate demand curve slopes downward.
- Distinguish between a movement along aggregate demand and a shift of aggregate demand.
- Explain why the short-run aggregate supply curve slopes upward when some input prices are fixed or slow to adjust.
- Distinguish between short-run aggregate supply and long-run aggregate supply.
- Use the AD-AS model to identify long-run equilibrium, recessionary gaps, inflationary gaps, and stagflation.
- Predict how changes in spending, production costs, productivity, and expectations affect Real GDP, unemployment, and the price level.
- Explain why this model becomes the foundation for the policy debates that follow.

1. The Big Picture: What the AD-AS Model Shows

The aggregate demand and aggregate supply model shows the relationship between the economy's overall price level and its level of real output. On the vertical axis, you place the price level. On the horizontal axis, you place Real GDP. The model helps you connect three major macroeconomic goals: price stability, full employment, and economic growth. It also helps you see why these goals can sometimes support each other and sometimes create tension.

You should immediately connect Real GDP to unemployment. When firms produce more output, they usually need more labor, more hours, or more intensive use of existing workers and capital. When Real GDP falls below potential, unemployment usually rises. This is

not a mechanical one-for-one relationship, but it is a powerful empirical pattern. Arthur Okun's work on potential output and the output gap helped make this connection central to macroeconomic analysis.[1]

The basic AD-AS model has three curves. Aggregate demand, or AD, slopes downward. Short-run aggregate supply, or SRAS, slopes upward. Long-run aggregate supply, or LRAS, is vertical at the economy's potential level of Real GDP. Potential Real GDP is the output the economy can produce when it is operating at full employment, meaning unemployment is at its natural rate rather than being unusually high because of a recession or unusually low because of an overheated boom.[2]

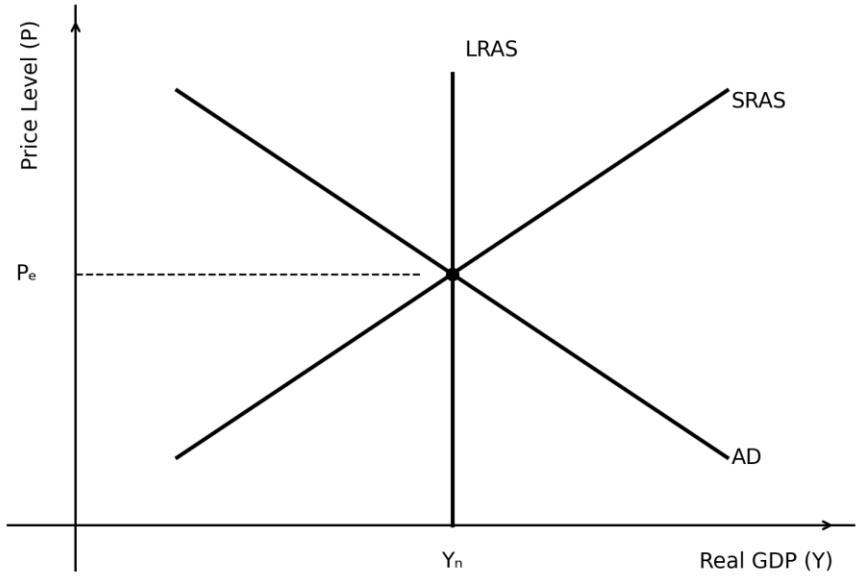

Figure 11.1. The basic AD-SRAS-LRAS model. Long-run equilibrium occurs where AD, SRAS, and LRAS intersect.

Figure 11.1 is the destination point of the chapter. Your job is to learn what each curve means, why each curve has its shape, what causes each curve to shift, and how to interpret the new equilibrium after a shift occurs.

A Five-Step Method for Reading Any AD-AS Graph

1. Identify the original equilibrium. Ask where AD and SRAS intersect, and compare that output level with LRAS.
2. Identify the event. Decide whether the event affects spending, production costs, productivity, resources, or expectations.
3. Shift the correct curve. Demand-side events shift AD. Short-run cost events shift SRAS. Long-run capacity changes shift LRAS and usually SRAS as well.
4. Find the new short-run equilibrium. Read the new price level and Real GDP from the intersection of AD and SRAS.
5. Translate the graph into economic language. Explain what happened to output, unemployment, inflation or deflation pressure, and whether the economy is at, below, or above potential output.

2. Aggregate Demand

Aggregate demand is the total quantity of final goods and services demanded in the economy at different price levels, holding other influences constant. In an open economy, aggregate demand is built from the spending components of Real GDP:

AD = C + I + G + NX

- C is consumer spending on goods and services.
- I is investment spending by firms and households on capital goods, structures, and inventories.
- G is government purchases of goods and services.
- NX is net exports, equal to exports minus imports.

You should be careful with the wording. Aggregate demand is not merely a number. It is a relationship between the price level and the quantity of Real GDP demanded, holding other demand determinants constant. When the price level changes, you move along the AD curve. When something other than the price level changes planned spending, the entire AD curve shifts.

Why Aggregate Demand Slopes Downward

The aggregate demand curve slopes downward because a lower domestic price level usually increases the quantity of Real GDP demanded, while a higher price level reduces it. In introductory macroeconomics, three effects are most important.

First, the real balance or wealth effect says that when the price level falls, the purchasing power of money balances and other nominal assets rises. Students sometimes confuse this with becoming richer in a deep sense. The more precise point is that a given number of dollars buys more goods and services when prices are lower. That increase in real purchasing power can support more spending.

Second, the interest rate effect says that a lower price level reduces the amount of money households and firms need for transactions. With money demand lower, interest rates tend to fall, all else equal. Lower interest rates encourage interest-sensitive spending such as business investment, home construction, durable goods purchases, and other borrowing-dependent expenditures.

Third, the international trade effect says that when domestic prices fall relative to foreign prices, domestic goods become more attractive to foreign buyers and foreign goods become less attractive to domestic buyers. Exports tend to rise, imports tend to fall, and net exports increase. The opposite occurs when domestic prices rise relative to foreign prices.

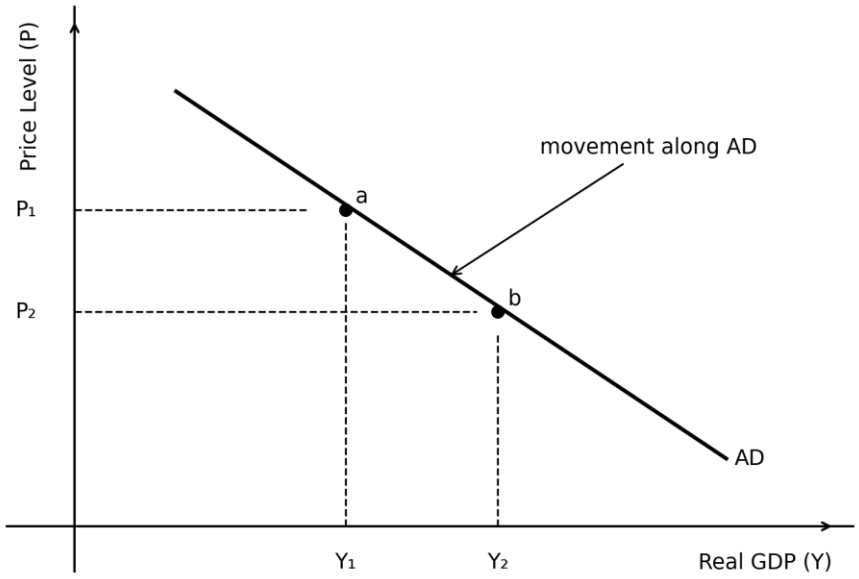

Figure 11.2. A change in the price level causes a movement along AD, not a shift of AD.

In Figure 11.2, the movement from point a to point b is caused by a change in the price level. Because the price level falls from P1 to P2, the quantity of Real GDP demanded rises from Y1 to Y2. The curve itself has not shifted. You are simply moving along the same relationship.

Movements Along AD versus Shifts of AD

This distinction is essential. A movement along AD is caused by a change in the price level. A shift of AD is caused by a change in total planned spending at every price level. When AD shifts right, consumers, firms, government, or foreign buyers are willing and able to purchase more domestic output at each price level. When AD shifts left, planned spending falls at each price level.

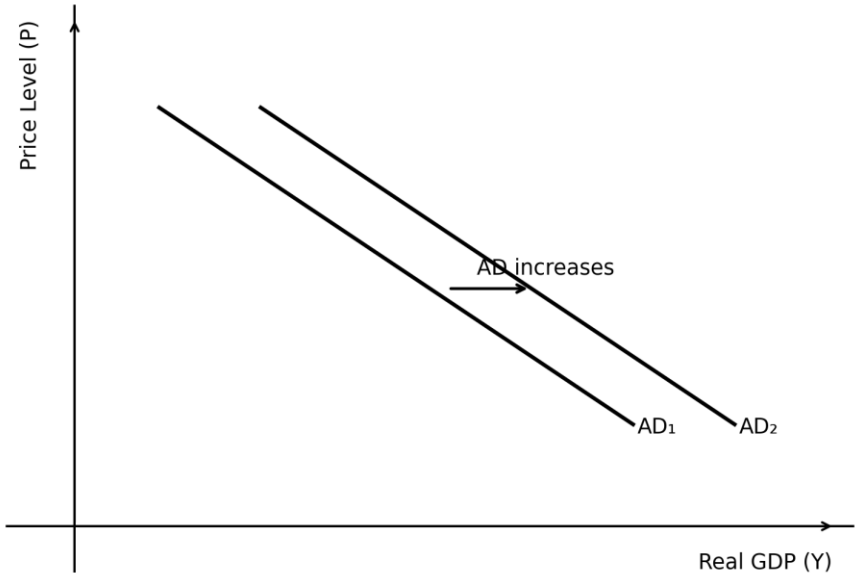

Figure 11.3. An increase in aggregate demand shifts AD to the right.

A rightward shift of AD means that at the same price level, the economy demands more Real GDP than before. A leftward shift means that at the same price level, the economy demands less Real GDP than before. In real life, these shifts often come from changes in confidence, interest rates, fiscal policy, taxes, wealth, foreign income, or exchange rates.

Determinants of Aggregate Demand

To decide whether AD shifts, ask whether the event changes one of the spending components: C, I, G, or NX. The following table gives you a practical checklist.

Spending component	What can shift it?	Likely AD effect

Consumption (C)	Household wealth, taxes, transfer payments, consumer confidence, expectations about income and jobs, household debt conditions	Higher confidence, higher wealth, lower taxes, or higher transfers tend to shift AD right; lower confidence or lower wealth tends to shift AD left.
Investment (I)	Interest rates, business confidence, expected profitability, taxes on capital, technology, credit conditions	Lower interest rates or stronger expected profits tend to shift AD right; tighter credit or weaker expectations tend to shift AD left.
Government purchases (G)	Fiscal policy decisions, defense spending, infrastructure spending, changes in the desired size of the public sector	Higher government purchases shift AD right; lower government purchases shift AD left.
Net exports (NX)	Foreign income, exchange rates, foreign price levels, domestic price competitiveness	Stronger foreign income or a weaker domestic currency tends to raise net exports and shift AD right; weaker foreign income or a stronger domestic currency tends to shift AD left.

Consumer confidence deserves special attention because it can influence several spending categories at once. If households become pessimistic about jobs and income, they may reduce consumption. If firms see weakening consumer demand, they may cut investment. If financial institutions become more cautious, credit conditions may tighten. One change in expectations can spread through the economy.

3. Short-Run Aggregate Supply

Aggregate supply shows the relationship between the price level and the quantity of Real GDP supplied. In the short run, firms decide how much to produce based on the prices they receive for their output and the costs they must pay for labor, raw materials, energy, interest, rent, and other inputs.

The short-run aggregate supply curve slopes upward because many input prices are fixed or slow to adjust for a period of time. Wages may be set by contracts, businesses may have supplier agreements, rents may be fixed, and firms may not instantly revise every price or wage when demand changes. This short-run stickiness is one reason output can rise or fall when the overall price level changes.[3]

Suppose the price level rises while many input costs remain temporarily fixed. Firms receive higher prices for their output, but their costs do not rise immediately by the same amount. Profit per unit can increase, and firms have an incentive to produce more. Suppose the price level falls while many input costs remain fixed. Profit margins shrink, and firms have an incentive to produce less. This explains the upward slope of SRAS.

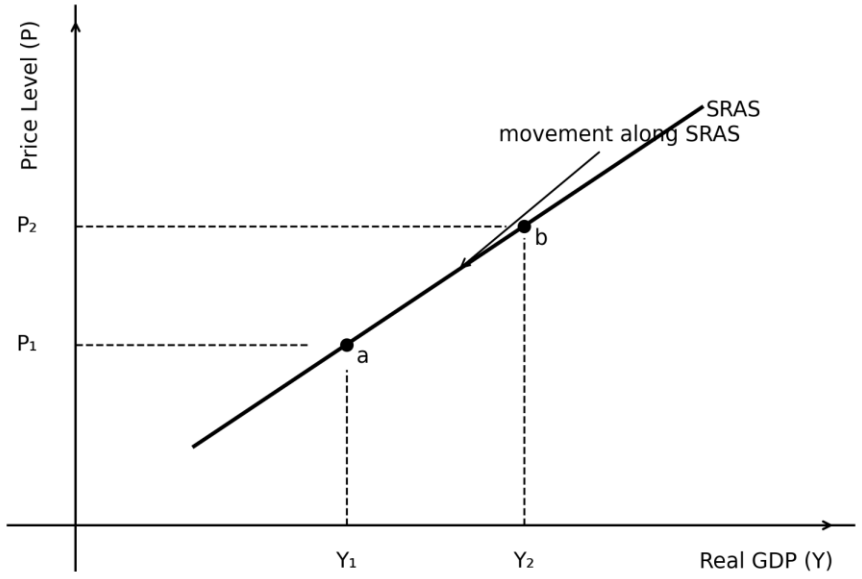

Figure 11.4. A change in the price level causes a movement along SRAS.

In Figure 11.4, the movement from point a to point b is caused by a higher price level. Because some input costs are sticky in the short run, firms respond to the higher price level by increasing production from Y1 to Y2.

What Shifts SRAS?

A shift of SRAS occurs when firms' willingness or ability to produce changes at every price level. The most common causes are changes in input prices, energy prices, productivity, technology, regulations, taxes on production, or the quantity and quality of resources.

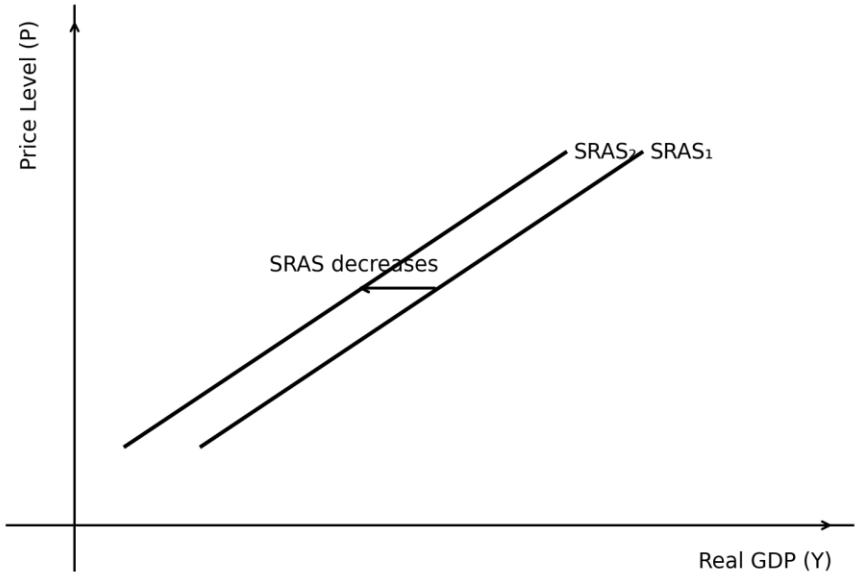

Figure 11.5. A decrease in short-run aggregate supply shifts SRAS to the left.

Cause	Direction of SRAS shift	Economic explanation
Higher nominal wages or higher input prices	Left	Production becomes more expensive at each price level, so firms supply less output.
Lower nominal wages or lower input prices	Right	Production becomes less expensive at each price level, so firms can profitably supply more output.
Higher energy prices	Left	Energy is a major input in transportation, production, and distribution; higher energy costs reduce SRAS.
Lower energy prices	Right	Lower energy costs reduce production costs and support higher output at each price level.
Improved technology or productivity	Right	Firms can produce more output from the same resources.
Natural disaster, war, supply-chain disruption	Left	Available productive capacity or input availability falls in the short run.

Notice that lower production costs shift SRAS right, while higher production costs shift SRAS left. This is one reason supply shocks can be so difficult for policymakers. A negative demand shock tends to lower output and reduce price pressure. A negative supply shock can lower output and raise the price level at the same time.

4. Long-Run Aggregate Supply and Potential Real GDP

The long-run aggregate supply curve is vertical at potential Real GDP, sometimes called natural Real GDP. Potential Real GDP is the level of output the economy can sustain when labor and other resources are used at normal, full-employment levels. It is not the maximum output the economy could produce for a short period by working everyone overtime. It is the sustainable level of output consistent with the economy's productive capacity.

LRAS is vertical because in the long run the economy's productive capacity depends on real factors rather than the price level. Those real factors include labor force size, human capital, physical capital, natural resources, technology, institutions, entrepreneurship, and productivity. A higher price level by itself does not make the economy capable of sustainably producing more goods and services. This idea is closely related to the natural-rate tradition associated with Friedman and Phelps, which argues that attempts to keep unemployment permanently below its natural rate tend to generate accelerating inflation rather than permanently higher real output.[4]

A change in input prices alone can shift SRAS, but it does not shift LRAS. For example, higher wages may reduce short-run profitability and shift SRAS left, but higher nominal wages do not necessarily reduce the economy's long-run productive capacity. By contrast, a major improvement in technology can shift LRAS right because it increases the economy's potential output.

Curve	What it represents	What shifts it
AD	Total planned spending on domestic output at each price level	Changes in C, I, G, or NX not caused by the domestic price level
SRAS	Output firms are willing to produce at each price level in the short run	Input prices, energy prices, productivity, short-run cost conditions, supply shocks
LRAS	Potential Real GDP at full employment in the long run	Labor force, capital stock, technology, institutions, natural resources, productivity

5. Macroeconomic Equilibrium

Short-run macroeconomic equilibrium occurs where AD and SRAS intersect. At that point, the quantity of Real GDP demanded equals the quantity of Real GDP supplied. However, short-run equilibrium does not automatically mean that the economy is healthy. The economy can be in short-run equilibrium while producing below potential, above potential, or exactly at potential.

Long-run equilibrium occurs where AD, SRAS, and LRAS all intersect. In long-run equilibrium, actual Real GDP equals potential Real GDP, and unemployment is at its natural rate. The economy is not in a recessionary gap or an inflationary gap. This is the benchmark against which you judge all other situations.

The AD-AS model is most useful when something changes. A shift in AD or SRAS moves the economy away from its original equilibrium. You then compare the new short-run equilibrium with LRAS to determine the condition of the economy. If output is to the left of LRAS, the economy is below potential. If output is to the right of LRAS, the economy is above potential. If output equals LRAS, the economy is at potential.

The Four Basic Short-Run Shifts

Initial event	Curve shift	Price level	Real GDP	Unemployment
Aggregate demand increases	AD shifts right	Rises	Rises	Falls
Aggregate demand decreases	AD shifts left	Falls or grows more slowly	Falls	Rises
Short-run aggregate supply increases	SRAS shifts right	Falls	Rises	Falls
Short-run aggregate supply decreases	SRAS shifts left	Rises	Falls	Rises

You should learn this table, but you should not use it as a substitute for the graph. The graph teaches you why the table is true. When AD shifts right, the new intersection with SRAS occurs at a higher output and higher price level. When SRAS shifts left, the new intersection with AD occurs at a lower output and higher price level. These results become clearer when you draw them yourself.

6. Recessionary Gaps

A recessionary gap occurs when the short-run equilibrium level of Real GDP is less than potential Real GDP. On the graph, the economy's equilibrium output is to the left of LRAS. This means actual output is below the sustainable full-employment level. Unemployment is above the natural rate, and factories, workers, offices, and equipment are not being used as fully as they could be.

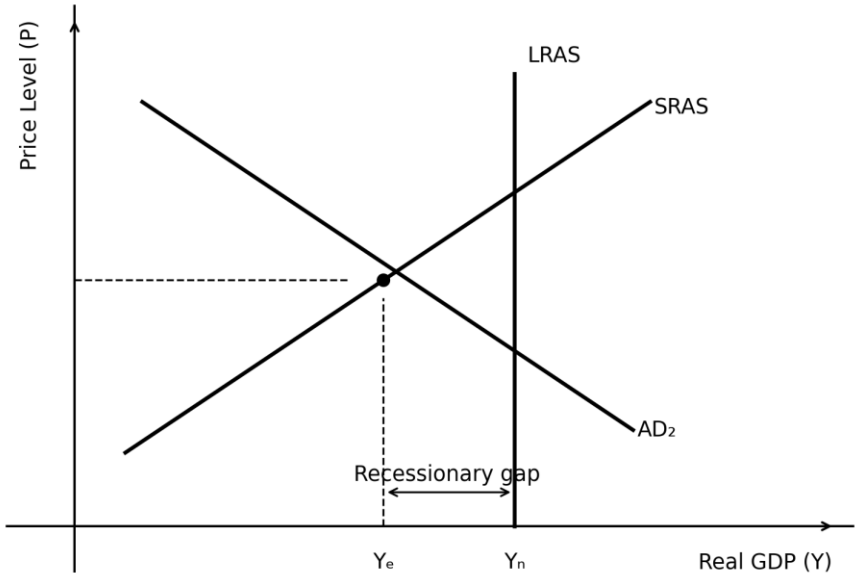

Figure 11.6. A recessionary gap occurs when short-run equilibrium output is less than potential output.

The most common cause of a recessionary gap in introductory AD-AS analysis is a leftward shift of aggregate demand. Households may lose confidence and reduce consumption. Firms may expect weaker sales and reduce investment. Government purchases may fall. Foreign demand may weaken. The result is not enough spending to purchase the output the economy could produce at full employment.

The economic story behind the graph is important. When spending falls, firms may see inventories rising faster than expected. If they cannot sell what they planned to sell, they cut production. As production falls, firms need fewer workers, and unemployment rises. Lower employment then reduces household income and may further weaken spending. Keynes's central insight was that weak aggregate demand could leave an economy stuck with high unemployment, at least for a significant period of time.[5]

In a self-correction story, high unemployment puts downward pressure on wages and other input costs. If wages and input costs fall, SRAS shifts right. That shift can move the economy back toward potential output, but at a lower price level. The key debate is how quickly this adjustment occurs and whether policymakers should wait for it. Keynesian economists emphasize the possibility that

wages and prices adjust slowly, while neoclassical economists place more confidence in market adjustment over time. The next chapters will examine these differences in more detail.

7. Inflationary Gaps

An inflationary gap occurs when the short-run equilibrium level of Real GDP is greater than potential Real GDP. On the graph, the economy's equilibrium output is to the right of LRAS. This means the economy is temporarily producing beyond its sustainable capacity. Unemployment is below the natural rate, labor markets are tight, and firms may be using resources more intensely than normal.

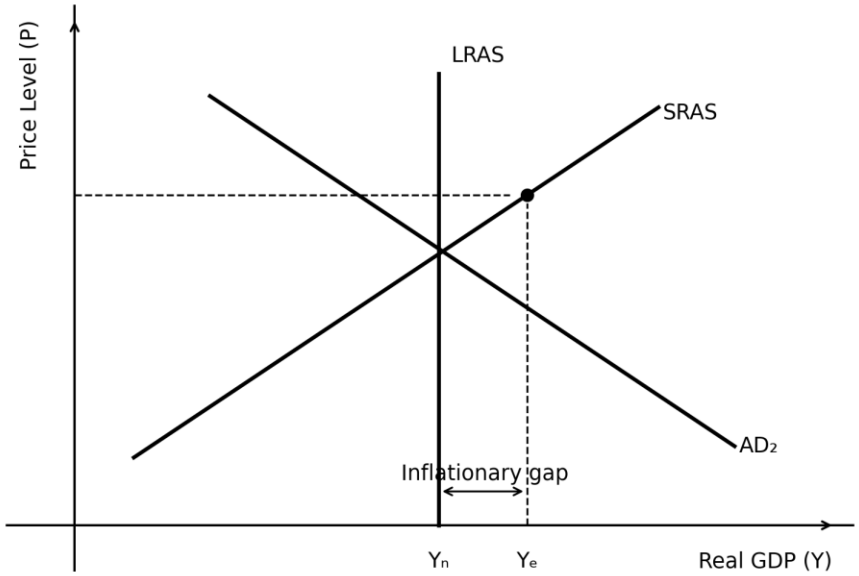

Figure 11.7. An inflationary gap occurs when short-run equilibrium output is greater than potential output.

An inflationary gap is usually caused by a rightward shift of aggregate demand. People are spending more than firms anticipated. Inventories are depleted faster than expected. Businesses respond by expanding production, hiring workers, extending hours, and purchasing more inputs. In the short run, output rises and unemployment falls. The economy may feel strong, but the pressure on prices and wages increases.

The self-correction story works in the opposite direction from a recessionary gap. Because labor markets are tight, wages and other input costs tend to rise. As production costs increase, SRAS shifts left. Output returns to potential, but the price level rises. This is why an overheated economy can create inflationary pressure even if the original increase in output looked beneficial.

Friedman and Phelps emphasized that an economy cannot permanently hold unemployment below its natural rate through ever-higher demand without creating inflationary consequences. In the long run, workers and firms adjust expectations, wages, and prices. The result is not permanently higher output, but a higher price level or continuing inflation if demand keeps being pushed beyond capacity.[6]

8. Long-Run Economic Growth in the AD-AS Model

Economic growth occurs when potential Real GDP increases. In the AD-AS model, this is shown by a rightward shift of LRAS. Because the same forces that increase long-run productive capacity often reduce costs or increase productive efficiency in the short run, SRAS may also shift right. Examples include improved technology, a larger or more skilled labor force, a larger capital stock, better transportation networks, and stronger institutions that support production and exchange.

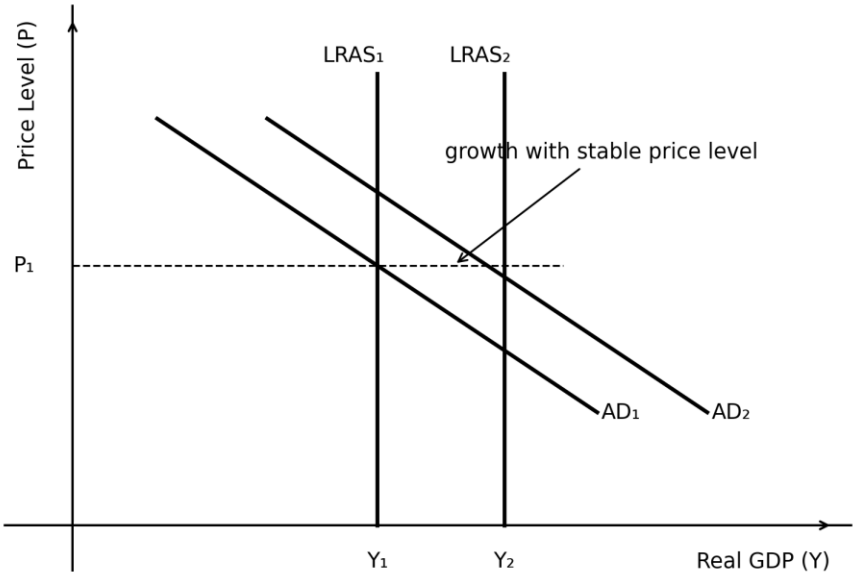

Figure 11.8. Long-run economic growth with stable prices occurs when LRAS expands and AD grows at a compatible pace.

Figure 11.8 shows a favorable case. Potential Real GDP increases from Y1 to Y2, and aggregate demand also increases enough to purchase the larger volume of output without pushing the price level upward. This is one way to visualize the goal of economic growth with price stability. If LRAS grows but AD does not keep pace, the economy may experience weak demand and unemployment. If AD grows much faster than LRAS, inflationary pressure builds.

This point matters because growth is a supply-side achievement, but stable growth also requires demand conditions that allow the economy to buy what it can produce. A growing economy needs productivity and capacity on the supply side, but it also needs monetary and financial conditions that support stable spending. This balance is one reason macroeconomic policy is difficult.

9. Stagflation and Negative Supply Shocks

Stagflation occurs when the economy experiences stagnant or falling output along with rising prices. In the AD-AS model, this is usually shown by a leftward shift of SRAS. A negative supply shock, such as a sharp increase in energy prices, can reduce output and raise the price level at the same time. This combination is especially painful because the economy faces both higher unemployment and higher inflation.

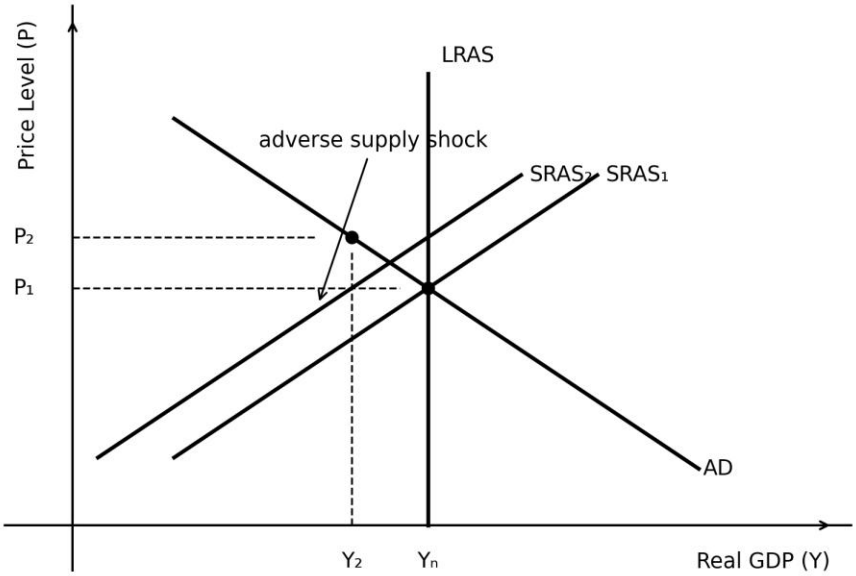

Figure 11.9. A negative supply shock shifts SRAS left, causing lower output and a higher price level.

Stagflation is important because it reveals the limits of simple demand-side thinking. If policymakers respond to higher unemployment by increasing AD, they may raise output but worsen inflation. If they respond to inflation by reducing AD, they may reduce price pressure but worsen unemployment. The 1970s made this problem central to macroeconomic debate and encouraged economists to pay more attention to expectations, supply shocks, credibility, and the natural rate of unemployment.[7]

10. Common Student Mistakes

- Confusing a movement along a curve with a shift of a curve. A change in the price level causes movement along AD or SRAS. A change in another determinant shifts the curve.
- Calling AD "GDP" without explaining the relationship. AD is planned spending on domestic output at each price level; equilibrium output becomes actual Real GDP.
- Forgetting LRAS when diagnosing the economy. AD and SRAS show short-run equilibrium, but LRAS tells you whether the economy is at, below, or above potential.
- Assuming full employment means zero unemployment. Full employment means unemployment is at the natural rate, not that every person has a job.
- Treating every inflation problem as a demand problem. Inflationary pressure can come from excessive aggregate demand or from a leftward shift in SRAS caused by rising production costs.
- Assuming market correction and policy correction are the same thing. Market self-correction works through wages, prices, and input costs; policy correction works through deliberate changes in fiscal or monetary conditions.

11. Why This Chapter Leads to the Next Chapters

After you learn to diagnose the economy with the AD-AS model, the next question is what should be done when the economy is not in long-run equilibrium. A recessionary gap raises questions about whether government spending, tax cuts, monetary expansion, lower interest rates, or market wage adjustment should close the gap. An inflationary gap raises questions about whether demand should be restrained, whether the central bank should tighten monetary policy, or whether policymakers should wait for wages and costs to adjust.

Keynesian economic thought generally emphasizes that aggregate demand failures can be severe and persistent because wages and prices are sticky. Neoclassical thought generally places more confidence in long-run market adjustment and the role of flexible prices and wages. Monetarist thought emphasizes the role of money growth, expectations, and long-run price stability. Modern macroeconomics uses pieces of each tradition, but the AD-AS model gives you the common language needed to compare them.

The goal in this chapter is not to settle those debates. The goal is to make sure you can read the economy's condition. Once you can identify a recessionary gap, an inflationary gap, long-run equilibrium, economic growth, or stagflation, you are ready to evaluate different policy responses.

Chapter Summary

The AD-AS model brings together the major tools of macroeconomics. Aggregate demand represents total planned spending on domestic output: consumption, investment, government purchases, and net exports. The AD curve slopes downward because of the real balance effect, interest rate effect, and international trade effect. A change in the price level causes movement along AD, while changes in spending determinants shift AD.

Short-run aggregate supply represents the quantity of output firms are willing to produce at each price level when some input costs are sticky. The SRAS curve slopes upward because higher prices can temporarily increase profits when input costs have not fully adjusted. Changes in input prices, energy costs, productivity, technology, or supply shocks shift SRAS.

Long-run aggregate supply is vertical at potential Real GDP, the sustainable level of output associated with full employment and the natural rate of unemployment. Long-run growth shifts LRAS to the right. Short-run equilibrium occurs where AD and SRAS intersect, but long-run equilibrium occurs only when AD, SRAS, and LRAS intersect together.

A recessionary gap occurs when equilibrium output is below potential output. Unemployment is above the natural rate, and the economy is producing too little. An inflationary gap occurs when equilibrium output is above potential output. Unemployment is below the natural rate, and the economy is producing beyond its sustainable capacity, creating upward pressure on wages and prices. Stagflation occurs when SRAS shifts left, raising the price level while lowering output. These diagnoses prepare you for the next chapters, where you will compare different schools of thought about how to correct an economy that is not in long-run equilibrium.

Key Terms

Term	Meaning
Aggregate demand (AD)	The relationship between the price level and the total quantity of domestic output demanded.
Aggregate supply (AS)	The relationship between the price level and the total quantity of domestic output supplied.
Short-run aggregate supply (SRAS)	Aggregate supply when some input prices are fixed or slow to adjust.
Long-run aggregate supply (LRAS)	Aggregate supply at potential Real GDP, independent of the price level.
Potential Real GDP	The sustainable full-employment level of real output.
Natural rate of unemployment	The unemployment rate consistent with full employment in the long run.
Recessionary gap	A situation in which actual Real GDP is less than potential Real GDP.
Inflationary gap	A situation in which actual Real GDP is greater than potential Real GDP.
Stagflation	A combination of rising prices and falling or stagnant output, often caused by a negative supply shock.
Self-correction	The process by which wages, input costs, and prices adjust over time to move the economy back toward potential output.

Workbook Questions and Problems

Part A: Conceptual Review

6. Explain why the AD-AS model is the bridge between earlier chapters on GDP, unemployment, inflation, and growth and later chapters on macroeconomic policy.
7. Why does the aggregate demand curve slope downward? Explain the real balance effect, interest rate effect, and international trade effect in your own words.
8. What is the difference between a movement along AD and a shift of AD? Give one example of each.
9. Why does SRAS slope upward in the short run? What role do sticky wages and input prices play?
10. Why is LRAS vertical? Why does a higher price level not permanently increase potential Real GDP?
11. Define potential Real GDP. How is it related to full employment and the natural rate of unemployment?
12. Why can the economy be in short-run equilibrium but still be in a recessionary gap?
13. Why can the economy be producing more than potential Real GDP in the short run but not in the long run?
14. Explain why stagflation is difficult for policymakers.
15. What does it mean to say that AD must grow at a pace compatible with LRAS growth if the economy is to grow with price stability?

Part B: Graphing Practice

For each problem, draw an AD-AS graph with AD, SRAS, and LRAS. Label the original equilibrium, shift the correct curve, label the new equilibrium, and explain what happens to Real GDP, unemployment, and the price level.

16. Consumer confidence falls sharply after households become worried about job security.
17. A central bank lowers interest rates, and business investment increases.
18. A major oil price increase raises transportation and production costs across the economy.
19. A wave of new technology improves productivity in manufacturing and services.
20. A tax cut raises disposable income and increases consumption spending.
21. A foreign recession reduces demand for U.S. exports.
22. A large infrastructure program raises government purchases.
23. A supply-chain disruption makes key inputs more expensive and harder to obtain.
24. The labor force grows and worker productivity rises over several years.
25. The domestic currency appreciates, making exports more expensive to foreigners and imports cheaper to domestic buyers.

Part C: Critical Thinking and Application

26. A policymaker says, “The economy is in recession, so we should increase aggregate demand.” What information would you want before agreeing or disagreeing? Use the AD-AS model in your answer.
27. A business leader says, “Higher wages are always good because workers have more income to spend.” Use the AD-AS model to explain why the macroeconomic effect depends on context.
28. Suppose actual Real GDP is below potential Real GDP and unemployment is above the natural rate. Explain how the economy might self-correct without policy intervention. Then explain why a Keynesian economist might not want to wait.
29. Suppose actual Real GDP is above potential Real GDP and inflation is rising. Explain why the economy feels strong in the short run but may be unstable in the long run.
30. Compare a recession caused by a fall in AD with a recession caused by a fall in SRAS. Why are the policy tradeoffs different?
31. Explain why stable long-run economic growth requires both supply-side growth in potential output and demand-side conditions that support spending without creating excessive inflation.
32. Using the AD-AS model, explain why an economy can have lower unemployment and higher inflation in the short run but not necessarily in the long run.
33. Why is consumer confidence so important in the AD-AS model? Explain how one change in confidence can affect consumption, investment, inventories, and employment.

Part D: Numerical and Analytical Problems

Use the information in each scenario to identify the gap and explain the likely direction of pressure on wages or input costs.

Scenario	Actual Real GDP	Potential Real GDP	Unemployment condition	Your task
1	$22.0 trillion	$23.0 trillion	Above the natural rate	Identify the gap and describe the likely self-correction process.
2	$24.5 trillion	$23.8 trillion	Below the natural rate	Identify the gap and describe what happens to wages and SRAS over time.
3	$25.0 trillion	$25.0 trillion	At the natural rate	Explain why this is long-run equilibrium if AD and SRAS also intersect at this output.
4	$21.5 trillion	$22.4 trillion	Above the natural rate	Explain why firms may cut production and employment when inventories rise unexpectedly.

34. Suppose potential Real GDP is $24 trillion and actual Real GDP is $22.8 trillion. Calculate the output gap in dollars. Is it recessionary or inflationary?
35. Suppose actual Real GDP rises from $20 trillion to $21 trillion after AD shifts right, while the price level rises from 110 to 116. Explain what happened to output, unemployment, and inflation pressure.
36. Suppose SRAS shifts left because energy prices increase. Real GDP falls from $23 trillion to $22 trillion and the price level rises from 120 to 128. Explain why this is not a typical demand-side recession.
37. Suppose LRAS shifts right from $25 trillion to $26 trillion while AD also shifts right enough to keep the price level stable. Explain why this represents growth with price stability.

Part E: Short Essay Questions

38. Explain how the AD-AS model helps you diagnose whether an economy is meeting the goals of full employment, price stability, and economic growth.
39. Discuss the difference between short-run and long-run adjustment in the AD-AS model. Why does this difference matter for policy debates?
40. Use the AD-AS model to explain how a fall in consumer confidence can spread through the economy and raise unemployment.
41. Use the AD-AS model to explain why inflation can arise from either excessive aggregate demand or reduced short-run aggregate supply.
42. Preview the policy debate: should policymakers intervene to close a recessionary gap, or should they allow market self-correction? Present arguments on both sides using the AD-AS model.

Endnotes

1. Arthur M. Okun, "Potential GNP: Its Measurement and Significance," Proceedings of the Business and Economic Statistics Section of the American Statistical Association (1962): 98–104.

2. Milton Friedman, "The Role of Monetary Policy," American Economic Review 58, no. 1 (1968): 1–17; Edmund S. Phelps, "Money-Wage Dynamics and Labor-Market Equilibrium," Journal of Political Economy 76, no. 4, Part 2 (1968): 678–711.

3. John B. Taylor, "Staggered Wage Setting in a Macro Model," American Economic Review 69, no. 2 (1979): 108–113; Guillermo A. Calvo, "Staggered Prices in a Utility-Maximizing Framework," Journal of Monetary Economics 12, no. 3 (1983): 383–398; George A. Akerlof, William T. Dickens, and George L. Perry, "The Macroeconomics of Low Inflation," Brookings Papers on Economic Activity 1996, no. 1 (1996): 1–76.

4. Friedman, "Role of Monetary Policy"; Phelps, "Money-Wage Dynamics."

5. John Maynard Keynes, The General Theory of Employment, Interest and Money (London: Macmillan, 1936).

6. Friedman, "Role of Monetary Policy"; Phelps, "Money-Wage Dynamics."

7. Robert J. Gordon, "What Is New-Keynesian Economics?" Journal of Economic Literature 28, no. 3 (1990): 1115–1171; Laurence Ball, N. Gregory Mankiw, and David Romer, "The New Keynesian Economics and the Output-Inflation Trade-off," Brookings Papers on Economic Activity 1988, no. 1 (1988): 1–82.

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