

Unit 3: National Income and Price Determination

Unit 3 is the core model of AP Macroeconomics. It builds the aggregate demand and aggregate supply model, explains how the economy settles at a level of output and a price level, and shows how fiscal policy and the economy's own wage adjustment move it back toward full employment.

AP Macroeconomics

National Income and Price Determination

About 14 minutes to read

How to use this guide

Read it in order the first time because the topics build on each other. Aggregate demand and the multipliers come first, then short-run and long-run aggregate supply, then the equilibrium where they meet. Shocks move the curves, self-adjustment brings the economy back, and fiscal policy is the government's way of speeding that up. Automatic stabilizers close out the unit.

After the first read, use the trap boxes and the comparison table to review the distinctions that exam questions test most often: which curve shifts, which multiplier to use, and which gap you are looking at. Finish with the practice questions, then complete the recall check on the last page out loud and note any items you cannot explain yet.

What this unit is worth. National Income and Price Determination is 17 to 27 percent of the AP Macroeconomics exam, one of the two biggest units. It also carries weight beyond that range, because the AD-AS model built here is the framework that later units keep returning to. A firm grip on these curves carries into the rest of the course.

3.1 Aggregate Demand (AD)

Aggregate demand is the total quantity of all final goods and services that households, firms, the government, and foreign buyers want to purchase at each price level, holding everything else constant. It is the whole-economy version of demand, and like a single-market demand curve it slopes downward. Adding up its parts gives the familiar identity: $AD = C + I + G + X_n$.

The downward slope comes from three effects of a changing price level. The **wealth effect**: when the price level rises, the money people hold buys less, so real wealth falls and households cut consumption. The **interest-rate effect**: a higher price level raises the demand for money, which pushes interest rates up and makes investment and big-ticket consumption more expensive. The **net export effect**: a higher domestic price level makes exports relatively expensive abroad and imports relatively cheap at home, so net exports fall. Each effect says the same thing in different words. A higher price level means a smaller quantity of output demanded.

Shifts of AD come from anything that changes C , I , G , or X_n at a given price level. Consumer spending shifts with after-tax income, household wealth from assets like stocks and housing, expectations about the future, and household debt. Investment shifts with interest rates set in financial markets, business expectations, and new technology. Government spending shifts when the budget changes. Net exports shift with foreign income, exchange rates, and foreign tastes for domestic goods.

Trap. A change in the price level is a movement along the AD curve, never a shift of it. Students see "prices rise, so people buy less" and draw a leftward shift. That is wrong. The AD curve already shows how quantity demanded responds to the price level, so a price change slides you along the curve you have. Only changes in C , I , G , or X_n at a fixed price level shift the curve.

3.2 Multipliers

A **multiplier** measures how an initial change in spending ripples through the economy. When the government spends an extra \$100 billion building roads, the construction firms receive \$100 billion of new income. They spend part of it and save the rest. The part they spend becomes someone else's income, which is partly spent again, and so on. Each round is smaller than the last because some income leaks into saving.

The size of the ripple depends on the **marginal propensity to consume (MPC)**, the fraction of each extra dollar of income that gets spent, and the **marginal propensity to save (MPS)**, the fraction saved. Since every extra dollar is either spent or saved, $MPC + MPS = 1$. The **spending multiplier** equals $1 / MPS$, which is the same as $1 / (1 - MPC)$. With an MPC of 0.8, the MPS is 0.2 and the multiplier is $1 / 0.2 = 5$. A \$100 billion increase in government spending then raises real GDP by \$500 billion, holding the price level constant.

Tax changes get a different multiplier. The **tax multiplier** equals $-MPC / MPS$. It is negative because a tax increase reduces GDP, and it is smaller in absolute value than the spending multiplier because the first round of a tax cut is partly saved. Only the spent portion, MPC times the cut, enters the spending chain. With an MPC of 0.8, the tax multiplier is $-0.8 / 0.2 = -4$, so a \$100 billion tax cut raises GDP by \$400 billion. If government spending and taxes rise by the same amount, the **balanced-budget multiplier** is 1, and GDP rises by exactly the amount of the increase.

Trap. Never use the spending multiplier on a tax change. A \$100 billion tax cut with an MPC of 0.8 does not raise GDP by \$500 billion. Part of the cut is saved in the first round, so the correct multiplier is the tax multiplier, -4, giving \$400 billion. Using 5 here is one of the most common arithmetic errors on the

3.3 Short-Run Aggregate Supply (SRAS)

Short-run aggregate supply shows the quantity of output firms are willing to produce at each price level, holding input prices and expectations fixed. It slopes upward. When the overall price level rises but wages and other input costs have not caught up yet, production becomes more profitable and firms expand output.

Three reasons explain why input costs lag behind. **Sticky wages**: many workers are paid under contracts that fix nominal wages for a year or more, so a rising price level cuts real labor costs temporarily. **Sticky prices**, sometimes called menu costs: firms face costs and risks in changing their posted prices, so some prices adjust slowly. **Misperceptions**: when the price level rises, an individual producer may mistake the general increase for a rise in the relative price of her own product and expand output. All three fade as time passes, which is why this curve describes the short run only.

SRAS shifts when the cost of production changes at a given price level. Higher **input prices**, such as oil or wages, shift SRAS left. Higher **productivity** shifts it right, since each worker produces more. **Taxes on producers** shift SRAS left by raising costs, while **subsidies** shift it right. **Supply shocks** like droughts or wars shift it left, and changes in **expected inflation** shift it as firms and workers build expectations into wages and prices.

Trap. A change in the price level does not shift SRAS. It moves the economy along the SRAS curve to a new quantity supplied. SRAS shifts only when production costs or productivity change independently of the price level. If the story mentions oil prices, wages, or productivity, shift the curve. If it only mentions the price level, slide along it.

3.4 Long-Run Aggregate Supply (LRAS)

Long-run aggregate supply is vertical at **full-employment output**, also called potential GDP and labeled Y_f . In the long run, wages and prices have fully adjusted, so the price level no longer affects how much the economy can produce. What the economy can produce depends only on its resources and how productively it uses them.

LRAS shifts only when the economy's productive capacity changes: the quantity or quality of **labor**, **capital**, and **natural resources**, improvements in **technology**, or changes in **institutions** such as property rights and the legal system. A larger or better-educated labor force, more capital equipment, or a genuine technological advance shifts LRAS right. Nothing about demand, the price level, or fiscal policy moves it.

Trap. Fiscal policy and demand shocks never shift LRAS. A tax cut that raises spending shifts AD, and an oil shock shifts SRAS, but LRAS stays put in both stories. LRAS moves only for supply-side reasons: resources, technology, and institutions. When a question asks which curve shifts, check the cause against this list before you answer.

3.5 Equilibrium in the Aggregate Demand-Aggregate Supply Model

Short-run equilibrium is where AD and SRAS intersect. That point gives the economy's actual real GDP and the actual price level. **Long-run equilibrium** is stricter: all three curves, AD, SRAS, and LRAS, intersect at a single point, which means the economy is producing exactly at full-employment output Y_f .

When short-run equilibrium output differs from Y_f , the economy has an **output gap**. An **inflationary gap** means equilibrium output is above Y_f . The economy is overproducing, unemployment is below its natural rate, and upward pressure on wages and prices is building. A **recessionary gap** means equilibrium output is below Y_f . Resources sit idle, unemployment is above its natural rate, and downward pressure on wages and prices is building. The gap is named by where output sits relative to Y_f , not by what happens to prices.

Trap. Students mix up the gap names constantly. "Inflationary gap" does not mean prices are falling, and "recessionary gap" does not guarantee deflation. The name tells you output is above or below full employment. An inflationary gap is output above Y_f . A recessionary gap is output below Y_f . Anchor the name to the output position every time.

3.6 Changes in the AD-AS Model in the Short Run

Every shock in this model works through one of the curves, and the table below summarizes what follows. A rightward shift of AD raises output and the price level while lowering unemployment. If it persists, the rising price level is **demand-pull inflation**: too much spending chasing the economy's capacity.

A leftward shift of SRAS does the opposite on output and prices at once: output falls while the price level rises, and unemployment climbs. Rising prices with falling output is **cost-push inflation**, and the combination of stagnation plus inflation is **stagflation**. This is the painful shock, because the usual policy response to inflation makes the output problem worse and vice versa.

SHOCK	REAL GDP	PRICE LEVEL	UNEMPLOYMENT
AD shifts right	Rises	Rises	Falls
AD shifts left	Falls	Falls	Rises
SRAS shifts right	Rises	Falls	Falls
SRAS shifts left	Falls	Rises	Rises

Trap. Rising prices do not always mean the economy is booming. When AD shifts right, prices and output rise together. When SRAS shifts left, prices rise while output falls. Read which curve shifted before you describe the economy. The exam loves a story about an oil price spike followed by answer choices that assume a demand boom.

3.7 Long-Run Self-Adjustment

The model has a built-in return mechanism because wages eventually adjust. Start with a **recessionary gap**: output is below Y_f and unemployment is above its natural rate. With many workers competing for few jobs, nominal wages fall. Lower wages cut firms' production costs, which shifts SRAS to the right. Output rises back toward Y_f , and the price level falls along the way. The economy reaches a new long-run equilibrium at full employment with a lower price level, and no government action was required.

An **inflationary gap** self-corrects in the mirror image. Output above Y_f means unemployment below its natural rate, so firms bid wages up to attract scarce workers. Higher wages raise production costs and shift SRAS left. Output falls back to Y_f while the price level rises. The classical economists trusted this mechanism completely and saw little need for government intervention.

The Keynesian objection is about speed and symmetry. Wages may be **sticky downward**: workers resist pay cuts, contracts lock wages in, and minimum wage laws set a floor. If wages do not fall during a recession, the SRAS shift is slow or never arrives, and the economy can sit below full employment for a long time. That possibility is the intellectual case for active fiscal policy in the next topic.

Trap. Self-adjustment shifts SRAS, not LRAS. In a recessionary gap, falling wages shift the SRAS curve right until it meets AD at Y_f . LRAS never moves during this process. Answers that shift LRAS to close a gap are describing long-run growth, not self-correction, and they are wrong for this question type.

3.8 Fiscal Policy

Fiscal policy is deliberate change in government spending or taxes to influence the economy, and it works by shifting AD. **Expansionary fiscal policy** fights a recessionary gap: the government increases spending, cuts taxes, or raises transfer payments, which shifts AD right and moves output toward Y_f . **Contractionary fiscal policy** fights an inflationary gap: the government cuts spending or raises taxes, which shifts AD left and cools the economy back toward Y_f .

The policy must be multiplied to size it. Closing a \$200 billion recessionary gap with an MPC of 0.8 means the AD curve must shift right by \$200 billion, so the required spending increase is \$200 billion divided by the spending multiplier of 5, or \$40 billion. A tax cut would need to be larger, \$50 billion, because the tax multiplier is only 4 in absolute value. This is where topic 3.2 stops being arithmetic practice and starts being policy.

Fiscal policy moves the budget too. Expansionary policy during a recession typically increases a **budget deficit** or shrinks a surplus, since spending rises or tax revenue falls. Contractionary policy does the reverse. Policy also faces **lags**: time to recognize the problem, time to pass legislation, and time for the spending to take effect. By the time the stimulus arrives, the economy may have already started recovering on its own.

Trap. Match the policy to the gap, and check the direction of the AD shift. Expansionary policy, higher G or lower T , shifts AD right and belongs to a recessionary gap. Contractionary policy shifts AD left and belongs to an inflationary gap. The single most common error is prescribing a tax cut for an inflationary gap or a spending cut for a recession, which pushes the economy further from full employment.

3.9 Automatic Stabilizers

Automatic stabilizers are features of the tax and transfer system that cushion the economy without any new legislation. The three to know are **progressive income taxes**, **unemployment insurance**, and **welfare and transfer programs**. They are always on, and they push back against whichever direction the economy is moving.

In a recession, incomes fall, so households automatically owe less under a progressive tax system, which leaves them with more after-tax income than a flat tax would. Layoffs automatically trigger unemployment insurance payments, and more families automatically qualify for welfare programs. All of this supports consumer spending and softens the fall in AD. In an expansion, the reverse happens automatically: rising incomes push households into higher tax brackets, transfer payments shrink, and the extra drag cools demand. Stabilizers reduce the size of fluctuations, but they do not close gaps on their own.

Trap. Automatic stabilizers require no new law. A stimulus check that Congress votes for during a recession is discretionary fiscal policy, not an automatic stabilizer, even though both raise spending. If the question says Congress passed something, it is discretionary. If payments rise or taxes fall because incomes changed under existing law, it is automatic.

Confusions That Cost Points

PAIR	HOW TO KEEP THEM STRAIGHT
Movement along AD vs shift of AD	A change in the price level slides along the AD curve. Only changes in C, I, G, or X_n at a fixed price level shift it.
Spending multiplier vs tax multiplier	Spending multiplier is $1 / \text{MPS}$. Tax multiplier is $-\text{MPC} / \text{MPS}$, smaller in absolute value because part of a tax cut is saved. Never use the spending multiplier on a tax change.
SRAS shifters vs LRAS shifters	SRAS shifts with input prices, productivity, producer taxes and subsidies, and supply shocks. LRAS shifts only with resources, technology, and institutions.
Inflationary gap vs recessionary gap	Inflationary gap: output above Y_f . Recessionary gap: output below Y_f . Name the gap by the output position, not by prices.
Demand-pull vs cost-push inflation	Demand-pull: AD shifts right, output and prices rise together. Cost-push: SRAS shifts left, prices rise while output falls (stagflation).
Discretionary policy vs automatic stabilizers	Discretionary means the government acted: new spending or tax laws. Automatic means existing programs responded on their own: progressive taxes, unemployment insurance, welfare.
Self-adjustment: which curve shifts	Wage adjustment shifts SRAS toward LRAS. LRAS does not move during self-correction.

Practice Questions

Original questions written for this guide in the style of the AP exam. Answers and explanations are on the next page, so complete the questions before checking them.

1. Which of the following would cause a movement along the aggregate demand curve rather than a shift of the curve?

1. An increase in the price level
2. A decrease in government spending
3. An increase in foreign income
4. A cut in personal income taxes

2. The marginal propensity to consume is 0.75. The government increases spending by \$200 billion, with no change in taxes. Assuming the price level is constant, by how much will equilibrium real GDP increase?

1. \$150 billion
2. \$200 billion
3. \$800 billion
4. \$267 billion

3. The marginal propensity to consume is 0.8. The government cuts taxes by \$100 billion, with no change in spending. By how much will real GDP change?

1. Increase by \$500 billion
2. Increase by \$400 billion
3. Increase by \$80 billion
4. Decrease by \$400 billion

4. Which of the following would shift the short-run aggregate supply curve but NOT the long-run aggregate supply curve?

1. A breakthrough in production technology
2. An increase in the price of oil
3. Growth in the size of the labor force
4. A new trade agreement that opens foreign markets to domestic goods

5. An economy is producing real GDP of \$18 trillion while full-employment output is \$19 trillion. Which of the following is true?

1. There is an inflationary gap of \$1 trillion.
2. There is a recessionary gap of \$1 trillion.
3. The price level must be rising.
4. The long-run aggregate supply curve has shifted to the left.

6. An economy is in a recessionary gap. According to the classical long-run self-adjustment process, how does the economy return to full employment without government action?

1. Falling wages and input prices shift the short-run aggregate supply curve rightward until output returns to full-employment output at a lower price level.
2. Rising consumer confidence shifts the aggregate demand curve rightward until the gap closes.
3. The government increases spending, which shifts aggregate demand rightward through the multiplier.
4. The long-run aggregate supply curve shifts rightward as unemployed workers find jobs.

7. An economy is experiencing an inflationary gap. Which of the following discretionary fiscal policies would be most appropriate?

1. Increase government spending and cut taxes
2. Decrease government spending and increase taxes
3. Increase government spending and increase taxes
4. Do nothing, because automatic stabilizers require new legislation to take effect

8. Which of the following is an example of an automatic stabilizer?

1. A one-time stimulus check that Congress passes during a recession
2. An increase in unemployment insurance payments as layoffs rise, with no new law passed
3. The central bank lowering interest rates to encourage borrowing
4. Congress raising the minimum wage to increase workers' purchasing power

Answer Key

- 1. A.** A change in the price level moves the economy along the existing AD curve because the curve already plots quantity demanded against the price level. B shifts AD left through G. C shifts AD right through net exports, since richer foreigners buy more domestic goods. D shifts AD right through C, since households keep more after-tax income.
- 2. C.** The spending multiplier is $1 / \text{MPS} = 1 / (1 - 0.75) = 1 / 0.25 = 4$. Multiply the \$200 billion of new spending by 4 to get \$800 billion. A multiplies by the MPC instead of the multiplier, which gives only the second round of spending. B ignores the multiplier entirely. D divides by the MPC, which is the wrong formula; the multiplier uses the MPS in the denominator.
- 3. B.** Tax changes use the tax multiplier, $-\text{MPC} / \text{MPS} = -0.8 / 0.2 = -4$. A tax cut is a negative change in taxes, so the change in GDP is -4 times -\$100 billion, which is +\$400 billion. A applies the spending multiplier of 5 to a tax change, the classic error; part of the cut is saved, so the tax multiplier is smaller. C counts only the first round of new spending, \$100 billion times 0.8, and stops before the multiplier chain finishes. D gets the magnitude right but the sign wrong; a tax cut raises GDP, it does not reduce it.
- 4. B.** An oil price increase raises firms' input costs, which shifts SRAS left. It does not change the economy's long-run productive capacity, so LRAS stays put. A shifts both curves right: better technology raises productivity (SRAS) and expands long-run capacity (LRAS). C expands the economy's resources, which shifts LRAS right. D raises net exports, which shifts AD right, not either supply curve.
- 5. B.** Output of \$18 trillion is below full-employment output of \$19 trillion, which is the definition of a recessionary gap, and the gap is \$1 trillion. A reverses the names; output above Y_f would be the inflationary gap. C confuses the gap with its price pressure: a recessionary gap puts downward pressure on wages and prices, and nothing here says prices must be rising. D invents a curve shift; the gap is measured against a fixed LRAS, and no information suggests LRAS moved.
- 6. A.** In the classical self-adjustment story, high unemployment in a recessionary gap pushes nominal wages down, lower wages cut production costs, and SRAS shifts right until the economy is back at Y_f with a lower price level. B shifts the wrong curve; self-adjustment works through supply, not a spontaneous demand recovery. C describes discretionary fiscal policy, which is government action, the opposite of what the question asks for. D shifts the wrong curve and misunderstands LRAS; unemployed workers finding jobs moves the economy back toward Y_f along existing curves, it does not shift long-run capacity.
- 7. B.** An inflationary gap calls for contractionary fiscal policy: lower government spending, higher taxes, or both, which shifts AD left and cools the economy back toward Y_f . A is expansionary policy, which would widen the inflationary gap. C pushes in both directions at once and is not a coherent stabilization policy. D misstates how stabilizers work; automatic stabilizers take effect without any new legislation, which is exactly what makes them automatic.
- 8. B.** Unemployment insurance payments rise automatically when layoffs increase under existing law, with no new vote required. That is the definition of an automatic stabilizer. A is discretionary fiscal policy because Congress had to pass it. C is monetary policy, not fiscal policy at all. D is a regulatory change, not a stabilizer; it does not automatically expand and contract with the business cycle.

When you check your answers, note which distinction each miss came from. Make a flashcard for that distinction and drill it spaced out over the next few days instead of rereading the whole section. If you missed one of these questions, the same distinction is worth practicing again in Rycal, where the

National Income and Price Determination deck has flashcards for it and more practice questions use the same kinds of traps.

One-Page Recall Check

Say each answer out loud before you look back, and mark the ones you cannot finish. Anything you cannot say out loud yet belongs in your flashcard deck. In Rycal, add those items to the National Income and Price Determination deck and let spaced review bring them back over the next few days.

- Define aggregate demand and write the identity that adds up its components.
- Explain the wealth effect, the interest-rate effect, and the net export effect behind the downward slope of AD.
- List three things that shift AD and explain which component each one works through.
- Explain why a change in the price level is a movement along AD, not a shift.
- Write the spending multiplier formula and compute it for an MPC of 0.9.
- Write the tax multiplier formula and explain why it is smaller in absolute value than the spending multiplier.
- Give the three reasons the SRAS curve slopes upward.
- List the shifters of SRAS and the shifters of LRAS, and name one shifter that moves SRAS but not LRAS.
- Define short-run equilibrium and long-run equilibrium in the AD-AS model.
- Define the inflationary gap and the recessionary gap using output relative to Y_f .
- Use the shock table to describe what happens to output, the price level, and unemployment when SRAS shifts left.
- Walk through the long-run self-adjustment process for a recessionary gap, naming the curve that shifts and the final price level result.
- State which fiscal policy fits each gap and which direction AD shifts in each case.
- Name the three automatic stabilizers and explain how each one responds in a recession without new legislation.

Where to go next. Turn every missed item above into flashcards and drill them spaced out over several days rather than in one sitting. In Rycal, open the National Income and Price Determination deck under AP Macroeconomics. The deck covers the terms in this guide, and its practice questions target the same traps named here. If you have a test date, add it in the Test Planner. You can also start your next review with a Brain Dump, then check what you missed against this guide. Unit 4, the Financial Sector, builds directly on this unit: money, interest rates, and the loanable funds market determine the investment spending that shifts the AD curve you just learned.

Key terms for this unit

Aggregate demand (AD), Wealth effect, Interest-rate effect, Net export effect, Marginal propensity to consume (MPC), Marginal propensity to save (MPS), Spending multiplier, Tax multiplier, Balanced-budget multiplier, Short-run aggregate supply (SRAS), Sticky wages, Sticky prices (menu costs), Misperceptions, Productivity, Supply shock, Long-run aggregate supply (LRAS), Full-employment output (potential GDP, Y_f), Short-run equilibrium, Long-run equilibrium, Inflationary gap, Recessionary gap (output gap), Demand-pull inflation, Cost-push inflation, Stagflation, Long-run self-adjustment, Sticky downward wages, Fiscal policy, Expansionary fiscal policy, Contractionary fiscal policy, Discretionary fiscal policy, Budget deficit, Automatic stabilizers, Progressive income taxes, Unemployment insurance.

About this guide. Written for Rycal and aligned to the College Board AP Macroeconomics course framework, Unit 3. All questions and explanations are original Rycal writing. Rycal is independent and is not affiliated with or endorsed by the College Board.